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During Stage 2 of the Site C Project, studies are underway to update many of the historical studies and information known about the project.

The potential Site C project, as originally conceived, will be updated to reflect current information and to incorporate new ideas brought forward by communities, First Nations, regulatory agencies and stakeholders. Today's approach to Site C will consider environmental concerns, impacts to land, and opportunities for community benefits, and will update design, financial and technical work.

PEACE RIVER SITE C PROJECT
FORESTRY STUDIES

A REVIEW OF THE FOREST RESOURCE WITHIN THE PEACE REGION AND THE AREA DIRECTLY AFFECTED BY THE SITE C PROJECT

JUNE 1991

PREPARED FOR:
BRITISH COLUMBIA HYDRO AND
POWER AUTHORITY

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PEACE RIVER SITE C PROJECT
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EXECUTIVE SUMMARY

The British Columbia Hydro and Power Authority (B.C. Hydro) is in the process of updating environmental studies of the proposed Site C hydroelectric Project on the Peace River. This report addresses the following aspects of the forestry studies:

1. A review and summation of the present distribution and utilization of the forest resources within the Peace region (consisting of the Fort St. John and Dawson Creek Timber Supply Areas).

2. An inventory and detailed summation of the forest resources within the project-affected area inclusive of the reservoir, the transmission line right-of-way widening, the construction site and the Highway 29 relocation right-of-way.

The Forest Resource Within the Peace Region

The net land base that supports the current coniferous Allowable Annual Cut (AAC) in the Peace region is 861,200 hectares (ha.). Total Allowable Annual Cut for coniferous species is 2,020,335 cubic metres (m^3). This includes 410,000 m^3 from TFL No. 48 (Canfor-Chetwynd) and 1,633,201 m^3 in Forest Licences and Timber Sale Licences held by Canfor, West Fraser Mills, and various licensees with smaller AACs.

The net land base that supports the deciduous Allowable Annual Cut is 873,800 ha. The Allowable Annual Cut for deciduous species is 1,915,000 m^3. Louisiana Pacific Panel Products Ltd. operating a panel board plant at Dawson Creek and a Pulp Mill at Chetwynd has rights to 904,000 m^3 of this AAC through Pulpwood Agreement (PA) tenures. The bulk of the remaining deciduous AAC, 1,011,000 m^3, is held in PAs by companies that have not yet built timber processing facilities in this region.

The Forest Resource in the Areas Directly Affected by the Site C Project.

The total land base directly affected (proposed reservoir, construction site, transmission Line ROW widening and Highway 29 relocation) is described as follows:

Category	Crown		Private		All Ownership	
	Area (ha)	%	Area (ha)	%	Area (ha.)	%
Merchantable Coniferous Forest	1,073.64	14.2	108.19	1.4	1,181.83	15.6
Merchantable Deciduous Forest	2,242.30	29.5	589.19	7.8	2,831.49	37.3
Non-merchantable forest	848.21	11.2	49.40	0.6	897.61	11.8
Non-forest	1,687.01	22.2	988.99	13.1	2,676.00	35.3
ALL	5,851.16	77.1	1,735.77	22.9	7586.93	100.0

NOTE: An additional 3430.8 of water bodies (Peace River, Halfway River etc.) are within the proposed reservoir making the total area affected (land and water) 11,017.73 ha. Merchantable forest is defined as all stands with an average net volume greater than or equal to 80 m^3/ha regardless of age.

The total net volume on the crown and private merchantable area is 1,202,330 m^3. This consists of 801,846 m^3 (66.7 percent) of deciduous timber and 400,484 m^3 (33.3 percent) of coniferous timber. Logging accessibility of this timber has not been determined.

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1.0 INTRODUCTION AND OBJECTIVES

The British Columbia Hydro and Power Authority (B.C. Hydro) is in the process of updating environmental studies of the proposed Site C Hydroelectric Project on the Peace River. An investigation of the forest resource and users of this resource that would be affected by this project form an integral part of these studies. Industrial Forestry Service Ltd. was asked in August of 1990 to proceed with the following phases of the Forestry Studies:

1. A review and summation of the present distribution and utilization of the forest resources within the Peace region.

2. An inventory and detailed summation of the forest resources within the project study area inclusive of the proposed reservoir area, transmission line right-of-way widening, construction site and the Highway 29 right-of-way relocation.

These phases of the Forestry Studies represent part of a larger series of forestry studies as outlined in the Draft Terms of Reference (Appendix I).

2.0 A REVIEW OF THE FOREST RESOURCE WITHIN THE PEACE REGION

2.1 The Forest Resource

Within this section the following items are addressed.

- A review is made of the forest resource in the Peace region.
- The uses and users of the forest resource within the Peace region are identified.

- Significant trends in resource availability, quality and use are summarized.

For the purposes of this report, the Peace region is defined as the Dawson Creek and Fort St. John Timber Supply Areas (TSAs) and Tree Farm Licence (TFL) No. 48. The forest resource of the TFL and both of these TSAs will be directly affected should the Site C project proceed. Figure 1 is a key map to the location of the two TSAs and Figure 4 shows the location of the TFL.

The basis for the forest resource analysis is the current Ministry of Forests Resource Analysis for the applicable Timber Supply Area (TSA). Documents used and cited include:

- **Draft Fort St. John TSA Plan #1**, Ministry of Forests - Prince George Region, November 1987
- **Dawson Creek TSA- Deciduous Timber Supply Analysis**, Ministry of Forests - Prince George Forest Region, May 1989
- **Dawson Creek TSA - Supplemental Coniferous Timber Supply Analysis**, Ministry of Forest - Prince George Forest Region, May 1989
- **Pulpwood Area #13 - Timber Supply Analysis**, Ministry of Forests - Prince George Forest Region, March 1988
- **Tree Farm Licence No. 48 - Timber Supply Analysis for the Revised AAC Rationale Scenario**, Ministry of Forests and Lands, December 1987

The majority of the forest inventorty work that supports the above analyses was done between 1969 and 1972.

It should be noted that during 1989 IFS was asked by the B.C. Forest Resource Commission to review analysis procedures used in the most recent timber supply analysis done on the Fort St. John TSA. Results of this study were published

in the *Forest Resources Commission Background Papers - Volume 7,* February 1990. Significant findings relating to the TSA analysis but not discussed in this report include:

1. Intensive silviculture programs originally planned to increase coniferous long-run sustained yield (LRSY) in the future are included in the yield analysis but have not yet materialized. This involves 98,100 ha. of currently non-satisfactory restocked land. This area conyributes approximately 226,000 m^3/yr to the LRSY.

2. The deciduous Allowable Annual Cut (AAC) may be overstated by 400,000 m^3/year due to the following:

    - Problem forest type reductions for unmerchantable deciduous stands appear to be to low.
    - The impact of planned range burning for domestic cattle and wildlife does not appear to be adequately allowed for.
    - The allowance of 5.5% of the current land base lost to non-productive (NP) following the first harvest may not be adequate. Up to 15 percent of sites may be adversely affected by harvesting. In addition, significant areas of the TSA are being lost to rights-of-way and seismic activity.

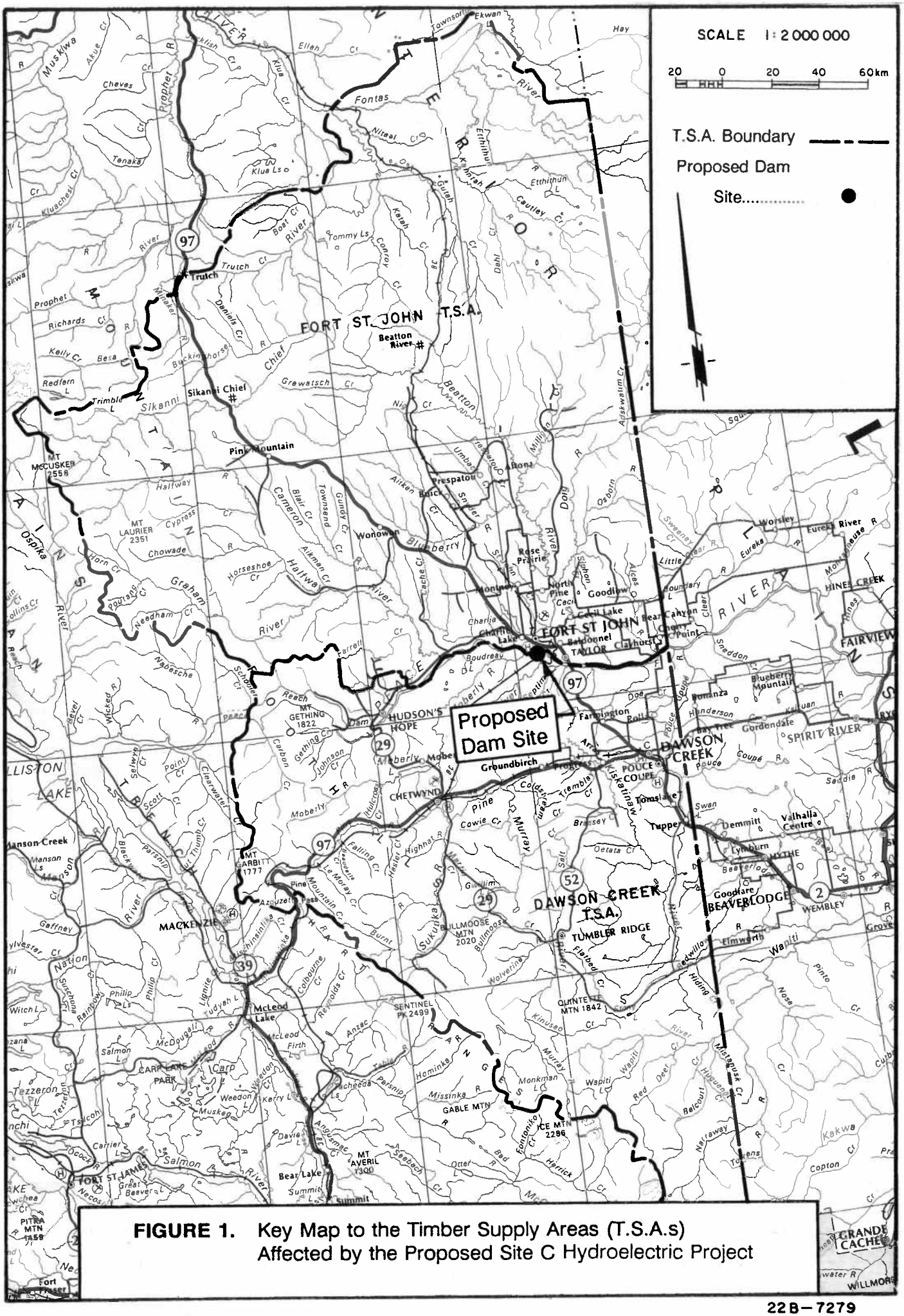

FIGURE 1. Key Map to the Timber Supply Areas (T.S.A.s) Affected by the Proposed Site C Hydroelectric Project

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2.1.1 Forest Ecology of the Peace Region

The Boreal White and Black Spruce (BWBS) Biogeoclimatic Zone comprises the vast majority of the Peace region. This zone occurs on an extension of the Great Plains (the Alberta Plateau) into the northeastern corner of British Columbia. It is characterized by its Northern Continental climate with frequent outbreaks of arctic air masses, long and cold winters and a short growing season. Forests of white spruce (*Picea glauca*), lodgepole pine (*Pinus contorta*), trembling aspen (*Populus tremuloides*), balsam poplar (*Populus balsamifera*) and paper birch (*Betula papyrifera*) predominate on the better drained plateau, foothill and cordilleran sections of the zone. Soils in these forested areas are primarily Grey Luvisols. The poorly drained lowlands support forests of black spruce (*Picea mariana*) and occasionally tamarack (*Larix laricina*). Lowland soils are Organic Cryosols, Luvic Gleysols and Organics resulting from the buildup of organic matter from bog vegetation.

The most productive forests and agricultural lands of this zone occur on rich, well drained alluvial sites. Soils on these floodplains are generally Cumulic Regosols. Forest productivity can exceed seven m^3/ha/yr. On these sites white spruce and balsam poplar may reach heights of over 50 metres.

Other biogeoclimatic zones represented in the Peace region include the Sub-boreal Spruce (SBS), the Engelmann Spruce-Subalpine Fir (ESSF), the Spruce-Willow-Birch (SWB) and the Alpine Tundra (AT) Zones.

Appendix IX is a key map to the location of the Biogeoclimatic Zones within the Peace Region.

The climate of the SBS Zone is continental and is characterized by

seasonal extremes of temperature, severe winters, relatively warm, moist and short summers and relatively low annual precipitation. This zone is transitional between the BWBS Zone of the Great Plains and the ESSF Zone of the mountains. Climax forests of the SBS Zone contain hybrid white spruce (*Picea engelmannii X P. glauca*), white spruce, and subalpine fir, also known as balsam (*Abies lasiocarpa*). Lodgepole pine, trembling aspen and paper birch pioneer the extensive pre-climax stands.

The ESSF Zone lies between the SBS and the AT Zones. The climate of the ESSF is relatively moist, with long snowy winters and a short, cool growing season. Trees growing in the ESSF must tolerate severe winters with long periods of frozen ground. Engelmann spruce, subalpine fir and lodgepole pine are the dominant climax species.

The AT Zone occurs above 1400 metres in elevation in this area of the province. Its climate is characterized by harsh, cold, windy and snowy winters, low growing season temperatures and a very short frost free period. The AT Zone is by definition treeless, but tree species are common albeit in stunted or krummholz form. The AT Zone occupies less than one percent of this region.

2.1.2 The Net Land Base

The net land base is generally defined as that portion of the total land area of a management unit which is deemed to contribute to, and be available for, long-term timber supply. The total net land base for the Peace region is summarized in Table 1. The Ministry of Forests recent TSA analyses report that the net coniferous land base of the Dawson Creek and Fort St. John TSAs is composed of 60 percent spruce stands, 38 percent lodgepole pine

TABLE 1. Current Net Land Base Summary[1] for the Forest Resource of the Peace Region[2]

Classification	Fort St. John TSA		Dawson Creek TSA		Tree Farm Licence 48		Total		
	Area (ha)	Area (ha)	Area (ha)	Area (ha)	Area (ha)	Area (ha)	Area (ha)	Area (ha)	% of Total Area
Total TSA Area		**4,567,100**		**2,316,700**		**661,400**		**7,545,200**	**100.0**
Reduction to TSA Area									
Non-forest Land[3]	1,733,400		434,000		192,800		2,360,200		
Non-crown Land[4]	504,400		366,400		0		870,800		
Subtotal	2,237,800		800,400		192,800		3,231,000		42.8
Productive Crown Forested Area		**2,329,300**		**1,516,300**		**468,600**		**4,314,200**	**57.9**
Reductions to Crown Forested Area									
Non-stocked (NSR&NC)[5]	310,900		206,500		58,000		575,400		
Low Sites[6]	245,100		206,400		76,500		528,000		
Environmentally Sensitive Areas (ESA)[7]	48,300		47,100		23,800		119,200		
Non-merchantable Deciduous Stands[8]	33,000		37,800		3,700		74,500		
Non-merchantable Coniferous Stands[8]	648,800		409,700		125,500		1,184,000		
Subtotal	1,286,100		907,500		287,500		2,481,100		32.9
Net Land Base		**1,043,200**		**608,800**		**181,100**		**1,833,100**	**24.3**
Coniferous Area	495,100[9]		310,400		153,800		959,300		12.7
Deciduous Area	548,100		298,400		27,300		873,800		11.5

SOURCES:

- Draft Fort St. John TSA Plan #1, Ministry of Forests - Prince George Forest Region, November 1987, p.4.
- Dawson Creek TSA - Deciduous Timber Supply Analysis, Ministry of Forests - Prince George Forest Region, May 1989, p.10.
- Dawson Creek TSA - Supplemental Coniferous Timber Supply Analyses-Updated option III E, Ministry of Forests - Prince George Forest Region, May 1989, p.4
- Pulpwood Area #13 - Timber Supply Analysis, Ministry of Forests, March 1988, p.22.
- Tree Farm Licence #48 - Timber Supply Analysis for the Revised AAC Rationale Scenario, Ministry of Forests, December 1987, p.56

NOTES:

1. As defined by the Ministry of Forests in the most recent Timber Supply Analyses.
2. The Peace region is defined as the Fort St. John and Dawson Creek TSAs and TFL No. 48.
3. Non-forest includes alpine, urban, roads, cleared etc. areas.
4. Non-crown includes all privately owned lands.
5. Non-stocked includes all areas that are potentially productive with respect to a forest crop but that are currently not sufficiently restocked. This classification also includes an allowance for future forest roads.
6. Site class assignment is based on tree height at a reference age. "Low" site indicates a marginally productive site in terms of tree growth.
7. The Ministry of Forests inventory system allows for the designation of certain areas as Environmentally Sensitive. The proportion of an area that contributes to the net land base is dependent upon the severity of the ESA designation. Figures for E.S.A. areas represent those E.S.A. areas, or portions of E.S.A. areas, that do not contribute. These areas should not be confused with those areas designated as environmentally sensitive in current environmental studies being undertaken by B.C. Hydro. See Appendix V for a summary of the Ministry of Forests ESA Classification System.
8. Non-merchantable coniferous and deciduous stands are those stands that do not meet certain established merchantability criteria based on such things as minimum volumes per hectare and minimum stems per hectare (stocking) at maturity.
9. The Fort St. John coniferous area includes 98,100 ha. currently classified as NSR but which are scheduled to be brought back into the net land base through intensive silviculture activities.

stands and 2 percent subalpine fir. The merchantable coniferous area by leading species, for each of the affected TSAs, is shown in Figure 2. Similar figures for TFL No.48 are unavailable.

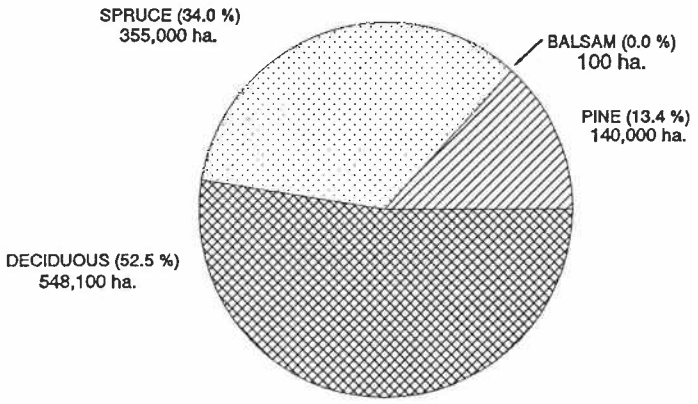
Of the total net landbase in the Peace region, 50 percent currently supports stands where aspen or balsam poplar are the dominant species. The net deciduous land base of the Dawson Creek TSA is reported to be composed of 22.6 percent (67,229 ha) balsam poplar stands and 77.4 percent (231,115 ha) trembling aspen stands. Although deciduous species composition figures are not available for the Fort St. John TSA and TFL No. 48 it is likely that they are similar to the Dawson Creek TSA

As shown in Table 1, 24.3 percent of the land base in the Peace region supports the forest industry. This compares to 42.2 percent for the Prince George Timber Supply Area. The lower percentage figure for the Peace region reflects the relative importance of the agricultural industry. This region is reported to be British Columbia's most important grain and forage production area. Cattle production on crown rangeland also shares the potential forest land base. Of the area supporting the forest industry, 12.7 percent supports the coniferous harvest while 11.6 percent supports the deciduous harvest. The distribution of the net land base by age for the Dawson Creek and Fort St. John TSAs is shown in Figure 3.

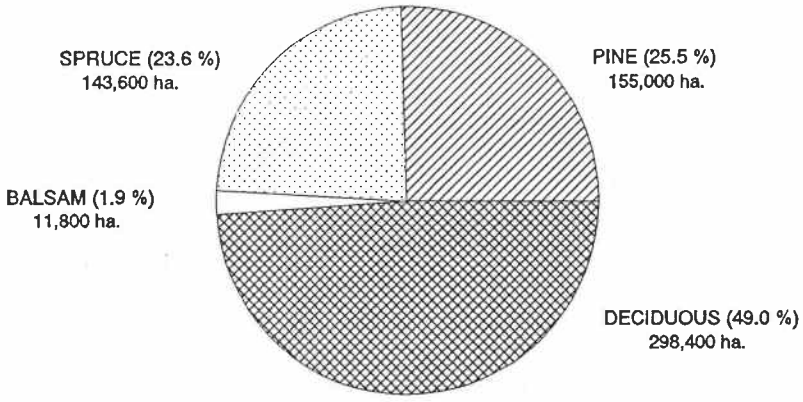
In other Timber Supply Areas, such as Prince George and Mackenzie TSAs a much higher proportion of the forested area can be found in old-growth stands aged 140 years plus. The relative lack of these older stands in the Peace region may be due to the history of extensive fires in of the area. Forest fires have been frequent throughout the region, therefore maintaining most of the forests in a variety of age ranges and successional states.

FIGURE 2. Area Distribution by Leading Species for the Current Net Land Base* of the Dawson Creek and Fort St. John Timber Supply Areas

FORT ST. JOHN TIMBER SUPPLY AREA
1,043,200 ha.



DAWSON CREEK TIMBER SUPPLY AREA
608,800 ha.



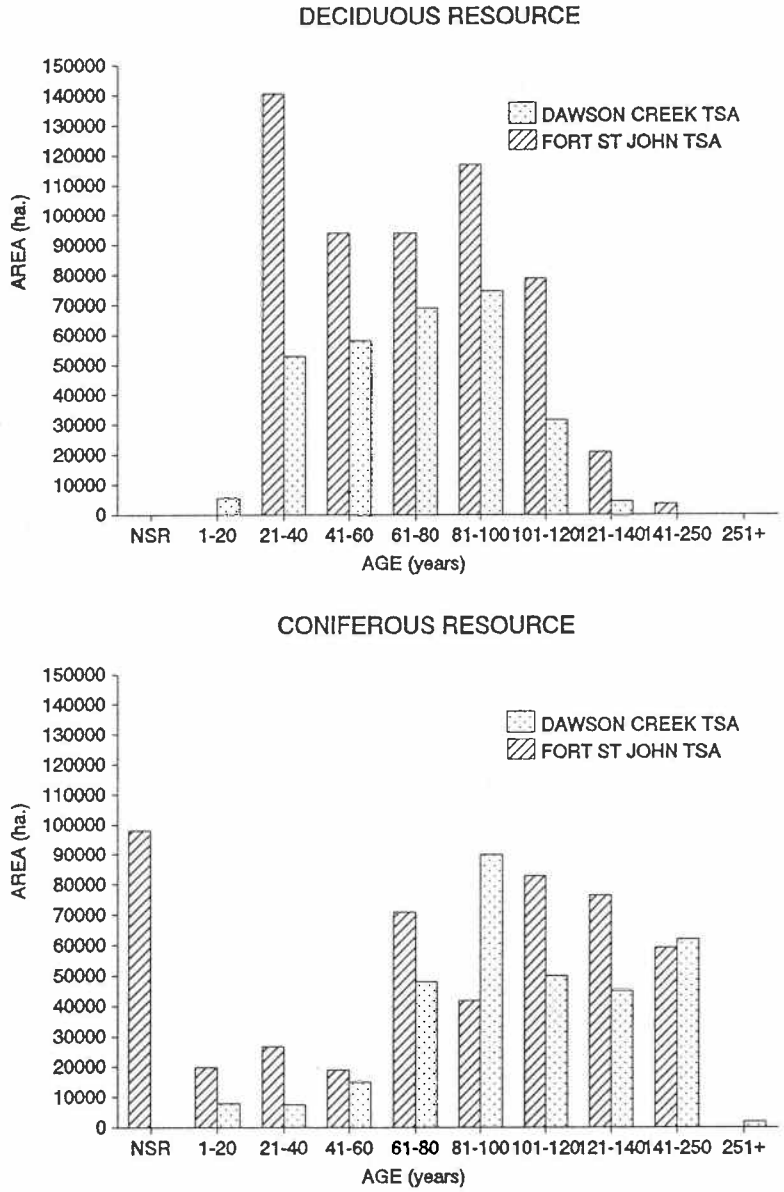
* Forested land (Crown ownership only) that supports the current AAC as reported in the following sources :

- DAWSON CREEK TSA - Supplemental Coniferous Timber Supply Analysis - Updated Option III E, Ministry of Forests - Prince George Forest Region, May 1989, p. 10.

- DAWSON CREEK TSA - Deciduous Timber Supply Analysis, Ministry of Forests - Prince George Forests Region, May 1989, p. 10.

- FORT ST JOHN TSA - Area Input Files for the MUSYC Timber Supply Analysis Model - AAC Rationale Scenario, Ministry of Forests - Integrated Resources Branch, January 1987.

FIGURE 3. Age Class Distribution by Leading Species for the Current Net Land Base* of the Dawson Creek and Fort St John Timber Supply Areas.



* Forested land (Crown ownership only) that supports the current AAC as reported in the following sources :

- FORT ST JOHN TSA - Area Input Files for the MUSYC Timber Supply Analysis Model - AAC Rationale Scenario, Ministry of Forests - Integrated Resources Branch, January 1987. The 98,100 ha. of NSR is scheduled to be brought back into production through intensive silviculture activities.

- DAWSON CREEK TSA - Supplemental Coniferous Timber Supply Analysis - Updated Option III E, Ministry of Forests - Prince George Forest Region, May 1989, pg. 13

- DAWSON CREEK TSA - Deciduous Timber Supply analysis, Ministry of Forests - Prince George Forest Region, May 1989, pg. 13.

2.1.3 The Mature Merchantable Inventory

The net land base that supports the current coniferous harvest in the Dawson Creek and Fort St. John TSAs is 707,400 ha.. Of this total, approximately 262,700 ha. (37 percent) has mature merchantable timber growing on it. The total (all species) volume on the net mature coniferous landbase is 82,431,200 m^3. This represents approximately 50 years of allowable annual harvest for local sawmills at the current Annual Allowable Cut.

The net land base supporting the deciduous harvest in the two TSAs is 846,500 ha. of which 494,500 ha. (58 percent) currently supports mature merchantable timber. The volume associated with this area is 96,034,000 m^3. This also represents approximately 50 years of deciduous allowable annual harvest at the current Allowable Annual Cut and about 100 years at the current actual harvest rate. The mature harvestable land base and associated net volume supporting both the coniferous and deciduous AACs are detailed in Table 2. Similar figures for TFL No. 48 are unavailable.

TABLE 2 Mature[1] Harvestable Area and Associated Net Merchantable Volumes[2] of the Dawson Creek and Fort St. John Timber Supply Areas

Timber Supply Area	CONIFEROUS RESOURCE			DECIDUOUS RESOURCE		
	Harvestable Area (ha)	Net Volume (m^3)	Average Volume per Hectare (m^3/ha)	Harvestable Area (ha)	Net Volume (m^3)	Average Volume per Hectare (m^3/ha)
Dawson Creek	106,300	31,390,400	295	180,600	40,700,000	225
Fort St. John	156,400	51,040,800	326	313,900	55,334,000	176
Total	262,700	82,431,200	314	494,500	96,034,000	194

SOURCE:

Fort St. John TSA - Area Input Files (Timber Class Data) and volume files (Aggregated Step Volumes and Diameters by Analysis Unit) for the MUSYC Timber Supply Analysis Model - AAC Rationale Scenario, Ministry of Forests - Integrated Resources Branch, January 1987.

Dawson Creek TSA - Supplemental Coniferous Timber Supply Analysis - Updated Option III E, Ministry of Forests - Prince George Forest Region, May 1989, pg.7.

Dawson Creek TSA - Deciduous Timber Supply Analysis, Ministry of Forests - Prince George Forest Region, May 1989, pg.11.

NOTES:

1. Maturity (Priority Cutting Age) is defined as follows:

Spruce	: 121 + years	Pine	: 101 + years
Balsam	: 121 + years	Deciduous	: 61 + years

2. All species will be utilized to close utilization standards (CU) less decay, waste and breakage. Volumes are calculated using the Ek-Payandeh Volume-ratio technique and are based on the following utilization standards:

	Utilization Standards (cm)		
Species	Minimum Diameter at Breast Height	Maximum Stump Height	Minimum Top Diameter
Spruce and Balsam	17.5	30	10
Pine	12.5	30	10
Deciduous:			
Fort St. John	17.5	30	10
Dawson Creek	12.5	30	10

2.1.4 The Long-Run Sustainable Yield and Allowable Annual Cut

Long-run sustainable yield (LRSY) is a measure of the forest land base productivity with respect to timber yields, given a prescribed set of management assumptions. LRSYs are calculated periodically by the MOF for all Timber Supply Areas and by the licensees in the case of Tree Farm Licences.

The Allowable Annual Cut (AAC) is also approved periodically by the MOF for each TSA or TFL. AAC's are determined by the Chief Forester of the Province in accordance with the Forest Act. AACs are based on factors which include consideration of the current state of the forest (e.g. age class profile, growth potential, etc.), the existing forest processing infrastructure and its raw material requirements, the economic and social objectives of the Crown and outbreaks of wildfire, pest infestation and disease. Allowable Annual Cuts are tested and confirmed through timber supply optimization and simulation modelling procedures.

The long-run sustainable yields and Allowable Annual Cuts for the Peace region are summarized in Table 3. The total AAC is 3,935,335 m^3. This represents approximately five percent of the 73,517,000 m^3 of total volume in committed timber cutting rights in the Province of British Columbia[1].

[1] Annual Report of the Ministry of Forests for the fiscal year ended March 31, 1989. B.C. Ministry of Forests and Lands, July 1990.

TABLE 3 Long-Run Sustainable Yields (LRSY) and Allowable Annual Cuts (AAC) of the Peace Region[1]

Timber Supply Area	Deciduous		Coniferous		Total	
	LRSY (m^3/year)	AAC (m^3/year)	LRSY (m^3/year)	AAC (m^3/year)	LRSY (m^3/year)	AAC (m^3/year)
Fort St. John	1,050,000[2]	915,000	880,000[2]	900,162	1,930,000[2]	1,815,162
Dawson Creek TSA and TFL No. 48	792,000[3]	1,000,000[3]	900,000	1,120,173	1,692,000	2,120,173
Total	1,842,000	1,915,000	1,780,000	2,020,335	3,622,000	3,935,335

SOURCES: Draft Fort St. John TSA Plan #1, Ministry of Forests - Prince George Forest Region, November 1987, p.4.

Dawson Creek TSA - Deciduous Timber Supply Analysis, Ministry of Forest - Prince George Region, May 1989, p.10.

Dawson Creek TSA - Supplemental Coniferous Timber Supply Analyses - Updated Option III E, Ministry of Forests - Prince George Forest Region, May 1989, p.4.

Tree Farm Licence No. 48 - Timber Supply Analysis for the Revised AAC Rationale Option, Ministry of Forests and Lands, December 1987.

NOTES:

1. As reported by the Ministry of Forests in the most recent Timber Supply Analysis.
2. The total combined deciduous and coniferous LRSY in the Fort St. John TSA are as reported in the Draft Plan, 1987. The deciduous LRSY was determined by subtracting the coniferous LRSY from the combined LRSY.
3. The LRSY for deciduous species in the Dawson Creek TSA and TFL 48 is inclusive of 728,000 m^3/yr from the TSA and an estimated 64,000 m^3/yr from the TFL. Page 22 of the PA #13 Timber Supply Analysis Report, March 1988 reports that the TFL contributes 27,300 ha. of leading deciduous land base to supporting potential deciduous harvest. Using the average deciduous MAI from the Dawson Creek TSA of 2.344 m^3/ha/yr. the contribution to LRSY is estimated to be 64,000 m^3/yr.

2.2 The Forest Resource Users

The Peace region has a variety of forest resource users both in terms of species utilized and products produced. Current users include dimension softwood lumber producers, a softwood pulp mill, an aspen pulp mill, an oriented strand board (OSB) plant, a chopstick manufacturing plant (not currently operating), and various others including furniture and log home manufacturers.

2.2.1 Major Softwood Lumber Producers

Presently there are four major sawmills operating within feasible hauling distance of Site C. Table 4 summarizes the capacity and AAC associated with these mills.

Under ideal market conditions these lumber mills would operate at full capacity, double shifting an average of 240 working days per year. Figures for estimated maximum annual timber requirements, reported in Table 4, are based on these conditions. Annual requirements in excess of quota could be as high as 980,000 m^3. This represents approximately 37 percent of timber requirements based on maximum capacity. Although technically possible, it is doubtful if these mills have over operated at these levels. Some of this excess demand could be supplied through the purchase of MOF Small Business Forest Enterprise Program (SBFEP) wood. Quota for Coniferous small business wood (Category one and two) totals 214,650 m^3 annually for the combined Timber Supply Areas in question. In good economic times the remaining requirements, approximately

TABLE 4 Major Softwood Lumber Producers in the Peace Region

Company	Location	Estimated 8-hour Output Capacity[1] (Mfbm)	Estimated Maximum Annual Output Capacity[1] (MMfbm)	Estimated Maximum Annual Log Requirement[2] (m^3/year)	Allowable Annual Cut (m^3/year)	Estimated Maximum Annual Requirement in excess of AAC (m^3/year)
Canadian Forest Products Ltd.	Chetwynd	315	151.2	672,000	497,046[3]	174,954
Canadian Forest Products Ltd.	Fort St. John	290	139.2	618,667	290,690	327,977
Canadian Forest Products Ltd.	Taylor	320	153.6	682,667	435,898	246,769
West Fraser Mills Ltd.	Chetwynd	300	144.0	640,000	409,567	230,433
ALL		1,225	588.0	2,613,334	1,633,201	980,133

NOTES:

1. Source: Major Primary Timber Processing Facilities in British Columbia, Ministry of Forests - Industry Development Branch, 1989. The estimated maximum annual capacity is based on 480 shifts per year.

2. Based on an average lumber recovery factor of 225 foot board measures (fbm) per cubic meter (m^3) of raw material processed. Mfbm is thousand board feet and MMfbm is million board feet.

3. Canadian Forest Products Ltd. Chetwynd AAC includes of 410,000 m^3 from TFL No. 48 and 87,046 m^3 from Forest Licence A18151.

765,000 m^3, might be obtained through the purchase of timber from private lands. During the 1990 recession, high stumpage rates, low lumber demand, low lumber prices and the high Canadian dollar, combined to preclude lumber mills from operating at maximum capacity.

Tenure for softwood quota is mainly in the form of Forest Licences (FL). These are volume-based tenures and as such are not restricted to a specific area other than the Timber Supply Area in which they are issued. Licence holders are, however, required to harvest within designated 20-Year Operating Areas as established through the Ministry of Forests planning process. Forest Licence holders can also be directed (by the MOF) to harvest in areas outside their approved Operating Area(s) to salvage timber that is damaged by fire, insect, or disease, or timber at risk of being damaged. The Ministry of Forests (Fort St. John District) has suggested that under this provision Licensees would be directed into timber available as a result of Site C activities. Timber harvested would be part of a licensee's annual cut and would be allocated pro-rata with respect to current AAC.

While 75 percent (1,223,201 m^3) of the major softwood lumber producers' cutting rights are derived from Forest Licence tenures, 25 percent (410,000 m^3) is in the form of a Tree Farm Licence (TFL No. 48, Canadian Forest Products in Chetwynd). Figure 4 shows both TFL No. 48 and the 20-Year Operating Areas for Forest Licence holders.

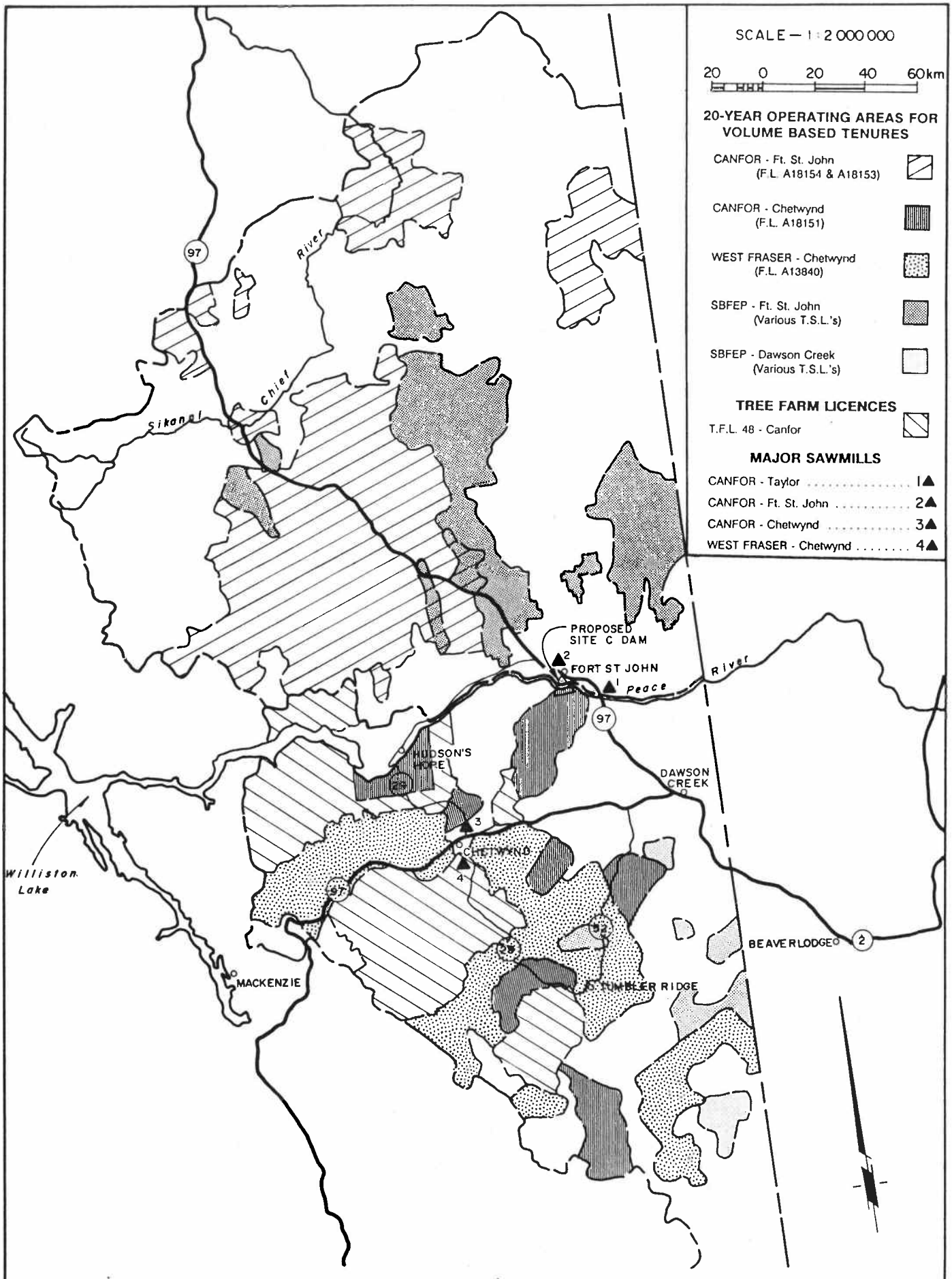


FIGURE 4. Key Map to the Forest Tenures (excluding P.A.s) within the Vicinity of the Proposed Site C Hydroelectric Project

2.2.2 Pulp Mills and Panelboard Producers

With the recent interest in the utilization of aspen and balsam poplar for both panelboard and pulp products, it was natural that these industries would establish themselves in the Fort St. John and Dawson Creek Timber Supply Areas. The Ministry of Forests-Inventory Branch reports that these TSAs alone contain approximately 78,000,000 m^3 of mature aspen growing stock (not counting other deciduous species). This represents 36 percent of the provincial mature aspen total of 215,800,000 m^3. Table 5 summarizes the existing and proposed pulp and panelboard producers in this region.

The Pulpwood Agreement (PA) tenure provides a backup guarantee of wood supply for much of the pulp and panelboard industry in the Interior of British Columbia. PA's provide for a maximum annual harvest of a specified species, or group of species, in a designated area (Pulpwood Area), if an adequate supply of competitively-priced fibre (private or otherwise) is unavailable for purchase. PA holders may only exercise their PA cutting rights to make up the shortfall between their private fibre purchases and the maximum AAC of the PA. Although there is generally no harvesting on coniferous PAs throughout the province, Louisiana-Pacific (LP) has activated cutting rights on both of its deciduous PAs, 10 and 13.

TABLE 5 Pulp and Panelboard Producers with Facilities or Allowable Annual Cut within Peace Region

Pulp and Panelboard Producers	Mill Location	Pulpwood Agreement Number	Date PA Awarded	Species Utilized	Maximum Annual Harvest Under PA. (m3/year)	Product	Estimated Annual Mill Capacity
EXISTING FACILITIES							
Louisiana-Pacific Canada Ltd.	Dawson Creek	10	86-09-15	Deciduous	452,000	Oriented Strand Board	250,000,000 $ft^2(3/8")$[1]
Louisiana-Pacific Canada Ltd.	Chetwynd	13	89-01-01	Aspen	452,000	Pulp	155,000 tonnes[1]
Fibreco Export Inc.	Taylor	None	N/A	Coniferous	N/A	Pulp	179,400 tonnes[2]
Canfor-Prince George Pulp and Paper Ltd.	Prince George	7	87-01-24	Coniferous	1,265,000[3]	Pulp	172,500 tonnes[2]
PROPOSED FACILITIES							
Makin Pulp and Paper Ltd.	Britannia Beach[4]	15	89-02-01	Deciduous	220,000	Coated Paper	140,000 tonnes[5]
Fibreco Pulp Inc.	Taylor[6]	12	89-11-01	Deciduous	500,000	Pulp	172,000 tonnes[7]

NOTES:

1. From: Proposal in Support of an Application for Pulpwood Agreement No. 13 to Utilize Aspen and Other Deciduous Species in the Fort Nelson, Fort St. John, and Dawson Creek Timber Supply Areas, Louisiana-Pacific Panel Products Ltd., September 1987.
2. From: Major Primary Timber Processing Facilities in British Columbia, Ministry of Forests - Industry Development Branch, 1989.
3. Only a small portion of the total 1,265,000 m3 is supported by the PA area in the Dawson Creek Timber Supply Area.
4. Makin Pulp and Paper Ltd. has proposed to establish satellite chipping facilities in their Pulpwood Agreement Area and ship chips via B.C. Rail to its proposed Britannia Beach pulp mill facility. The cancellation of P.A. 15 is imminant due to lack of performance under the terms of the P.A. agreement.
5. From: Proposal for a Pulpwood Agreement to Utilize Hardwoods in the North Peace Area of British Columbia, Makin Pulp and Paper Ltd., September 1987.
6. Fibreco Pulp Inc. has planned an expansion of existing facilities to incorporate a deciduous CTMP process.
7. From: Proposal for Pulpwood Agreement No. 13, Fibreco Export Inc., October 1987.

LP currently has the only operational panelboard plant and pulp mill utilizing deciduous species in this region of British Columbia. LPs pulpmill is currently operating under temporary operating permits. In 1990 LP's fibre sources were as follows:

TIMBER SOURCE BY MILL (Percent)

Mill	PA Harvest	Other (Purchased Wood)
LP Panel - Dawson Creek	30	70
LP Pulp - Chetwynd	97	3

*Source: Louisiana Pacific Canada Ltd. - Dawson Creek. - Construction of LP's bleached CTMP mill in Chetwynd was completed in late 1990. Purchased Wood volume reported above for the pulpmill is not representative of the final target level of 10 percent.

Much of the potential deciduous timber resource in the vicinity of the Site C project occurs on privately owned land. This is evident by the high percentage of purchased timber utilized in Louisiana-Pacific's panelboard plant at Dawson Creek, most of which is private.

In 1988 two other companies were offered cutting rights in the Peace Region. Fibreco Pulp Inc.'s proposed pulp mill expansion at Taylor will incorporate deciduous species in a CTMP pulping process. Makin Pulp and Paper Ltd. has proposed to utilize deciduous pulpwood in its proposed coated paper plant at Britannia Beach. It is proposed that Satellite chipping facilities, set up in the PA area, will provide chips via B.C. Rail to the proposed plant. This plant has been designed to produce 100 tonnes of

hardwood CTMP per day and an equal amount of spruce CTMP. The proposed paper mill will be fed by both CTMP products and will produce 140,000 tonnes per year of coated papers. Completion of this project was originally slated for 1995. The cancellation of Makins P.A. is imminent due to lack of performance.

Figure 5 shows the location of Pulpwood Areas and associated facilities in the vicinity of the proposed Site C Project.

2.2.3 Other Manufacturing Facilities

Other manufacturing facilities include a chopstick manufacturing plant (Dawson Creek Chopsticks Inc. (DCC), located in the City of Dawson Creek) and several log home building plants. Dawson Creek Chopsticks Inc. uses aspen to produce disposable chopsticks. Timber requirements are provided by a Forest Licence which allows for the harvest of 25,000 m^3 of aspen per year. Chopstick production capacity is 144,000 cases annually. Currently a trading agreement between Louisiana-Pacific Canada Ltd. and Dawson Creek Chopsticks Inc. allows LP to do the harvesting of timber for DCC. In return, DCC is permitted to select chopstick quality aspen bolts from within LP's current inventory. DCC is not currently operating.

Log Structures Ltd., located in Wonowon, currently uses pine from a timber sale awarded under the Ministry of Forests Small Business Forest Enterprise Program. This company has also used aspen on occasion and actually prefers using it because of the ease with which it is worked. Lack of

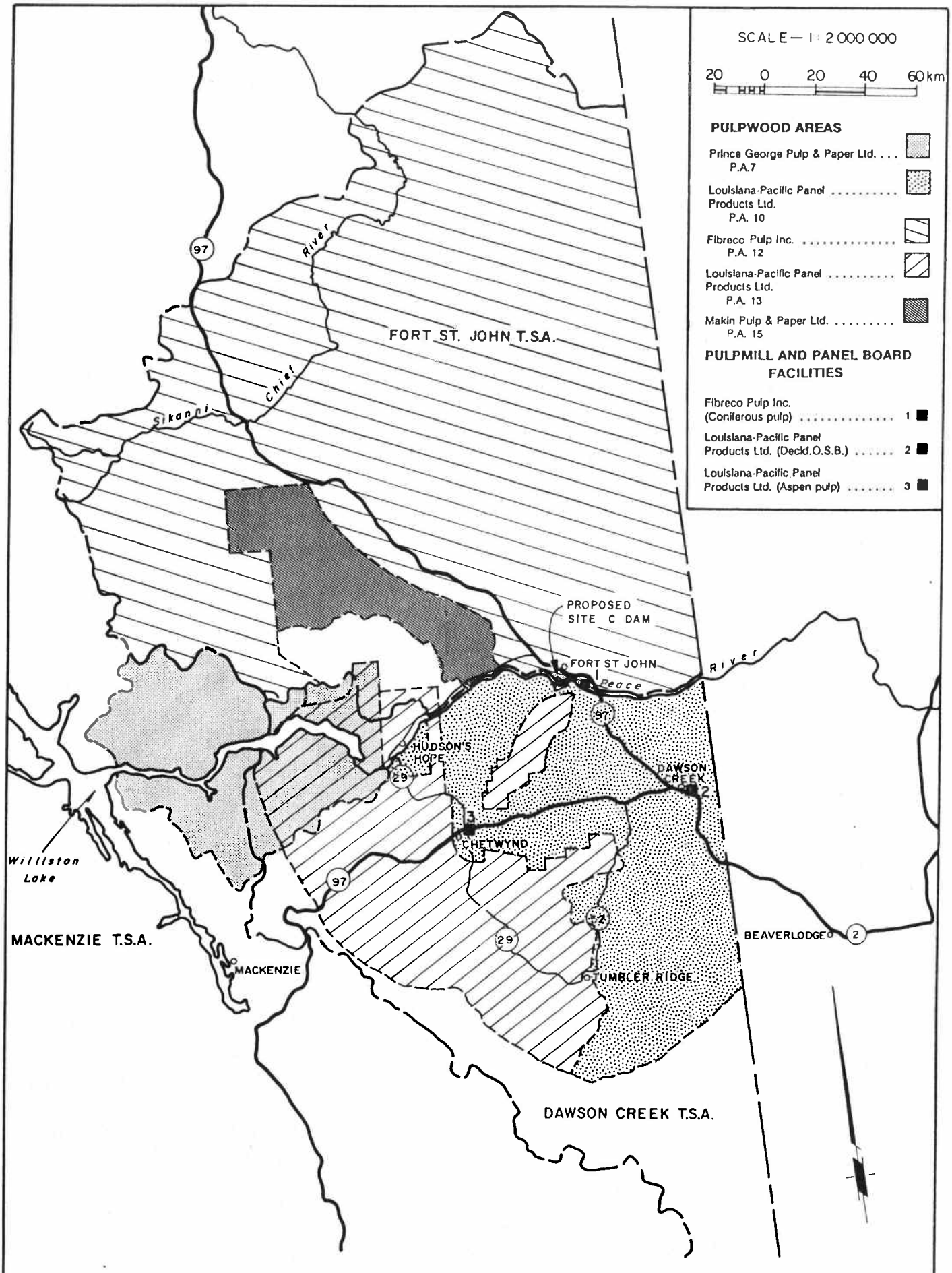


FIGURE 5. Key Map to the Pulpwood Areas (P.A.s) within the Vicinity of the Proposed Site C Hydroelectric Project

market acceptance for aspen log homes has prevented development of this product. Annual production is 15,000 to 20,000 lineal feet of processed logs.

Trunor Log Homes located in Farmington, 20 kilometres north of Dawson Creek on Highway 97, uses 500 to 1500 m^3 of timber annually to produce up to ten log homes. Facilities include both a small sawmill and building log plant. Supplies of building logs come from private sources and small Timber Sale Licences offered by the Ministry of Forests.

2.3 Trends in Forest Resource Availability and Use

Currently, the SBFEP and private coniferous timber in the vicinity of Fort St. John and Taylor are sold locally to Canadian Forest Products Ltd. mills. The long distances and associated high hauling cost discourages sales to other mills. Alternate access routes resulting from the construction of Site C, namely the Jackfish Road and a permanent bridge over the Peace River at the construction site, could allow this wood to be sold to other buyers.

As is evident throughout this report, the deciduous fibre resource now plays an important role in the developing forest industry of the Peace region. This importance has only been realized over the past five to seven years. Previously, aspen and balsam poplar were considered "weed" species, and stands were considered as range for domestic cattle, wildlife habitat or potential stands for conversion to coniferous species through intensive silviculture.

Current MOF commitments for deciduous cutting rights total 1,778,000 m^3/yr. Louisiana Pacific Canada Ltd. estimated that in 1991, 550,000 m^3 of its wood fibre requirements will be harvested under the terms and conditions of their two Pulpwood

Agreements. Additional fibre requirements will be obtained mainly through the MOF Small Business Forest Enterprise Program and from private sources. While the annual SBFEP fibre supply can be expected to remain fairly constant over the next several years, private sources may decline since farmers closest to the mill have sold their aspen. Private sources of wood may be in greater demand upon completion of the Fibreco expansion at the Taylor millsite. Wood fibre resulting from the Site C project may help to temporarily satisfy some of this anticipated demand.

3.0 AN ASSESSMENT OF THE FOREST RESOURCE WITHIN THE AREA DIRECTLY AFFECTED BY THE SITE C PROJECT

The objective of this phase of the forestry studies is to quantify the forest resource that would be directly affected by the proposed Site C project. The method by which this was achieved involved three phases.

1. A forest resource inventory of the areas directly affected by the Site C project.
2. Forest inventory data load and extraction (clipping) of Site C activity areas.
3. Application of merchantability criteria to the clipped forest inventory file and preparation of summaries of affected forest resources.

The methodology is discussed in detail in Appendix III.

The areas that would be directly affected by the Site C Project are as follows:

1. The reservoir area as defined by B.C. Hydro included all area below the maximum normal operating level of 461.8 metres above sea level.

2. The construction site inclusive of the dam, excavations, spillway, powerhouse,

construction materials, construction camp and spoil areas.

3. The Highway 29 relocation right-of-way.

4. The widening of an established B.C. Hydro transmission line corridor to accommodate two 500 kV transmission lines.

Sources of data used to define the Site C activity areas are discussed in Appendix VI. Figure 6 is a key map to the location of project-affected areas.

In keeping with the instruction of the Ministry of Forests regarding utilization standards to which the forest inventory is to be compiled for all salvage work related to Site C, forested land with an average volume greater than or equal to 80 m^3/ha is considered to be merchantable. The utilization limits for these stands are 12.5 + cm DBH, maximum 30 cm stump height and maximum 10 cm top diameter. A letter from the Ministry of Forests confirming these standards is included as Appendix IV. This merchantability standard applies to all stands except those where birch is the leading species. Birch stands are not considered to be merchantable as they do not contribute to the allowable annual cut of either the Dawson Creek or Fort St. John Timber Supply Areas.

Summary tables presented in the following sections are for all project-affected areas. Similar tables are presented in Appendix VII for the affected areas by TSA and in total. It should be noted that a small portion of TFL No. 48 would be directly affected by the proposed reservoir and transmission line ROW widening. In all tables presented in this report the TFL No.48 area is incuded as part of the crown portion of the Dawson Creek TSA.

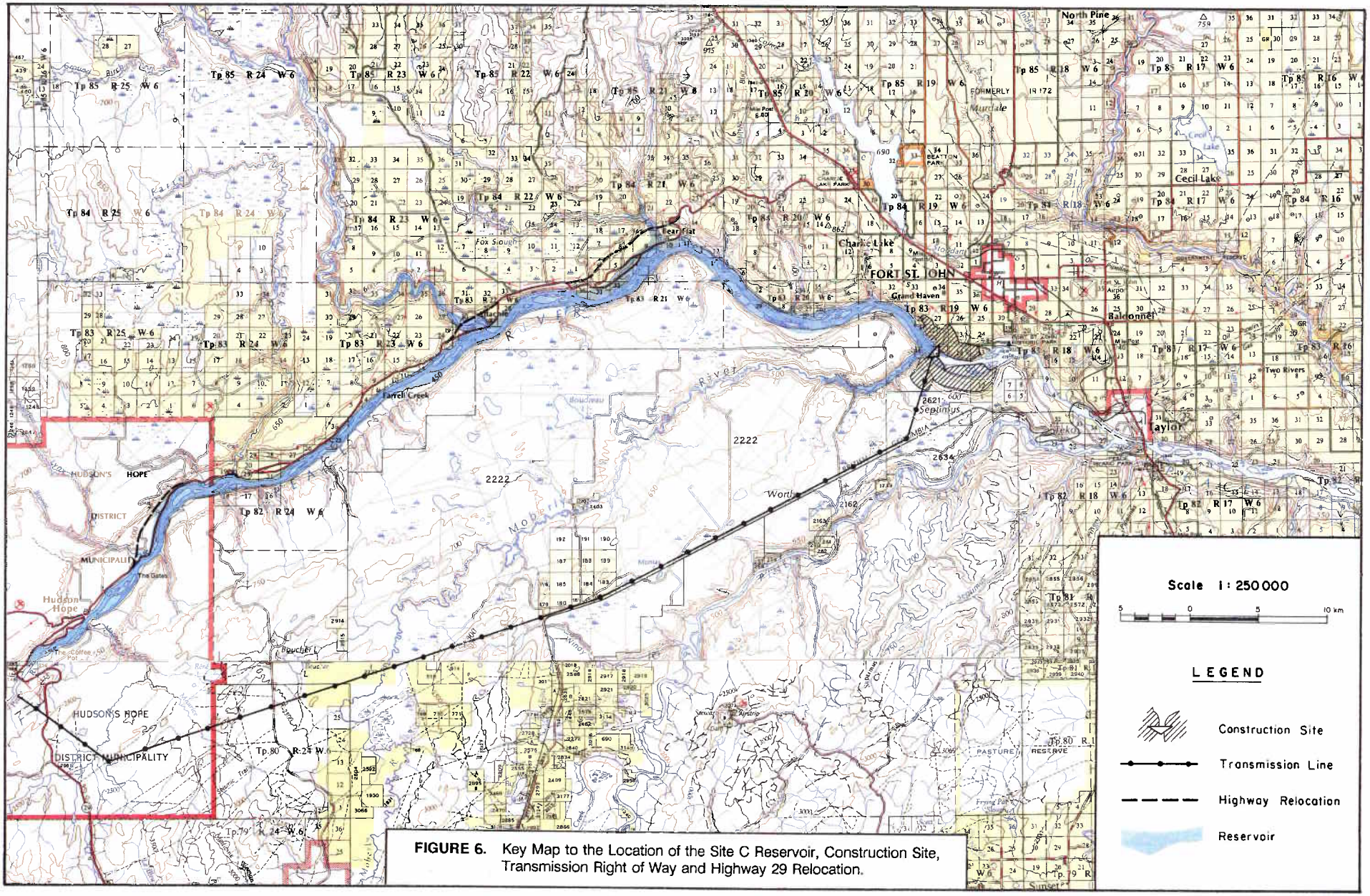


FIGURE 6. Key Map to the Location of the Site C Reservoir, Construction Site, Transmission Right of Way and Highway 29 Relocation.

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3.1 Ecology of the Project-Affected Areas

All Site C affected areas are within the BWBSmw1 variant of the Boreal White and Black Spruce (BWBS) biogeoclimatic zone. As apparent from the species composition summaries (Figure 8) and indicated in the MOF ecosystem interpretation guide[2], aspen is the major component of forests within this variant. The dominance of aspen is attributable to the high incidence of stand disturbance (e.g. forest fires) in the area and the tendency of aspen to have a re-establishment advantage over competing species because of its root suckering regeneration capabilities. The silty clay soils commonly found in the area are also conducive to aspen establishment and growth.

Location determinants for other species are described in the interpretation guide:

> "Balsam poplar is common on the low lying, wetter sites. White spruce is present on moist to wetter sites where there has been limited fire history. Lodgepole pine is present as a seral species on drier and poorer sites. Black spruce forests, often with a minor component of tamarack, are common on organic soils".

Appendix IX is a key map to the Biogeoclimatic zones of the Peace region.

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2 A Field Guide for Identification and Interpretation of Ecosystems in the Northeast Portion of the Prince George Forest Region, B.C. Ministry of Forests, February 1990.

3.2 The Gross Land Base

The total land base of areas directly affected by Site C activities is 7586.93 ha. A further 3430.80 ha. of water bodies (Peace River, Halfway River etc.) are within the proposed reservoir. The total area (land and water) directly affected is 11,017.73 ha. Of the land base affected, 22.9 percent (1735.77 ha) is privately owned and 77.1 percent (5851.16 ha) is Crown land.

Table 6 and Figure 7 summarize the areas directly affected by the Site C project. The proposed reservoir will cover 5805.19 ha. of land base. This represents 76.5 percent of all of the gross land base affected. The construction site will affect 1238.42 ha. (16.3 percent), the transmission line ROW widening, 460.35 ha. (6.1 percent), and the Highway 29 relocation, 82.97 ha. (1.1 percent).

Of the total gross land base affected by Site C, 3,879.59 ha. (51.1 percent) are within the Dawson Creek TSA (inclusive of TFL No. 48), and 3,707.34 ha. (48.9 percent) are within the Fort St. John TSA. A further 1,259.00 ha. of water bodies are affected in the Dawson Creek TSA and 2,171.90 ha. in the Fort St. John TSA.

The total gross area (all ownership) of the Dawson Creek TSA and TFL No. 48 is 2,978,100 ha. (See Table 1). The 5,138.59 ha. within project-affected areas represents 0.17 percent of the combined TSA and TFL. The 5,879.24 ha. of project-affected areas in the Fort St. John TSA represents 0.13 percent of the gross area (4,567,100 ha.) of this TSA.

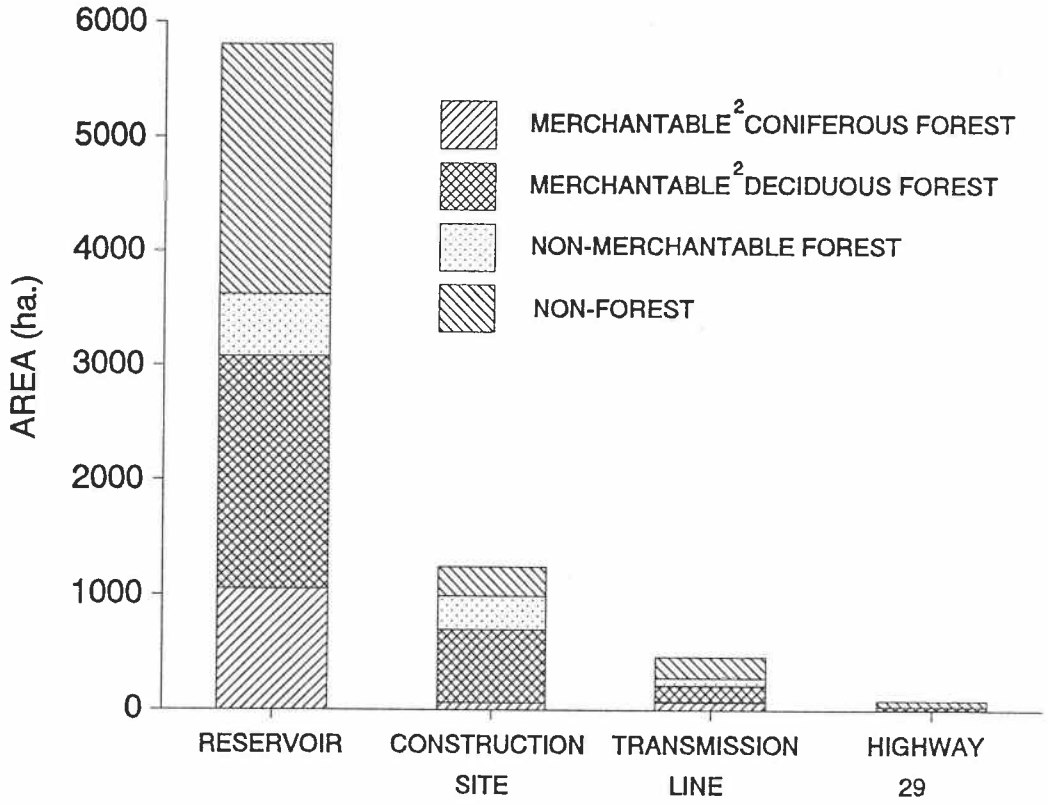
TABLE 6 Summary of Areas (ha) Directly Affected by the Peace River Site C Hydroelectric Project

	RESERVOIR AREA	CONSTRUCTION SITE	HWY 29 RELOCATION	TRANSMISSION ROW	TOTAL AREA
CROWN OWNERSHIP					
FORESTED					
MERCHANTABLE TIMBER[1]					
Coniferous[2]	941.57	63.08	0.00	68.99	1073.64
Deciduous[3]	1,666.54	437.62	0.14	138.00	2242.30
TOTAL MERCHANTABLE	2,608.11	500.70	0.14	206.99	3315.94
NON-MERCHANTABLE[4]	515.70	266.27	0.25	65.99	848.21
TOTAL FORESTED	3,123.81	766.97	0.39	272.98	4164.15
NON-FORESTED	1,455.63	80.73	3.81	146.84	1687.01
TOTAL CROWN OWNERSHIP	4,579.44	847.70	4.20	419.82	5851.16
PRIVATE OWNERSHIP[5]					
FORESTED					
MERCHANTABLE TIMBER[1]					
Coniferous[2]	105.48	0.00	2.71	0.00	108.19
Deciduous[3]	364.20	193.61	29.33	2.05	589.19
TOTAL MERCHANTABLE	469.68	193.61	32.04	2.05	697.38
NON-MERCHANTABLE[4]	22.45	26.72	0.23	0.00	49.40
TOTAL FORESTED	492.13	220.33	32.27	2.05	746.78
NON-FORESTED	733.62	170.39	46.50	38.48	988.99
TOTAL PRIVATE OWNERSHIP	1,225.75	390.72	78.77	40.53	1735.77
TOTAL ALL OWNERSHIP	5,805.19[6]	1,238.42	82.97	460.35	7586.93

NOTES:

1. Merchantable timber is defined as all timber stands with an average net volume per hectare greater than 80 m3/ha when compiled to close utilization (C.U). standards (12.5 cm + DBH, 30 cm stump height and a 10 cm top diameter).
2. Coniferous species include leading spruce (MOF species type groups 21-25),lodgepole pine (type groups 28-31) and tamarack (type groups 33 and 34) stands.
3. Deciduous species include leading aspen (type groups 41 and 42) and cottonwood (type groups 35 and 36) but exclude all leading birch stands. Birch (type group 40) is included in the Non-Merchantable category.
4. Non-merchantable timber is defined as all forested stands that do not meet the merchantable timber definiton.
5. Private ownership includes both B.C. Hydro owned and other privately owned land. Ownership status was provided by B.C. Hydro for Hydro owned land (status date January 1991) and by the Ministry of Forests Inventory Branch for all other areas (status date 1988).
6. An additional 3430.80 ha. of water-bodies (Peace River, Halfway River etc.) are within the proposed reservoir.

FIGURE 7. Summary of Land Base[1] Directly Affected by the Peace River Site C Hydroelectric Project



1. Inclusive of both crown and privately owned land within the proposed reservoir, construction site, Highway 29 relocation and transmission line ROW widening. Figures for the reservoir do not include 3430.8 hectares of existing water bodies (Peace River, Halfway River etc.)
2. Merchantable forest is defined as all forested areas (excluding leading birch stands)with an average net volume greater than or equal to 80 m3/ha when compiled to close utilization (cu) standards.

3.3 The Merchantable Land Base

The total land area (7586.93 ha) directly affected by Site C, contains 4013.32 ha. (52.9 percent) forested with timber stands that meet the merchantability criteria. Non-merchantable forested areas total 897.61 ha. or 11.8 percent of the total gross landbase. These non-merchantable areas consist of immature stands that may or may not grow to attain the minimum merchantability limit (80 m^3/ha) and mature stands that do not currently meet the limit. Figures describing the merchantability of the forested areas by age class are shown in Tables VII-16 to VII-21 in Appendix VII.

The total leading deciduous area of 3610.37 ha. contains 2831.49 ha. (78.4 percent) of merchantable timber and 778.88 ha. (21.6 percent) of non-merchantable forest. The non-merchantable area consists of 70.22 ha. (1.9 percent) of mature (age 61+ years) aspen or balsam poplar stands that do not meet the merchantability limit, 74.83 ha. (2.1 percent) of leading birch stands and 633.83 ha. (17.6 percent) of immature aspen and balsam poplar stands.

Within the total leading coniferous area of 1300.56 ha, 1181.83 ha. (90.9 percent) are forested with merchantable timber and 118.73 ha. (9.1 percent) are non-merchantable forest areas. The non-merchantable forest area consists of 1.99 ha. (0.4 percent) of mature leading spruce stands that do not meet the merchantability limit and 116.74 ha. (9.0 percent) of immature leading spruce and pine stands.

3.4 Net Volume on the Merchantable Land Base

Figures from Table 7 and Appendix Tables VII-4 to VII-6 indicate that there is a total of 1,202,330 cubic m^3 of net (gross volume less decay, waste and breakage) merchantable timber in the project-affected areas, with 65 percent in leading deciduous stands and, 35 percent in leading coniferous stands. Because leading deciduous stands contain 8% coniferous volume and leading coniferous stands contain 20% deciduous volume the overall proportion of deciduous volume is slightly higher than the proportion of volume in leading deciduous stands at 67%.

Reported volumes are for the total Site C project-affected areas. No evaluation of the accessibility of these stands has been made.

3.5 Site Productivity of the Gross Land Base

Tables 8 and 9 summarize gross forested areas and associated net volumes by leading species and MOF site class. The total coniferous forested project-affected area of 1300.56 ha. contains 743.65 ha. (57.2 percent) of leading coniferous stands on sites classified as *good* with respect to potential for tree growth. A further 470.78 ha. (36.2 percent) are on *medium* sites, 71.98 ha. (5.5 percent) are on *poor* sites, and 14.15 ha. (1.1 percent) are on *low* sites.

TABLE 7 **Summary of Merchantable[1] Timber Areas and Net Volumes[2] by Leading Species Within the Areas Directly Affected by The Peace River Site C Hydroelectric Project**

	CONIFEROUS[4]		DECIDUOUS[5]		ALL SPECIES	
	Area (ha)	Volume (m3)	Area (ha)	Volume (m3)	Area (ha)	Volume (m3)
CROWN OWNERSHIP[3]						
Reservoir	941.57	340,755	1,666.54	514,365	2,608.11	855,120
Construction Site	63.08	25,833	437.62	90,963	500.70	116,795
Hwy 29 Relocation	0.00	0	0.14	29	0.14	29
Transmission ROW	68.99	19,031	138.00	35,623	206.99	54,654
TOTAL CROWN	1,073.64	385,619	2,242.30	640,980	3,315.94	1,026,599
PRIVATE OWNERSHIP[3]						
Reservoir	105.48	35,660	364.20	88,505	469.68	124,164
Construction Site	0.00	0	193.61	44,785	193.61	44,785
Hwy 29 Relocation	2.71	777	29.33	5,378	32.04	6,154
Transmission ROW	0.00	0	2.05	627	2.05	627
TOTAL PRIVATE	108.19	36,437	589.19	139,295	697.38	175,731
ALL OWNERSHIP						
Reservoir	1,047.05	376,415	2,030.74	602,870	3,077.79	979,285
Construction Site	63.08	25,833	631.23	135,748	694.31	161,580
Hwy 29 Relocation	2.71	777	29.47	5,407	32.18	6,184
Transmission ROW	68.99	19,031	140.05	36,250	209.04	55,281
TOTAL ALL OWNERSHIP	1,181.83	422,055	2,831.49	780,275	4,013.32	1,202,330

NOTES:

1. Merchantable timber is defined as all timber stands with an average net volume greater than 80 m3/ha when compiled to close utilization (CU) standards.
2. Volumes are compiled to CU standards (12.5 cm + DBH, 30 cm stump height and a 10 cm top diameter) less decay, waste and breakage.
3. The Crown and Private ownership status date is 1988 for information supplied by the Ministry of Forests Inventory Branch. The status of B.C. Hydro owned land was supplied by B.C. Hydro and is current to January 1991.
4. Coniferous species include leading spruce (MOF species type groups 21-25),lodgepole pine (type groups 28-31) and tamarack (type groups 33 and 34) stands.
5. Deciduous species include leading aspen (type groups 41 and 42) and cottonwood (type groups 35 and 36) but exclude all leading birch (type group 40) stands.

TABLE 8 Summary of Deciduous Forested Areas by Leading Species and Site Class[1] Within the Areas Directly Affected by the Peace River Site C Hydroelectric Project[2]

LEADING SPECIES	SITE CLASS	CROWN[3] OWNERSHIP	PRIVATE[3] OWNERSHIP	ALL OWNERSHIP	
		Area (ha)	Area (ha)	Area (ha)	Area (%)
ASPEN	GOOD	14.28	71.43	85.71	2.4
	MED	1068.25	306.20	1374.45	38.9
	POOR	491.46	111.93	603.39	17.1
	LOW	8.09	0.00	8.09	0.2
	ALL	1582.08	489.56	2071.64	58.6
BALSAM POPLAR	GOOD	53.53	0.00	53.53	1.5
	MED	1200.07	149.03	1349.10	38.2
	POOR	61.27	0.00	61.27	1.7
	LOW	0.00	0.00	0.00	0.0
	ALL	1,314.87	149.03	1463.90	41.4
TOTAL DECID.[6]	GOOD	67.81	71.43	139.24	3.9
	MED	2268.32	455.23	2723.55	77.1
	POOR	552.73	111.93	664.66	18.8
	LOW	8.09	0.00	8.09	0.2
	ALL	2896.95	638.59	3535.54	100.0

NOTES:

1. Site Class assignment based on site indicies (tree height at a reference age) as determined using current MOF procedures. Deciduous species use MOF Site Indices (Reference age 100 years at stump height) in Forest Inventory Zone (FIZ) L.

2. Inclusive of the proposed reservoir, contruction site, Highway 29 relocation and the transmission line ROW widening.

3. The Crown and Private ownership status date is 1988 for information supplied by the Ministry of Forests Inventory Branch. The status of B.C. Hydro owned land was provided by B.C. Hydro and is current to January of 1991.

4. Birch is not included as it is not currently considered to be merchantable. There are 74.83 hectares of leading birch stands in the areas directly affected by the Site C project.

TABLE 9 Summary of Coniferous Forested Areas by Leading Species and Site Class[1] Within the Areas Directly Affected by the Peace River Site C Hydroelectric Project[2]

LEADING SPECIES	SITE CLASS	CROWN[3] OWNERSHIP AREA	PRIVATE[3] OWNERSHIP AREA	ALL OWNERSHIP AREA	
		Area (ha)	Area (ha)	Area (ha)	Area (%)
SPRUCE	GOOD	677.85	54.75	732.60	56.3
	MED	406.30	29.30	435.60	33.5
	POOR	42.63	0.58	43.21	3.3
	LOW	14.15	0.00	14.15	1.1
	ALL	1,140.93	84.63	1,225.56	94.2
PINE	GOOD	8.21	2.84	11.05	0.9
	MED	32.41	2.77	35.18	2.7
	POOR	10.82	1.24	12.06	0.9
	LOW	0.00	0.00	0.00	0.0
	ALL	51.44	6.85	58.29	4.5
TAMARACK	GOOD	0.00	0.00	0.00	0.0
	MED	0.00	0.00	0.00	0.0
	POOR	0.00	16.71	16.71	1.3
	LOW	0.00	0.00	0.00	0.0
	ALL	0.00	16.71	16.71	1.3
TOTAL CONIFER	GOOD	686.06	57.59	743.65	57.2
	MED	438.71	32.07	470.78	36.2
	POOR	53.45	18.53	71.98	5.5
	LOW	14.15	0.00	14.15	1.1
	ALL	1,192.37	108.19	1,300.56	100.0

NOTES:

1. Site Class assignment based on site indicies (tree height at a reference age) as determined using current M.O.F. procedures. Spruce and Pine species use Goudie's site indices (Reference age 50 at breast height) and Tamarack uses MOF site indices (reference age 100 at stump height) in Forestry Inventory Zone L.
2. Inclusive of the reservoir, construction site, Highway 29 relocation and the transmission line ROW widening.
3. The Crown and Private ownership status date is 1988 for information supplied by the Ministry of Forests Inventory Branch. The status of B.C. Hydro owned land was supplied by B.C. Hydro and is current to January of 1991.

Of the total area of 3,535.54 ha. in merchantable leading deciduous stands, 139.24 ha. (3.9 percent) are on *good* growing sites, 2,723.55 ha. (77.1 percent) are on *medium* sites, 664.66 ha. (18.8 percent) are on *poor* sites, and 8.09 ha. (0.2 percent) are on *low* sites.

The site class distribution for the Site C project-affected areas and the Peace region are summarized in Table 10.

The Site C project-affected areas contain a higher proportion of better sites than the Peace region.

TABLE 10 Site Class Distribution[1] for the Site C Project-Affected Areas[2] and the Combined TSA and TFL Areas of the Peace Region[3]

Leading Species	Site Class	Site C Affected Area[4] (%)	Total TSA and TFL Areas[5] (%)
Deciduous	Good	4.0	0.6
	Medium	77.2	40.9
	Poor	18.8	58.5
Coniferous	Good	57.8	3.4
	Medium	36.6	35.9
	Poor	5.6	60.7

NOTES:
1. The Site class distribution is based on the gross forested land base of the areas in question. Low sites and leading birch types are excluded.
2. Includes crown and private land within the proposed reservoir, construction site, transmission line ROW widening and Highway 29 relocation.
3. Includes crown land within the Fort St. John and Dawson Creek TSAs and TFL No. 48. Source: Unit Survey Reports, Ministry of Forests, 1969 to 1972.
4. Site Class for the Site C project area is based on MOF Site Index Curves for leading aspen, balsam poplar and tamarack species and Goudie Site Index curves for leading spruce and pine species.
5. Site Class for the Combined TSA and TFL areas is based on MOF Site Index Curves for all species.

Mean annual increment (MAI) is a measure of the productive capacity of forested land. MAI is calculated by dividing stand volume by stand age. The stand age at which the MAI has its maximum value is called the culmination age. Culmination age MAIs for the project-affected area are reported in Table 11 for the merchantable and non-merchantable land base.

TABLE 11 Mean Annual Increments at Culmination Age for the Site C Project-Affected Area

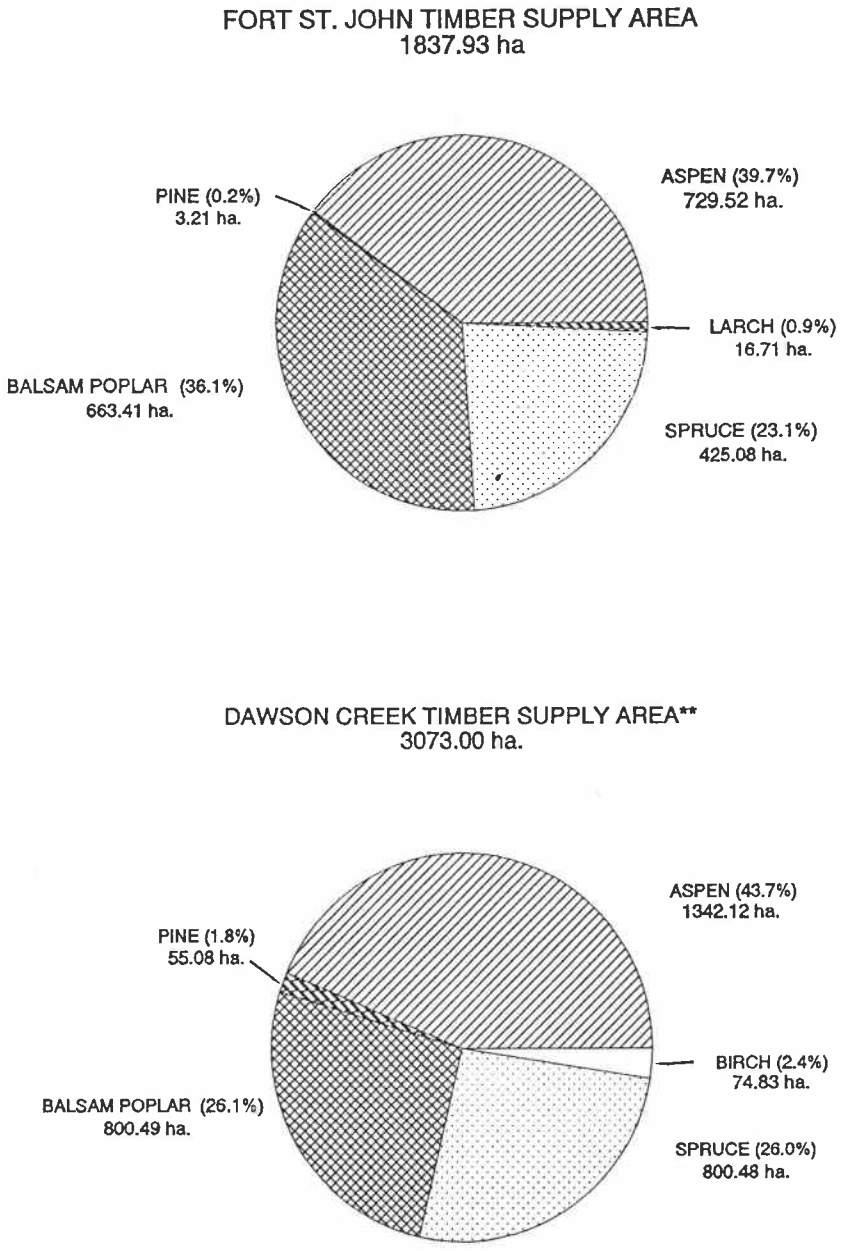
Category	Area (ha)	Culmination Age (Years)	Culmination Age MAI (m^3/ha/yr)
Merchantable Coniferous Forest	1,183.83	110	3.43
Merchantable Deciduous Forest	2,831.49	113	3.31
Non-Merchantable Coniferous Forest	118.73	86	3.23
Non-Merchantable Deciduous Forest	778.8	102	2.55

3.6 Species and Age Class Distribution of the Gross Land Base

The species distribution for the gross forested area of the project-affected area is shown in Figure 8. The distribution is similar for the Fort St. John TSA and the combined Dawson Creek TSA and TFL No. 48 area. Leading aspen and balsam poplar stands make up 72 percent (3535.54 ha) of the forested area of the combined TSAs and TFL. Spruce makes up 25 percent and pine, larch and birch make up the remaining 3 percent.

The age class distribution of the gross forested landbase is shown in Figure 9. Of note is the large proportion (1020.70 ha) of deciduous area in the 81 to 100

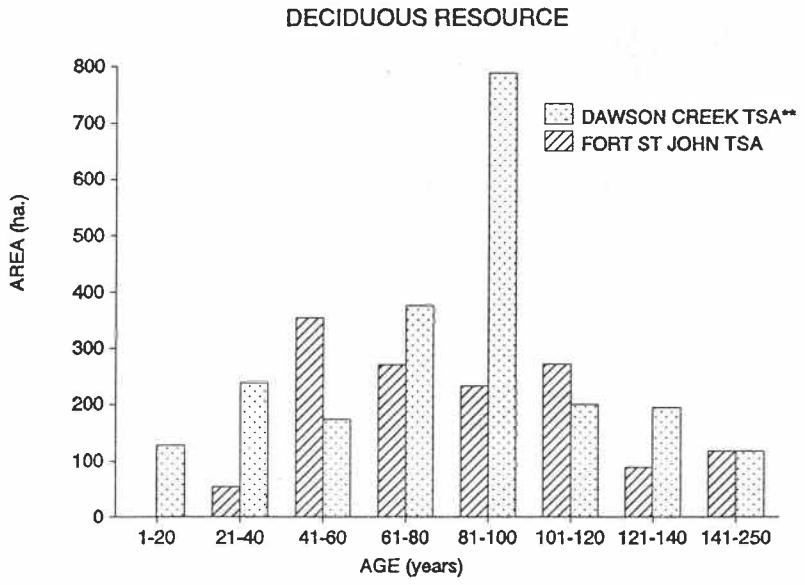
FIGURE 8. Area Distribution by Leading Species for the Gross Forested Land Base* Directly Affected by the Peace River Site C Hydroelectic Project

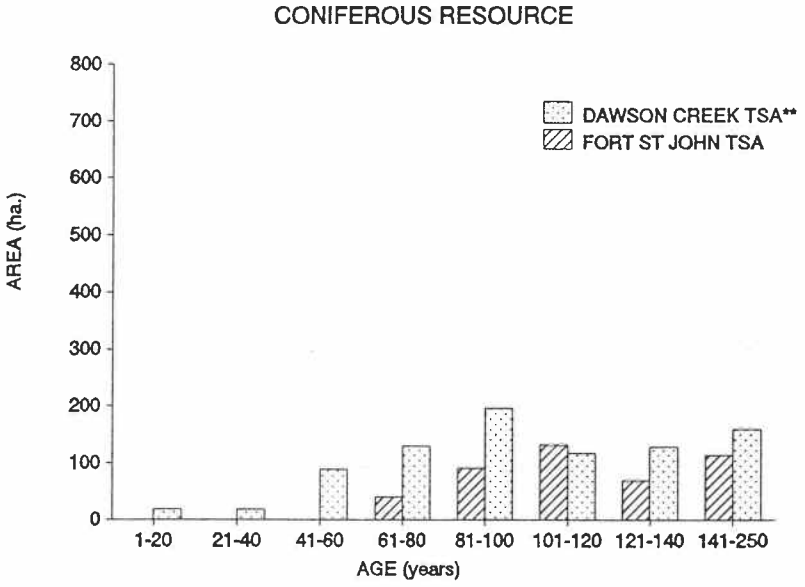


* Inclusive of crown and privately owned forest within the proposed reservoir, construction site, Highway 29 relocation and transmission line ROW widening.

** Figures reported for the Dawson Creek TSA include the area from TFL No. 48 as well as the TSA.

FIGURE 9. Age Class Distribution by Leading Species for the Gross Forested Land Base* Directly Affected by the Peace River Site C Hydoelectic Project





* Inclusive of all crown and privately owned forest within the proposed reservoir, construction site, Highway 29 relocation and transmission line ROW widening. Areas reported include birch stands and all other stands regardless of merchantable volume per hectare.

** Figures reported for the Dawson Creek TSA include the area from TFL No. 48 as well as the TSA.

year old age class. Tables VII-16 to VII-21 in Appendix VII contain age class distribution figures by merchantability, ownership, TSA and leading species for the net land base.

3.7 Environmentally Sensitive Areas

As part of Ministry of Forests inventory procedures, areas having a high likelihood of being environmentally sensitive are identified. Tables 12 and VII-13 to VII-15 summarize ESAs for Crown and private land in the project-affected areas. Of the 1499.17 ha. that are classified as sensitive, 1248.96 ha. (83.3 percent) relate to wildlife habitat sensitivity and 250.21 ha. (16.7 percent) relate to soils. Figures reported are for the total land base having ESA designations. These areas have not been netted down as is done in MOF timber supply analysis studies.

TABLE 12 **Summary of Environmentally Sensitive Areas (ESAs)[1] within the Site C Project Affected[2] Area**

E.S.A.	CATEGORY[3]	MERCHANTABLE[4] AREAS (ha)	NON-MERCH[5] AREAS (ha)	NON-FORESTED[6] AREAS (ha)	ALL AREAS (ha)
A	0	0.00	0.00	0.00	0.00
	1	0.00	0.00	0.00	0.00
	2	0.00	0.00	0.00	0.00
H	0	0.00	0.00	0.00	0.00
	1	0.00	0.00	0.00	0.00
	2	0.00	0.00	0.00	0.00
I	0	0.00	0.00	0.00	0.00
	1	0.00	0.00	0.00	0.00
	2	0.00	0.00	0.00	0.00
P	0	0.00	0.00	0.00	0.00
	1	0.00	0.00	0.00	0.00
	2	0.00	0.00	0.00	0.00
R	0	0.00	0.00	0.00	0.00
	1	0.00	0.00	0.00	0.00
	2	0.00	0.00	0.00	0.00
S	0	0.00	0.00	0.00	0.00
	1	179.20	49.25	17.89	246.34
	2	3.87	0.00	0.00	3.87
W	0	0.00	0.00	0.00	0.00
	1	0.00	0.00	0.00	0.00
	2	852.55	286.85	109.56	1,248.96
ALL	0	0.00	0.00	0.00	0.00
	1	179.20	49.25	17.89	246.34
	2	856.42	286.85	109.56	1,252.83

NOTES:

1. In the Fort St. John Timber Supply Area (TSA) and a small portion of the Dawson Creek TSA (mapsheet 94A025) ESA's were taken from Ministry of Forests inventory information. For the remainder of the project area, in which MOF ESA classification did not exist, I.F.S. inventory personnel assigned ESA categories for soils only.

2. Inclusive of Crown land within the proposed reservoir, construction site, Highway 29 relocation and transmission line ROW widening.

3. See Appendix V for Ministry of Forests ESA categories.

4. Merchantable timber is defined as all timber stands (except leading Birch) with an average net volume greater than 80 m3/ha when compiled to close utilization standards.

5. Non-merchantable timber is defined as all forested stands that do not meet the merchantable timber definition.

6. Non-forested includes cleared areas, sand banks, roads, etc.

APPENDIX I

PEACE SITE C PROJECT - FOREST RESOURCES DRAFT TERMS OF REFERENCE

BC hydro *proud of our Service*

18 June 1990
File: 1016-200.0(3)
C9A-G04E

INDUSTRIAL FORESTRY SERVICES LTD.
1595 Fifth Avenue
Prince George, B.C.
V2L 3L9

Attention: C.H. Gairns

Dear Mr. Gairns:

Re: Peace River Site C Project
Forestry Studies

You are hereby invited to submit a proposal for consultant services to update the subject studies. Draft terms of reference for this work are attached.

Five (5) copies of your proposal should be submitted no later than noon 03 July 1990 to:

B.C. Hydro
Attn: Dr. Glen Singleton
808 Nelson Street
13th Floor
Vancouver, B.C.
V6Z 2H2

Your attention is drawn to the following information items.

1. The terms of reference are in draft form and may be revised as planned consultations with government agencies and the public proceed.

2. The scheduling of project development activities, including applications through provincial and federal processes is uncertain. Your study schedule should make provision for the earliest possible production of the draft and final reports, consistent with the field season limitations.

3. For budgeting purposes, it is suggested that you plan for 5 copies of the draft report and 25 copies of the final report.

4. The successful consultant will be called on to provide expert testimony on behalf of B.C. Hydro at federal, provincial, and local hearings. Participation in public meetings could also be anticipated. However, the budget required for these meetings and hearings will be provided by a separate source and should not be included in your proposal.

5. The following items will be required from the successful consultant:
   * a safety management plan.
   * certification indicating full compliance with requirements of the Worker's Compensation Act.
   * Monthly submission of time sheets indicating dates and hours worked.

B.C. Hydro is not obligated to accept the lowest or any quotation on this competition. Furthermore, the work can be terminated at any point specified by B.C. Hydro. B.C. Hydro would remunerate for satisfactory work up to and including the date of any termination.

If you require any further information on the preparation of your proposal, please contact Dr. Stan Hirst (980-9750 or 663-1904) or Dr. Glen Singleton (663-1809 or 663-4589). Thank you for your consideration of this request.

Yours truly,

Colin Gurnsey
Manager, Land and Social Resources

cc: G.A. Singleton (w/att., Nelson A-13)
S.M. Hirst (w/o att., Howe K-14)
L. Russel (w/att., Howe K-14)

/gs

Attachment (1)

DRAFT
Version 4
25 May 1990

PEACE SITE C PROJECT
FOREST RESOURCES

A. BACKGROUND

B.C. Hydro previously applied for an Energy Project Certificate (EPC) for the Peace Site C Project in 1981. An assessment of forest resources within the reservoir area was made and a preliminary set of clearing standards were developed[1], based on data available in 1975. B.C. Hydro proposes to update the environmental studies and assessments for the Site C project, and further work is required on the forest resources.

B. OBJECTIVES

The objectives of the forest resource studies are to:

a. provide a revised impact assessment;
b. develop a timber and vegetation clearing plan for the reservoir and construction site areas;
c. establish a basis for future forest compensation programs;
d. provide all documentation required to permit forest resource assessment in terms of the provincial EPC process and the federal Environmental Assessment Review Process (EARP) guidelines.

C. RESPONSIBILITIES

Based on recommendations made by the B.C. Utilities Commission during the previous EPC application and on subsequent discussions between B.C. Hydro, the Ministry of Forests (MOF) and the Energy Project Coordinating Committee (EPCC), the above objectives will best be achieved through the following suggested partitioning of responsibilities:

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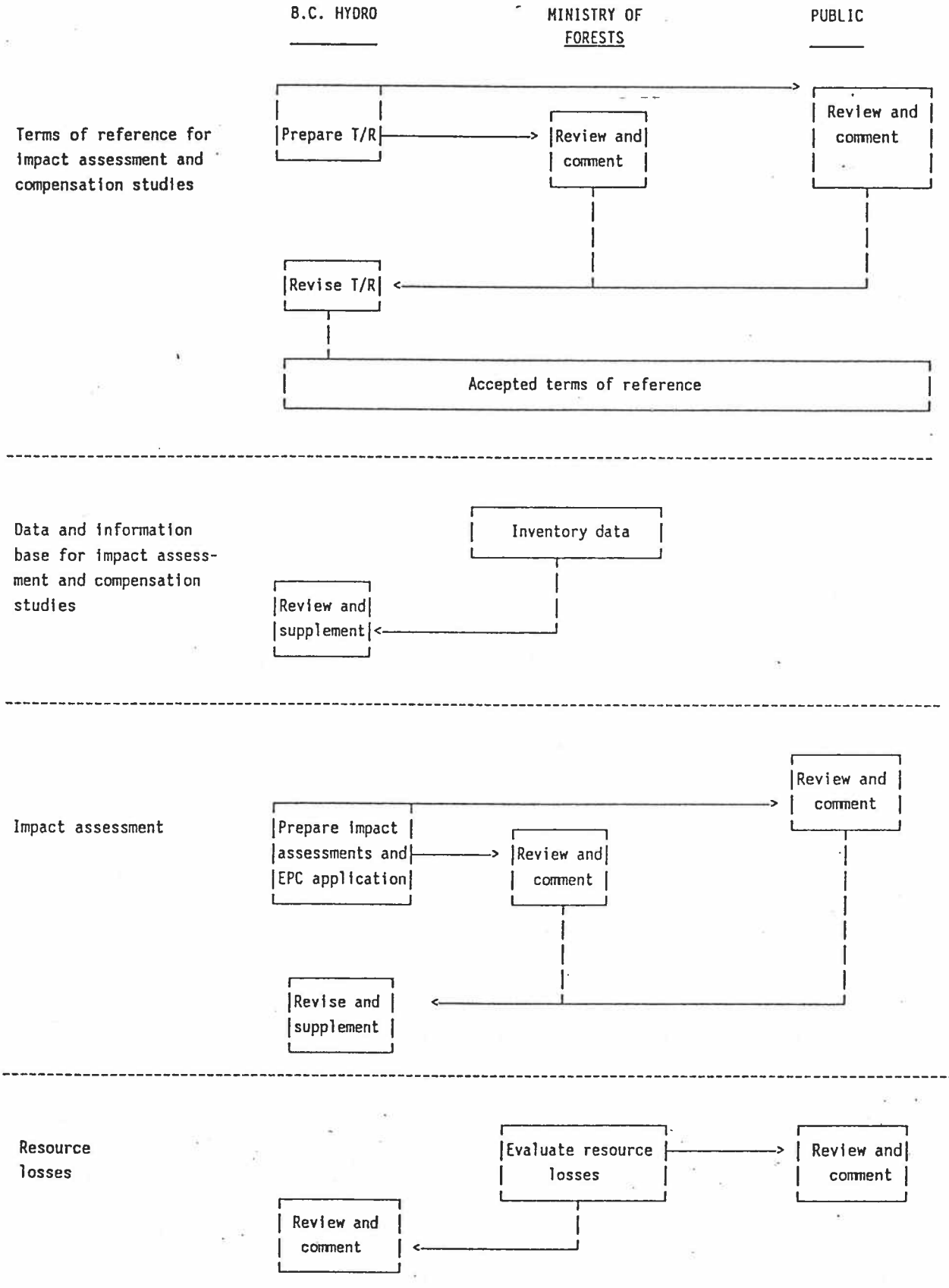
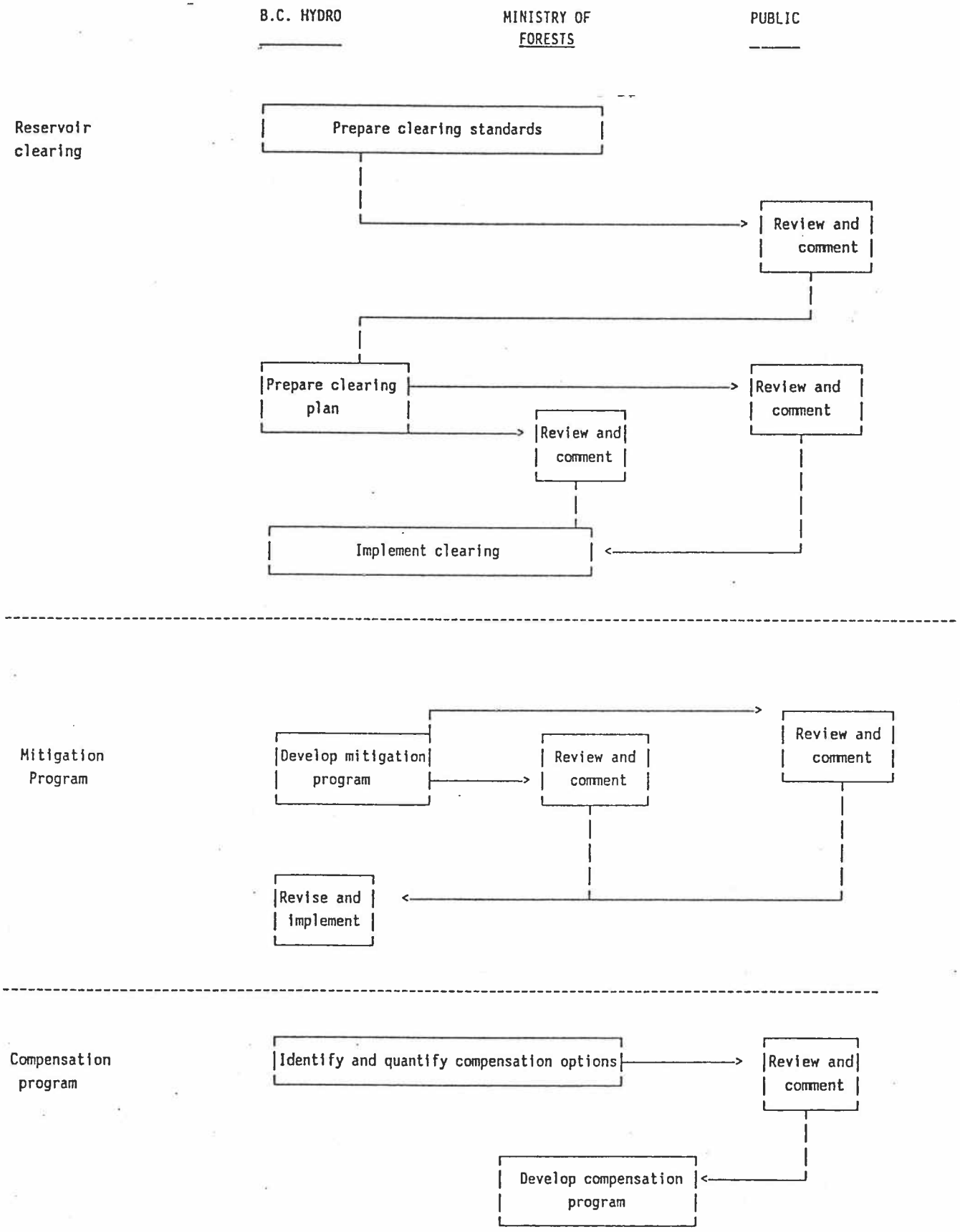
*1 Reid, Collins and Associates Ltd. 1979. Peace River Site C Hydroelectric Development: environmental and socio-economic assessment: forest resource assessment.


B.C. HYDRO
MINISTRY OF FORESTS
PUBLIC
Terms of reference for impact assessment and compensation studies
Prepare T/R
Review and comment
Review and comment
Revise T/R
Accepted terms of reference
Data and information base for impact assessment and compensation studies
Inventory data
Review and supplement
Impact assessment
Review and comment
Prepare impact assessments and EPC application
Review and comment
Revise and supplement
Resource losses
Evaluate resource losses
Review and comment
Review and comment


B.C. HYDRO
MINISTRY OF FORESTS
PUBLIC
Reservoir clearing
Prepare clearing standards
Review and comment
Prepare clearing plan
Review and comment
Review and comment
Implement clearing
Mitigation Program
Develop mitigation program
Review and comment
Review and comment
Revise and implement
Compensation program
Identify and quantify compensation options
Review and comment
Develop compensation program

D. TERMS OF REFERENCE

The terms of reference will provide a basis for defining the scope and objectives of the forest resource studies, and will serve as a focus for review and input by MOF and the public. They will be revised and amended as required throughout the course of the studies and assessments.

E. STUDY AREAS

The project study area refers to the general area of the floodplain, side slopes and terraces of the Peace River below the lateral valley scarp from the Peace Canyon Dam to a point about 1 km below the proposed Site C dam site, plus the upland area south of the Peace River (Figure 1) which would be traversed by two 500 kV transmission lines joining Site C to Peace Canyon Dam (the right-of-way [ROW] is presently occupied by two 138 Kv lines). Specific areas involved in project impact assessment include:

a. the reservoir area which lies behind the proposed Site C dam to an elevation of 461.8 m a.s.l.;
b. the dam and powerhouse construction site at Site C;
c. the transmission ROW noted above.
d. areas required for relocated sections of Highway 29 and minor access roads. Relocation of the public highway is the responsibility of the Ministry of Transportation and Highways, however assessment of the impacts of such relocation on forest resources is included in these studies.

F. ASSOCIATED STUDIES

The forest resource studies will interface and collaborate with other project-related studies and activities, in particular:

a. a land resources inventory which utilizes a Geographic Information System to develop and maintain a data base of biophysical features, resources, land uses and project components and facilities, and to provide a basis for quantitative impact analysis;
b. an assessment of wildlife resource impacts;
c. studies of recreational impacts, including the recreational use of the reservoir and areas surrounding it.

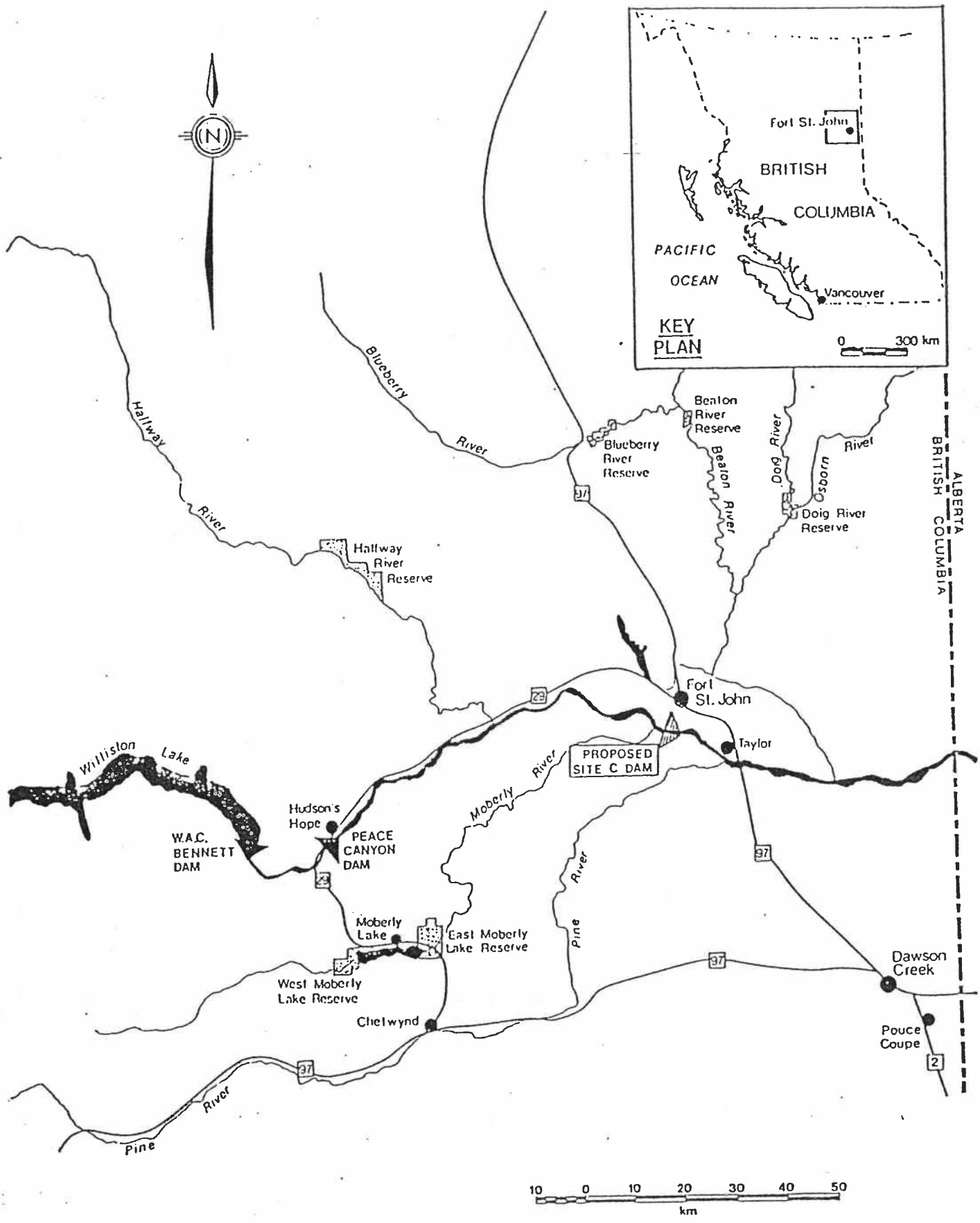


Figure 1

REGIONAL CONTEXT OF SITE C PROJECT

G. REQUIREMENTS

a. Inventory

1. Review the present distribution and utilization of forest resources within the Peace region and the project study area. Identify and briefly describe the salient biogeoclimatic factors determining the distribution and quality of the present resources. Identify the uses and users of forest resources within the study area and the region. Describe and interpret any significant trends in resource availability, quality and use

   a. within the reservoir and project areas;
   b. with and without the proposed project;
   c. over the short (< 10 years) and long term (> 10 years).

2. Provide a detailed summarization of the forest resources within the project study area, the reservoir area, the transmission ROW (sections requiring widening) and all other project-affected areas, based on the most recent available inventory data. Field inventories should be undertaken as necessary to establish reliability and accuracy of existing inventory information. Summaries shall specifically include areas, site classes, species, volumes and mean annual increments. Identify any deficiencies in the existing database as they pertain to impact assessment, resource evaluation and/or the development of clearing plans.

b. Impact Assessment

1. Quantitatively assess the impacts of the project on forest resources. Distinguish between impacts due to the major project components (reservoir, construction site, borrow areas, spoil areas, transmission ROW widening, etc.). Provide an assessment of the loss of existing timber resources as well as the loss of growing sites. [In terms of the partitioning of responsibilities indicated in section C, this assessment shall be limited to timber areas, volumes, MAI's and similar parameters, but shall exclude monetary evaluation].

2. Indicate the significance of the loss of timber and production capacity:

   a. in a local, regional and provincial context;
   b. in an industry-specific context (timber, pulp fibre, small industry development, etc.).

c. Reservoir and Transmission Right-of-Way Clearing

1. Briefly review the clearing programs undertaken for other reservoirs and summarize major findings, specifically:

   a. efficiency of resource recovery;
   b. effects on local and regional timber extraction programs;
   c. environmental impacts of clearing, especially fish and wildlife habitats, water quality, recreation, reservoir safety, etc.

   Mica, Revelstoke and Peace Canyon should specifically be addressed. Pertinent information from projects located in biophysical environments similar to Site C may be included.

2. Develop a set of clearing standards for the Site C reservoir and ensure that they adequately address all criteria, including:

   a. the results of previous clearing programs for other projects;
   b. concerns expressed and requirements established during the previous Site C EPC application;
   c. concerns raised by the public and by other resource users (especially water quality, fisheries, wildlife, recreation, safety, costs and efficiency of resource recovery);
   d. the possible need to remove organic material and debris to facilitate eventual recreational use of the reservoir and to reduce the potential for mercury accumulation within the aquatic food chain.

Clearing standards shall be reviewed by B.C. Hydro, MOF and the public before the following step is undertaken.

3. Develop a clearing plan for the Site C reservoir, based on the established clearing standards. The plan shall be sufficiently detailed to permit its use in contract specifications and MOF planning for allowable cuts and regional plans. The plan shall identify major sections of the reservoir area for clearing purposes, species and volumes to be removed from each section, locations of required access roads, and harvest methods to be used. A schedule for harvesting and clearing shall be established, to link closely with the construction and operating schedules for the coffer dam, the diversion tunnels and the main dam. The costs of clearing the reservoir shall be estimated.

4. Prepare a mitigation[*2] plan to reduce impacts during and following reservoir clearing. Identify and evaluate the efficiency of all options for mitigation, including those which reduce sediment input to the river system, minimize air quality deterioration, and minimize disturbance to land-owners, wildlife populations and recreational users.

5. Develop a clearing plan for the widening of the transmission ROW. The plan shall be sufficiently detailed to permit its use in contract specifications and MOF planning for allowable cuts and regional plans. The plan shall identify species and volumes to be removed, locations of required access roads, and harvest methods to be used. The costs of clearing the ROW shall be estimated.

6. Prepare a mitigation plan to minimize impacts during and following transmission ROW clearing. Identify and evaluate options for reducing disturbance to wildlife, fisheries and other resources, and to land-owners and settlements near the ROW[*3].

[*2] The term 'mitigation' as used here refers to actions and design changes which could be implemented to reduce the impacts of the project, e.g. timing of reservoir filling. Any actions which are subsequently taken to replace unavoidable losses are included under 'compensation'.

[*3] Existing B.C. Hydro procedures for right-of-way clearing should be included in the study

d. Compensation

1. Identify and evaluate the potential methods of forest enhancement which could be utilized to increase production in selected compensation areas. Provide a preliminary assessment of the advantages and disadvantages of each approach and indicate the expected cost per unit of enhanced timber production.

2. Review current forest resource inventories, forest management programs and objectives, and future timber supply patterns and of the Peace region and determine the feasibility of establishing forest compensation programs based on the methods examined under (1) above. Determine approximately how much would be required to implement compensation programs and the respective proportions of such areas likely to be found adjacent within the two Forest Districts and elsewhere in the Forest Region.

APPENDIX II

PROPOSAL FOR PEACE RIVER SITE C PROJECT
FORESTRY STUDIES

INDUSTRIAL FORESTRY SERVICE LTD.

B.C. HYDRO AND POWER AUTHORITY

PROPOSAL FOR PEACE RIVER SITE C PROJECT-FORESTRY STUDIES

INTRODUCTION

B.C. Hydro proposes to update the environmental studies and assessments for the proposed Peace River Site C hydroelectric development. Consequently, further work is required on the forest resources analyses which were done in support of the 1981 Energy Project Certificate application.

This proposal is in response to a request for proposals letter of June 19, 1990.

TERMS OF REFERENCE

The project terms of reference are appended. The scope of the study includes:

A. Quantifying the location, attributes, utilization and users of timber resources:
   i) by project component, total project area, and Peace region
   ii) with and without the proposed development
   iii) over the short (< 10 years) and long term

B. Assessing the impact of the development on timber resources, including loss of timber production potential as well as existing stands.

C. Evaluating the significance of losses of existing timber and timber production potential in an industry-specific, local, regional and provincial context.

D. Analyzing significant local trends in forest resource availability and use.

E. Reviewing the effectiveness of previous clearing programs.

F. Developing clearing standards.

G. Developing clearing plans.

H. Preparing mitigation plans for reducing impacts of the development.

I. Identifying and evaluating options for enhancing timber production elsewhere to compensate for losses caused by planned flooding or other disturbance in the project area.

METHODOLOGY

A. Quantify the location, attributes, utilization and users of forest resources.

1. Industrial Forestry Service Ltd., under contract to the Ministry of Forests, completed a forest inventory of the Ft. St. John T.S.A. in March 1990. This work includes about 50% of the Site C project area. Forest cover maps and data resulting from the inventory are available in digital format and will be used in conjunction with other digital inventory data from adjacent areas, updated as necessary, to prepare detailed summaries of forest resources, including areas, volume, species composition, site classes and mean annual increments, as requested. A one-day helicopter reconnaissance should be adequate to confirm or revise forest types outside the recently completed inventory area.

Statistics will be tabulated in detail for merchantable and non-merchantable cover within the project study area, the reservoir area, the transmission ROW and other project-affected areas. More general information will be provided for the overall Peace region.

The character of the timber will be described and salient

biogeoclimatic factors determining its location and quality will be addressed.

The location of timber resources will be indicated on forest cover maps but contour maps will also be utilized. There are several considerations regarding contour map availability and use. Terrain Resource Information Management (TRIM) maps for the project area are expected to be available from the Ministry of Crown Lands (key maps indicate that all but 2 needed mapsheets have been produced and these 2 sheets are scheduled for production soon). We also understand that the production of 1:5000 scale, 5 metre contour interval, digital mapping, covering the project area, is scheduled for completion through B.C. Hydro in November 1990. This information level is an improvement over TRIM and the maps will be utilized if time allows. Where necessary to fill information gaps, National Topographic maps will be used. Contour maps will be used to superimpose flood lines onto forest cover maps for identification of land areas to be submerged by the proposed dam and for preparation of clearing plans. Our budget is based on B.C. Hydro providing digital files, where available, for the applicable mapsheets.

A geographic information system (G.I.S.) will be used for preparation and presentation of forest resource information. For a comprehensive description of I.F.S. G.I.S. capabilities please refer to the enclosed "Outline of Services".

2. Current timber utilization and users will be investigated through contacting the Ministry of Forests Dawson Creek and Ft. St. John Districts and major licensees (Canadian Forest Products Ltd., West Fraser Mills Ltd.).

B. Assess the impact of the development on timber resources

1. Current levels of yield and resultant allowable annual cuts (AAC) for the affected management units will be detailed.

2. Yield and AAC reductions attributable to timber and growing site losses will be calculated and documented. MOF forest inventory computer files would be analyzed using our IFSYIELD yield analysis program. I.F.S. is currently undertaking a major evaluation of provincial yield analysis procedures using the Ft. St. John TSA as an example.

C. Evaluate the significance of projected timber and timber production potential losses.

Projected volume reductions will be compared to current licensee and MOF Small Business Forest Enterprise and Woodlot programs allocations.

D. Analyze significant local trends in local forest resource availability and use.

1. Current and projected local availability of timber from non-quota sources such as private land and grazing permits will be derived through discussions with Ministry of Forests District personnel.

2. Trends toward increased utilization, including deciduous species and small diameter pine, will be discussed. Development timing will determine whether the pondage deciduous will be utilized by the area manufacturing facilities coming on-stream.

E. Review the effectiveness of previous clearing programs.

1. MOF District personnel, contractors, and licensees which had significant involvement in previous clearing programs will be interviewed regarding their evaluation of the efficiency of resource recovery and effects on local and regional timber extraction programs. Suggestions for improvement will be solicited.

2. The appropriate government and/or non-government agencies will be

contacted and interviewed regarding previous environmental impacts of clearing.

F. Develop clearing standards.

Previous clearing standards for this development and others will be reviewed. New standards will be proposed incorporating concerns and requirements referred to in the terms of reference, then presented for review to B.C. Hydro.

G. Develop clearing plans (reservoir and ROW)

1. Any existing B.C. Hydro, licensee and MOF plans will be reviewed.

2. Based on the developed clearing standards, clearing plans will be prepared from aerial photographs, forest cover maps and contour maps. Harvest and clearing areas, roads and landings will be proposed, expected species and volumes to be logged will be estimated and presented, and schedules, coordinated with other work, will be derived. The G.I.S. will be used extensively for this work.

3. Clearing and logging costs will be estimated by canvassing contractors and licensees having relevant experience.

H. Prepare mitigation plans

Mitigation plans will be prepared through discussion with B.C. Hydro personnel regarding previous experience, with the MOF and other knowledgable government and non-government agencies. It is anticipated that outside experts will be subcontracted to address specific areas of concern (eg. hydrology, fish, wildlife, recreation).

I. Review compensation options

One of our silviculture foresters, in conjunction with the local

MOF, will investigate methods and sites where intensive silviculture could be undertaken to enhance timber production to compensate for expected site losses. Advantages, disadvantages, costs, risks and expected results will be discussed, the overall feasibility will be evaluated and conclusions will be presented.

PERSONNEL

The following personnel are proposed for the project. Their resumes are attached.

Ron Bellamy, R.P.F.	- responsible for overall project administration and final report
Craig Farnden, R.P.F.	- responsible for yield analysis, evaluation of timber and site loss impacts, determining timber availability and use trends.
Bob Parolin, P. Eng.	- responsible for clearing standards and clearing plans, including mitigation options; co-ordinating experts in specific mitigation areas.
Ian Moss, M.Sc., R.P.F.	- responsible for biogeoclimatic related input and study of compensation possibilities.
Jim Girvan, R.P.F.	- responsible for quantifying, analyzing and presenting forest resource inventory information.
Harry Gairns, R.P.F., P. Eng.	- available to advise on economic analysis and impacts on regional timber supplies.

APPENDIX III

METHODOLOGY OF FOREST RESOURCE QUANTIFICATION WITHIN THE PROJECT-AFFECTED AREAS

III-1 The Forest Resource Inventory

III-2 Forest Inventory Data Load and Extraction (Clipping) of Site C Activity Areas.

III-3 Application of Merchantability Criteria to the Clipped Forest Inventory and Preparation of Summaries of Affected Forest Resources.

III-1 The Forest Resource Inventory

The forest resource inventory was derived from two sources. Approximately 35 percent of the area to be directly affected by the Site C project was inventoried in 1989 by Industrial Forestry Service Ltd. under contract to the Ministry of Forests (MOF). This inventory, done on portions of the Fort St. John Timber Supply Area, was incorporated directly into the GIS database used in this project. For the remaining 65 percent of the project study area, the existing MOF inventory was completed between 1969 and 1972 and was too old to use for this project and a re-inventory of this area was done. Forest inventory procedures used are described below.

Preparation

A preliminary assessment was made to determine the extent of the project study area.

Digital forest cover map files in Intergraph Design System (IGDS) format were requested and received from the Ministry of Forests for all mapsheets except the following:

93P.091	94A.023(Dawson Creek TSA portion)
93P.092	94A.024(Dawson Creek TSA portion)
93P.093	94A.025(Dawson Creek TSA portion)

Paper copies of these mapsheets were acquired from the MOF.

Maps received in digital format consisted of:

94A.001	94A.012
94A.003	94A.013
94A.004	94A.015
94A.005	94A.023(Ft.St. John TSA portion)
94A.011	94A.024(Ft.St. John TSA portion)
	94A.025(Ft.St. John TSA portion)

These digital files contained georeferenced planimetric and forest inventory information. Figure III-1 is an index to the location of the BCGS mapsheets of the Site C project area.

Preliminary maps of those areas which would be directly affected by the proposed Site C project: the transmission line right-of-way (ROW) widening, the reservoir, the construction site and the Highway 29 relocation were obtained and area boundaries were transferred onto 1:20000 scale paper prints of the forest cover base maps. On mapsheets where forest inventory updating was required, a buffer zone extending about 500 metres beyond the project-affected areas was marked and forest inventory was updated within these boundaries.

Using these forest cover maps and a flight index map, a list of aerial photographs covering the areas requiring inventory was made and the photographs were purchased. Areas requiring re-inventory consisted of all portions of the project area within the Dawson Creek Timber Supply Area.

Photo interpreters stratified forest cover on these new photos based on tree species, age, height, crown closure and stem density attributes.

As part of Ministry of Forests inventory procedures, areas having a high likelihood of being environmentally sensitive are identified on forest cover maps. Environmentally Sensitive Areas (ESAs) indicated on updated portions of forest

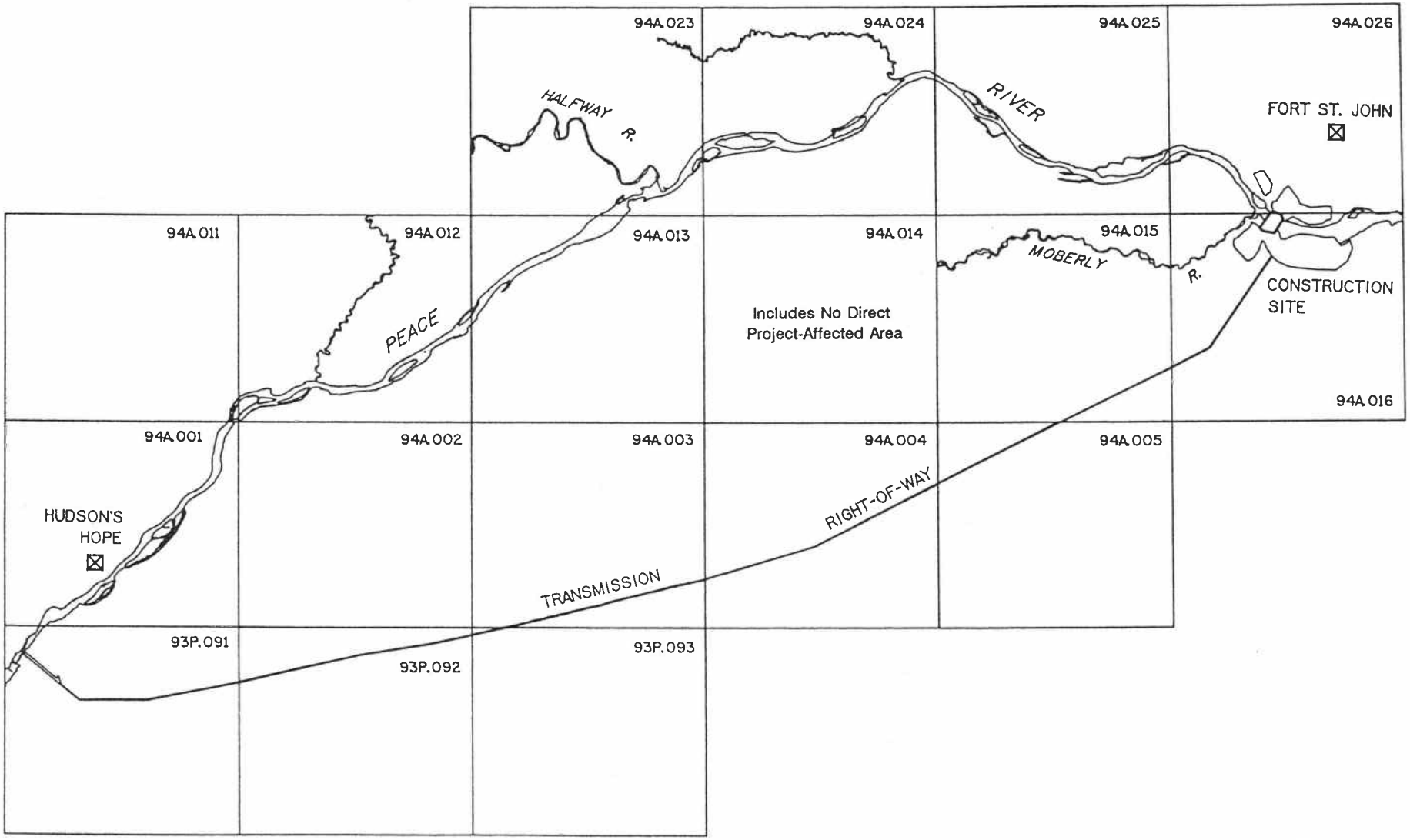


FIGURE III-1. British Columbia Geographic System (B C G S) Map Sheet Index for the Site C Project Area

cover maps, provided as part of the Site C forestry project, remain as determined from previous inventory work with the exception of soils-related ESAs. During forest cover stratification, areas were examined on aerial photographs and soils-related ESA delineations were adjusted as necessary. A summary of the Ministry of Forests ESA classification system is provided in Appendix IV.

Forest Inventory Field Work

Twenty eight helicopter air calls and seven ground calls were performed within the reservoir and right-of-way corridors using standard MOF inventory procedures. An attempt was made to sample every type of forest cover in the areas of interest to give the classifier a wide assortment of samples to draw on when evaluating adjacent forest cover polygon attributes. Information collected during the aerial reconnaissance included species composition, height, age and crown closure. Data collected in ground plots included species composition, age, height, tree diameter at breast height (1.3 meters above the tree germination point), pathology, timber quality and crown closure.

Inventory Evaluation

Once the classifier was familiar with the species and growth patterns of the area (i.e. after the field reconnaissance), the forest cover attributes and polygon boundaries as proposed in the aerial photography stratification phase were analyzed and revised if necessary.

In preparation for the loading of forest inventory information into the GIS database, all revised forest inventory polygons were transferred from the air photos to 1:20 000 scale paper prints.

A check of 1990 satellite imagery indicated no new disturbances (logging or wildfire) requiring map updating.

III-2 Forest Inventory Data Load and Extraction (Clipping) of Site C Activity Areas.

For twelve of the seventeen BCGS mapsheets required for this project, the digital planimetric base map information was received as part of the Ministry of Forests IGDS forest cover files. For six mapsheets, digital planimetric files were created from paper prints of forest cover maps. Ownership and administrative information was also added from paper prints.

Forest inventory polygon boundaries were digitized into the GIS database for mapsheets where a new inventory was done or the old inventory was updated. Attributes for these polygons were keypunched into digital files and linked to the GIS database.

Boundaries of areas directly affected by the proposed Site C project were obtained and digitized into the GIS database as a layer. Sources of data used to define these areas are outlined in Appendix VI. All overlays were clipped to the Site C activity areas. After all files were translated from IGDS format to ARC/INFO, a composite coverage was created through the intersection of all overlays. Translation was done to facilitate data analysis.

III-3 Application of Merchantability Criteria to the Clipped Forest Inventory and Preparation of Summaries of Affected Forest Resources.

INFO data files containing forest inventory attribute information were used for this phase of the project. For all forested polygons average volume per hectare (m^3/ha) was calculated using the current MOF volume assignment technique. The Ek-Payandeh Volume-ratio Method uses age, height and stocking attributes to calculate volumes. Where real attributes for age and height did not exist, IFS used the midpoint of the age and height classes as assigned during the inventory phase. All forested areas (except leading birch areas) with an average volume per hectare greater than or equal to 80 cubic metres (compiled to 12.5 + centimetres diameter

at breast height) were considered merchantable. Appendix IV contains a letter from the MOF confirming these merchantability standards. Area and volume summaries for areas directly affected by the Site C project were prepared on this basis.

Two files were provided to Hugh Hamilton Ltd. for use in constructing the forest inventory maps in the Land Resource Atlas. Provided IGDS files contained forest cover attribute, topographic and graphic information. An ASCII file was also provided that contained average volume per hectare information by mapsheet and forest cover polygon number.

APPENDIX IV

UTILIZATION STANDARDS FOR THE SITE C PROJECT

Province of
British Columbia

Ministry of
Forests

Fores vice
1011 ... th Avenue
Prince George
British Columbia
V2L 3H9
Fax: (604) 565-6671

December 10, 1990

File: 740-23

Industrial Forestry Services Ltd.
1595 Fifth Avenue
Prince George, B.C.
V2L 3L9

Attention: Mr. John Pousette

RE: Utilization Standards for Site C Project

Dear John:

Per your request, this letter will confirm that the utilization standards to which the forest inventory should be compiled for all salvage works related to Site C is 80 m^3/ha, to 12.5 + cm DBH, for all species. Physical operability of these stands will have to be field checked.

Yours truly,

K.A. Collingwood
Regional Manager
Prince George Forest Region

APPENDIX V

SUMMARY OF MINISTRY OF FORESTS ENVIRONMENTALLY SENSITIVE AREA (ESA) CLASSIFICATION SYSTEM

APPENDIX V Ministry of Forests Environmentally Sensitive Areas (E.S.A.) Classification System

Category Letter Code	Description
A	Snow and avalanche problems
H	Water supply areas
I	Inoperable areas due to access problems
P	Areas with regeneration problems
R	Areas with recreational potential
S	Steep slopes, unstable soils, and/or thin soils over bedrock
W	Areas with fish and wildlife values

Category Number Code	Description
1	High constraint
2	Medium constraint
0	Constraint level not specified

SOURCE: Forest and Range Inventory Manual, Chapter 2 - Environmentally Sensitive Areas, Ministry of Forests, 1984

APPENDIX VI

SOURCES OF DATA USED TO DEFINE THE AREAS DIRECTLY AFFECTED BY THE SITE C PROJECT

RESERVOIR AND CONSTRUCTION SITE

The reservoir boundary as defined by 461.8 metres above sea level, and construction site boundary were received as IGDS 3D files (NAD 27) from Hugh Hamilton Ltd. These digital files, received on three 3-1/2" floppy discs, also contained topographic information and were added as a layer in the GIS database.

An adjustment of Peace River, reservoir floodline and construction site location file data, as provided by Hugh Hamilton Ltd., was necessary to match Ministry of Forests forest cover basemap files. Because of recent physical changes in the river, its location had to be revised on the forest inventory digital files, and forest cover polygons rationalized before the floodline could be inputted. This was necessary to ensure the forest inventory GIS files would be compatible with Hugh Hamilton environmental resources mapping.

TRANSMISSION LINE RIGHT-OF-WAY (ROW) WIDENING

The existing cleared ROW is 65 meters wide. It is to be widened on the north side by 53 metres for a total width of 118 metres.

The existing ROW did not appear on most of the forest cover base maps or digital files provided by the Ministry of Forest. For areas east of the Moberly River, aerial photography and simple transfer techniques (Map-O-Graph) were used to map the existing ROW onto forest cover map sheets. For areas west of the Moberly River, the existing ROW was transferred to the forest cover map

sheets from B.C. Terrain Resource Information Management (TRIM) representational file plots. Due to variation in the planimetry of the two basemaps, direct transfer was not possible and some estimation was required. Once the location of the existing ROW was known, the extra width (53 meters) required for the new transmission line was simply measured off and added as a layer in the GIS database.

HIGHWAY 29 RELOCATION

Information regarding the current preferred rerouting of Highway 29 was obtained from maps contained in the report entitled *Peace River Site C Project Description, B.C. Hydro, September 1990.* Highway right-of-way information was transferred from these maps to forest cover maps and then digitized into the GIS database.

APPENDIX VII

DETAILED FOREST INVENTORY STATISTICS

It should be noted that a small portion of TFL No. 48 would be directly affected by the proposed reservoir and transmission line ROW widening. In all tables presented in this Appendix the TFL No. 48 area is included as part of the crown portion of the Dawson Creek TSA.

TABLE

TABLE VII-1 Summary of Areas (ha) Directly Affected by the Peace River Site C Hydroelectric Project Fort ST. John TSA

	RESERVOIR	CONSTRUCTION SITE	HWY 29 RELOC.	TRANSMISSION ROW	TOTAL AREA
CROWN					
Forested:					
Merchantable Timber[1]					
Coniferous[2]	361.97	36.32	0.00	0.00	398.29
Deciduous[3]	723.77	45.16	0.14	0.00	769.07
Total Merch.	1085.74	81.48	0.14	0.00	1167.36
Non-Merch.[4]	197.30	4.59	0.00	0.00	201.89
Total Forested	1283.04	86.07	0.14	0.00	1369.25
Non-Forested	1020.76	52.17	2.13	0.00	1075.06
Total Crown	2303.80	138.24	2.27	0.00	2444.31
PRIVATE[5]					
Forested:					
Merchantable Timber					
Coniferous	44.56	0.00	2.13	0.00	46.69
Deciduous	182.62	193.61	17.10	0.00	393.33
Total Merch.	227.18	193.61	19.23	0.00	440.02
Non-Merch.	1.71	26.72	0.23	0.00	28.66
Total Forested	228.89	220.33	19.46	0.00	468.68
Non-Forested	590.94	170.39	33.02	0.00	794.35
Total Private	819.83	390.72	52.48	0.00	1263.03
ALL OWNER					
Forested:					
Merchantable Timber					
Coniferous	406.53	36.32	2.13	0.00	444.98
Deciduous	906.39	238.77	17.24	0.00	1162.40
Total Merch.	1312.92	275.09	19.37	0.00	1607.38
Non-Merch.	199.01	31.31	0.23	0.00	230.55
Total Forested	1511.93	306.40	19.60	0.00	1837.93
Non-Forested	1611.70	222.56	35.15	0.00	1869.41
Total Crown & Private	3123.63	528.96	54.75	0.00	3707.34

NOTES

1. Merchantable timber is defined as all timber stands with an average net volume per hectare greater than or equal to 80 m3 when compiled to close utilization (CU) standards (12.5 cm + DBH, 30 cm stump height and a 10 cm top diameter).

2. Coniferous species include leading spruce (Ministry of Forests species type groups 21-25) and lodgepole pine (type groups 28-31) stands.

3. Deciduous species include leading aspen (type groups 41 and 42) and balsam poplar (type groups 35 and 36) but exclude all leading birch stands. Birch (type group 40) is excluded as it is not considered to be merchantable. Balsam poplar is referred to as cottonwood on forest cover maps.

4. Non-merchantable timber is defined as all forested areas that do not meet the merchantable timber definition.

5. Private ownership includes both B.C. Hydro owned and other privately owned land.

   Ownership status was provided by B.C. Hydro for Hydro owned land (status date January 1991) and the Ministry of Forests Inventory Branch for all other areas (status date 1988).

TABLE VII-2 Summary of Areas (ha) Directly Affected by the Peace River Site C Hydroelectric Project
Dawson Creek TSA

	RESERVOIR	CONSTRUCTION SITE	HWY 29 RELOC.	TRANSMISSION ROW	TOTAL AREA
CROWN					
Forested:					
Merchantable Timber[1]					
Coniferous[2]	579.60	26.76	0.00	68.99	675.35
Deciduous[3]	942.77	392.46	0.00	138.00	1473.23
Total Merch.	1522.37	419.22	0.00	206.99	2148.58
Non-Merch.[4]	318.40	261.68	0.25	65.99	646.32
Total Forested	1840.77	680.90	0.25	272.98	2794.90
Non-Forested	434.87	28.56	1.68	146.84	611.95
Total Crown	2275.64	709.46	1.93	419.82	3406.85
PRIVATE[5]					
Forested:					
Merchantable Timber					
Coniferous	60.92	0.00	0.58	0.00	61.50
Deciduous	181.58	0.00	12.23	2.05	195.86
Total Merch.	242.50	0.00	12.81	2.05	257.36
Non-Merch.	20.74	0.00	0.00	0.00	20.74
Total Forested	263.24	0.00	12.81	2.05	278.10
Non-Forested	142.68	0.00	13.48	38.48	194.64
Total Private	405.92	0.00	26.29	40.53	472.74
ALL OWNER					
Forested:					
Merchantable Timber					
Coniferous	640.52	26.76	0.58	68.99	736.85
Deciduous	1124.35	392.46	12.23	140.05	1669.09
Total Merch.	1764.87	419.22	12.81	209.04	2405.94
Non-Merch.	339.14	261.68	0.25	65.99	667.06
Total Forested	2104.01	680.90	13.06	275.03	3073.00
Non-Forested	577.55	28.56	15.16	185.32	806.59
Total Crown & Private	2681.56	709.46	28.22	460.35	3879.59

NOTES

1. Merchantable timber is defined as all timber stands with an average net volume per hectare greater than or equal to 80 m3 when compiled to close utilization (CU) standards (12.5 cm + DBH, 30 cm stump height and a 10 cm top diameter).

2. Coniferous species include leading spruce (Ministry of Forests species type groups 21-25) and lodgepole pine (type groups 28-31) stands.

3. Deciduous species include leading aspen (type groups 41 and 42) and balsam poplar (type groups 35 and 36) but exclude all leading birch stands. Birch (type group 40) is excluded as it is not considered to be merchantable. Balsam poplar is referred to as cottonwood on forest cover maps.

4. Non-merchantable timber is defined as all forested areas that do not meet the merchantable timber definition.

5. Private ownership includes both B.C. Hydro owned and other privately owned land.

   Ownership status was provided by B.C. Hydro for Hydro owned land (status date January 1991) and the Ministry of Forests Inventory Branch for all other areas (status date 1988).

TABLE VII-3 Summary of Areas (ha) Directly Affected by the Peace River Site C Hydroelectric Project Fort ST. John and Dawson Creek TSA's

	RESERVOIR	CONSTRUCTION SITE	HWY 29 RELOC.	TRANSMISSION ROW	TOTAL AREA
CROWN					
Forested:					
Merchantable Timber[1]					
Coniferous[2]	941.57	63.08	0.00	68.99	1073.64
Deciduous[3]	1666.54	437.62	0.14	138.00	2242.30
Total Merch.	2608.11	500.70	0.14	206.99	3315.94
Non-Merch.[4]	515.70	266.27	0.25	65.99	848.21
Total Forested	3123.81	766.97	0.39	272.98	4164.15
Non-Forested	1455.63	80.73	3.81	146.84	1687.01
Total Crown	4579.44	847.70	4.20	419.82	5851.16
PRIVATE[5]					
Forested:					
Merchantable Timber					
Coniferous	105.48	0.00	2.71	0.00	108.19
Deciduous	364.20	193.61	29.33	2.05	589.19
Total Merch.	469.68	193.61	32.04	2.05	697.38
Non-Merch.	22.45	26.72	0.23	0.00	49.40
Total Forested	492.13	220.33	32.27	2.05	746.78
Non-Forested	733.62	170.39	46.50	38.48	988.99
Total Private	1225.75	390.72	78.77	40.53	1735.77
ALL OWNER					
Forested:					
Merchantable Timber					
Coniferous	1047.05	63.08	2.71	68.99	1181.83
Deciduous	2030.74	631.23	29.47	140.05	2831.49
Total Merch.	3077.79	694.31	32.18	209.04	4013.32
Non-Merch.	538.15	292.99	0.48	65.99	897.61
Total Forested	3615.94	987.30	32.66	275.03	4910.93
Non-Forested	2189.25	251.12	50.31	185.32	2676.00
Total Crown & Private	5805.19	1238.42	82.97	460.35	7586.93

NOTES

1. Merchantable timber is defined as all timber stands with an average net volume per hectare greater than or equal to 80 m3 when compiled to close utilization (CU) standards (12.5 cm + DBH, 30 cm stump height and a 10 cm top diameter).

2. Coniferous species include leading spruce (Ministry of Forests species type groups 21-25) and lodgepole pine (type groups 28-31) stands.

3. Deciduous species include leading aspen (type groups 41 and 42) and balsam poplar (type groups 35 and 36) but exclude all leading birch stands. Birch (type group 40) is excluded as it is not considered to be merchantable. Balsam poplar is referred to as cottonwood on forest cover maps.

4. Non-merchantable timber is defined as all forested areas that do not meet the merchantable timber definition.

5. Private ownership includes both B.C. Hydro owned and other privately owned land.

   Ownership status was provided by B.C. Hydro for Hydro owned land (status date January 1991) and the Ministry of Forests Inventory Branch for all other areas (status date 1988).

TABLE VII-4 Summary of Merchantable[1] Timber Areas (ha) and Net Volumes[2] (m3) Within the Areas Directly Affected by the Peace River Site C Hydroelectric Project
Fort St John TSA

	Coniferous[4]				Deciduous[5]				Total Merch.			
	Area	Conif Vol	Decid Vol	Total Vol	Area	Conif Vol	Decid Vol	Total Vol	Area	Conif Vol	Decid Vol	Total Vol
CROWN[3]												
Reservoir	361.97	105276	22910	128186	723.77	16102	197426	213528	1085.74	121378	220336	341714
Construction	36.32	12899	3903	16802	45.16	2092	21267	23359	81.48	14991	25169	40161
Hwy 29 reloc.	0.00	0	0	0	0.14	0	29	29	0.14	0	29	29
Transmission	0.00	0	0	0	0.00	0	0	0	0.00	0	0	0
Total	398.29	118174	26813	144988	769.07	18195	218722	236916	1167.36	136369	245535	381904
PRIVATE[3]												
Reservoir	44.56	10302	2328	12629	182.62	413	42897	43310	227.18	10715	45224	55939
Construction	0.00	0	0	0	193.61	125	44659	44785	193.61	125	44659	44785
Hwy 29 reloc.	2.13	548	10	558	17.10	7	2705	2713	19.23	555	2715	3270
Transmission	0.00	0	0	0	0.00	0	0	0	0.00	0	0	0
Total	46.69	10849	2338	13187	393.33	546	90261	90807	440.02	11395	92599	103994
ALL OWNER												
Reservoir	406.53	115577	25238	140815	906.39	16516	240323	256838	1312.92	132093	265561	397653
Construction	36.32	12899	3903	16802	238.77	2217	65926	68143	275.09	15116	69829	84945
Hwy 29 reloc.	2.13	548	10	558	17.24	7	2735	2742	19.37	555	2745	3300
Transmission	0.00	0	0	0	0.00	0	0	0	0.00	0	0	0
Total	444.98	129024	29151	158175	1162.40	18740	308983	327724	1607.38	147764	338134	485898

NOTES

1. Merchantable timber is defined as all timber stands with an average net volume greater than or equal to 80 m3/ha when compiled to close utilization (CU) standards.

2. Volumes are compiled to CU standards (12.5 cm + DBH, 30 cm stump height and a 10 cm top diameter) less decay, waste and breakage.

3. The Crown and Private ownership status date is 1988 for information supplied by the Ministry of Forests Inventory Branch. The status of B.C. Hydro owned land was provided by B.C. Hydro and is current to January 1991.

4. Coniferous species include leading spruce (MOF species type groups 21-25) and lodgepole pine (type groups 28-31) stands.

   Leading coniferous stands may contain some deciduous volume.

5. Deciduous species include leading aspen (type groups 41 and 42) and cottonwood (type groups 35 and 36) but exclude all leading birch stands. Birch (type group 40) is excluded as it is not considered to be merchantable.

   Leading deciduous stands may contain some coniferous volume.

TABLE VII-5 Summary of Merchantable Timber[1] Areas (ha) and Net Volumes[2] (m3) Within the Areas Directly Affected by the Peace River Site C Hydroelectric Project
Dawson Creek TSA

	Coniferous[4]				Deciduous[5]				Total Merch.			
	Area	Conif Vol	Decid Vol	Total Vol	Area	Conif Vol	Decid Vol	Total Vol	Area	Conif Vol	Decid Vol	Total Vol
CROWN[3]												
Reservoir	579.60	164014	48555	212569	942.77	37772	263065	300837	1522.37	201786	311620	513406
Construction	26.76	7316	1715	9031	392.46	230	67374	67604	419.22	7545	69089	76635
Hwy 29 reloc.	0.00	0	0	0	0.00	0	0	0	0.00	0	0	0
Transmission	68.99	14626	4405	19031	138.00	4423	31200	35623	206.99	19049	35605	54654
Total	675.35	185956	54675	240631	1473.23	42424	361640	404064	2148.58	228380	416315	644695
PRIVATE[3]												
Reservoir	60.92	19184	3846	23031	181.58	4936	40259	45195	242.50	24120	44105	68225
Construction	0.00	0	0	0	0.00	0	0	0	0.00	0	0	0
Hwy 29 reloc.	0.58	219	0	219	12.23	0	2665	2665	12.81	219	2665	2884
Transmission	0.00	0	0	0	2.05	0	627	627	2.05	0	627	627
Total	61.50	19403	3846	23250	195.86	4936	43551	48487	257.36	24340	47397	71737
ALL OWNER												
Reservoir	640.52	183198	52401	235600	1124.35	42708	303324	346032	1764.87	225906	355725	581631
Construction	26.76	7316	1715	9031	392.46	230	67374	67604	419.22	7545	69089	76635
Hwy 29 reloc.	0.58	219	0	219	12.23	0	2665	2665	12.81	219	2665	2884
Transmission	68.99	14626	4405	19031	140.05	4423	31828	36250	209.04	19049	36232	55281
Total	736.85	205359	58521	263881	1669.09	47360	405190	452551	2405.94	252720	463712	716431

NOTES

1. Merchantable timber is defined as all timber stands with an average net volume greater than or equal to 80 m3/ha when compiled to close utilization (CU) standards.

2. Volumes are compiled to CU standards (12.5 cm + DBH, 30 cm stump height and a 10 cm top diameter) less decay, waste and breakage.

3. The Crown and Private ownership status date is 1988 for information supplied by the Ministry of Forests Inventory Branch. The status of B.C. Hydro owned land was provided by B.C. Hydro and is current to January 1991.

4. Coniferous species include leading spruce (MOF species type groups 21-25) and lodgepole pine (type groups 28-31) stands.

   Leading coniferous stands may contain some deciduous volume.

5. Deciduous species include leading aspen (type groups 41 and 42) and cottonwood (type groups 35 and 36) but exclude all leading birch stands. Birch (type group 40) is excluded as it is not considered to be merchantable.

   Leading deciduous stands may contain some coniferous volume.

TABLE VII-6 Summary of Merchantable[1] Timber Areas (ha) and Net Volumes[2] (m3) Within the Areas Directly Affected by the Peace River Site C Hydroelectric Project
Fort St John and Dawson Creek TSA's

	Coniferous[4]				Deciduous[5]				Total Merch.			
	Area	Conif Vol	Decid Vol	Total Vol	Area	Conif Vol	Decid Vol	Total Vol	Area	Conif Vol	Decid Vol	Total Vol
CROWN[3]												
Reservoir	941.57	269290	71465	340755	1666.54	53874	460491	514365	2608.11	323164	531956	855120
Construction	63.08	20215	5618	25833	437.62	2322	88641	90963	500.70	22536	94259	116795
Hwy 29 reloc.	0.00	0	0	0	0.14	0	29	29	0.14	0	29	29
Transmission	68.99	14626	4405	19031	138.00	4423	31200	35623	206.99	19049	35605	54654
Total	1073.64	304130	81488	385619	2242.30	60619	580362	640980	3315.94	364749	6618501026599	
PRIVATE[3]												
Reservoir	105.48	29486	6174	35660	364.20	5349	83155	88505	469.68	34835	89329	124164
Construction	0.00	0	0	0	193.61	125	44659	44785	193.61	125	44659	44785
Hwy 29 reloc.	2.71	767	10	777	29.33	7	5370	5378	32.04	774	5380	6154
Transmission	0.00	0	0	0	2.05	0	627	627	2.05	0	627	627
Total	108.19	30253	6184	36437	589.19	5482	133812	139294	697.38	35734	139996	175731
ALL OWNER												
Reservoir	1047.05	298776	77639	376415	2030.74	59223	543646	602870	3077.79	357999	621286	979285
Construction	63.08	20215	5618	25833	631.23	2447	133300	135748	694.31	22662	138918	161580
Hwy 29 reloc.	2.71	767	10	777	29.47	7	5400	5407	32.18	774	5410	6184
Transmission	68.99	14626	4405	19031	140.05	4423	31828	36250	209.04	19049	36232	55281
Total	1181.83	334383	87672	422055	2831.49	66101	714174	780274	4013.32	400484	8018461202330	

NOTES

1. Merchantable timber is defined as all timber stands with an average net volume greater than or equal to 80 m3/ha when compiled to close utilization (CU) standards.

2. Volumes are compiled to CU standards (12.5 cm + DBH, 30 cm stump height and a 10 cm top diameter) less decay, waste and breakage.

3. The Crown and Private ownership status date is 1988 for information supplied by the Ministry of Forests Inventory Branch. The status of B.C. Hydro owned land was provided by B.C. Hydro and is current to January 1991.

4. Coniferous species include leading spruce (MOF species type groups 21-25) and lodgepole pine (type groups 28-31) stands.

   Leading coniferous stands may contain some deciduous volume.

5. Deciduous species include leading aspen (type groups 41 and 42) and cottonwood (type groups 35 and 36) but exclude all leading birch stands. Birch (type group 40) is excluded as it is not considered to be merchantable.

   Leading deciduous stands may contain some coniferous volume.

TABLE VII-7 Summary of Merchantable[1] Coniferous Timber Areas and Net Volumes[2] by Leading Species and Site Class[4] Within the Areas Directly Affected by the Peace River Site C Hydroelectric Project[5]
Fort St John TSA

	CROWN[3]		PRIVATE[3]		ALL OWNER	
	Area (ha)	Volume (m3)	Area (ha)	Volume (m3)	Area (ha)	Volume (m3)
Spruce						
GOOD	213.19	88980.76	19.20	7888.34	232.39	96869.10
MEDIUM	178.33	54578.47	7.59	1849.31	185.92	56427.78
POOR	6.75	1422.85	0.00	0.00	6.75	1422.85
LOW	0.00	0.00	0.00	0.00	0.00	0.00
ALL SITES	398.27	144982.07	26.79	9737.65	425.06	154719.72
Pine						
GOOD	0.00	0.00	0.00	0.00	0.00	0.00
MEDIUM	0.02	5.59	1.95	521.25	1.97	526.84
POOR	0.00	0.00	1.24	134.66	1.24	134.66
LOW	0.00	0.00	0.00	0.00	0.00	0.00
ALL SITES	0.02	5.59	3.19	655.91	3.21	661.50
Larch						
GOOD	0.00	0.00	0.00	0.00	0.00	0.00
MEDIUM	0.00	0.00	0.00	0.00	0.00	0.00
POOR	0.00	0.00	16.71	2793.40	16.71	2793.40
LOW	0.00	0.00	0.00	0.00	0.00	0.00
ALL SITES	0.00	0.00	16.71	2793.40	16.71	2793.40
Total Conif.						
GOOD	213.19	88980.76	19.20	7888.34	232.39	96869.10
MEDIUM	178.35	54584.06	9.54	2370.56	187.89	56954.62
POOR	6.75	1422.85	17.95	2928.05	24.70	4350.90
LOW	0.00	0.00	0.00	0.00	0.00	0.00
ALL SITES	398.29	144987.66	46.69	13186.96	444.98	158174.62

NOTES

1. Merchantable timber is defined as all timber stands with an average net volume greater than or equal to 80 m3/ha when compiled to close utilization (CU) standards.

2. Volumes are compiled to close utilization standards (12.5 cm + DBH, 30 cm stump height and a 10 cm top diameter) less decay, waste and breakage.

3. The Crown and Private ownership status date is 1988 for information supplied by the Ministry of Forest Inventory Branch. The Status of B.C. Hydro owned land was provided by B.C. Hydro and is current to January 1991.

4. Site Class assignment based on site indices (tree height at a reference age) as determined using current MOF procedures. Spruce and Pine species use Goudie's site indices (Reference age 50 at breast height) in Forest Inventory Zone (FIZ) L.

5. Inclusive of reservoir, construction site, Highway 29 relocation and the transmission line ROW widening.

TABLE VII-8 Summary of Merchantable[1] Coniferous Timber Areas and Net Volumes[2] by Leading Species and Site Class[4] Within the Areas Directly Affected by the Peace River Site C Hydroelectric Project[5]
Dawson Creek TSA

	CROWN[3]		PRIVATE[3]		ALL OWNER	
	Area (ha)	Volume (m3)	Area (ha)	Volume (m3)	Area (ha)	Volume (m3)
Spruce						
GOOD	431.81	177906.57	35.55	15396.84	467.36	193303.40
MEDIUM	158.22	43800.53	21.71	6560.31	179.93	50360.84
POOR	35.88	3773.53	0.58	50.98	36.46	3824.52
LOW	0.00	0.00	0.00	0.00	0.00	0.00
ALL SITES	625.91	225480.63	57.84	22008.13	683.75	247488.76
Pine						
GOOD	8.21	3357.95	2.84	1013.71	11.05	4371.65
MEDIUM	32.39	10621.12	0.82	227.90	33.21	10849.02
POOR	8.84	1171.14	0.00	0.00	8.84	1171.14
LOW	0.00	0.00	0.00	0.00	0.00	0.00
ALL SITES	49.44	15150.21	3.66	1241.60	53.10	16391.81
Larch						
GOOD	0.00	0.00	0.00	0.00	0.00	0.00
MEDIUM	0.00	0.00	0.00	0.00	0.00	0.00
POOR	0.00	0.00	0.00	0.00	0.00	0.00
LOW	0.00	0.00	0.00	0.00	0.00	0.00
ALL SITES	0.00	0.00	0.00	0.00	0.00	0.00
Total Conif.						
GOOD	440.02	181264.51	38.39	16410.54	478.41	197675.06
MEDIUM	190.61	54421.65	22.53	6788.21	213.14	61209.85
POOR	44.72	4944.68	0.58	50.98	45.30	4995.66
LOW	0.00	0.00	0.00	0.00	0.00	0.00
ALL SITES	675.35	240630.84	61.50	23249.73	736.85	263880.57

NOTES

1. Merchantable timber is defined as all timber stands with an average net volume greater than or equal to 80 m3/ha when compiled to close utilization (CU) standards.

2. Volumes are compiled to close utilization standards (12.5 cm + DBH, 30 cm stump height and a 10 cm top diameter) less decay, waste and breakage.

3. The Crown and Private ownership status date is 1988 for information supplied by the Ministry of Forest Inventory Branch. The Status of B.C. Hydro owned land was provided by B.C. Hydro and is current to January 1991.

4. Site Class assignment based on site indices (tree height at a reference age) as determined using current MOF procedures. Spruce and Pine species use Goudie's site indices (Reference age 50 at breast height) in Forest Inventory Zone (FIZ) L.

5. Inclusive of reservoir, construction site, Highway 29 relocation and the transmission line ROW widening.

TABLE VII-9 Summary of Merchantable[1] Coniferous Timber Areas and Net Volumes[2] by Leading Species and Site Class[4] Within the Areas Directly Affected by the Peace River Site C Hydroelectric Project[5]
Fort St John and Dawson Creek TSA's

	CROWN[3]		PRIVATE[3]		ALL OWNER	
	Area (ha)	Volume (m3)	Area (ha)	Volume (m3)	Area (ha)	Volume (m3)
Spruce						
GOOD	645.00	266887.32	54.75	23285.18	699.75	290172.50
MEDIUM	336.55	98379.00	29.30	8409.62	365.85	106788.62
POOR	42.63	5196.38	0.58	50.98	43.21	5247.37
LOW	0.00	0.00	0.00	0.00	0.00	0.00
ALL SITES	1024.18	370462.70	84.63	31745.78	1108.81	402208.48
Pine						
GOOD	8.21	3357.95	2.84	1013.71	11.05	4371.65
MEDIUM	32.41	10626.71	2.77	749.15	35.18	11375.86
POOR	8.84	1171.14	1.24	134.66	10.08	1305.80
LOW	0.00	0.00	0.00	0.00	0.00	0.00
ALL SITES	49.46	15155.80	6.85	1897.51	56.31	17053.31
Larch						
GOOD	0.00	0.00	0.00	0.00	0.00	0.00
MEDIUM	0.00	0.00	0.00	0.00	0.00	0.00
POOR	0.00	0.00	16.71	2793.40	16.71	2793.40
LOW	0.00	0.00	0.00	0.00	0.00	0.00
ALL SITES	0.00	0.00	16.71	2793.40	16.71	2793.40
Total Conif.						
GOOD	653.21	270245.27	57.59	24298.89	710.80	294544.15
MEDIUM	368.96	109005.71	32.07	9158.77	401.03	118164.48
POOR	51.47	6367.53	18.53	2979.04	70.00	9346.56
LOW	0.00	0.00	0.00	0.00	0.00	0.00
ALL SITES	1073.64	385618.50	108.19	36436.69	1181.83	422055.20

NOTES

1. Merchantable timber is defined as all timber stands with an average net volume greater than or equal to 80 m3/ha when compiled to close utilization (CU) standards.

2. Volumes are compiled to close utilization standards (12.5 cm + DBH, 30 cm stump height and a 10 cm top diameter) less decay, waste and breakage.

3. The Crown and Private ownership status date is 1988 for information supplied by the Ministry of Forest Inventory Branch. The Status of B.C. Hydro owned land was provided by B.C. Hydro and is current to January 1991.

4. Site Class assignment based on site indices (tree height at a reference age) as determined using current MOF procedures. Spruce and Pine species use Goudie's site indices (Reference age 50 at breast height) in Forest Inventory Zone (FIZ) L.

5. Inclusive of reservoir, construction site, Highway 29 relocation and the transmission line ROW widening.

TABLE VII-10 Summary of Merchantable[1] Deciduous Timber Areas and Net Volumes[2] by Leading Species and Site Class[3] Within the Areas Directly Affected by the Peace River Site C Hydroelectric Project[4]
Fort St John TSA

	CROWN[5]		PRIVATE[5]		ALL OWNER	
	Area (ha)	Volume (m3)	Area (ha)	Volume (m3)	Area (ha)	Volume (m3)
Aspen						
GOOD	14.28	6396.30	64.82	27719.62	79.10	34115.91
MEDIUM	143.74	21380.37	230.46	34195.45	374.20	55575.82
POOR	71.81	11283.05	28.76	3721.64	100.57	15004.69
LOW	0.00	0.00	0.00	0.00	0.00	0.00
ALL SITES	229.83	39059.72	324.04	65636.71	553.87	104696.43
Balsam Poplar						
GOOD	25.46	14570.23	0.00	0.00	25.46	14570.23
MEDIUM	513.78	183286.55	69.29	25170.50	583.07	208457.05
POOR	0.00	0.00	0.00	0.00	0.00	0.00
LOW	0.00	0.00	0.00	0.00	0.00	0.00
ALL SITES	539.24	197856.77	69.29	25170.50	608.53	223027.27
Total Decid.[6]						
GOOD	39.74	20966.52	64.82	27719.62	104.56	48686.14
MEDIUM	657.52	204666.92	299.75	59365.95	957.27	264032.87
POOR	71.81	11283.05	28.76	3721.64	100.57	15004.69
LOW	0.00	0.00	0.00	0.00	0.00	0.00
ALL SITES	769.07	236916.49	393.33	90807.21	1162.40	327723.70

NOTES

1. Merchantable timber is defined as all timber stands with an average net volume greater than or equal to 80 m3/ha when compiled to close utilization (CU) standards.

2. Volumes are compiled to CU standards (12.5 cm + DBH, 30 cm stump height and a 10 cm top diameter) less decay, waste and breakage.

3. Site Class assignment based on site indices (tree height at a reference age) as determined using current MOF procedures. Deciduous species use MOF site indices (Reference age 100 years at stump height) in Forest Inventory Zone (FIZ) L.

4. Inclusive of the reservoir, construction, site, Highway 29 relocation and the transmission line ROW widening.

5. The Crown and Private ownership status date is 1988 for information supplied by the Ministry of Forests Inventory Branch. The status of B.C. Hydro owned land was provided by B.C. Hydro and is current to January 1991.

6. Birch is not included as it is not currently considered to be merchantable.

TABLE VII-11 Summary of Merchantable[1] Deciduous Timber Areas and Net Volumes[2] by Leading Species and Site Class[3] Within the Areas Directly Affected by the Peace River Site C Hydroelectric Project[4]
Dawson Creek TSA

	CROWN[5]		PRIVATE[5]		ALL OWNER	
	Area (ha)	Volume (m3)	Area (ha)	Volume (m3)	Area (ha)	Volume (m3)
Aspen						
GOOD	0.00	0.00	6.61	2251.40	6.61	2251.40
MEDIUM	650.53	159611.99	75.51	14629.25	726.04	174241.24
POOR	186.79	23295.23	34.00	4642.49	220.79	27937.73
LOW	0.00	0.00	0.00	0.00	0.00	0.00
ALL SITES	837.32	182907.22	116.12	21523.14	953.44	204430.36
Balsam Poplar						
GOOD	28.07	16975.38	0.00	0.00	28.07	16975.38
MEDIUM	549.24	195500.73	79.74	26963.71	628.98	222464.45
POOR	58.60	8680.42	0.00	0.00	58.60	8680.42
LOW	0.00	0.00	0.00	0.00	0.00	0.00
ALL SITES	635.91	221156.53	79.74	26963.71	715.65	248120.25
Total Decid.[6]						
GOOD	28.07	16975.38	6.61	2251.40	34.68	19226.78
MEDIUM	1199.77	355112.72	155.25	41592.96	1355.02	396705.68
POOR	245.39	31975.66	34.00	4642.49	279.39	36618.15
LOW	0.00	0.00	0.00	0.00	0.00	0.00
ALL SITES	1473.23	404063.76	195.86	48486.86	1669.09	452550.61

NOTES

1. Merchantable timber is defined as all timber stands with an average net volume greater than or equal to 80 m3/ha when compiled to close utilization (CU) standards.

2. Volumes are compiled to CU standards (12.5 cm + DBH, 30 cm stump height and a 10 cm top diameter) less decay, waste and breakage.

3. Site Class assignment based on site indices (tree height at a reference age) as determined using current MOF procedures. Deciduous species use MOF site indices (Reference age 100 years at stump height) in Forest Inventory Zone (FIZ) L.

4. Inclusive of the reservoir, construction, site, Highway 29 relocation and the transmission line ROW widening.

5. The Crown and Private ownership status date is 1988 for information supplied by the Ministry of Forests Inventory Branch. The status of B.C. Hydro owned land was provided by B.C. Hydro and is current to January 1991.

6. Birch is not included as it is not currently considered to be merchantable.

TABLE VII-12 Summary of Merchantable[1] Deciduous Timber Areas and Net Volumes[2] by Leading Species and Site Class[3] Within the Areas Directly Affected by the Peace River Site C Hydroelectric Project[4] Fort St John and Dawson Creek TSA's

	CROWN[5]		PRIVATE[5]		ALL OWNER	
	Area (ha)	Volume (m3)	Area (ha)	Volume (m3)	Area (ha)	Volume (m3)
Aspen						
GOOD	14.28	6396.30	71.43	29971.02	85.71	36367.31
MEDIUM	794.27	180992.36	305.97	48824.70	1100.24	229817.06
POOR	258.60	34578.28	62.76	8364.14	321.36	42942.42
LOW	0.00	0.00	0.00	0.00	0.00	0.00
ALL SITES	1067.15	221966.94	440.16	87159.85	1507.31	309126.79
Balsam Poplar						
GOOD	53.53	31545.61	0.00	0.00	53.53	31545.61
MEDIUM	1063.02	378787.28	149.03	52134.22	1212.05	430921.49
POOR	58.60	8680.42	0.00	0.00	58.60	8680.42
LOW	0.00	0.00	0.00	0.00	0.00	0.00
ALL SITES	1175.15	419013.31	149.03	52134.22	1324.18	471147.52
Total Decid.[6]						
GOOD	67.81	37941.90	71.43	29971.02	139.24	67912.92
MEDIUM	1857.29	559779.64	455.00	100958.92	2312.29	660738.55
POOR	317.20	43258.70	62.76	8364.14	379.96	51622.84
LOW	0.00	0.00	0.00	0.00	0.00	0.00
ALL SITES	2242.30	640980.24	589.19	139294.07	2831.49	780274.31

NOTES

1. Merchantable timber is defined as all timber stands with an average net volume greater than or equal to 80 m3/ha when compiled to close utilization (CU) standards.

2. Volumes are compiled to CU standards (12.5 cm + DBH, 30 cm stump height and a 10 cm top diameter) less decay, waste and breakage.

3. Site Class assignment based on site indices (tree height at a reference age) as determined using current MOF procedures. Deciduous species use MOF site indices (Reference age 100 years at stump height) in Forest Inventory Zone (FIZ) L.

4. Inclusive of the reservoir, construction, site, Highway 29 relocation and the transmission line ROW widening.

5. The Crown and Private ownership status date is 1988 for information supplied by the Ministry of Forests Inventory Branch. The status of B.C. Hydro owned land was provided by B.C. Hydro and is current to January 1991.

6. Birch is not included as it is not currently considered to be merchantable.

TABLE VII-13

Summary of Environmentally Sensitive Areas (E.S.A.s)[1] within the Area Directly Affected by the Peace River Site C Hydroelectric Project[2]
Fort St John TSA

ESA CATEGORY[3]	MERCHANTABLE[4] AREA (ha)	NON-MERCH[5] AREA (ha)	NON-FOREST[6] AREA (ha)	ALL AREAS (ha)
A				
0	0.00	0.00	0.00	0.00
1	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00
H				
0	0.00	0.00	0.00	0.00
1	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00
I				
0	0.00	0.00	0.00	0.00
1	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00
P				
0	0.00	0.00	0.00	0.00
1	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00
R				
0	0.00	0.00	0.00	0.00
1	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00
S				
0	0.00	0.00	0.00	0.00
1	13.76	2.58	13.38	29.72
2	0.00	0.00	0.00	0.00
W				
0	0.00	0.00	0.00	0.00
1	0.00	0.00	0.00	0.00
2	106.54	2.66	42.35	151.55
ALL				
0	0.00	0.00	0.00	0.00
1	13.76	2.58	13.38	29.72
2	106.54	2.66	42.35	151.55

NOTES

1. In the Fort St. John Timber Supply Area (TSA) and a small portion of the Dawson Creek TSA (mapsheet 94A025) ESA's were taken from Ministry of Forests inventory information. For the remainder of the project area, in which MOF ESA classification did not exist, I.F.S. inventory personnel assigned ESA categories for soils only.

2. Inclusive of Crown land within the reservoir, construction, site, Highway 29 relocation and transmission line ROW widening.

3. See Appendix IV for ESA classifications.

4. Merchantable timber is defined as all timber stands (except leading Birch) with an average net volume greater than or equal to 80 m3/ha when compiled to close utilization (12.5 + cm DBH, 30 cm stump height and a 10 cm top diameter) standards.

5. Non-merchantable timber is defined as all forested areas that do not meet the merchantable timber definition.

6. Non-forest includes cleared areas, sand banks, roads, etc.

TABLE VII-14 Summary of Environmentally Sensitive Areas (E.S.A.s)[1] within the Area Directly Affected by the Peace River Site C Hydroelectric Project[2]
Dawson Creek TSA

ESA CATEGORY[3]	MERCHANTABLE[4] AREA (ha)	NON-MERCH[5] AREA (ha)	NON-FOREST[6] AREA (ha)	ALL AREAS (ha)
A				
0	0.00	0.00	0.00	0.00
1	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00
H				
0	0.00	0.00	0.00	0.00
1	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00
I				
0	0.00	0.00	0.00	0.00
1	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00
P				
0	0.00	0.00	0.00	0.00
1	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00
R				
0	0.00	0.00	0.00	0.00
1	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00
S				
0	0.00	0.00	0.00	0.00
1	165.44	46.67	4.51	216.62
2	3.87	0.00	0.00	3.87
W				
0	0.00	0.00	0.00	0.00
1	0.00	0.00	0.00	0.00
2	746.01	284.19	67.21	1097.41
ALL				
0	0.00	0.00	0.00	0.00
1	165.44	46.67	4.51	216.62
2	749.88	284.19	67.21	1101.28

NOTES

1. In the Fort St. John Timber Supply Area (TSA) and a small portion of the Dawson Creek TSA (mapsheet 94A025) ESA's were taken from Ministry of Forests inventory information. For the remainder of the project area, in which MOF ESA classification did not exist, I.F.S. inventory personnel assigned ESA categories for soils only.

2. Inclusive of Crown land within the reservoir, construction, site, Highway 29 relocation and transmission line ROW widening.

3. See Appendix IV for ESA classifications.

4. Merchantable timber is defined as all timber stands (except leading Birch) with an average net volume greater than or equal to 80 m3/ha when compiled to close utilization (12.5 + cm DBH, 30 cm stump height and a 10 cm top diameter) standards.

5. Non-merchantable timber is defined as all forested areas that do not meet the merchantable timber definition.

6. Non-forest includes cleared areas, sand banks, roads, etc.

TABLE VII-15 Summary of Environmentally Sensitive Areas (E.S.A.s)[1] within the Area Directly Affected by the Peace River Site C Hydroelectric Project[2]
Fort St John and Dawson Creek TSA's

ESA CATEGORY[3]	MERCHANTABLE[4] AREA (ha)	NON-MERCH[5] AREA (ha)	NON-FOREST[6] AREA (ha)	ALL AREAS (ha)
A				
0	0.00	0.00	0.00	0.00
1	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00
H				
0	0.00	0.00	0.00	0.00
1	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00
I				
0	0.00	0.00	0.00	0.00
1	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00
P				
0	0.00	0.00	0.00	0.00
1	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00
R				
0	0.00	0.00	0.00	0.00
1	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00
S				
0	0.00	0.00	0.00	0.00
1	179.20	49.25	17.89	246.34
2	3.87	0.00	0.00	3.87
W				
0	0.00	0.00	0.00	0.00
1	0.00	0.00	0.00	0.00
2	852.55	286.85	109.56	1248.96
ALL				
0	0.00	0.00	0.00	0.00
1	179.20	49.25	17.89	246.34
2	856.42	286.85	109.56	1252.83

NOTES

1. In the Fort St. John Timber Supply Area (TSA) and a small portion of the Dawson Creek TSA (mapsheet 94A025) ESA's were taken from Ministry of Forests inventory information. For the remainder of the project area, in which MOF ESA classification did not exist, I.F.S. inventory personnel assigned ESA categories for soils only.

2. Inclusive of Crown land within the reservoir, construction, site, Highway 29 relocation and transmission line ROW widening.

3. See Appendix IV for ESA classifications.

4. Merchantable timber is defined as all timber stands (except leading Birch) with an average net volume greater than or equal to 80 m3/ha when compiled to close utilization (12.5 + cm DBH, 30 cm stump height and a 10 cm top diameter) standards.

5. Non-merchantable timber is defined as all forested areas that do not meet the merchantable timber definition.

6. Non-forest includes cleared areas, sand banks, roads, etc.

TABLE VII-16 Summary of Coniferous Forested Areas (ha) by Age Class[1] within the Areas Directly Affected[2] by the Peace River Site C Hydroelectric Project
Fort St John TSA

	1	2	3	4	5	6	7	8	9	all
Merchantable[3]										
CROWN										
Spruce	0.00	0.00	0.00	22.74	70.26	129.28	62.42	113.57	0.00	398.27
Pine	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.02
Larch	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
All conif	0.00	0.00	0.00	22.74	70.28	129.28	62.42	113.57	0.00	398.29
PRIVATE[4]										
Spruce	0.00	0.00	0.00	0.16	17.21	2.78	6.64	0.00	0.00	26.79
Pine	0.00	0.00	0.00	0.00	3.19	0.00	0.00	0.00	0.00	3.19
Larch	0.00	0.00	0.00	16.71	0.00	0.00	0.00	0.00	0.00	16.71
All conif	0.00	0.00	0.00	16.87	20.40	2.78	6.64	0.00	0.00	46.69
ALL OWNER										
Spruce	0.00	0.00	0.00	22.90	87.47	132.06	69.06	113.57	0.00	425.06
Pine	0.00	0.00	0.00	0.00	3.21	0.00	0.00	0.00	0.00	3.21
Larch	0.00	0.00	0.00	16.71	0.00	0.00	0.00	0.00	0.00	16.71
All conif	0.00	0.00	0.00	39.61	90.68	132.06	69.06	113.57	0.00	444.98
Non-merch.[3]										
CROWN										
Spruce	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
Pine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Larch	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
All conif	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
PRIVATE										
Spruce	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Larch	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
All conif	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ALL OWNER										
Spruce	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
Pine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Larch	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
All conif	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
Total										
CROWN										
Spruce	0.00	0.02	0.00	22.74	70.26	129.28	62.42	113.57	0.00	398.29
Pine	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.02
Larch	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
All conif	0.00	0.02	0.00	22.74	70.28	129.28	62.42	113.57	0.00	398.31
PRIVATE										
Spruce	0.00	0.00	0.00	0.16	17.21	2.78	6.64	0.00	0.00	26.79
Pine	0.00	0.00	0.00	0.00	3.19	0.00	0.00	0.00	0.00	3.19
Larch	0.00	0.00	0.00	16.71	0.00	0.00	0.00	0.00	0.00	16.71
All conif	0.00	0.00	0.00	16.87	20.40	2.78	6.64	0.00	0.00	46.69
ALL OWNER										
Spruce	0.00	0.02	0.00	22.90	87.47	132.06	69.06	113.57	0.00	425.08
Pine	0.00	0.00	0.00	0.00	3.21	0.00	0.00	0.00	0.00	3.21
Larch	0.00	0.00	0.00	16.71	0.00	0.00	0.00	0.00	0.00	16.71
All conif	0.00	0.02	0.00	39.61	90.68	132.06	69.06	113.57	0.00	445.00

SEE FOLLOWING PAGE FOR ACCOMPANYING NOTES

NOTES TO TABLE VII-16

1. Ministry of Forests Age Class definitions:

Age Class	Age (years)	Age Class	Age (years)
1	1-20	6	101-120
2	21-40	7	121-140
3	41-60	8	141-250
4	61-80	9	251+
5	81-100		

2. Inclusive of the reservoir, construction site, Highway 29 relocation and transmission line ROW widening.

3. Merchantable timber is defined as all forested areas (except leading birch) with an average net volume greater than or equal to 80 m3/ha when compiled to close utilization (12.5 + cm DBH, 30 cm stump height and a 10 cm top diameter) standards. Non-merchantable timber is defined as all forested areas that do not meet the merchantable timber definition.

4. The crown and private ownership status date is 1988 for information supplied by the Ministry of Forests Inventory Branch. The status of B.C. Hydro owned land was provided by B.C. Hydro and is current to January of 1991.

TABLE VII-17 Summary of Coniferous Forested Areas (ha) by Age Class[1] within the Areas Directly Affected[2] by the Peace River Site C Hydroelectric Project
Dawson Creek TSA

	1	2	3	4	5	6	7	8	9	all
Merchantable[3]										
CROWN										
Spruce	0.00	0.00	18.65	109.03	167.77	91.21	125.90	113.35	0.00	625.91
Pine	0.00	0.00	3.08	10.64	20.04	13.46	2.22	0.00	0.00	49.44
Larch	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
All conif	0.00	0.00	21.73	119.67	187.81	104.67	128.12	113.35	0.00	675.35
PRIVATE[4]										
Spruce	0.00	0.00	0.00	8.63	1.04	3.38	0.42	44.37	0.00	57.84
Pine	0.00	0.00	0.00	0.00	3.66	0.00	0.00	0.00	0.00	3.66
Larch	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
All conif	0.00	0.00	0.00	8.63	4.70	3.38	0.42	44.37	0.00	61.50
ALL OWNER										
Spruce	0.00	0.00	18.65	117.66	168.81	94.59	126.32	157.72	0.00	683.75
Pine	0.00	0.00	3.08	10.64	23.70	13.46	2.22	0.00	0.00	53.10
Larch	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
All conif	0.00	0.00	21.73	128.30	192.51	108.05	128.54	157.72	0.00	736.85
Non-merch.[3]										
CROWN										
Spruce	18.31	17.39	66.88	0.00	2.85	9.31	0.00	1.99	0.00	116.73
Pine	0.00	0.58	0.00	1.40	0.00	0.00	0.00	0.00	0.00	1.98
Larch	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
All conif	18.31	17.97	66.88	1.40	2.85	9.31	0.00	1.99	0.00	118.71
PRIVATE										
Spruce	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Larch	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
All conif	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ALL OWNER										
Spruce	18.31	17.39	66.88	0.00	2.85	9.31	0.00	1.99	0.00	116.73
Pine	0.00	0.58	0.00	1.40	0.00	0.00	0.00	0.00	0.00	1.98
Larch	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
All conif	18.31	17.97	66.88	1.40	2.85	9.31	0.00	1.99	0.00	118.71
Total										
CROWN										
Spruce	18.31	17.39	85.53	109.03	170.62	100.52	125.90	115.34	0.00	742.64
Pine	0.00	0.58	3.08	12.04	20.04	13.46	2.22	0.00	0.00	51.42
Larch	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
All conif	18.31	17.97	88.61	121.07	190.66	113.98	128.12	115.34	0.00	794.06
PRIVATE										
Spruce	0.00	0.00	0.00	8.63	1.04	3.38	0.42	44.37	0.00	57.84
Pine	0.00	0.00	0.00	0.00	3.66	0.00	0.00	0.00	0.00	3.66
Larch	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
All conif	0.00	0.00	0.00	8.63	4.70	3.38	0.42	44.37	0.00	61.50
ALL OWNER										
Spruce	18.31	17.39	85.53	117.66	171.66	103.90	126.32	159.71	0.00	800.48
Pine	0.00	0.58	3.08	12.04	23.70	13.46	2.22	0.00	0.00	55.08
Larch	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
All conif	18.31	17.97	88.61	129.70	195.36	117.36	128.54	159.71	0.00	855.56

SEE FOLLOWING PAGE FOR ACCOMPANYING NOTES

NOTES TO TABLE VII-17

1. Ministry of Forests Age Class definitions:

Age Class	Age (years)	Age Class	Age (years)
1	1-20	6	101-120
2	21-40	7	121-140
3	41-60	8	141-250
4	61-80	9	251+
5	81-100		

2. Inclusive of the reservoir, construction site, Highway 29 relocation and transmission line ROW widening.

3. Merchantable timber is defined as all forested areas (except leading birch) with an average net volume greater than or equal to 80 m3/ha when compiled to close utilization (12.5 + cm DBH, 30 cm stump height and a 10 cm top diameter) standards. Non-merchantable timber is defined as all forested areas that do not meet the merchantable timber definition.

4. The crown and private ownership status date is 1988 for information supplied by the Ministry of Forests Inventory Branch. The status of B.C. Hydro owned land was provided by B.C. Hydro and is current to January of 1991.

TABLE VII-18 Summary of Coniferous Forested Areas (ha) by Age Class[1] within the Areas Directly Affected[2] by the Peace River Site C Hydroelectric Project
Fort St John and Dawson Creek TSA's

	1	2	3	4	5	6	7	8	9	all
Merchantable[3]										
CROWN										
Spruce	0.00	0.00	18.65	131.77	238.03	220.49	188.32	226.92	0.00	1024.18
Pine	0.00	0.00	3.08	10.64	20.06	13.46	2.22	0.00	0.00	49.46
Larch	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
All conif	0.00	0.00	21.73	142.41	258.09	233.95	190.54	226.92	0.00	1073.64
PRIVATE[4]										
Spruce	0.00	0.00	0.00	8.79	18.25	6.16	7.06	44.37	0.00	84.63
Pine	0.00	0.00	0.00	0.00	6.85	0.00	0.00	0.00	0.00	6.85
Larch	0.00	0.00	0.00	16.71	0.00	0.00	0.00	0.00	0.00	16.71
All conif	0.00	0.00	0.00	25.50	25.10	6.16	7.06	44.37	0.00	108.19
ALL OWNER										
Spruce	0.00	0.00	18.65	140.56	256.28	226.65	195.38	271.29	0.00	1108.81
Pine	0.00	0.00	3.08	10.64	26.91	13.46	2.22	0.00	0.00	56.31
Larch	0.00	0.00	0.00	16.71	0.00	0.00	0.00	0.00	0.00	16.71
All conif	0.00	0.00	21.73	167.91	283.19	240.11	197.60	271.29	0.00	1181.83
Non-merch.[3]										
CROWN										
Spruce	18.31	17.41	66.88	0.00	2.85	9.31	0.00	1.99	0.00	116.75
Pine	0.00	0.58	0.00	1.40	0.00	0.00	0.00	0.00	0.00	1.98
Larch	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
All conif	18.31	17.99	66.88	1.40	2.85	9.31	0.00	1.99	0.00	118.73
PRIVATE										
Spruce	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Larch	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
All conif	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ALL OWNER										
Spruce	18.31	17.41	66.88	0.00	2.85	9.31	0.00	1.99	0.00	116.75
Pine	0.00	0.58	0.00	1.40	0.00	0.00	0.00	0.00	0.00	1.98
Larch	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
All conif	18.31	17.99	66.88	1.40	2.85	9.31	0.00	1.99	0.00	118.73
Total										
CROWN										
Spruce	18.31	17.41	85.53	131.77	240.88	229.80	188.32	228.91	0.00	1140.93
Pine	0.00	0.58	3.08	12.04	20.06	13.46	2.22	0.00	0.00	51.44
Larch	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
All conif	18.31	17.99	88.61	143.81	260.94	243.26	190.54	228.91	0.00	1192.37
PRIVATE										
Spruce	0.00	0.00	0.00	8.79	18.25	6.16	7.06	44.37	0.00	84.63
Pine	0.00	0.00	0.00	0.00	6.85	0.00	0.00	0.00	0.00	6.85
Larch	0.00	0.00	0.00	16.71	0.00	0.00	0.00	0.00	0.00	16.71
All conif	0.00	0.00	0.00	25.50	25.10	6.16	7.06	44.37	0.00	108.19
ALL OWNER										
Spruce	18.31	17.41	85.53	140.56	259.13	235.96	195.38	273.28	0.00	1225.56
Pine	0.00	0.58	3.08	12.04	26.91	13.46	2.22	0.00	0.00	58.29
Larch	0.00	0.00	0.00	16.71	0.00	0.00	0.00	0.00	0.00	16.71
All conif	18.31	17.99	88.61	169.31	286.04	249.42	197.60	273.28	0.00	1300.56

SEE FOLLOWING PAGE FOR ACCOMPANYING NOTES

NOTES TO TABLE VII-18

1. Ministry of Forests Age Class definitions:

Age Class	Age (years)	Age Class	Age (years)
1	1-20	6	101-120
2	21-40	7	121-140
3	41-60	8	141-250
4	61-80	9	251+
5	81-100		

2. Inclusive of the reservoir, construction site, Highway 29 relocation and transmission line ROW widening.

3. Merchantable timber is defined as all forested areas (except leading birch) with an average net volume greater than or equal to 80 m3/ha when compiled to close utilization (12.5 + cm DBH, 30 cm stump height and a 10 cm top diameter) standards. Non-merchantable timber is defined as all forested areas that do not meet the merchantable timber definition.

4. The crown and private ownership status date is 1988 for information supplied by the Ministry of Forests Inventory Branch. The status of B.C. Hydro owned land was provided by B.C. Hydro and is current to January of 1991.

TABLE VII-19

Summary of Deciduous Forested Areas (ha) by Age Class[1] within the Areas Directly Affected[2] by the Peace River Site C Hydroelectric Project
Fort St John TSA

	1	2	3	4	5	6	7	8	9	all
Merchantable[3]										
CROWN										
Aspen	0.00	0.00	24.28	135.14	14.32	56.09	0.00	0.00	0.00	229.83
B Poplar	0.00	0.00	0.00	16.13	148.46	181.99	84.08	108.58	0.00	539.24
Birch	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
All decid	0.00	0.00	24.28	151.27	162.78	238.08	84.08	108.58	0.00	769.07
PRIVATE[4]										
Aspen	0.00	0.00	178.32	105.25	35.70	2.98	0.00	1.79	0.00	324.04
B Poplar	0.00	0.00	0.00	4.74	20.80	30.99	5.09	7.67	0.00	69.29
Birch	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
All decid	0.00	0.00	178.32	109.99	56.50	33.97	5.09	9.46	0.00	393.33
ALL OWNER										
Aspen	0.00	0.00	202.60	240.39	50.02	59.07	0.00	1.79	0.00	553.87
B Poplar	0.00	0.00	0.00	20.87	169.26	212.98	89.17	116.25	0.00	608.53
Birch	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
All decid	0.00	0.00	202.60	261.26	219.28	272.05	89.17	118.04	0.00	1162.40
Non-merch.[3]										
CROWN										
Aspen	0.16	39.30	98.14	9.39	0.00	0.00	0.00	0.00	0.00	146.99
B Poplar	0.00	16.04	25.34	0.00	13.50	0.00	0.00	0.00	0.00	54.88
Birch	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
All decid	0.16	55.34	123.48	9.39	13.50	0.00	0.00	0.00	0.00	201.87
PRIVATE										
Aspen	0.00	0.00	28.51	0.15	0.00	0.00	0.00	0.00	0.00	28.66
B Poplar	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Birch	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
All decid	0.00	0.00	28.51	0.15	0.00	0.00	0.00	0.00	0.00	28.66
ALL OWNER										
Aspen	0.16	39.30	126.65	9.54	0.00	0.00	0.00	0.00	0.00	175.65
B Poplar	0.00	16.04	25.34	0.00	13.50	0.00	0.00	0.00	0.00	54.88
Birch	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
All decid	0.16	55.34	151.99	9.54	13.50	0.00	0.00	0.00	0.00	230.53
Total										
CROWN										
Aspen	0.16	39.30	122.42	144.53	14.32	56.09	0.00	0.00	0.00	376.82
B Poplar	0.00	16.04	25.34	16.13	161.96	181.99	84.08	108.58	0.00	594.12
Birch	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
All decid	0.16	55.34	147.76	160.66	176.28	238.08	84.08	108.58	0.00	970.94
PRIVATE										
Aspen	0.00	0.00	206.83	105.40	35.70	2.98	0.00	1.79	0.00	352.70
B Poplar	0.00	0.00	0.00	4.74	20.80	30.99	5.09	7.67	0.00	69.29
Birch	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
All decid	0.00	0.00	206.83	110.14	56.50	33.97	5.09	9.46	0.00	421.99
ALL OWNER										
Aspen	0.16	39.30	329.25	249.93	50.02	59.07	0.00	1.79	0.00	729.52
B Poplar	0.00	16.04	25.34	20.87	182.76	212.98	89.17	116.25	0.00	663.41
Birch	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
All decid	0.16	55.34	354.59	270.80	232.78	272.05	89.17	118.04	0.00	1392.93

SEE FOLLOWING PAGE FOR ACCOMPANYING NOTES

NOTES TO TABLE VII-19

1. Ministry of Forests Age Class definitions:

Age Class	Age (years)	Age Class	Age (years)
1	1-20	6	101-120
2	21-40	7	121-140
3	41-60	8	141-250
4	61-80	9	251+
5	81-100		

2. Inclusive of the reservoir, construction site, Highway 29 relocation and transmission line ROW widening.

3. Merchantable timber is defined as all forested areas (except leading birch) with an average net volume greater than or equal to 80 m3/ha when compiled to close utilization (12.5 + cm DBH, 30 cm stump height and a 10 cm top diameter) standards. Non-merchantable timber is defined as all forested areas that do not meet the merchantable timber definition.

4. The crown and private ownership status date is 1988 for information supplied by the Ministry of Forests Inventory Branch. The status of B.C. Hydro owned land was provided by B.C. Hydro and is current to January of 1991.

TABLE VII-20 Summary of Deciduous Forested Areas (ha) by Age Class[1] within the Areas Directly Affected[2] by the Peace River Site C Hydroelectric Project
Dawson Creek TSA

	1	2	3	4	5	6	7	8	9	all
Merchantable[3]										
CROWN										
Aspen	0.00	0.02	66.14	164.10	592.73	13.84	0.49	0.00	0.00	837.32
B Poplar	0.00	0.00	16.80	73.86	136.04	123.51	167.31	118.39	0.00	635.91
Birch	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
All decid	0.00	0.02	82.94	237.96	728.77	137.35	167.80	118.39	0.00	1473.23
PRIVATE[4]										
Aspen	0.00	4.50	7.49	78.65	14.65	0.00	10.83	0.00	0.00	116.12
B Poplar	0.00	0.00	0.00	0.52	27.98	35.59	15.65	0.00	0.00	79.74
Birch	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
All decid	0.00	4.50	7.49	79.17	42.63	35.59	26.48	0.00	0.00	195.86
ALL OWNER										
Aspen	0.00	4.52	73.63	242.75	607.38	13.84	11.32	0.00	0.00	953.44
B Poplar	0.00	0.00	16.80	74.38	164.02	159.10	182.96	118.39	0.00	715.65
Birch	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
All decid	0.00	4.52	90.43	317.13	771.40	172.94	194.28	118.39	0.00	1669.09
Non-merch.[3]										
CROWN										
Aspen	128.13	146.23	57.62	35.96	0.00	0.00	0.00	0.00	0.00	367.94
B Poplar	0.00	84.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00	84.84
Birch	0.00	2.91	16.42	12.41	16.52	26.57	0.00	0.00	0.00	74.83
All decid	128.13	233.98	74.04	48.37	16.52	26.57	0.00	0.00	0.00	527.61
PRIVATE										
Aspen	0.00	0.06	9.46	11.22	0.00	0.00	0.00	0.00	0.00	20.74
B Poplar	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Birch	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
All decid	0.00	0.06	9.46	11.22	0.00	0.00	0.00	0.00	0.00	20.74
ALL OWNER										
Aspen	128.13	146.29	67.08	47.18	0.00	0.00	0.00	0.00	0.00	388.68
B Poplar	0.00	84.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00	84.84
Birch	0.00	2.91	16.42	12.41	16.52	26.57	0.00	0.00	0.00	74.83
All decid	128.13	234.04	83.50	59.59	16.52	26.57	0.00	0.00	0.00	548.35
Total										
CROWN										
Aspen	128.13	146.25	123.76	200.06	592.73	13.84	0.49	0.00	0.00	1205.26
B Poplar	0.00	84.84	16.80	73.86	136.04	123.51	167.31	118.39	0.00	720.75
Birch	0.00	2.91	16.42	12.41	16.52	26.57	0.00	0.00	0.00	74.83
All decid	128.13	234.00	156.98	286.33	745.29	163.92	167.80	118.39	0.00	2000.84
PRIVATE										
Aspen	0.00	4.56	16.95	89.87	14.65	0.00	10.83	0.00	0.00	136.86
B Poplar	0.00	0.00	0.00	0.52	27.98	35.59	15.65	0.00	0.00	79.74
Birch	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
All decid	0.00	4.56	16.95	90.39	42.63	35.59	26.48	0.00	0.00	216.60
ALL OWNER										
Aspen	128.13	150.81	140.71	289.93	607.38	13.84	11.32	0.00	0.00	1342.12
B Poplar	0.00	84.84	16.80	74.38	164.02	159.10	182.96	118.39	0.00	800.49
Birch	0.00	2.91	16.42	12.41	16.52	26.57	0.00	0.00	0.00	74.83
All decid	128.13	238.56	173.93	376.72	787.92	199.51	194.28	118.39	0.00	2217.44

SEE FOLLOWING PAGE FOR ACCOMPANYING NOTES

NOTES TO TABLE VII-20

1. Ministry of Forests Age Class definitions:

Age Class	Age (years)	Age Class	Age (years)
1	1-20	6	101-120
2	21-40	7	121-140
3	41-60	8	141-250
4	61-80	9	251+
5	81-100		

2. Inclusive of the reservoir, construction site, Highway 29 relocation and transmission line ROW widening.

3. Merchantable timber is defined as all forested areas (except leading birch) with an average net volume greater than or equal to 80 m3/ha when compiled to close utilization (12.5 + cm DBH, 30 cm stump height and a 10 cm top diameter) standards. Non-merchantable timber is defined as all forested areas that do not meet the merchantable timber definition.

4. The crown and private ownership status date is 1988 for information supplied by the Ministry of Forests Inventory Branch. The status of B.C. Hydro owned land was provided by B.C. Hydro and is current to January of 1991.

TABLE VII-21 Summary of Deciduous Forested Areas (ha) by Age Class[1] within the Areas Directly Affected[2] by the Peace River Site C Hydroelectric Project
Fort St John and Dawson Creek TSA's

	1	2	3	4	5	6	7	8	9	all
Merchantable[3]										
CROWN										
Aspen	0.00	0.02	90.42	299.24	607.05	69.93	0.49	0.00	0.00	1067.15
B Poplar	0.00	0.00	16.80	89.99	284.50	305.50	251.39	226.97	0.00	1175.15
Birch	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
All decid	0.00	0.02	107.22	389.23	891.55	375.43	251.88	226.97	0.00	2242.30
PRIVATE[4]										
Aspen	0.00	4.50	185.81	183.90	50.35	2.98	10.83	1.79	0.00	440.16
B Poplar	0.00	0.00	0.00	5.26	48.78	66.58	20.74	7.67	0.00	149.03
Birch	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
All decid	0.00	4.50	185.81	189.16	99.13	69.56	31.57	9.46	0.00	589.19
ALL OWNER										
Aspen	0.00	4.52	276.23	483.14	657.40	72.91	11.32	1.79	0.00	1507.31
B Poplar	0.00	0.00	16.80	95.25	333.28	372.08	272.13	234.64	0.00	1324.18
Birch	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
All decid	0.00	4.52	293.03	578.39	990.68	444.99	283.45	236.43	0.00	2831.49
Non-merch.[3]										
CROWN										
Aspen	128.29	185.53	155.76	45.35	0.00	0.00	0.00	0.00	0.00	514.93
B Poplar	0.00	100.88	25.34	0.00	13.50	0.00	0.00	0.00	0.00	139.72
Birch	0.00	2.91	16.42	12.41	16.52	26.57	0.00	0.00	0.00	74.83
All decid	128.29	289.32	197.52	57.76	30.02	26.57	0.00	0.00	0.00	729.48
PRIVATE										
Aspen	0.00	0.06	37.97	11.37	0.00	0.00	0.00	0.00	0.00	49.40
B Poplar	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Birch	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
All decid	0.00	0.06	37.97	11.37	0.00	0.00	0.00	0.00	0.00	49.40
ALL OWNER										
Aspen	128.29	185.59	193.73	56.72	0.00	0.00	0.00	0.00	0.00	564.33
B Poplar	0.00	100.88	25.34	0.00	13.50	0.00	0.00	0.00	0.00	139.72
Birch	0.00	2.91	16.42	12.41	16.52	26.57	0.00	0.00	0.00	74.83
All decid	128.29	289.38	235.49	69.13	30.02	26.57	0.00	0.00	0.00	778.88
Total										
CROWN										
Aspen	128.29	185.55	246.18	344.59	607.05	69.93	0.49	0.00	0.00	1582.08
B Poplar	0.00	100.88	42.14	89.99	298.00	305.50	251.39	226.97	0.00	1314.87
Birch	0.00	2.91	16.42	12.41	16.52	26.57	0.00	0.00	0.00	74.83
All decid	128.29	289.34	304.74	446.99	921.57	402.00	251.88	226.97	0.00	2971.78
PRIVATE										
Aspen	0.00	4.56	223.78	195.27	50.35	2.98	10.83	1.79	0.00	489.56
B Poplar	0.00	0.00	0.00	5.26	48.78	66.58	20.74	7.67	0.00	149.03
Birch	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
All decid	0.00	4.56	223.78	200.53	99.13	69.56	31.57	9.46	0.00	638.59
ALL OWNER										
Aspen	128.29	190.11	469.96	539.86	657.40	72.91	11.32	1.79	0.00	2071.64
B Poplar	0.00	100.88	42.14	95.25	346.78	372.08	272.13	234.64	0.00	1463.90
Birch	0.00	2.91	16.42	12.41	16.52	26.57	0.00	0.00	0.00	74.83
All decid	128.29	293.90	528.52	647.52	1020.70	471.56	283.45	236.43	0.00	3610.37

SEE FOLLOWING PAGE FOR ACCOMPANYING NOTES

NOTES TO TABLE VII-21

1. Ministry of Forests Age Class definitions:

Age Class	Age (years)	Age Class	Age (years)
1	1-20	6	101-120
2	21-40	7	121-140
3	41-60	8	141-250
4	61-80	9	251+
5	81-100		

2. Inclusive of the reservoir, construction site, Highway 29 relocation and transmission line ROW widening.

3. Merchantable timber is defined as all forested areas (except leading birch) with an average net volume greater than or equal to 80 m3/ha when compiled to close utilization (12.5 + cm DBH, 30 cm stump height and a 10 cm top diameter) standards. Non-merchantable timber is defined as all forested areas that do not meet the merchantable timber definition.

4. The crown and private ownership status date is 1988 for information supplied by the Ministry of Forests Inventory Branch. The status of B.C. Hydro owned land was provided by B.C. Hydro and is current to January of 1991.

TABLE VII-22 Summary of Gross Coniferous[1] Forested Areas and Net Volumes[2] by Leading Species and Site Class[3] Within the Areas Directly Affected[4] by the Peace River Site C Hydroelectric Project Fort St John TSA

	CROWN[5]		PRIVATE[5]		ALL OWNER	
	Area (ha)	Volume (m3)	Area (ha)	Volume (m3)	Area (ha)	Volume (m3)
Spruce						
GOOD	213.21	88980.76	19.20	7888.34	232.41	96869.10
MEDIUM	178.33	54578.47	7.59	1849.31	185.92	56427.78
POOR	6.75	1422.85	0.00	0.00	6.75	1422.85
LOW	0.00	0.00	0.00	0.00	0.00	0.00
ALL SITES	398.29	144982.07	26.79	9737.65	425.08	154719.72
Pine						
GOOD	0.00	0.00	0.00	0.00	0.00	0.00
MEDIUM	0.02	5.59	1.95	521.25	1.97	526.84
POOR	0.00	0.00	1.24	134.66	1.24	134.66
LOW	0.00	0.00	0.00	0.00	0.00	0.00
ALL SITES	0.02	5.59	3.19	655.91	3.21	661.50
Larch						
GOOD	0.00	0.00	0.00	0.00	0.00	0.00
MEDIUM	0.00	0.00	0.00	0.00	0.00	0.00
POOR	0.00	0.00	16.71	2793.40	16.71	2793.40
LOW	0.00	0.00	0.00	0.00	0.00	0.00
ALL SITES	0.00	0.00	16.71	2793.40	16.71	2793.40
Total Conif.						
GOOD	213.21	88980.76	19.20	7888.34	232.41	96869.10
MEDIUM	178.35	54584.06	9.54	2370.56	187.89	56954.62
POOR	6.75	1422.85	17.95	2928.05	24.70	4350.90
LOW	0.00	0.00	0.00	0.00	0.00	0.00
ALL SITES	398.31	144987.66	46.69	13186.96	445.00	158174.62

NOTES

1. Coniferous species include leading spruce (MOF species type groups 21-25), lodgepole pine (type groups 28-31) and tamarack, often called larch (type groups 33 and 34), stands.

2. Volumes are compiled to close utilization standards (12.5 cm + DBH, 30cm stump height and a 10 cm top diameter) less decay, waste and breakage. Leading coniferous stands may contain some deciduous volume.

3. Site Class assignment based on site indices (tree height at a reference age) as determined using current MOF procedures. Spruce and Pine species use Goudie's site indices (Reference age 50 at breast height) and Tamarack (larch) uses MOF site indices (reference age 100 at stump height) in Forest Inventory Zone (FIZ) L.

4. Inclusive of reservoir, construction site, Highway 29 relocation and the transmission line ROW widening.

5. The Crown and Private ownership status date is 1988 for information supplied by the Ministry of Forest Inventory Branch. The Status of B.C. Hydro owned land was provided by B.C. Hydro and is current to January 1991.

TABLE VII-23 Summary of Gross Coniferous[1] Forested Areas and Net Volumes[2] by Leading Species and Site Class[3] Within the Areas Directly[4] Affected by the Peace River Site C Hydroelectric Project
Dawson Creek TSA

	CROWN[5]		PRIVATE[5]		ALL OWNER	
	Area (ha)	Volume (m3)	Area (ha)	Volume (m3)	Area (ha)	Volume (m3)
Spruce						
GOOD	464.64	177906.57	35.55	15396.84	500.19	193303.40
MEDIUM	227.97	46426.15	21.71	6560.31	249.68	52986.46
POOR	35.88	3773.53	0.58	50.98	36.46	3824.52
LOW	14.15	722.45	0.00	0.00	14.15	722.45
ALL SITES	742.64	228828.71	57.84	22008.13	800.48	250836.84
Pine						
GOOD	8.21	3357.95	2.84	1013.71	11.05	4371.65
MEDIUM	32.39	10621.12	0.82	227.90	33.21	10849.02
POOR	10.82	1306.14	0.00	0.00	10.82	1306.14
LOW	0.00	0.00	0.00	0.00	0.00	0.00
ALL SITES	51.42	15285.21	3.66	1241.60	55.08	16526.81
Larch						
GOOD	0.00	0.00	0.00	0.00	0.00	0.00
MEDIUM	0.00	0.00	0.00	0.00	0.00	0.00
POOR	0.00	0.00	0.00	0.00	0.00	0.00
LOW	0.00	0.00	0.00	0.00	0.00	0.00
ALL SITES	0.00	0.00	0.00	0.00	0.00	0.00
Total Conif.						
GOOD	472.85	181264.51	38.39	16410.54	511.24	197675.06
MEDIUM	260.36	57047.27	22.53	6788.21	282.89	63835.48
POOR	46.70	5079.67	0.58	50.98	47.28	5130.66
LOW	14.15	722.45	0.00	0.00	14.15	722.45
ALL SITES	794.06	244113.91	61.50	23249.73	855.56	267363.64

NOTES

1. Coniferous species include leading spruce (MOF species type groups 21-25), lodgepole pine (type groups 28-31) and tamarack, often called larch (type groups 33 and 34), stands.

2. Volumes are compiled to close utilization standards (12.5 cm + DBH, 30cm stump height and a 10 cm top diameter) less decay, waste and breakage. Leading coniferous stands may contain some deciduous volume.

3. Site Class assignment based on site indices (tree height at a reference age) as determined using current MOF procedures. Spruce and Pine species use Goudie's site indices (Reference age 50 at breast height) and Tamarack (larch) uses MOF site indices (reference age 100 at stump height) in Forest Inventory Zone (FIZ) L.

4. Inclusive of reservoir, construction site, Highway 29 relocation and the transmission line ROW widening.

5. The Crown and Private ownership status date is 1988 for information supplied by the Ministry of Forest Inventory Branch. The Status of B.C. Hydro owned land was provided by B.C. Hydro and is current to January 1991.

TABLE VII-24 Summary of Gross Coniferous[1] Forested Areas and Net Volumes[2] by Leading Species and Site Class[3] Within the Areas Directly Affected[4] by the Peace River Site C Hydroelectric Project Fort St John and Dawson Creek TSA's

	CROWN[5]		PRIVATE[5]		ALL OWNER	
	Area (ha)	Volume (m3)	Area (ha)	Volume (m3)	Area (ha)	Volume (m3)
Spruce						
GOOD	677.85	266887.32	54.75	23285.18	732.60	290172.50
MEDIUM	406.30	101004.62	29.30	8409.62	435.60	109414.24
POOR	42.63	5196.38	0.58	50.98	43.21	5247.37
LOW	14.15	722.45	0.00	0.00	14.15	722.45
ALL SITES	1140.93	373810.78	84.63	31745.78	1225.56	405556.56
Pine						
GOOD	8.21	3357.95	2.84	1013.71	11.05	4371.65
MEDIUM	32.41	10626.71	2.77	749.15	35.18	11375.86
POOR	10.82	1306.14	1.24	134.66	12.06	1440.79
LOW	0.00	0.00	0.00	0.00	0.00	0.00
ALL SITES	51.44	15290.80	6.85	1897.51	58.29	17188.31
Larch						
GOOD	0.00	0.00	0.00	0.00	0.00	0.00
MEDIUM	0.00	0.00	0.00	0.00	0.00	0.00
POOR	0.00	0.00	16.71	2793.40	16.71	2793.40
LOW	0.00	0.00	0.00	0.00	0.00	0.00
ALL SITES	0.00	0.00	16.71	2793.40	16.71	2793.40
Total Conif.						
GOOD	686.06	270245.27	57.59	24298.89	743.65	294544.15
MEDIUM	438.71	111631.33	32.07	9158.77	470.78	120790.10
POOR	53.45	6502.52	18.53	2979.04	71.98	9481.56
LOW	14.15	722.45	0.00	0.00	14.15	722.45
ALL SITES	1192.37	389101.57	108.19	36436.69	1300.56	425538.27

NOTES

1. Coniferous species include leading spruce (MOF species type groups 21-25), lodgepole pine (type groups 28-31) and tamarack, often called larch (type groups 33 and 34), stands.

2. Volumes are compiled to close utilization standards (12.5 cm + DBH, 30cm stump height and a 10 cm top diameter) less decay, waste and breakage. Leading coniferous stands may contain some deciduous volume.

3. Site Class assignment based on site indices (tree height at a reference age) as determined using current MOF procedures. Spruce and Pine species use Goudie's site indices (Reference age 50 at breast height) and Tamarack (larch) uses MOF site indices (reference age 100 at stump height) in Forest Inventory Zone (FIZ) L.

4. Inclusive of reservoir, construction site, Highway 29 relocation and the transmission line ROW widening.

5. The Crown and Private ownership status date is 1988 for information supplied by the Ministry of Forest Inventory Branch. The Status of B.C. Hydro owned land was provided by B.C. Hydro and is current to January 1991.

TABLE VII-25 Summary of Gross Deciduous[1] Forested Areas and Net Volumes[2] by Leading Species and Site Class[3] Within the Areas Directly[4] Affected by the Peace River Site C Hydroelectric Project Fort St John TSA

	CROWN[5]		PRIVATE[5]		ALL OWNER	
	Area (ha)	Volume (m3)	Area (ha)	Volume (m3)	Area (ha)	Volume (m3)
Aspen						
GOOD	14.28	6396.30	64.82	27719.62	79.10	34115.91
MEDIUM	194.48	23119.23	230.69	34206.11	425.17	57325.34
POOR	165.38	15798.16	57.19	5076.48	222.57	20874.64
LOW	2.68	94.12	0.00	0.00	2.68	94.12
ALL SITES	376.82	45407.81	352.70	67002.20	729.52	112410.01
Cottonwood						
GOOD	25.46	14570.23	0.00	0.00	25.46	14570.23
MEDIUM	568.66	184824.81	69.29	25170.50	637.95	209995.31
POOR	0.00	0.00	0.00	0.00	0.00	0.00
LOW	0.00	0.00	0.00	0.00	0.00	0.00
ALL SITES	594.12	199395.03	69.29	25170.50	663.41	224565.53
Total Decid.						
GOOD	39.74	20966.52	64.82	27719.62	104.56	48686.14
MEDIUM	763.14	207944.04	299.98	59376.61	1063.12	267320.64
POOR	165.38	15798.16	57.19	5076.48	222.57	20874.64
LOW	2.68	94.12	0.00	0.00	2.68	94.12
ALL SITES	970.94	244802.84	421.99	92172.70	1392.93	336975.54

NOTES

1. Deciduous species include leading aspen (type groups 41 and 42) and cottonwood (type groups 35 and 36) but exclude all leading birch stands. There are 74.83 ha of leading birch stands in the combined Fort St. John and Dawson Creek TSAs.

2. Volumes are compiled to CU standards (12.5 cm + DBH, 30 cm stump height and a 10 cm top diameter) less decay, waste and breakage. Leading deciduous stands may contain some coniferous volume.

3. Site Class assignment based on site indices (tree height at a reference age) as determined using current MOF procedures. Deciduous species use MOF site indices (Reference age 100 years at stump height) in Forest Inventory Zone (FIZ) L.

4. Inclusive of the reservoir, construction, site, Highway 29 relocation and the transmission line ROW widening.

5. The Crown and Private ownership status date is 1988 for information supplied by the Ministry of Forests Inventory Branch. The status of B.C. Hydro owned land was provided by B.C. Hydro and is current to January 1991.

TABLE VII-26 Summary of Gross Deciduous[1] Forested Areas and Net Volumes[2] by Leading Species and Site Class[3] Within the Areas Directly Affected[4] by the Peace River Site C Hydroelectric Project
Dawson Creek TSA

	CROWN[5]		PRIVATE[5]		ALL OWNER	
	Area (ha)	Volume (m3)	Area (ha)	Volume (m3)	Area (ha)	Volume (m3)
Aspen						
GOOD	0.00	0.00	6.61	2251.40	6.61	2251.40
MEDIUM	873.77	165915.01	75.51	14629.25	949.28	180544.26
POOR	326.08	27444.16	54.74	5823.75	380.82	33267.91
LOW	5.41	71.25	0.00	0.00	5.41	71.25
ALL SITES	1205.26	193430.42	136.86	22704.40	1342.12	216134.82
Cottonwood						
GOOD	28.07	16975.38	0.00	0.00	28.07	16975.38
MEDIUM	631.41	197987.31	79.74	26963.71	711.15	224951.03
POOR	61.27	8703.21	0.00	0.00	61.27	8703.21
LOW	0.00	0.00	0.00	0.00	0.00	0.00
ALL SITES	720.75	223665.90	79.74	26963.71	800.49	250629.62
Total Decid.						
GOOD	28.07	16975.38	6.61	2251.40	34.68	19226.78
MEDIUM	1505.18	363902.33	155.25	41592.96	1660.43	405495.29
POOR	387.35	36147.37	54.74	5823.75	442.09	41971.12
LOW	5.41	71.25	0.00	0.00	5.41	71.25
ALL SITES	1926.01	417096.33	216.60	49668.11	2142.61	466764.44

NOTES

1. Deciduous species include leading aspen (type groups 41 and 42) and cottonwood (type groups 35 and 36) but exclude all leading birch stands. There are 74.83 ha of leading birch stands in the combined Fort St. John and Dawson Creek TSAs.

2. Volumes are compiled to CU standards (12.5 cm + DBH, 30 cm stump height and a 10 cm top diameter) less decay, waste and breakage. Leading deciduous stands may contain some coniferous volume.

3. Site Class assignment based on site indices (tree height at a reference age) as determined using current MOF procedures. Deciduous species use MOF site indices (Reference age 100 years at stump height) in Forest Inventory Zone (FIZ) L.

4. Inclusive of the reservoir, construction, site, Highway 29 relocation and the transmission line ROW widening.

5. The Crown and Private ownership status date is 1988 for information supplied by the Ministry of Forests Inventory Branch. The status of B.C. Hydro owned land was provided by B.C. Hydro and is current to January 1991.

TABLE VII-27 Summary of Gross Deciduous[1] Forested Areas and Net Volumes[2] by Leading Species and Site Class[3] Within the Areas Directly Affected[4] by the Peace River Site C Hydroelectric Project Fort St John and Dawson Creek TSA's

	CROWN[5]		PRIVATE[5]		ALL OWNER	
	Area (ha)	Volume (m3)	Area (ha)	Volume (m3)	Area (ha)	Volume (m3)
Aspen						
GOOD	14.28	6396.30	71.43	29971.02	85.71	36367.31
MEDIUM	1068.25	189034.24	306.20	48835.35	1374.45	237869.60
POOR	491.46	43242.32	111.93	10900.23	603.39	54142.55
LOW	8.09	165.37	0.00	0.00	8.09	165.37
ALL SITES	1582.08	238838.24	489.56	89706.60	2071.64	328544.83
Cottonwood						
GOOD	53.53	31545.61	0.00	0.00	53.53	31545.61
MEDIUM	1200.07	382812.12	149.03	52134.22	1349.10	434946.33
POOR	61.27	8703.21	0.00	0.00	61.27	8703.21
LOW	0.00	0.00	0.00	0.00	0.00	0.00
ALL SITES	1314.87	423060.94	149.03	52134.22	1463.90	475195.15
Total Decid.						
GOOD	67.81	37941.90	71.43	29971.02	139.24	67912.92
MEDIUM	2268.32	571846.36	455.23	100969.57	2723.55	672815.93
POOR	552.73	51945.53	111.93	10900.23	664.66	62845.76
LOW	8.09	165.37	0.00	0.00	8.09	165.37
ALL SITES	2896.95	661899.17	638.59	141840.81	3535.54	803739.98

NOTES

1. Deciduous species include leading aspen (type groups 41 and 42) and cottonwood (type groups 35 and 36) but exclude all leading birch stands. There are 74.83 ha of leading birch stands in the combined Fort St. John and Dawson Creek TSAs.

2. Volumes are compiled to CU standards (12.5 cm + DBH, 30 cm stump height and a 10 cm top diameter) less decay, waste and breakage. Leading deciduous stands may contain some coniferous volume.

3. Site Class assignment based on site indices (tree height at a reference age) as determined using current MOF procedures. Deciduous species use MOF site indices (Reference age 100 years at stump height) in Forest Inventory Zone (FIZ) L.

4. Inclusive of the reservoir, construction, site, Highway 29 relocation and the transmission line ROW widening.

5. The Crown and Private ownership status date is 1988 for information supplied by the Ministry of Forests Inventory Branch. The status of B.C. Hydro owned land was provided by B.C. Hydro and is current to January 1991.

APPENDIX VIII

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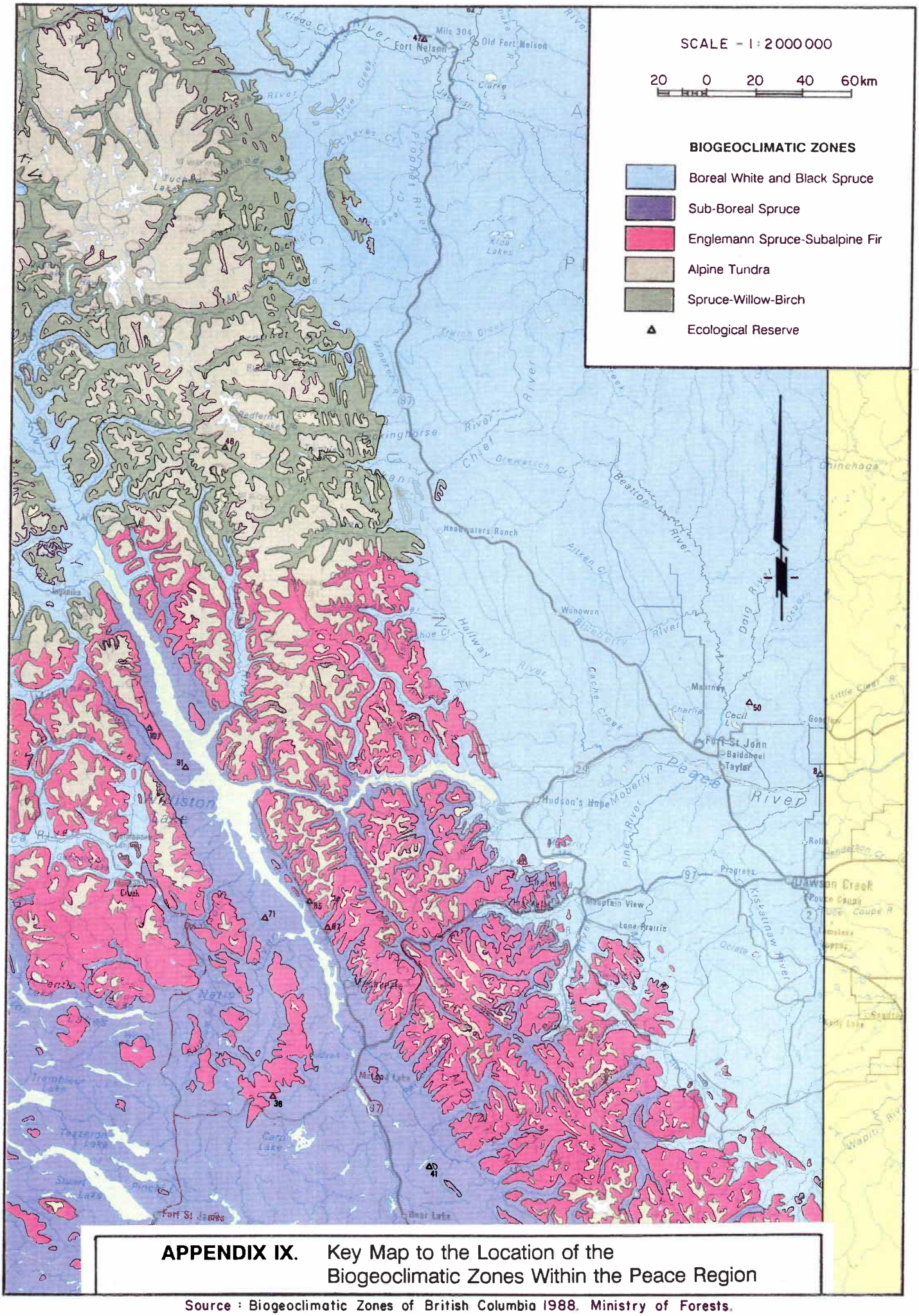
John Gray	Ministry of Forests -	Fort St. John District
Howard Willis	Ministry of Forests -	Prince George Region
Darrell Robb	Ministry of Forest -	Prince George Region
Dick Nakatsu	Ministry of Forest -	Prince George Region
Alf Kivari	Ministry of Forests -	Integrated Resources Branch, Victoria

APPENDIX IX

KEY MAP TO THE LOCATION OF THE BIOGEOCLIMATIC ZONES WITHIN THE PEACE REGION



APPENDIX IX. Key Map to the Location of the Biogeoclimatic Zones Within the Peace Region

Source : Biogeoclimatic Zones of British Columbia 1988. Ministry of Forests.