

Forest Resource Improvement Association of Alberta

Forest Resource Improvement Program

Measurement and Maintenance of Historic Research Trials

Proposal Prepared by:

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Submitted by:

Foothills Growth and Yield Association

Foothills Model Forest
P.O. Box 6330
Hinton, Alberta
T7V 1X6

March, 2003

Proposal Summary

Applicant

Name: Foothills Model Forest
Mailing Address: Box 6330, Hinton, Alberta, T7V 1X6
Delivery Address: Environmental Training Centre, Hinton, Alberta
Contact Person: Dick Dempster, telephone / fax: 780 424 5980

Sponsors

<i>Company</i>	<i>Contact Person</i>	<i>Telephone</i>
Alberta Newsprint Company	J. McCammon	(780) 778 7000
Blue Ridge Lumber	M. Summers	(780) 648 6325
Canfor	D. Weeks	(780) 538 7745
Millar Western Forest Products	J. Russell	(780) 778 2221
Spray Lakes Sawmills	G. Lehn	(403) 932 2234
Sundance Forest Industries	J. Huey	(780) 723 3977
Sunpine Forest Products	K. Branter	(403) 638 4482
Weldwood of Canada	H. Lougheed	(780) 865 8191
Weyerhaeuser Canada	H. Chojnacki	(780) 539 8167

Project Information

Type: Inventory / Planning

Term: April 1, 2003 – June 30, 2007

Amount of funds: \$ FRIP funds to Applicant
\$ external funds to Applicant

Attachments

1. Proposal
2. Project Schedules
3. Appendices
 - Letter of Agreement
 - Authorization of funds by sponsors for 2003

Acknowledgement by Applicant

The Applicant (jointly with the Sponsors and severally the "Signatory") acknowledges having read and agreed to the terms and conditions described on the attached schedule to which the Application under the Program is made subject. The Applicant acknowledges and agrees that by its submission of this application it shall be bound by the terms of the Program, FRIAA's policies, procedures, protocols and guidelines. It is also acknowledged and agreed that this application may be accepted by FRIAA on further terms or conditions, which shall be binding on the Signatory once the proposed project is undertaken by the Signatory.

Applicant: _____

1. Proposal

1.1. Background

The Northern Forestry Centre, Northwest Region, Canadian Forest Service (NoFC) has been instrumental since 1938 in the establishment and analysis of research trials evaluating the growth response of lodgepole pine to thinning and fertilization in western Alberta. In August 2001, representatives of the NoFC, the Land and Forest Division, Alberta Sustainable Resource Development (LFD), and the Foothills Growth and Yield Association (FGYA) toured these historic NoFC lodgepole pine trials. They concluded that links should be forged to ensure the ongoing protection, measurement and interpretation of these trials.

Subsequently, the 3 agencies signed a Letter of Agreement, effective July 1, 2002 (see Appendix 1). The purpose of the agreement between the 3 parties is to facilitate the collaborative arrangements necessary to provide forest managers in Alberta with the full and continued benefit of relevant long-term field trials assessing responses of lodgepole pine to nutrition and density management.

Consistent with the Letter of Agreement, the FGYA wishes to undertake field re-measurements of the NoFC trials, and contribute to the protection, signage and maintenance of the trials

1.2. Purpose

The purpose of the cooperative arrangement between the CFS, LFD and FGYA is to ensure:

1. Maintenance and protection the identified trials. This includes:
 - Demarcation and signage of trials for protection and demonstration purposes;
 - Provision and maintenance of appropriate land reservation status;
 - Communication of the protection status and its purpose to land managers, and creating awareness of status to land users.
2. Synthesis of results to date. The synthesis will involve analysis and presentation of trial results, interpretation of implication of results for forest managers, and publication of results and interpretations.
3. Ongoing measurement and analysis, involving:
 - Scheduled re-measurement on prioritized basis;
 - Timely compilation, analysis, and distribution of results;
 - Periodic update of the synthesis described under (2) above.

The specific objectives that will be met by the FGYA and sponsored by its members under this Project proposal are:

- Demarcation and signage of the trials for protection and demonstration purposes;
- Field re-measurement of the trials, based on a schedule mutually agreed and prioritized by the NoFC, LFD, and FGYA.

1.3. Methods and Deliverables

The trials that will be maintained, and considered for re-measurement, are listed in Table 1. All except Ricinus have been scheduled for re-measurement during the next 4 years.

Table 1
Lodgepole Pine Field Trials

<i>Owner/ #</i>	<i>Title / Location</i>	<i>Established</i>	<i>Publication</i>
NoFC / A34	Lodgepole pine pre-commercial thinning, Mackay	1954	W.D. Johnstone, 1981, NOR-X-237
NoFC / A100	Spacing trials – 7 year old fire origin stand of lodgepole pine, Gregg River	1963/64	W.D. Johnstone, 1981, NOR-X-236 R.C. Yang, 1991, NOR-X-322
NoFC / NOR-402	Spacing trials – 28 year old fire origin stand of lodgepole pine, Gregg River	1984	Kolabinski and Lux, unpublished establishment report
NoFC / NOR-405	Thinning and fertilization of 40-year-old semi-mature lodgepole pine, McCardle Creek	1984-85	R.C. Yang, 1998, Can J For Res 28
NoFC	Early development of lodgepole pine after three different mechanical thinning treatments, Swan Lake	1977	I. Bella, 1990, For Chron
NoFC	Ricinus thinning	1975	
NoFC	Fertilizing after thinning 70-year-old lodgepole pine, Clearwater	1968	I. Bella, 1978, Bi-monthly Research Note 34
NoFC / NOR-008	Juvenile spacing of 25-year-old lodgepole pine, Teepee Pole Creek	1967	W.D. Johnstone, 1981, NOR-X-244 R.C. Yang, 1986, Forest Management Note
NoFC	Strip thinning of lodgepole pine, Teepee Pole Creek	1966	
NoFC / K-57	Development of a 77-year-old lodgepole pine stand following heavy thinning, Kananaskis	1941	J. Quaite, 1950, Silviculture Leaflet #47
NoFC / K-3	Various thinnings based on European practices, Kananaskis	1938-39	Smithers, 1961, Dept. For. Bulletin # 127
NoFC / K-58	Economic possibilities of commercial thinning in an 88-year-old lodgepole pine, Kananaskis	1950	D.I. Crossley and R.S. Jewesson, 1952 (unpublished)
NoFC	Commercial thinning in 85-year-old lodgepole pine, Strachan	1952	

The following tasks will be undertaken at each re-measurement:

- Update / provide location information and access notes, including geographical positioning and mapping of plot boundaries.
- Repair or replace failing plot demarcation.
- Fabrication and installation of signage to facilitate self-guided study.
- Ecological assessment of each treatment plot (to the plant community level).

- Mensuration: including tree measurements of diameter breast-height, height, height to live crown, crown radius, crown class, and condition.

The FGYA will deliver:

- Maintained, demarcated and signed trials;
- Data in a database format acceptable to the NoFC.

The NoFC will analyze the data and synthesize it into scientific papers and interpretive reports.

1.4. Rationale

This Section further describes how the Project fulfils the key proposal evaluation criteria of FRIAA.

1.4.1. Application of Results

The Project will enhance the management of forest resources by providing a continually improved, scientific, quantitative, and credible basis for:

- Evaluating and selecting silvicultural regimes for the enhanced management of lodgepole pine;
- Forecasting the sustainable supply of timber from forest tenures containing lodgepole pine, and validating estimates of allowable cut;
- Improving the sustained yield of these forests through enhanced forest management.

The results will be applicable to the natural range of lodgepole pine in Alberta. This includes over two million hectares of tenured and operable pine stands with a current allowable cut of about 5 million cubic metres per year, within the forest tenures of the 9 member companies of the Association. Information from this Project will be used to assess, develop, and approve strategies for enhanced and sustainable forest management.

The Project will improve the integrated and sustainable management of forest ecosystems through:

- improved assessment of ecosystem productive capacity;
- improved assessment of the sustainable use levels of a biological resource;
- promotion of cooperation, partnership, and shared responsibility among forest managers and researchers;
- increased levels of knowledge and awareness of sustainable forest management;
- continual improvement of sustainable forest management practices;
- stand-level data providing the basis for assessing impacts of enhanced forest management practices on biological diversity, natural ecosystem processes, and contributions to global ecological cycles.

1.4.2. Relationship to Existing Responsibilities

The work proposed pertains to the voluntary enhancement of forest management information and practices, and is not the responsibility of the industrial sponsors under any legislation, regulation,

tenure, policy or specific agreement. The Project will assist the Government of Alberta in meeting its responsibilities for sustainable resource management, by providing improved assessment of forest growth and yield through the development of scientifically rigorous data and third-party evaluations. The work supports one of the major Science and Technology priorities of the Canadian Forest Service, namely to evaluate and enhance Canada's ability to practise sustainable forest management and to develop techniques to enhance timber production.

1.4.3. Impacts

The Project is not anticipated to have any adverse impacts on any other forest resource values or users. It has the active support of the land management agency involved (Alberta Sustainable Resource Development, Land and Forest Division), the Canadian Forest Service, and the Foothills Model Forest.

1.4.4. Standards

Standards of experimentation and measurement will meet those accepted by the scientific community for biometric research. This is being achieved by participation of experts from the NoFC and LFD in project planning and quality control.

1.4.5. Fair Market Value

Work will be undertaken using contractors retained by the Foothills Model Forest following a competitive bidding process.

1.5. *Project Management and Responsibilities*

The work will be administered by the Foothills Model Forest on behalf of the FGYA, under the Direction of Dr. W.R. (Dick) Dempster (Director, FGYA) and with field management by Mr. Rand McPherson (Field Coordinator, FGYA). The related involvement and responsibilities of the NoFC and LFD is specified in the appended Letter of Agreement.

2. Project Schedules

2.1. Work and Reporting Schedule

Table 2 identifies the trials to be re-measured during the 2003 field season. The remaining trials have not been definitively ordered by year. The scheduling of these subsequent re-measurements by year will be subject to ongoing review of priorities by the NoFC, and approval each year by the FGYA Steering Committee. The work to be undertaken each year will be included in an annual work plan approved by the Steering Committee by April 1 each year. Provision has been made in the 2003 budget to include repair and replacement for some of the trials scheduled for later measurement.

Table 2
Trial Re-measurement Schedule

Trial	2003	2004-06
MacKay thinning (A34)	X	
Swan Lake thinning	X	
Teepee Pole Creek spacing (NOR-008)	X	
Gregg spacing 1963 (A-100)		X
McCardle fertilization & thinning		X
Kananaskis heavy thinning (K-57)		X
Gregg spacing 1984 (NOR-4-02)		X
Clearwater fertilization & thinning		X
Strachan thinning		X
Teepee Pole Creek strip thinning		X
Kananaskis European thinning (K-3)		X
Kananaskis economic thinning (K-58)		X

The FGYA will report to FRIAA and sponsors by December 31 each year, on work completed and delivered relative to that scheduled in the annual work plan.

2.2. Budget and Payment Schedules

Table 3 identifies the estimated Project budget by year and trial. The actual amounts may vary, because the work will be awarded to contractors on the basis of competitive bidding. Initial authorization is being sought only for the 2003 expenditures. Subsequent expenditures will be subject to revision of this proposal, and approval of the FGYA Steering Committee. Members of the Association have agreed on a formula and schedule for allocating costs among members. The allocation of costs authorized for 2003 is shown in Appendix 2.

FRIAA and the sponsors will be requested to advance to the Foothills Model Forest 90% of the funds for each year, following approval of the FGYA annual work plan and selection of a contractor or contractors. The outstanding amount will be claimed on completion and verification of the annual fieldwork program by December 31 of each year.

Table 3
Project Budget

Trial	2003	2004-06	Total
MacKay thinning (A34)	28,000		28,000
Swan Lake thinning	4,000		4,000
Teepee Pole Creek spacing (NOR-008)	37,000		37,000
Gregg spacing 1963 (A-100)		23,000	23,000
McCardle fertilization & thinning		18,000	18,000
Kananaskis heavy thinning (K-57)		5,000	5,000
Gregg spacing 1984 (NOR-4-02)		16,000	16,000
Clearwater fertilization & thinning		11,000	11,000
Strachan thinning		4,000	4,000
Teepee Pole Creek strip thinning		15,000	15,000
Kananaskis European thinning (K-3)		9,000	9,000
Kananaskis economic thinning (K-58)		2,000	2,000
Contingency		10,300	10,300
Total	69,000	113,300	182,300

3. APPENDICES

APPENDIX 1

LETTER OF AGREEMENT

between

Northern Forestry Centre, Northwest Region, Canadian Forest Service (NoFC),

Land and Forest Division, Alberta Sustainable Resource Development (LFD),

and

Foothills Growth and Yield Association (FGYA)

for

Cooperative Management of Historic Lodgepole Pine Research Trials

1. Preamble

The NoFC has been instrumental since 1938 in the establishment and analysis of research trials evaluating the growth response of lodgepole pine to thinning and fertilization in western Alberta. Continuation of this research supports one of the major Science and Technology priorities of the Canadian Forest Service, namely to evaluate and enhance Canada's ability to practise sustainable forest management and to develop techniques to enhance timber production.

LFD is committed to ensuring the sustainable contribution of benefits to Albertans from Alberta's forests. It has since 1960 maintained a system of permanent sample plots in lodgepole pine stands in the Foothills, Sub-Alpine and Montane natural sub-regions. In 1980 it established a trial near Edson, Alberta, to evaluate the effects and interactions of thinning and fertilization on lodgepole pine growth.

The FGYA is a consortium of 9 companies holding major forest tenures in western Alberta, administered by the Foothills Model Forest. The mandate of the Association is to continually improve the assessment of lodgepole pine growth and yield in managed stands by forecasting and monitoring responses to silvicultural treatments, facilitating the scientific development and validation of yield forecasts, and promoting knowledge, shared responsibility and cost-effective cooperation.

In August 2001, representatives of the above-mentioned organizations toured the historic NoFC lodgepole pine trials. They concluded that links should be forged to ensure the ongoing protection, measurement and interpretation of these trials.

2. Purpose

The purpose of this Letter of Agreement is to facilitate the collaborative arrangements necessary to provide forest managers in Alberta with the full and continued benefit of relevant long-term field trials established to assess the responses of lodgepole pine to nutrition and density management.

Table 1 lists currently identified relevant trials. Installations may be added or deleted from the list by the mutual agreement of all parties. The scope of cooperative efforts will initially be limited to lodgepole pine and species growing in association with pine on the listed research trials. This does not preclude the identification of other opportunities for cooperation, and extension of joint efforts to other species and trials upon the mutual agreement of the parties.

Specific objectives of cooperation are:

4. Maintain and protect the identified trials. This includes:
 - Ensuring trials are clearly demarcated and signed for protection and demonstration purposes;
 - Provision and maintenance of appropriate land reservation status;
 - Communication of the protection status and its purpose to land managers, and creating awareness of status to land users.
5. Synthesis of results to date. The synthesis will involve:
 - Standardized analysis and presentation of trial results. The intent here is to ensure that results of the various trials are comparable, comprehensible, and useful to forest managers. Examples are: the use of common and ecologically-referenced taper equations and site index equations; reporting of merchantable volume using applicable utilization standards; referencing of sites to the provincial ecological classification; standardized thematic presentation of results on stand density management diagrams or other frameworks facilitating comparison and management interpretation.
 - Interpretation of implication of results for forest managers. This component is crucial given the interests and priorities of the FGYA membership and LFD, and the science and technology objectives of the NoFC.
 - Publication of results and interpretations. The intent is have a scientific paper and interpretive report completed within one year of signing this Agreement.
6. Ongoing measurement and analysis, involving:
 - Scheduled re-measurement on prioritized basis;
 - Timely compilation, analysis, and distribution of results;
 - Periodic update of the synthesis described under (2) above.

3. Data Access and Use

Data will remain the property of the trial owner (see Table 1).

Data will be shared among the three agencies for the purposes of:

- Cooperative syntheses of results as provided for in this Proposal, including scientific analysis and expert interpretations of the data for the benefit of forest managers;
- Assessment and validation of growth and yield assumptions and models;
- Singularly or jointly publishing the results of research and other knowledge accrued, in a manner that recognizes and gives credit to the parties of this agreement.

The data and results obtained will not be published, in whole, in part, or in summary form in any public document without the written consent and acknowledgement of the owner that the data has been fairly and accurately used and represented. This consent will not be unreasonably withheld.

Data will not be released to third parties, including individual members of the FGYA, without the agreement of the owner. Distribution of data to third parties, at the discretion of the owner, will be carried out under a separate data-sharing agreement between the data owner and the party requesting the data.

Syntheses of results will be published, following review by representatives of the NoFC, LFD and FGYA. Periodic updates on work progress will be distributed among the three organizations.

Table 1
Lodgepole Pine Field Trials

<i>Owner/ #</i>	<i>Title / Location</i>	<i>Established</i>	<i>Publication</i>
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NoFC / K-58	Economic possibilities of commercial thinning in an 88-year-old lodgepole pine, Kananaskis	1950	D.I. Crossley and R.S. Jewesson, 1952 (unpublished)
NoFC	Commercial thinning in 85-year-old lodgepole pine, Strachan	1952	
LFD	Fertilization and thinning of 26-year-old lodgepole pine, Edson	1980	S.K. Takyi, 1984 (internal Alberta Forest Service report)
LFD / NoFC	Lodgepole pine PSPs, Foothills and Subalpine subregions	various	
FGYA	Regenerated lodgepole pine study	2000	

4. Anticipated Activities and Required Level of Effort

Activities and the anticipated required level of effort are outlined below under three task groupings:

1. Maintenance and protection of the field installations;
2. Synthesis of results to date;
3. Ongoing measurement and analysis.

Estimates of required effort or cost contained in this letter represent the mutual expectation and understanding of the three parties at the time of signing, and are intended solely to provide a common basis for cooperative planning. Nothing in this Letter shall be construed as obligating the parties to expend money, or as involving any party in any contract or other obligation for the future payment of money, in excess of any funds that may be mutually agreed to for joint undertakings.

Table 2 summarizes the activities and effort required for Task 1. The participation of all three parties is important for successful maintenance and protection of the trials. The role of LFD, as the land management authority, is crucial. A shared protocol will be developed whereby the trials are profiled in a publicly accessible web site, LFD field staff are well informed and actively involved in protection, and all three parties respond quickly and effectively to inquiries, encroachment risks, and trespass.

Table 2
Task 1: Maintenance and protection

Activity	Required Level of Effort
<ul style="list-style-type: none">• Markers and signage• Registration, maintenance and update• Notification and communications• Response and enforcement	The listed activities are, in total, expected to require approximately 30 person days per year. Maintenance of markers and signage can be incorporated with measurement field visits.

Table 3 summarizes the activities and effort required for Task 2. The significant amount of analytical and compilation support is justified because the data is of variable format, having been collected over a long period of time by different researchers.

Table 3
Task 2: Synthesis

Activities	Approximate Level of Effort required
Data compilation, analysis, management interpretations, report preparation, publication and editorial support	<ul style="list-style-type: none">• 100 days senior analysts (2)• 200 days assistant analyst and compilation support• 40 days forest management expert(s)• \$30,000 publication costs

Tables 4 and 5 schedule and summarize the activities required under Task 3. Table 4 contains an indication of person-days required to re-measure trials during the five-year period commencing

April 1, 2002. Trials and measurements have been tentatively grouped into two categories: *highly important* and *moderately important*. Measurements in the *highly important* category represent the recommended minimum level of effort. Those in the *moderately important* category will be undertaken subject to available resources and further review of their priority. The categories will be reviewed and may be adjusted following the initial synthesis of available data.

In Task 3, data collection will follow formats and quality control standards agreed to by all three parties.

Table 4
Task 3: Fieldwork (estimate of required person days)

Site	Total 2002-2006
McCardle fertilization & thinning	36
MacKay thinning (A34)	56
Swan Lake thinning	8
Teepee Pole Creek spacing (NOR-008)	74
Kananaskis heavy thinning (K-57)	10
Edson fertilization and thinning (Takyi)	75
<i>Sub-total: highly important</i>	259
Gregg spacing 1963 (A-100)	46
MacKay thinning (A34)	56
Teepee Pole Creek spacing (NOR-008)	74
Gregg spacing 1984 (NOR-4-02)	32
Clearwater fertilization & thinning	22
Strachan thinning	8
Teepee Pole Creek strip thinning	30
Kananaskis European thinning (K-3)	18
Kananaskis economic thinning (K-58)	4
<i>Sub-total: moderately important</i>	290
Total: all trials and measurements	549

Table 5
Task 3: Ongoing measurement and analysis

Activity	Approximate Level of Effort Required
Fieldwork (see Table 4)	<ul style="list-style-type: none"> • 259 person days minimum (includes only those trials and measurements rated as highly important) • 549 person days total (includes all trials and measurements rated as highly or moderately important)
Data verification, storage, compilation (assistant analyst)	<ul style="list-style-type: none"> • 20 days per year average, excluding 2002 which is covered by assistant analyst under Task 2 • 80 days total 2003 - 2006
Analysis (senior analyst)	<ul style="list-style-type: none"> • 10 days per year senior analyst 2003 – 2005 • 60 days senior analyst 2006 (synthesis update)

Table 6 shows the estimated total personnel requirement for the five-year period (2002 – 2006), summarized from Tables 2 through 5, plus indicative financial costs. A project management allowance of 100 days (approximately 10% of personnel inputs) has been added for technical direction, field coordination, and quality control. Financial costs for protection and maintenance are excluded, on the assumption that the activity will be absorbed under existing budgets of the three parties.

Table 6
Summary of personnel requirements and indicative costs

Item	Person days
Senior analysts	220
Assistant analyst	200
Field measurement services	259 - 549
Data compilation services	80
Forest management expert(s)	40
Publication	-
Protection and maintenance	150
Project management & QC	150
Total	1053 - 1343

5. Roles, Responsibilities and Contributions

This Letter does not obligate the parties to expend money, or involve any party in any contract or other obligation for the future payment of money. Nevertheless, it is the intent of the parties to contribute to the cooperative effort, to the best of their respective abilities, as follows:

1. The FGYA will undertake field re-measurement of NoFC trials, based on a mutually agreed and prioritized schedule, as well as re-measurement of its own trials.
2. The NoFC will allocate senior analysts to analyze and synthesize existing and new data into scientific papers and interpretive reports.
3. The LFD will provide financial support for cleaning and compiling existing data, in-house support for analysis and interpretation of results, and will undertake periodic re-measurements of its own trials and permanent sample plots.
4. All parties will contribute to protection and maintenance of installations, project management, quality control, interpretation of results to forest management, and dissemination of information and results.

6. Administration

1. This Letter of Agreement will be administered jointly by designated representatives from each of NoFC, LFD, and FGYA, and other members from each of the parties, as each party deems appropriate. The representatives will be:
 - for NoFC: Program Director, Forest Resources;
 - for LFD: Executive Director, Forest Management Branch;
 - for FGYA: Chairman of the Steering Committee.
2. These representatives will each name their representatives with regard to the day-to-day or periodic implementation of this Letter.

3. These representatives will have the power to add other members or observers as they judge desirable, by unanimous consent of the other parties to this Agreement.
4. The representatives or their designates will meet at least annually to review the activities covered by this agreement and their costs, assess progress toward the objectives, and discuss the direction and extent of subsequent work.

7. General

1. Any notice which is given to the party pursuant to this Letter may be given personally or sent by mail or facsimile to:
 - For NoFC: Program Director, Forest Resources, Canadian Forestry Service, Northern Forestry Centre, 5320 122 Street, Edmonton, Alberta T6H 3S5.
 - For LFD: Executive Director, Forest Management Branch, Alberta Sustainable Resource Development, 9th Floor 9920-108 Street, Edmonton, Alberta T5K 2M4.
 - For FGYA: Chairman, FGYA Steering Committee, Foothills Model Forest, Environmental Training Centre, P.O. Box 6330, Hinton, Alberta, T7V 1X6.
2. Any of the three parties may terminate this agreement by giving the other parties six months notice in writing.
3. This letter may be amended by the written agreement of the parties.
4. Nothing in this letter in any way affects the rights of any of the three parties to make other arrangements on the same subject matter with other parties.
5. The Letter of Agreement shall take affect on April 1, 2002 and shall terminate on March 31, 2007 unless terminated earlier in accordance with Clause 7.2.

Witness

A.B. Case
Director General
Northern Forestry Centre

Witness

D.A. Sklar
Executive Director
Forest Management Branch

Witness

H. Lougheed
Chairman
Foothills Growth and Yield Association

APPENDIX 2

Measurement and Maintenance of Historical Research Trials Authorization of Funds by Sponsors for 2003

Company	Amount approved		Name	Signature
	FRIP	Other		
Alberta Newsprint Company				
Blue Ridge Lumber				
Canfor				
Millar Western Forest Products				
Spray Lakes Sawmills				
Sundance Forest Industries				
Sunpine Forest Products				
Weldwood of Canada				
Weyerhaeuser Canada				
Total				