

# Ring of Fire Resources Inc – Project 81 Timber Valuation for the Abitibiowater Smooth Rock Falls Freehold

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CONFIDENTIAL

By:



Steve Bros, M.B.A., R.P.F.  
Aug 2011

## Executive Summary

Ring of Fire Resources Inc (ROF) has asked Merin Forest Management (Merin) to complete an assessment of the current gross value of timber on land they have entered into an agreement for an exclusive right to purchase from Abibow Canada Inc (Abibow).

The area, known as Project 81, consists of approximately 60,000 ha in the Smooth Rock Falls, Iroquois Falls and Timmins areas of north eastern Ontario. A review of the Abitibi Consolidated (the previous company to Abibow) Smooth Rock Falls Freehold Forest Management Plan 2002-2022 was as well as the Ministry of Northern Development Mines and Forestry (MNDMF) Policy FOR 05 05 45 Valuation of Trees Reserved to the Crown on Patented Lands for Release of Tree Reservations .

The methodology provides a value of the timber that is currently merchantable for forest products based on the standards of the Crown Forest Sustainability Act (1994) and a value for unmerchantable young growth in terms of the Net Present Value of the timber's future value when it is merchantable. The table below summarizes the current value of the timber

BLOCK	UNMERCHANTABLE VLAUE (\$)	MERCHANTABLE VLAUE (\$)	TOTAL (\$)
A	\$9,825,086.27	\$7,865,422.91	\$17,690,509.19
B	\$430,909.10	\$344,989.82	\$775,898.92
TOTAL	\$10,255,995.37	\$8,210,412.73	\$18,466,408.11

Reading or using this timber valuation is subject to the following caveat:

1. Unmerchantable NPV (\$) is an estimate of the future value of the timber when it is merchantable to harvest in today's dollars. There is no guarantee that a forest will reach this potential as forests are living systems subject to forest fire, insect, disease, wind and force majeure.
2. Merchantable value (\$) is the value of the timber today. This assumes all the trees are harvested. Under a system of sustainable forest management it can be expected that at a minimum 25 % of the timber will be left to account for inoperable areas, reserves on water systems and protection of wildlife habitat i.e. only 75 % of the timber value will be realized.
3. This valuation only considers the value of timber in terms of value to produce traditional forest products (sawlogs, pulp, veneer, biomass) it does not necessarily refer to profit from harvesting these trees nor does it account for other non quantitative values like aesthetics or habitat for wildlife

**Ring of Fire Resources Inc – Project 81  
Timber Valuation for the Abitibowater  
Smooth Rock Falls Freehold**

***I hereby certify that I have completed and compiled this tree release volume and value estimation to the best of my professional judgment subject to the following qualifications:***

1. *The volume calculations are completed using generally accepted standards and methods used by foresters in Ontario and are governed by the principles of forest mensuration and standard operating procedures outlined in the Province of Ontario Forest Management Planning Manual (FMPM). The FMPM is a regulated manual under the Crown Forest Sustainability Act (1994).*
2. *The procedures used to calculate volumes and values are governed by the standards of the Ontario Professional Foresters Association.*
3. *I have relied on data in the Abitibi Consolidated Smooth Rock Falls Freehold (SRFF) Forest Management Plan 2002-2022 and supplementary documents provided by Abibow Canada (Abibow) to Ring of Fire Resources Inc (ROF) for the completion of calculations. Abibow and its predecessor Abitibi Consolidated completed all work on the SRFF under the standards of their environmental management system CAN/CSA – Z809. I believe the data to be reasonable based on my 30 years of experience working in the Boreal Forest and my knowledge of the professional foresters who completed this work.*
4. *The method of valuation using Crown Policy FOR 05 05 45 Valuation of Trees Reserved to the Crown on Patented Lands for Release of Tree Reservations (24 Nov 2010) is a standard providing the intrinsic value of a tree for forest products. It has been a Crown Policy since early 2003 and is reviewed and revised periodically. Prior to 2003 earlier methods existed, in various forms, for valuing trees on patented claims has been in existence since the late 1960's. The value derived from this calculation does not necessarily equal profit if these trees were harvested and sold for forest products nor does it account for other potential values (aesthetic, wildlife).*
5. *Since I was instructed by ROF not to perform our own independent due diligence we cannot certify as to the accuracy of the data provided to us in No. 3 above.*
6. *Using data provided and various government requirements and recognized cost accounting principles I have created and used a methodology in which I have the sole and absolute proprietary interest. Should details of such methodology be required a confidentiality agreement will be necessary.*




Completed by: Steve Bros, M.B.A., R.P.F. , Provincial Scaler #4778  
Aug 2011



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## **1.0 Introduction**

Ring of Fire Resources Inc. (ROF) has entered into an agreement with AbiBow Canada Inc. (Abibow) to purchase the Smooth Rock Falls Freehold lands (SRFF) in northeastern Ontario. The property consists of 2 blocks (Block A and Block B in 15 townships in north eastern Ontario and is collectively referred to as Project 81 by ROF). These lands have been managed by Abibow and its predecessor companies for over 100 years.

ROF through their forestry consultant Williams & Associates Forestry Consultants Ltd has asked Merin Forest Management (Merin) to provide an estimate of the value of trees on the SRFF. Merin and its predecessor firms have been assessing forests for volume and value in Ontario since 1986. The principals of the firm, Steve Bros and Sarah Bros are Registered Professional Foresters (RPF) in Ontario since 1985. Appendix A contains the company profile of Merin and the CV's of the principals of the firm.

Merin proposed 3 valuation methodologies to ROF:

1. Review the Abitibi Consolidated (the predecessor to Abibow) Sustainable Forest Management Plan (FMP) and the associated SRFF FMP summaries and complete a valuation.
2. Review the Abitibi Consolidated Sustainable FMP and the associated SRFF FMP summaries and any associated forest resource inventory data (FRI) to verify FMP summaries.
3. Review the Abitibi Consolidated Sustainable FMP and the associated SRFF FMP summaries and any associated forest resource inventory data (FRI) to verify FMP summaries; and, complete sample timber cruise inventories (field surveys) to audit the FRI data and resulting FMP summaries.

ROF requested the Level 2 report format, the report contained herein is the review of the SRFF FMP and associated FRI data provided by Abibow.

## **2.0 Forest Description**

Figure 1. outlines the location of the SRFF Part A and B. It is located entirely within the Abitibi River Forest Sustainable Forest Licence (#110). Figure 2 is the SRFF area summary from the Abitibi Consolidated Sustainable Forest Plan 2002-2022.

The description of the forest for Part A is taken directly from the SRFF FMP for the period 2002-2022 (AbitibiConsolidated, 2005). No data or description exists for part B but it is fair and reasonable to assume that the forest description for Block B is similar to Block A.

*The SRF Freehold is located within the Timmins and Cochrane Districts of the Ontario Ministry of Natural Resources (OMNR), Northeast Region. The freehold lands were accumulated over time during the early 1900s primarily through the purchase of old veteran's lots that had been disbursed to veterans of the Boer War at the turn of the 20th century. The area was heavily harvested in the 1960s and 1970s resulting in very poor age class distributions which in turn makes current harvesting possibilities very limiting for certain products such as sawlogs.*



The Freehold comprises a total area of 58,545 hectares spread over portions of 10 townships. Of the total area, 49,263 hectares are considered productive forestlands. Within all of this area there is a scattering of Crown and other private lots.

The SRF Freehold lies in the Northern Clay Section of the Boreal Forest Region. The forests of the Northern Clay Section are conditioned by widespread surface deposits of water-worked tills and lacustrine materials, and by a nearly level topography. One characteristic of this area is the large expanse of black spruce stands that covers the gently rising uplands as well as the lowland flats. While extensive areas of spruce-cedar swamps occur, eastern white cedar reaches tree size only at the swamp borders. White birch is also dominant on sandy soils whereas poplar thrives in open sunlight.

The SRF Freehold was aggregated into a total of 7 forest units that have similar species composition, stand development, site typing, economic products and silvicultural requirements. The forest units are as follows:

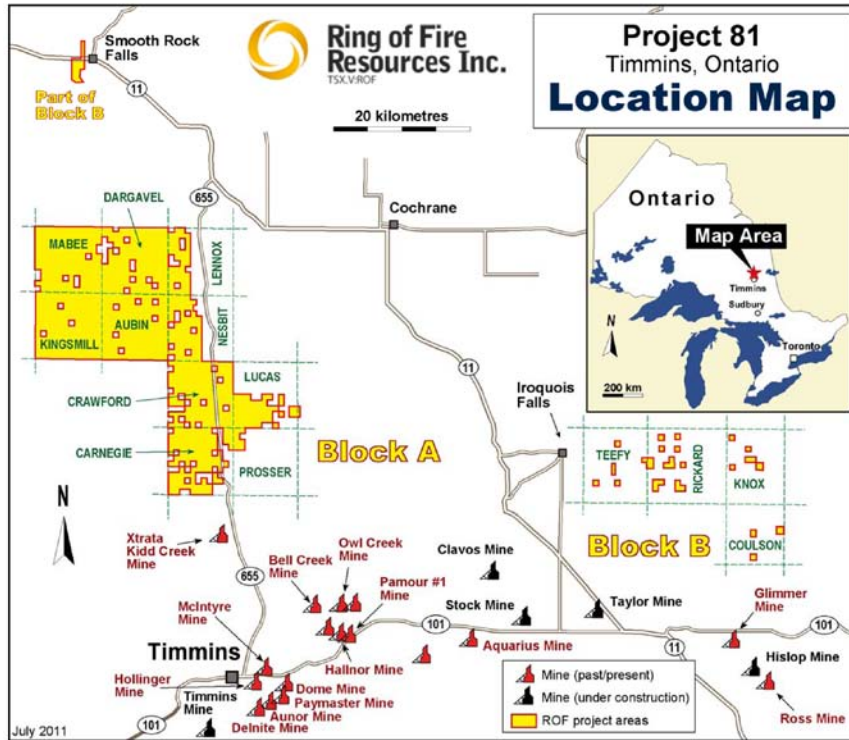
- BOG Spruce Bog
- SB1 Black Spruce Lowland
- LC1 Lowland Conifer
- SP1 Spruce / Pine
- SF1 Spruce / Fir
- PO1 Poplar
- BW1 Birch Poplar
- MW2 Spruce Fir Mixed

The following table shows the proportion of managed productive forest area by working group:

<b>Working Group</b>	<b>Area (ha)</b>	<b>%</b>
▪ Black Spruce	36,685	74.5
▪ White Spruce	62	0.1
▪ Balsam Fir	5,713	11.6
▪ Jack Pine	0	0
▪ Cedar	231	0.5
▪ Larch	1,085	2.2
▪ Poplar	4,929	10.0
▪ Birch	559	1.1
▪ Total	49,263	100.0

A classification of predominant vegetation and soil types was developed in 1983 and updated in 1994 and 2000. These vegetation / soil site relationships were organized into site types that serve as a guide to planning harvest, renewal and maintenance operations.

**Figure 1. Location of the Project 81 Landbase (Block A and B)**



Source: Ring of Fire Resources Press Release July 15, 2011

**Figure 2. Landbase Summary Block A**

Land Type	Area (ha)
<b>Non Forested</b>	
Water	473
Other	116
<b>Subtotal Non Forested</b>	<b>589</b>
<b>Forested</b>	
Non-Productive Forest	8692
Productive Forest:	
Protection Forest	3664
Production Forest	45598
<b>Subtotal Forested</b>	<b>57954</b>
<b>TOTAL</b>	<b>58543</b>

Source: SRFF FMP, Abitibi Consolidated



### **3.0 Methodology for Timber Valuation**

#### **3.1 Block A**

1. A complete review of the Abitibi Consolidated SRFF FMP 2002-2022 and any other correspondence provided by Abibow to ROF was completed to find pertinent material related to merchantable and unmerchantable volumes. This review was completed using the same methodology and standards used to analyze FRI data on Sustainable Forest Licenses (SFL) in Ontario.
2. Analysis and review of stand list tables and figures summarizing FRI data related to forest units (FU), areas in hectares, age class distributions and volumes for merchantable and unmerchantable timber was performed.
3. Standard calculations were performed on the Excel format FRI stand list database in to produce summaries of:
  - a. Unmerchantable areas (ha) by forest unit and age class
  - b. Merchantable volumes (m3) by each species by forest unit and age class
4. For the purpose of this valuation Ministry of Northern Development Mines and Forestry (MNDMF) *Policy FOR 05 05 45 Valuation of Trees Reserved to the Crown on Patented Lands for Release of Tree Reservations* was implemented. Specifically the section outlining the procedure to be used for calculating the value of a known volume. A copy of the policy and associated procedure is contained in Appendix B. FOR 05 05 45 is a procedure used by the MNDMF and Ministry of Natural Resources (MNR) to determine the value of Crown reserved trees on patented mining claims and veteran's lots. Merin has used this procedure and submitted valuations to:
  - a. MNR and MNDMF for tree releases;
  - b. Lawyers for legal actions; and,
  - c. Mining firms to assess the value of trees on their patented claims since 2004.
 It is an accepted methodology by MNDMF/MNR for determining the intrinsic value of timber at a given point in time. Values (\$/m3) are based on the Province of Ontario Stumpage and Renewal Matrix which measures the:
  - a. Value of timber /m3 based on market conditions for forest products (the stumpage portion of the matrix); and,
  - b. Cost of renewing the tree (the renewal portion of the matrix).
5. The FRI data used, calculations completed, assumptions made and resulting merchantable and unmerchantable values were summarized in the results section.

#### **3.2 Block B**

1. Abibow indicated prior to this valuation review that no FRI data existed for Block B
2. Results for Block B are interpreted based on area using the volumes and values found in Block A.

### **4.0 Results and Calculations**

Abibow provided a detailed CD with all the FMP and FRI data for Block A. Review of the CD revealed the Block A area of Project 81 has detailed FRI data from the Sustainable Forest Management Plan SRFF FMP 2002-2022. The stand list form this FRI has been completed to similar standards required for stand lists on Sustainable Forest licences governed by the Crown Forest Sustainability Act (1994), the law which governs forest management on Crown land in Ontario.





As indicated by Abibow and after a review of the FRI data delivered by Abibow it was confirmed the Block B area has no FRI data and therefore an estimate of volume and value is based on the calculations and results for Block A prorated to the Block B area.

#### **4.1 Block A**

##### **4.1.1 Volume and Area**

From the CD a detailed stand list for every forest stand in Block A was selected and used as the source of data. This stand list (a copy of which is provided as a supplementary document to this valuation) provided required data for each stand on the landbase including

- Stand Number and Species Composition
- Forest Unit Classification based on SRFF Block A
- Age Class in 5 year classes
- Yield (m<sup>3</sup>/ha) of each species by forest unit
- A total volume (m<sup>3</sup>) for each stand

By completing calculations on this Excel data base unmerchantable and merchantable volumes were calculated. Merchantable volume in m<sup>3</sup> is required to complete the value calculation using FOR 05 05 45, while area calculations are required to complete the value calculation for unmerchantable young growth.

##### **4.1.2 Merchantable Volume**

By completing calculations of the yield by species for each forest stand the Gross Merchantable Volume (GMV) was determined and is detailed in the supporting document entitled ROF SRFF Stand List.

##### **4.1.3 Unmerchantable Areas**

Areas for unmerchantable young growth were calculated for all forest units based on their age of merchantability using the Timmins District MNR Net Present Value (NPV) Matrix. Figure 3 describes the forest units and their associated time period when classified as young unmerchantable growth. For example SB1 has a period from 0-75 years for it to grow and reach merchantability when forest products can be produced from the tree.

Under the Ontario Provincial Scaling Manual, a regulated manual under the CFSA, a merchantable log for:

- a. Conifer is 10 cm or greater outside the bark at the smaller end; and,
- b. Poplar/White Birch (Hardwood) is 14cm or greater outside the bark at the smaller end

**Figure 3. Period of Unmerchantability (years) for Forest Units on the SRFF Block A**

Forest Unit	Unmerchantable Age (yrs)
SB1	0-75
LC1	0-75
SP1	0-65
SF1	0-65
PO1	0-45
BW1	0-45
MW2	0-55

Source: Timmins District MNR Net Present Value Chart, 2008

#### 4.2.1 Value

The value calculation is based on the volumes derived in section 5.1. As noted the valuation calculation uses the Value Section Policy of FOR 05 05 45 as the methodology to complete the valuation.

#### 4.2.2 Merchantable Value

This valuation assumes that the value of the wood volume in a tree today has two components

- a. The value of the wood today; and,
- b. The value of the wood in the tree in the future.

The valuation method uses the stumpage as a representation of the value today and uses the cost of renewal as the value of the tree in the future.

The value for merchantable wood uses the following portions of the Provincial Stumpage Matrix:

- a. The July 2011 Provincial Stumpage Matrix for the timber volume value today ;and,
- b. The renewal rates for 2011-12 on the Abitibi River Forest (the surrounding Sustainable Forest Licence) for the future timber volume value.

The complete stumpage matrix and renewal summaries are found in Appendix C. The values from the July 2011 provincial stumpage matrix that will be used for the valuation are summarized in Figure 4.

**Figure 4. Value (\$) of Each Species within the Forest Units**

Species	FOR 05 05 45 Value (\$)
SB	\$8.35
SW	\$8.35
BF	\$8.35
CE	\$8.96
LA	\$8.35
PO	\$1.43
BW	\$1.43

Source: MNDMF Provincial Stumpage Matrix, July 2011

Notes:

SB-Black Spruce; SW-White Spruce; BF-Balsam Fir; CE-Cedar, LA-Larch; PO-Poplar; BW-White Birch



### 4.2.3 Unmerchantable Value

Unmerchantable young growth will have a value in the future when those trees reach maturity. The value for young growth is a Net Present Value (NPV) of the tree at its current stage of development and what it will grow to in the future.

The Timmins District MNR which much of the SRFF falls in has developed a NPV matrix for the different forest units and age classes based on \$/ ha. Appendix D includes a copy of the complete NPV matrix.

The NPV matrix requires an area in hectares of unmerchantable young growth by each forest unit which is calculated using the stand area and yield by species .

**Figure 5. Estimate of Value of Merchantable Timber and Young Unmerchantable Growth SRFF Block A**

<b>UNMERCHANTABLE VOLUME</b>									
FOREST UNIT	Age Class (yrs)	Area (ha)	NPV (\$/ha)	VALUE (\$)					TOTAL VALUE (\$)
BW1	0-45	115	\$190.83	\$21,872.12					
PO1	0-46	741	\$315.40	\$233,670.43					
LC1	0-75	3009	\$221.65	\$666,894.26					
MW2	0-55	392	\$191.93	\$75,173.36					
SB1	0-75	18645	\$347.40	\$6,477,279.71					
SF1	0-65	5306	\$363.30	\$1,927,664.61					
SP1	0-65	955	\$442.38	\$422,531.78					
TOTAL VALUE UNMERCHANTABLE>>>				\$9,825,086.27					\$9,825,086.27
<b>MERCHANTABLE VOLUME</b>									
FOREST UNIT	Age Class	SB (m3)	SW (m3)	BF (m3)	CE (m3)	LA (m3)	PO (m3)	BW (m3)	TOTAL VALUE
BW1	>45	5431.658	2386.418	28869.298	0.000	0.000	107761.579	16963.123	
PO1	>45	4119.766	1125.181	15421.694	0.000	0.000	136508.011	1660.263	
LC1	>75	19053.641	0.000	2290.396	9317.269	23681.825	0.000	283.851	
MW2	>55	29398.626	10392.001	128031.373	481.983	128.064	173708.037	37492.698	
SB1	>75	280625.256	0.000	16701.270	1190.096	12245.775	0.000	257.080	
SF1	>65	71754.780	5876.863	124729.321	2398.749	2394.775	14596.585	20037.466	
SP1	>65	39767.009	0.000	13698.048	0.000	675.470	5833.421	3427.982	
TOTAL M3 BY SPECIES>>>		450150.736	19780.463	329741.400	13388.096	39125.908	438407.633	80122.462	
\$/M3 VALUE JULY 2011		\$8.35	\$8.35	\$8.35	\$8.96	\$8.35	\$1.43	\$1.43	
TOTAL VALUE MERCHANTABLE		\$3,758,758.65	\$165,166.86	\$2,753,340.69	\$119,957.34	\$326,701.33	\$626,922.92	\$114,575.12	\$7,865,422.91
TOTAL VALUE MERCHANTABLE AND UNMERCHANTABLE>>>									\$17,690,509.19

#### 4.2 Block B

Block B is not part of the Abibow SRFF FMP 2002-2022 and no FRI data exists. Since the land parcels are within the same region and districts, for the purpose of this valuation it is assumed:

- The forest unit and age class distribution by area are similar to Block A

Figure 6 is the Landbase Summary prorated from Figure 2 for Block A.

***Figure 6. Estimated Landbase Summary Block B***

<i>Land Type</i>	<i>Area (ha)</i>
<b>Non Forested</b>	
<i>Water</i>	16
<i>Other</i>	4
<b>Subtotal Non Forested</b>	20
<b>Forested</b>	
<i>Non-Productive Forest</i>	297
<i>Productive Forest:</i>	
<i>Protection Forest</i>	125
<i>Production Forest</i>	1558
<b>Subtotal Forested</b>	1980
<b>TOTAL</b>	2000

Based on the area summaries assumed in Figure 5 and 6 calculations to prorate the value to Block B were completed and summarized in Figure 7.

**Figure 7. Estimate of Value of Merchantable Timber and Young Unmerchantable Growth Block B**

<b>UNMERCHANTABLE VOLUME</b>									
FOREST UNIT	Age Class (yrs)	Area (ha)	NPV (\$/ha)	VALUE (\$)					TOTAL VALUE (\$)
BW1	0-45	5	\$190.83	\$959.27					
PO1	0-46	32	\$315.40	\$10,248.33					
LC1	0-75	132	\$221.65	\$29,248.68					
MW2	0-55	17	\$191.93	\$3,296.96					
SB1	0-75	818	\$347.40	\$284,080.84					
SF1	0-65	233	\$363.30	\$84,543.61					
SP1	0-65	42	\$442.38	\$18,531.42					
TOTALS>>>		1279							
TOTAL VALUE UNMERCHANTABLE>>>				\$430,909.10					\$430,909.10
<b>MERCHANTABLE VOLUME</b>									
FOREST UNIT	Age Class (yrs)	SB (m3)	SW (m3)	BF (m3)	CE (m3)	LA (m3)	PO (m3)	BW (m3)	TOTAL VALUE (\$)
BW1	>45	238.241	104.672	1266.253	0.000	0.000	4726.592	744.029	
PO1	>45	180.699	49.352	676.420	0.000	0.000	5987.456	72.822	
LC1	>75	835.723	0.000	100.460	408.670	1038.722	0.000	12.450	
MW2	>55	1289.470	455.809	5615.657	21.141	5.617	7619.108	1644.489	
SB1	>75	12308.665	0.000	732.544	52.199	537.119	0.000	11.276	
SF1	>65	3147.278	257.768	5470.824	105.213	105.039	640.229	878.875	
SP1	>65	1744.244	0.000	600.818	0.000	29.627	255.863	150.357	
TOTAL M3 BY SPECIES>>>		19744.319	867.602	14462.976	587.223	1716.124	19229.248	3514.297	
\$/M3 VALUE JULY 2011		\$8.35	\$8.35	\$8.35	\$8.96	\$8.35	\$1.43	\$1.43	
TOTAL VALUE MERCHANTABLE>>>		\$164,865.07	\$7,244.48	\$120,765.85	\$5,261.52	\$14,329.63	\$27,497.83	\$5,025.45	\$344,989.82
TOTAL VALUE MERCHANTABLE AND UNMERCHANTABLE>>>									\$775,898.92

## 5.0 Summary Project 81 Timber Value

Figure 8 provides the estimated value of the Project 81 timber value.

***Figure 8. Estimated Summary of Merchantable Timber and Young Unmerchantable Growth Block and Block B***

<b>BLOCK</b>	<b>UNMERCHANTABLE VLAUE (\$)</b>	<b>MERCHANTABLE VLAUE (\$)</b>	<b>TOTAL (\$)</b>
A	\$9,825,086.27	\$7,865,422.91	\$17,690,509.19
B	\$430,909.10	\$344,989.82	\$775,898.92
<b>TOTAL</b>	<b>\$10,255,995.37</b>	<b>\$8,210,412.73</b>	<b>\$18,466,408.11</b>

## 6.0 Caveat

The reader must be cautioned when reading and using this data as these valuations are for the value of all timber on the land base.

1. Unmerchantable NPV (\$) is an estimate of the future value of the timber when it is merchantable to harvest in today's dollars. There is no guarantee that a forest will reach this potential as forests are living systems subject to forest fire, insect, disease, wind and force majeure.
2. Merchantable value (\$) is the value of the timber today. This assumes all the trees are harvested. Under a system of sustainable forest management it can be expected that at a minimum 25 % of the timber will be left to account for inoperable areas, reserves on water systems and protection of wildlife habitat i.e. only 75 % of the timber value will be realized.
3. This valuation only considers the value of timber in terms of value to produce traditional forest products (sawlogs, pulp, veneer, biomass) it does not necessarily refer to profit from harvesting these trees nor does it account for other non quantitative values like aesthetics or habitat for wildlife
4. No FRI data exists for Block B and therefore the value is based on assumptions based on Block A.



**Appendix A. Merin Company Profile and CV of Steve Bros and Sarah Bros**

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## Our Mission

***We provide sustainable integrated solutions, forestry technical expertise and practical business experience to North American land owners, businesses and governments in the forest and mining sectors to help them sustainably achieve their project goals.***

## Our Headquarters

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Website. [www.merinfoest.com](http://www.merinfoest.com)

## Company Profile

Merin Forest Management (1999) and its predecessor companies started business in 1986 and is owned and operated by Steve Bros (R.P.F.) and Sarah Bros (R.P.F.). We are professional foresters with a combined 56 years experience and an entrepreneurial background.

Mrs. Bros has a B.Sc.F. from the University of Toronto and is a Certified Forest Stewardship Certification (FSC) Auditor, Managed Forest Plan Approver (Ontario) and focuses on providing forest management services. Mrs. Bros as an industry forester with The Ontario Paper Company and Buchanan Forest Products authored or co authored seven Forest Management Plans. In addition she was responsible for: all silvicultural programs on the Black River and Big Pic Forests; the planting and maintenance of over 56 million trees from 1983 to 1999; and, was involved in two Forest Management Agreement audits. As a consultant she has completed numerous audits; computer modeled several forests; written two forest management plans; and planned and supervised the planting of another 20 million trees. Mrs. Bros understands and appreciates the changing forestry climate.

Mr. Bros has a B.Sc.F. from the University of Toronto and a MBA from the Athabasca University Centre for Innovative Management and provides business management services and technical operational forestry consulting services to the forestry and mining



sectors. Mr. Bros has owned/co-owned and developed four businesses over the last twenty eight years and has extensive operational logging experience particularly in the area of planning, financing and negotiation, and implementing harvest plans. The largest firm, North West Timber Ltd, grew to revenues of eight million dollars and employed fifty people. His business background has provided him with insight in the importance of risk management, human resources, marketing, operations management, and cost efficiency to a firm's profitability. As a consultant he has provided: supervision of forestry operations, forestry operations management and planning (from planning large harvest operations to completing stream crossing plans to permitting and licencing for all these operations); business management and planning; strategic planning; negotiation of business deals; and, financial analysis services to clients both large and small.

### **Description of Services**

#### Forest Management

- Forest management planning and strategic forest management modeling (SFMM).
- Silvicultural consulting.
- Regeneration and operational cruising, damage assessments, woodlot cruising and valuation.
- Forest auditing, preparation for forest audits and FSC Auditing.
- Road locations and field surveys.
- Stream crossing locations, watershed calculations, culvert/bridge sizing, sediment control and installation plans for forest access roads.
- Consultative services to First Nations.
- Forest management auditing.
- Managed Forest Tax Incentive Plans.
- Trees Ontario delivery agent.
- Licenced and approved Province of Ontario Scaler.

#### Operational and Business Management

- Strategic business planning for forest operations.
- Forest Licencing and permitting, and negotiation of all types of agreements.
- Valuation of timber and tracts of land.
- Management accounting, cost accounting systems and capital budgeting analysis for forest operations.
- Operational planning and decision-making.
- Planning and supervising all types of forestry operations.
- Feasibility studies.
- Chain of custody and Environmental Management System (EMS) auditing

### **Our Competitive Edge**

Our asset is our professional integrity combined with our business management and technical forestry knowledge obtained by hands on experience. We have a network of long term partner businesses we use for everything from GIS to surveys to legal opinions. Moreover our network of contacts, including senior management at all major forest companies and the Ontario Ministry of Natural Resources, ensures we can complete any job with current data and knowledge.



## **Our Clients and Projects**

### **Forestry**

**Forestry Futures Committee (Thunder Bay, Ont)** – As a Forest Audit Analyst for Ontario's Crown Forests Mrs. Bros has used her twenty eight years experience including the authoring and co authoring of seven-forest management plans and operational silvicultural experience to critically analyze forest audits and provide synopses to the committee. This is a long-term business relationship that has been in existence since 2001.

**Timmins Forest Products (Timmins, Ont)** – Assist in all licence and land negotiations; act as liaison for Timmins Forest Products with MNR, client mills, mining clients; deal with all Timmins Forest Product forestry issues. Completed Managed Forest Tax Incentive Plans for 22,000 acres of private land and the first Landowner Management Agreement in northeastern Ontario. This is a long-term business relationship that started in 2003.

**Scierie Landrienne (Landrienne, QC)** – Assist with forestry issues on their Ontario operations. Completed an Environmental Study Report and handled all public negotiations for a road corridor proposal across Chapleau- Nemegosenda Provincial Park under the new Class Environmental Assessment for Parks and Conservation Reserves. Help negotiate Ontario wood deals. This is a long term business relationship started in 2005.

**Cochrane and Timmins Area Independent Harvesters (Cochrane, Ont)** – Represented and negotiated on behalf of nine independent harvesters during the Cochrane cooperative forest amalgamation. Obtained and secured wood volumes, open market pricing and dispute resolution process to protect the harvesters.

**Townships of Manitouwadge and Marathon (Manitouwadge, Marathon, Ont)** – Developed a business plan for the creation of a forest COOP for the Big Pic Forest; helped create a functioning and economically viable forest management infrastructure based on actual worst case scenario cash flow estimates.

**Trees Ontario Partner (South River – Hearst, Ont)** – Delivery Agent for the Trees Ontario private land afforestation program. Site prescriptions, tree production and planting and follow up assessment of the plantation is included in the program. This is an ongoing business relationship.

**Grant Forest Products (Englehart, Ont)** - Provide operational planning and supervision for Grant's contractor woodland operations on the Nipissing Forest. This included harvest planning, road locations and assisted in operational decision-making. This was a long-term business relationship that had been in existence from 1999 to 2007 until market conditions resulted in the suspension of operations.

**Abitibowater (Iroquois Falls, Ont)** – Completed the Comparison and Trend Analysis of Planned versus Actual Forest Operations for the 2008 Independent Forest Audit of the Nighthawk Forest.

**Norbord Industries Inc (LaSarre, QC)** – Completed a wood supply analysis for possible mill acquisitions.

**Tembec (Smooth Rock Falls and Chapleau, Ont)** – Completed a review of Tembec's road strategies in terms of their FSC commitments and made recommendations to ensure certification.

**Saskatchewan Environment – Ministry of Forests (Saskatoon, Sask)** – Assisted in completion of a discussion paper reviewing road and stream crossing standards from across Canada and their application in Saskatchewan for the purposes of policy development (2008).



**Mazinaw Lanark Forest (Cloyne, Ont)** – Assisted with the completion of the 2006-2026 FMP and authored the 2005 Report on Past Forest Operations (RPFO).

**Nipissing Forest Resource Management (North Bay, Ont)** – Coordinated and supervised the tree plant on the Nipissing Forest in 2002 to 2004. Assisted in the preparation of the 2004-2009 Nipissing Forest Management Plan. Completed regeneration and free to grow surveys from 2000-2004.

**Vermillion Forest Management Company (Sudbury, Ont)** – Completed the Report on Past Forest Operations (RPFO) on the Sudbury forest for the period 2000-2005.

**Aundeck Omni Kaning First Nation (Little Current, Ont)** – Created forest operations prescriptions for stand improvement on the reserve land, assisted in the training and certification of forestry workers. Developed a Draft Land Use Plan for discussion purposes on the reserve area.

**Nipissing First Nation (North Bay, Ont)**–Completed a 20-year forest management plan in 2001 including all SFMM.

**Dokis First Nation (Dokis, Ont)** – Completed a forest management plan including all strategic forest management modeling for the period 2004 to 2009.

**Domtar (Timmins, Espanola Ont)** –Analyzed the strategic forest management modeling and completed sections of the Forest Management Plan for the Shining Tree Forest in 2000. Assisted in formulation of wood purchase agreements with First Nations.

**Tembec (Temiscaming, QC)** – Assisted in completing forestry database for Tembec's company intranet site.

**Ontario Ministry of Natural Resources (North Bay, Ont)**– Developed a decision matrix tool to evaluate road corridors for the 2004-2024 Temagami Forest Management Plan. Used this tool to assess road alternatives and arrive at cost estimates for road alternatives.

**Ontario Ministry of Natural Resources (Sault Ste. Marie, Ont)** – Completed an internal review of Forest Management Planning in Ontario. Reviewed problems and issues faced during the development of a Forest Management Plan. Assisted in completion of the 2002 State of the Forest Report.

**Precut Hardwood (North Bay, Ont)**– Completed a wood supply analysis and wood utilization strategy as part of a business proposal to the Ontario Ministry of Natural Resources. This proposal enabled Precut to receive a forest license area on the Nipissing Forest.

**Temagami Forest Industry Advisory Committee (a coalition of Liskeard Lumber, Grant Forest Products, Tembec, Goulard Lumber)** – Completed a capital budgeting analysis (including cash flows and net present values) for various road location scenarios to determine the most economical road strategy for the 2004-2024 Temagami Forest Management Plan.

**Integreytd International (Syracuse, New York)**– Assisted in completion of an Environmental Management System Audit on the Kimberly Clark Woodlands in Longlac, Ontario in 2003.

### **Mining**

**The Estate of F.W. Schumacher (Pasadena, Calif)** – Completed Managed Forest Tax Incentive Plans for 10,000 acres of patented mining claims owned by the Estate in 2007; resulting in tax savings of 75% on municipal/provincial taxes.



**First Nickel Inc (Sudbury, Ont)** – Obtained all licences and forestry permits for development of the Premiere Ridge Mine site and Strathcona Road in 2007.

**Explor Resources (Rouyn Noranda, QC)** – Completed all required hydrology, sediment control and installation plans for bridge stream crossings to access exploration sites in 2007, 2008.

**Lakeshore Gold Corp (Timmins, Ont)** – Obtained all licences and forestry permits for development of the Timmins West Gold and completed several land valuations related to Thunder Creek project and Bell Creek Portal in 2007-2009.

**St. Andrew Goldfields (Timmins, Ont)** – Obtained all licences and forestry permits for development of the Clavos road including all hydrology, sediment control and installation plans for stream crossings in 2005.

**Excellon Resources (Toronto, Ont)** – Completed an analysis of timber value on patented mining claims in Timmins area in 2008.

**Cogitore Resources (Rouyn-Noranda, QC)** - Completed all required hydrology, sediment control and installation plans for bridge stream crossings to access exploration sites in 2008 – Cochrane District.

**Sarissa Resources (Oakville, Ont)** – Completed stream crossing rehabilitation plans and obtained permits for access to their Nemegosenda Project in Chapleau District in 2009.

**Rubicon Minerals Corp (Vancouver, BC)** – Completed a watershed analysis for the east bay of Red Lake for the Phoenix project in 2009. Assisted in preliminary feasibility of biomass cogeneration of electricity for the Phoenix Project

**Blue Heron Solutions for Environmental Management (Timmins, Ont)** – Completed watershed analysis for Fletcher Nickel Redstone Project in 2008.

**Rare Earth Metals Inc (Thunder Bay, Ont)** - Completed all required hydrology, sediment control and installation plans for bridge stream crossings to access exploration sites in 2009/10 – Kapuskasing District.

#### **Other**

**Frank M. Falconi Barrister & Solicitor (North Bay, Ont)** – Completed timber volume estimates and valuations on behalf of Mr. Falconi's clients involved in property disputes related to harvesting of private timber.

**Mattawa Voyageur Multi-use Trail System (Mattawa, Ont)** – Assisted in the establishment of a multi-use trail system on old logging roads. Completed a survey of 39 stream crossings, calculated all watershed sizes and culvert sizes, completed bridge designs for 4 crossings, completed sediment control and installation plans for all crossings. Dealt with the Ministry of Natural Resources in obtaining permits 2001-2003.

**TransCanada Pipelines (North Bay, Ont)** – Completed a detailed timber evaluation for a pipeline easement in 2005.

**Sarah J. Bros, R.P.F.**

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North Bay, ON  
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**PROFESSIONAL EXPERIENCE**

Have over 27 years experience in forest management in the Boreal and Great Lakes/St. Lawrence forest, Certified *Smartwood* FSC auditor  
Have been involved in economic development at the community level since 1994  
Avid volunteer in the community

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**EDUCATION** Bachelor of Science in Forestry (BScF), University of Toronto, 1983

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**EMPLOYMENT RECORD****1999-Present** *Partner, Professional Forestry Consultant, Merin Forest Management, North Bay, Ontario*

- contracted services to *Forestry Futures Committee*(Independent Forest Audits); *Smartwood- The Rain Forest Alliance* (Forest Stewardship Council Auditing); *Integreyted International*(internal forest company environmental audit); *Nipissing Forest Resource Management Inc.* (various silviculture services, FMP/Annual Reports/RPFO); *Grant Forest Products* (logger negotiations), *Domtar* (FMP planning); *Donohue* (land tenure); *Ministry of Natural Resources*(document reviews, facilitations); *Tembec Inc.*(intranet silviculture website development); *Dokis First Nation* (FMP author) and *Nipissing First Nations*(FMP author)
- Partner Trees Ontario (afforestation program on private land)
- Managed Forest Tax Incentive Program plans

**1998-1999** *Management Forester, Buchanan Forest Products Ltd, Manitowadge, Ontario.*

- responsible for all aspects of one of the company's licence areas;
- responsible for the silvicultural program on three forests;
- perform job duties as assigned by the Company's Chief Forester;
- Plan co-author of the Black River Forest's Forest Management Plan 2001-2006;
- attended regular training sessions and information seminars with respect to forest management;
- responsible for the production of Annual Work Schedules and Annual Reports for two forests;
- liaise and negotiate all silvicultural contracts on behalf of the Company;
- directly supervise the silviculture program on three forests with a budget of nearly 6 million dollars;
- represent the Company on matters relating to the forest management on the Black River Forest and silviculture on the Black and Big Pic Forests;
- directly involved in first nation negotiations as it relates to silviculture on three forests.

**1986-1998** *Management Forester/Office Manager, North West Timber Ltd, Manitowadge, Ontario.*

- responsible for the forest management on the Black River Forest FMA500800;
- authored and/or co-authored 3 forest management plans for the Black River Forest; and assisted with the (1997-2002) Forest Management Plan for the Big Pic Forest;
- implemented and increased the silvicultural programs on the Big Pic and Pic-River Ojibway Forests under the SFL program;





- responsible for the establishment of over 56 million trees and associated silviculture budgets (some in excess of 6 million dollars);
- designed a computer database for storing information on silviculture projects established under FMA/ SFL;
- responsible for maintaining, updating and extracting information as required on the Company FRI database;
- responsible for reconciling silviculture and forest management costs for all 3 forests on an annual basis as required under the terms of the Sustainable Forest Licence and Forest Management Agreement;
- contracted forestry department services to licence holder Buchanan Forest Products;
- responsible for the preparation of Annual Work Schedules and Annual Reports as required for the three Forests;
- field supervised silviculture operations between 1986 and 1996.
- Responsible for day-to-day office operations which included negotiating and administering company benefits plans, liaise with government organizations (WSIB, Revenue Canada, etc.) regarding company information

**1983-1985**

***Forester, Ontario Paper Company (now Donohue)***

- assisted with various Forestry duties as assigned;
- responsible for implementing Company computerized silvicultural record-keeping system on the Black River Forest;
- directly supervised all silviculture projects(tree planting, site preparation, chemical spraying);
- carried out tree plant quality assessments, regeneration cruises, survival plot assessments and various other silviculture responsibilities;
- responsible for submitting Forest Management Agreement invoices to the MNR for reimbursement; and
- assisted with various forest management planning duties as assigned by the Limit Forester.

**INTERESTS, ACTIVITIES & ASSOCIATIONS**

- Enjoy skiing, figure skating and long distance walking. Recently have taken up sewing and am an avid reader.
- Have held various positions from Guide Leader to Area Treasurer to Elected Member - Provincial Council as a member of the Girl Guides of Canada since 1985.
- Elected member of the Manitowadge Economic Development Committee 1994-97 & 1998 - June 1999.
- Elected member of the Manitowadge Figure Skating Club in the capacity of Public Relations, Skater Development, and Boutique 1997-98 & 1998-99.
- President of the North Bay Figure Skating Club 2001-2004, Vice-President 2000-2001
- Volunteer helper Vincent Massey Public School
- Volunteer Treasurer for the Manitowadge Nursery School 1995-96.
- Member of the Ontario Professional Foresters Association since 1986.
- Member of the Canadian Institute of Forestry since 1986.

**COMPUTER SKILLS**

- Proficient in Microsoft Word, Excel, Access, and Microsoft Project. Have been working with versions of Microsoft Word and Excel since approximately 1990. In the last two years have concentrated on programs such as Access and Project 98.
- Good working knowledge of Dbase IV. Have used various versions of Dbase since 1994. I am familiar and comfortable with writing programs in MSDOS Program Edit to be used in Dbase.



- Proficient in provincial government computer programs (SFMM, SFMMTool, etc.)

## **CURRICULUM VITAE**

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## **WORK AND BUSINESS ACCOMPLISHMENTS**

### **1999-Present: President, Merin Forest Management, North Bay, Ontario**

- A principal partner and forestry consultant with an entrepreneurial outlook providing business negotiation, cost accounting, timber valuations, cash management, strategic and operational planning, and forest prescriptions to the forest and mining industries.
- Thirty one years operational logging experience in the Boreal and Mixed Wood transition forests of northern Canada. Professional contacts throughout Ontario's forest and mining industries.

#### **Merin Forest Management Recent Projects:**

- Several land negotiations on behalf of Timmins Forest Products ranging in value from \$10,000 to an excess of \$1 million dollars.
- Representative for the Cochrane and Timmins area independent harvesters. Negotiating on behalf of the harvesters during development and phase in of the shareholders agreement for the Cochrane Area Forest.
- Business Plan for the creation of a community based Forest Cooperative to manage the Big Pic Forest.
- Road location/stream crossing planning, permit applications and approvals for mining firms like First Nickel Inc (Sudbury, ON), St. Andrew Goldfields and Lakeshore Gold (Timmins, ON), Rare Earth Metals Inc (Thunder Bay, ON), Sarissa Resources (Oakville, ON)
- Assisted in the completion of a discussion paper for the development of road standards for forest access roads for the Province of Saskatchewan, Ministry of Forests (Saskatoon, SA)
- Planning and obtaining approval for roads and stream crossings for Scierie Landrienne (Landrienne, PQ) in Chapleau-Nemegosenda Provincial Park.
- Provided firms like Grant Forest Products (Englehart, ON) with road location, woodlands cost accounting analysis, timber valuations, supervision of forestry operations and logging advice to lower operational costs.
- Developed a decision matrix for the Ontario Ministry of Natural Resources (OMNR) to evaluate road alternatives and capital costs for the 2004-24 Temagami Forest Management Plan (FMP).
- Completed a capital budgeting analysis for a coalition of Grant Forest Products, Liskeard Lumber (New Liskeard, ON), Domtar (Nairn Centre, ON), and Tembec (North Bay, ON). to determine the best road investment scenario. Data quantified a \$7,400,000 difference between best and worst investments.
- Licence negotiation, completion of Crown Tree Releases and timber valuations, operational and strategic planning, stream crossing planning permitting and installations and timber cruising for Timmins Forest Products (Timmins, ON) and Scierie Landrienne (Landrienne, QC).



**1986-1999: Vice President and Partner, North West Timber Ltd., Manitowadge, Ontario**

- An active partner with 49% share ownership in a contract logging and forest management company established in 1986 that employed 40-50 and grew to annual revenues of \$8,000,000 while contracting to Buchanan Forest Products (Thunder Bay, ON) and Domtar (White River, ON).
- Planned an annual harvest of approximately 220,000 m<sup>3</sup> and road construction of 30-100 km and implemented various strategies that reduced costs by 20% and eliminated \$2,100,000 of start-up debt during the period 1987-98. Co-planned restructuring of the business and implemented turn around strategies during 1990-91 recession.
- Negotiated with groups ranging from First Nations, OMNR, company managers, bankers, and politicians to ensure sufficient cash and wood supply to meet strategic objectives.
- Developed and integrated Human Resource strategies into the operations to create a Total Quality Management System that increased productivity by 40%.
- Created, developed and maintained North West Timber's Information Technology Systems including computer scaling and activity based cost accounting systems used for the production of budgets, cash flow projections and financial statements. This was an integral part of cost reduction and restructuring necessary to survive the 1990-91 recession
- Analyses of these statements to improve production, negotiate contracts, reduce costs, manage a monthly cash flow of nearly \$600,000, and obtain bank financing.
- Implemented business diversification strategies including the purchase of 60 flat bed railcars used in a leasing business with Canadian Pacific Railway, and purchase of a bulk fuel plant.
- Sold shares in 1999 to pursue other business and educational interests.

**1992-1999: Vice President and Partner, Manitowadge Fuels Ltd., Manitowadge, Ontario**

- A 33% shareholder and manager of this associated company to North West Timber that provided bulk fuel storage for use in North West Timber's logging operations.
- The business was diversified into furnace fuel and tendered contract sales that provided an additional \$60,000 - \$100,000 in annual revenue.

**1983-1986: Woods Foreman, Spruce Falls Power and Paper Corp., Kapuskasing, Ontario**

- Supervised 10 to 30 unionized workers in forestry and harvesting activities.

**EDUCATION**

- **Master of Business Administration (MBA), 2003**, Centre for Innovative Management Executive Program, Athabasca University, Edmonton, Alberta, Canada.
- **European Business Management, July – August 2002**, Johannes Gutenberg Universitat Mainz, Mainz, Germany.
- **Advanced Graduate Diploma in Management, (AGDM), 2001**, Centre for Innovative Management Executive Program, Athabasca University, Edmonton, Alberta, Canada.
- **Bachelor of Science in Forestry (BScF), 1983**, University of Toronto, Toronto, Ontario, Canada.

**INTERESTS, ACTIVITIES & ASSOCIATIONS**

- An active 51 year old in excellent health, married for 25 years with 2 daughters.
- Member Ontario Professional Foresters Association since 1985, Registered Professional Forester (R.P.F.) No. 1382.
- Certified Forest Operations Compliance Inspector in Ontario obtained 2006.
- Licensed and Approved Scaler Province of Ontario No. 4778 obtained 1987.
- Tree Marker Certification Course 1999.
- S100 Forest Fire Training obtained 1997.
- Several Ministry of Natural Resources courses on water crossings, compliance, Forest



- Ecosystem Classification, bridge engineering 1983-2006.
- Member of Manitowadge Old-timers hockey team 1988-1999.
- Alpine touring and telemark skier – have skied throughout Europe and North America since 1980
- Golfer and avid fisherman (fly and bait)
- Carpentry skills in home construction and renovation.
- Past treasurer Manitowadge Co-op Nursery School (1996-97).
- Volunteer Manitowadge Figure Skating Club (1992-2000.)
- Volunteer Canadian Cancer Society, helped in fund raising and involved in Cancermount program in Northwestern Ontario.
- Past President Kiwissa Ski Club Manitowadge, Ontario (1990-91).
- Coached youth baseball (1993-94).
- Coached youth soccer in North Bay (2000-02).



**Appendix B. MNR Policy FOR 05 05 45**

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## Forest Management Directives and Procedures

FOR 05 Forest Licensing, Wood Allocation and Measurement  
FOR 05 05 Wood MeasurementFOR 05 05 45  
Procedure**VALUATION OF TREES RESERVED TO THE CROWN ON PATENTED LANDS FOR  
RELEASE OF TREE RESERVATIONS****Approval date:** November 24, 2010**Review date:** September, 2015**Contact:** Wood Allocation and Measurement Section, Industry Relations Branch – Forestry Division**DIRECTION**

The Ministry of Natural Resources (MNR) is occasionally approached by patent land owners who wish to purchase the patented rights to the trees on their property. Any valuation of forest resources to be used in release of forest resources reserved to the Crown must be conducted in accordance with this procedure which outlines the proper methods of measurement and valuation of the forest resource.

This procedure supplements Procedure PL 4.03.01, "Release and Voidance of Reservations and Conditions in Land Grants".

Only licensed scalers, registered professional foresters, MNR certified tree markers, or a person certified by the MNR as a Managed Forest Plan Approver may measure forest resources for the determinations of volumes and values for the purpose of this procedure.

A minimum 5% representative cruise of the area is required (this may be adjusted with the approval of the Regional Measurement Coordinator, Ministry of Northern Development, Mines and Forestry (MNDMF)).

The **proponent** is to pay the full costs of the sampling for the determination of volumes and values of Crown forest resources associated with the property.

In most cases, the evaluation of the forest resource consists of the value of merchantable volumes, as outlined in the Scaling Manual, and the value of the trees that have not yet reached a merchantable size. The volumes of each are determined and then added together to arrive at the full value of the forest resource.

**Merchantable Timber*****Measuring Procedures***

Diameters of trees are measured at breast height (1.4 m above ground level) outside the bark in 2 cm size class intervals, with the class boundary occurring on the odd-centimetre and recorded in even-centimetre classes. A diameter that coincides with the class boundary of two size classes belongs to the lower size class. Diameters are recorded by species product and/or destination where applicable. Calipers are used to measure diameters.

The MNDMF Regional Measurement Coordinator must approve the:

- method used to calculate the individual heights of trees or stands, which are recorded in metres correct to one decimal place
- sampling procedure used where age, height and size class are uniform
- volume tables utilized in the calculation of volumes.

Examples include:

- approved local standing tree volume tables
- approved local tree length volume tables
- Honer's standing tree volume tables

#### **Calculation of Value**

- Determine the gross merchantable volume in cubic metres (no deductions for defect or undersized)
- To determine the marketable value of the forest resources using the stumpage matrix
  - Use the NES (Not Elsewhere Specified) product sector rate (minimum rate + residual value) for the month the forest resources were measured
  - For white and red pine and graded hardwoods, any grade distribution must be approved by the MNDMF Regional Measurement Coordinator
  - Use renewal rate by species grouping for that specific management unit
  - Forestry Futures charges (includes FF & FRI) per cubic metre
  - Add the Harmonized Sales Tax where applicable

Formula format

Value of merchantable standing forest resources = (gross merchantable volume X marketable value) + HST

Example

Gross merchantable volume of spruce is: 358.123 m<sup>3</sup>

Marketable value

- NES stumpage matrix rate for July, 2010	\$ 1.50
- Renewal rate for the M.U.	6.00
- Forestry futures rate (includes forest resource inventory charge)	<u>2.98</u>
Total marketable value per cubic metre	\$10.48

GMV 358.123 X MV \$10.48 =	\$3,753.13
X HST at 13% =	<u>487.91</u>
Total value =	\$4,241.04



## Unmerchantable Young Growth

### Measuring Procedures

- From the cruise data, calculate the average age and the stocking of the unmerchantable trees by species or species group
- Determine the site class of the stand(s)
- From the forest management plan (FMP), in this unit or, if no plan exists, the closest management unit, determine the rotation age for each species or species group
- From the yield curves used (growth models) in the FMP, determine the volume per hectare at rotation age (based on stocking)
- Determine total rotation age volume by multiplying the volume per hectare times the total hectares
- Only gross volumes will be used. Deductions for undersize or defect are not used.

### Calculation of Value

- Future value will be determined using the projected volume per hectare times the number of hectares times the stumpage marketable value
- To determine the stumpage marketable value of the forest resources:  
Use the NES (Not Elsewhere Specified) product sector rate (minimum rate + residual value) for the month the forest resources were measured
  - For white and red pine and graded hardwoods, any grade distribution must be approved by the MNDFM Regional Measurement Coordinator
  - Renewal by species grouping for that specific management unit
  - Forestry futures rate per cubic metre
  - Add the Harmonized Sales Tax

Future Value (FV) = Rotation Age Volume X Stumpage Market Value

$$NPV = FV / (1 + i)^n$$

NPV is - net present value

FV is - future value

i is - interest rate at 4%

<sup>n</sup> is - number of years to maturity (rotation age minus current average age of unmerchantable forest resources)

In the following example the future value of the unmerchantable forest resources was calculated to be \$34,373.00. This forest resource is expected to reach rotation age in 45 years; therefore, the calculation of the net present value is:

$$\begin{aligned} NPV &= 34,373 / (1 + .04)^{45} \\ &= 34,373 / 5.84 \\ &= \$5,885.79 \end{aligned}$$

$$HST = 5,885.79 \times 0.13 = 765.15$$

Value of unmerchantable forest resources (young growth) = NPV + HST = \$6,650.94

Total value for this release = merchantable forest resources value + unmerchantable forest resources (young growth) value = \$4,241.04 + \$6,650.94 = \$10,891.98

Source:

<http://www.mnr.gov.on.ca/stdprodconsume/groups/lr/@mnr/@forests/documents/document/275538.pdf>



**Appendix C. MNDMF Stumpage Matrix Aug 2011**

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**7.0 Ontario Crown Timber Charges (Stumpage)  
Charges Payable To Consolidated Revenue Fund (CRF) CFSA Section 31(1) &  
Forestry Futures Trust (FFT) CFSA Section 51(5)  
2011/2012 Period 5: August 01 - August 31 (\$/m<sup>3</sup>)  
8.0**

Species Group	Pulp	Veneer	Sawmill	Composite	Paper	Fuelwood	Bioproduct	N.E.S.
<b>Spruce / Jack Pine / Scots Pine / Balsam Fir / Larch</b>								
<b>CRF Price - CFSA Section 31(1)</b>								
Minimum Stumpage:	1.62	1.62	1.62	1.62	1.62	1.62	0.00	1.62
Residual Stumpage:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>FFT Charge - CFSA Section 51(5)</b>								
Forest Resource Inventory:	2.50	2.50	2.50	2.50	2.50	2.50	0.59	2.50
Forestry Futures:	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48
<b>Total Crown Charge</b>	<b>4.60</b>	<b>4.60</b>	<b>4.60</b>	<b>4.60</b>	<b>4.60</b>	<b>4.60</b>	<b>1.07</b>	<b>4.60</b>
<b>Poplar</b>								
<b>CRF Price - CFSA Section 31(1)</b>								
Minimum Stumpage:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Residual Stumpage:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>FFT Charge - CFSA Section 51(5)</b>								
Forest Resource Inventory:	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59
Forestry Futures:	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48
<b>Total Crown Charge</b>	<b>1.07</b>	<b>1.07</b>	<b>1.07</b>	<b>1.07</b>	<b>1.07</b>	<b>1.07</b>	<b>1.07</b>	<b>1.07</b>
<b>White Birch</b>								
<b>CRF Price - CFSA Section 31(1)</b>								
Minimum Stumpage:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Residual Stumpage:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>FFT Charge - CFSA Section 51(5)</b>								
Forest Resource Inventory:	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59
Forestry Futures:	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48
<b>Total Crown Charge</b>	<b>1.07</b>	<b>1.07</b>	<b>1.07</b>	<b>1.07</b>	<b>1.07</b>	<b>1.07</b>	<b>1.07</b>	<b>1.07</b>
<b>Hemlock / Cedar</b>								
<b>CRF Price - CFSA Section 31(1)</b>								
Minimum Stumpage:	1.62	1.62	1.62	1.62	1.62	1.62	0.00	1.62
Residual Stumpage:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>FFT Charge - CFSA Section 51(5)</b>								
Forest Resource Inventory:	2.50	2.50	2.50	2.50	2.50	2.50	0.59	2.50
Forestry Futures:	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48
<b>Total Crown Charge</b>	<b>4.60</b>	<b>4.60</b>	<b>4.60</b>	<b>4.60</b>	<b>4.60</b>	<b>4.60</b>	<b>1.07</b>	<b>4.60</b>

**9.0**

**10.0 Ontario Crown Timber Charges (Renewal)  
Crown Charges Payable To Forest Renewal Trust (FRT) CFSA Section 49  
April 01, 2011 - March 31, 2012 (\$/m<sup>3</sup>)  
Northeast Region**

Management Unit	Forest Renewal Charge							
	White & Red Pine	White & Red Pine	Hemlock / Cedar	Spruce / Jack Pine / Scots	Poplar	White Birch	Hardwood Grade 1	Hardwood Grade 2



	Category 1	Category 2		Pine / Balsam Fir / Larch				
921 Abitibi River Forest - Iroquois Falls	4.36	4.36	4.36	3.75	0.36	0.36	8.00	1.50

**11.0**

Source:

<http://www.web2.mnr.gov.on.ca/mnr/forests/businessweb/stumpage/home.htm>

Value by species:

SB, SW,BF,LA = \$4.60+\$3.75 = \$8.35

Ced = \$4.60+\$4.37 = \$8.97

PO = \$1.07+\$0.36 = \$1.43

BW = \$1.07+\$0.36 = \$1.43

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**Appendix D: NPV Matrix Developed by Timmins District MNR**

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Net Present Value Chart  
Romeo Malette Forest Only

Forest Unit:	Pj2	Pj1	SB1	LC1	MW1	MW2	SF1	SP1	PO1	BW1
Rotation Age:	65	65	85	90	65	70	75	75	55	60
Future Value at Rotation age (\$/ha)	1504.82	1849.09	1395.22	890.17	1149.26	611.12	1305.11	1589.22	881.37	533.26

Net Present Value: - \$ per hectare										
Current										
Age (yrs)	Pj2	Pj1	SB1	LC1	MW1	MW2	SF1	SP1	PO1	BW1
85										
75			942.56	601.37						
65			636.76	406.26			881.69	1073.62		
55	1016.60	1249.18	430.17	274.46	776.40	412.85	595.64	725.30		
45	686.78	843.90	290.61	185.41	524.51	278.91	402.39	489.99	595.42	360.25
35	463.96	570.11	196.33	125.26	354.34	188.42	271.84	331.02	402.25	243.37
25	313.44	385.15	132.63	84.62	239.38	127.29	183.65	223.62	271.74	164.41
15	211.75	260.19	89.60	57.17	161.72	85.99	124.06	151.07	183.58	111.07
5	143.05	175.78	60.53	38.62	109.25	58.09	83.81	102.06	124.02	75.04
Average	472.60	580.72	347.40	221.65	360.93	191.93	363.30	442.38	315.40	190.83

eg: A 5 year old black pruce stand is worth \$60.53/ha

Interest Rates Calcs  
NPV = FV/(1+i) to the nth power

			R = 85
		R = 75	
	R = 65		
R = 55	(1+.04) <sup>nth</sup>		1.4802
		1.4802	2.1911
		2.1911	3.2434
		3.2434	4.8010
		4.8010	7.1067
		7.1067	10.5196
		10.5196	15.5716
		15.5716	23.0498

Source: MNR Timmins District

Note:  
Average = average NPV of various age classes while Forest unit is unmerchantable young growth



## **Glossary of Terms**

**AGE CLASS** - One of several intervals/groupings into which the age range of forest stands is divided for classification and use. (ie. 1-20, 21-40).

**CONIFER(OUS)** -- Trees and shrubs usually evergreen with cones and needleshaped leaves.

**CROWN LAND** - Land vested in Her Majesty in right of Ontario. (FMPM)

**CROWN FOREST SUSTAINABILITY ACT, 1994** – A piece of legislation that provides for the sustainability of Crown forests and, in accordance with that objective, allows for the management of Ontario’s Crown forests to meet social, economic and environmental needs for present and future generations.

**ECOSITE** - An ecological landscape unit (ranging in resolution from thousands to hundreds of hectares) comprised of relatively uniform geology, parent materials, soils, topography, and hydrology, occupied by a consistent complex of successional-related vegetation conditions.

**FOREST MANAGEMENT PLAN** - A forest management plan contains pertinent information and prescriptions by means of which company forest policy, aims and objectives are translated into a continuous sequence of specific treatments on a forest management unit for a specified period of years. In this case the forest management plan is modelled after Crown forest management plans and utilize the regulated Crown Forest Management Planning Manual (2001).

**FOREST STAND(S)** - An aggregation of trees occupying a specific area and uniform enough in composition (species), age and arrangement to be distinguishable from an adjacent aggregation of trees.

**FOREST UNIT** – An aggregation of forest stands of similar characteristics (age, tree species) growing on a similar ecosite.

**FRI** – Forest Resource Inventory – A composite information product which is assembled from a collection of individual geographic information coverages that contain descriptive information about the timber resource on each management unit (e.g. stand age, stand height, species composition, stocking level). The forest resources inventory for a management unit divides the area into a number of components, such as water, non-forested, non-productive forest and productive forest, and further classifies each component by ownership/land use categories.

**HARDWOOD** - Trees that have broad leaves, in contrast to the needle-bearing conifers. Also, the wood produced by broad leaved trees, regardless of texture or density. (FMPM)

**LOG** – Refers to a 16 ft sawlog used to produce dimensional lumber.

**MERCHANTABLE VOLUME** - A descriptor for a tree or forest stand that has attained sufficient size, quality, and/or volume to be suitable for harvest.





**MIXEDWOOD(S)** – Is described as MW - A forest type in which 26-75% of the canopy is softwood. (FMPPM 1996)

**NON-MERCHANTABLE** – A descriptor for a tree or forest stand that has yet to attain sufficient size, quality, and/or volume to be suitable for harvest.

**PATENT LAND** - Land transferred from Her Majesty the Queen in the Right of Ontario to an individual, company or corporation in perpetuity.

**PRODUCTION FOREST** - Is described as productive forest land, at various stages of growth, with no obvious physical limitations on the ability to practice forest management. (*after EA Decision*)

**PRODUCTIVE FOREST** - All forest areas which are capable of growing commercial trees, irrespective of planning decisions, and which is further sub-divided into “protection forest” and “production forest”. (*after EA Decision*)

**PROTECTION FOREST** - Productive forest land on which forest management activities cannot normally be practiced without incurring deleterious environmental effects because of obvious physical limitations such as steep slopes and shallow soils over bedrock. (FMPPM *after EA Decision*)

**REGISTERED PROFESSIONAL FORESTER (R.P.F.)** - A qualified person registered with Ontario Professional Foresters Association under the Statutes of Ontario Professional Foresters Act, 2000

**RENEWAL** - The silvicultural operations undertaken to stimulate and promote the establishment and growth of desired future forest stands, which may include the activities of site preparation and regeneration. (FMPPM)

**SCALING MANUAL** - A manual prepared under section 68 of the *Crown Forest Sustainability Act* and approved by the regulations, including amendments to the Manual approved by the regulations. (CFSA)

**SILVICULTURE** - Generally, the science and art of cultivating forest crops, based on a knowledge of silvics (URN 5384). More particularly, the theory and practice of controlling the establishment composition, constitution, and growth of forests (URN 5385).

**STUMPAGE MATRIX** – Representation of the charges for harvesting Crown timber in Ontario by end use separated by the Consolidated Revenue charge, Forestry Futures Trust charge and the Crown charge. The matrix is calculated on a monthly basis.

**SUSTAINABLE FOREST LICENCE** - A renewable licence to harvest Crown forest resources in a management unit that requires the licensee to carry out renewal and maintenance activities necessary



o provide for the sustainability of the Crown forest in the area covered by the licence. This type of licence may be granted for a term of up to 20 years. (CFSA Part III)

**SUSTAINABLE FOREST MANAGEMENT** – The province of Ontario defines it as the management of forest ecosystems to maintain a healthy forest ecosystem which provides a continuous, predictable flow of benefits. Indicators of forest sustainability criteria are incorporated into strategic decision-making and into the periodic assessments of both forest and socioeconomic conditions. Forest operations are conducted in a manner that conserves forest health and minimizes undesirable effects on the physical and social environments. (FMPM)

**VOLUME** - The amount of wood in a tree, forest stand, or other specified area, recorded by unit of measure. (FMPM)

**GROSS MERCHANTABLE VOLUME** - Volume of the main stem, excluding stump and top but including defective and decayed wood, of trees or stands. (FMPM 1996)

**NET MERCHANTABLE VOLUME** - Volume of the main stem, excluding stump and top as well as defective and decayed wood, of trees or stands. (FMPM 1996)

**YIELD** - The actual or estimated amount of product from a tree or a forest stand, or other specified area. (FMPM)

*Note: Most of these definitions are borrowed from the Province of Ontario's Forest Management Planning Manual (FMPM) Glossary of Terms, Ministry of Northern Development, Mines and Forestry website, and the Province of Ontario's Forest Information Manual (FIM) Glossary of Terms.*

