

**Audit of Road and Timber  
Harvesting Practices**

**Finlay Forest Industries Inc.  
Forest Licence A15385**



February 1997

FPB/ARC/01

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## A. Report from the Board

One of the principal roles of the Forest Practices Board is to conduct periodic, independent audits of forest practices in British Columbia and provide the findings of those audits to the public and three ministers. The *Forest Practices Code of British Columbia Act* requires the Board to undertake two types of audits:

- audits of compliance with the forest practices requirements of the Code - referred to as forest practices audits; and
- audits of the appropriateness of government enforcement of the Code - referred to as enforcement audits.

Independent auditing and reporting of forest practices is a relatively new undertaking and has attracted considerable attention from government, agreement holders, environmental groups, forest worker organizations, and the public. Few jurisdictions in the world provide for a similar independent authority to undertake audits of compliance with forest practices legislation.

The uniqueness of the responsibility and the requirement to report findings publicly has necessitated the development of a structured set of standards and procedures, as set out in the Board's audit reference manual. These were developed by the Board in 1995 and 1996 and field tested in the first half of 1996.

In the fall of 1996, the Board conducted four limited scope<sup>1</sup> compliance audits: two of roading and harvesting practices, one of silvicultural activities, and one of operational planning.

This report presents the findings of one of those - an audit of the timber harvesting and road construction, maintenance, and deactivation practices on Forest Licence A15385 held by Finlay Forest Industries Inc. The document containing this report is in three parts:

- Part A – this report from the Board;
- Part B – a description of the process used by the Board to audit compliance with the Forest Practices Code; and
- Part C – a report from the auditor.

The licence, located in the Mackenzie Forest District in north-eastern British Columbia, was selected randomly, and not on the basis of location or level of performance. The total area of the licence is about 1.8 million hectares spread out over 6.1 million hectares in the Mackenzie Timber Supply Area.

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<sup>1</sup> The Board decided that by having each of these initial audits focus on certain areas of forestry practices only, it would allow easier implementation of its audit program.

The audit was conducted in September 1996. The objective of the audit was to determine if timber harvesting and road construction, maintenance, and deactivation practices carried out in the licence area from January 1, 1996, to September 15, 1996, complied with the requirements of the Forest Practices Code, including the transitional provisions.

The Board recognizes that the practices were carried out during a period of transition to full Code compliance, during which there was uncertainty about interpretation of some Code requirements. This audit examined whether practices in the field complied with approved operational plans, and therefore complied with the requirements of the Code.

The audit work included both intensive ground-based examination and assessments from the air using helicopters, of selected roads and cutblocks in the licence area. The ground-based audit examined the following in detail:

- timber harvesting practices in 25 cutblocks;
- road construction practices on selected sections of 9 new roads;
- road maintenance practices on 13 randomly selected road sections totaling 110.2 kilometres; and
- road deactivation practices on 17 roads within cutblocks.

Assessments from the air by helicopter included:

- timber harvesting practices in 59 cutblocks;
- the full length of 9 new roads, totaling 73.5 kilometres;
- an undetermined length of road for road maintenance activities; and
- all 49 roads deactivated within cutblocks.

The Board's audit reference manual, "Reference Manual - Compliance Audits, Version 1, September, 1996," sets out the standards and procedures that were used to select and audit practices in the field. Part B of this document describes the direction provided to auditors about assessing compliance with the Code.

As required by Section 182 of the *Forest Practices Code of British Columbia Act*, the Board provided a draft copy of this report from the Board to Finlay Forest Industries Inc. and invited the company to make representations to the Board.

## Conclusions

The Board has reviewed the report from the auditor and considered the representations made by Finlay Forest Industries Inc. The Board has concluded as follows:

1. The Board accepts the opinion of the auditor that, with the exception of the situations of significant non-compliance<sup>2</sup> detailed below, Finlay Forest Industries Inc. was, in all other significant respects, in compliance with the Code's timber harvesting and road construction, maintenance, and deactivation requirements.
2. The situations of significant non-compliance identified in the report from the auditor were confined to the following:
  - a) Two S-6 streams (non-fish-bearing, less than or equal to 3 metres in width) were not accurately depicted on maps, and consequently, culverts were not installed on two crossings on roads constructed during the winter. This resulted in one situation where sediment entered an S-2 stream (fish-bearing, greater than 5 metres and up to 20 metres in width) and another where sediment entered an S-5 stream (non-fish-bearing, greater than 3 metres in width). See page C-3 of this document.
  - b) The maintenance of some inactive and 1996 roads constructed in the winter was inadequate, which could result in harm to the environment. See page C-4.
  - c) A blocked culvert resulted in the erosion of sediment that was subsequently deposited into a fisheries sensitive zone, a back channel of Mugaha Creek, an S-2 stream (fish-bearing, greater than 5 metres and up to 20 metres in width). See page C-5. According to Finlay Forest Industries Inc., this event occurred despite the company's active monitoring of a potential problem they had identified. They advised that prompt action was taken after the event occurred.
  - d) Harvesting practices required by approved plans for the protection of non-fish-bearing streams and unclassified watercourses were frequently not implemented in the field. See page C-5. If these practices were to continue in future operations, there is a high risk that harm to the environment could occur.

Finlay Forest Industries Inc. has advised the Board that they developed standard operating procedures for road construction and harvesting in August 1996, and have instituted strategies and training programs to minimize risk to the environment relative to:

- the maintenance of inactive and 1996 roads constructed in the winter; and
- the identification and protection of non-fish-bearing streams.

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<sup>2</sup> The concept of significant non-compliance is described in Part B of this document "Forest Practices Board compliance audit process" and set out in the Board's audit reference manual "Reference Manual - Compliance Audits, Version 1, September, 1996."

## Recommendations

In accordance with Section 185 of the *Forest Practices Code of British Columbia Act*, the Board recommends that:

1. Finlay Forest Industries Inc. continue to take action to address all of the significant non-compliance findings described in the Board's conclusions.
2. The Ministry of Forests and the Ministry of Environment, Lands and Parks review the significant non-compliance events described in the Board's conclusions under points 2 a) and 2 c) and decide if any further actions are necessary.
3. Finlay Forest Industries Inc., in conjunction with the Ministry of Forests, review plans to address the Board's conclusion under point 2 b).

In accordance with Section 186 of the *Forest Practices Code of British Columbia Act*, the Board requests that Finlay Forest Industries Inc., the Ministry of Forests, and the Ministry of Environment, Lands and Parks advise the Board by April 30, 1997, of the actions taken, or proposed, to address its recommendations above.

We would like to thank the individual auditors for their work in the field and in preparing this report. We also appreciate the cooperation shown to the auditors by the staff of Finlay Forest Industries Inc.



Keith Moore  
Chair

February 14, 1997

## **B. Forest Practices Board compliance audit process**

### **Audit standards and criteria**

Audits by the Forest Practices Board are conducted in accordance with the auditing standards developed by the Board. These standards are consistent with generally accepted auditing standards.

The audits determine compliance with the Code based on audit criteria derived from the *Forest Practices Code of British Columbia Act* and the related regulations. The audit criteria were established for the evaluation or measurement of each practice required by the Code. These reflect judgments about the level of performance that constitutes compliance with each requirement.

The Board's audit reference manual, "Reference Manual - Compliance Audits, Version 1, September, 1996," sets out the standards and procedures for its compliance audits.

### **Audit methodology**

At the outset of an audit, an analysis of each forestry activity, such as the cutting and removal of trees from a specified forested area (harvesting of a cutblock), is used to identify the items, e.g., those cutblocks harvested or roads constructed, that comprise the activity during the period subject to audit. The items comprising each forest activity are referred to as a "population."

The most efficient means of obtaining information, to conclude whether there is compliance with the Code, are chosen for each population. Because of limited resources, sampling is usually relied upon to obtain audit evidence, rather than inspecting all activities.

As individual sites and forest practices within each population have different characteristics, such as the type of terrain or the type of yarding, each population is divided into distinct sub-populations ("strata") on the basis of common characteristics (e.g., steep terrain versus flat ground). A separate sample is selected for each population, such as the cutblocks selected for auditing timber harvesting. Within each population, more audit effort (i.e., higher sampling) is allocated to the strata where the risk of non-compliance is higher.

The audit work in the field includes assessments from helicopters and intensive ground procedures such as measurement of specific features, e.g., road width.

## Audit conclusions

The Board recognizes that compliance with many Code requirements is a function of degree, rather than of absolute compliance and requires the exercise of professional judgment within the direction provided by the Board.

In performing the audit, auditors collect, analyse, interpret and document information to support the audit results. This requires the audit team, comprised of professionals and technical experts, to first determine whether forest practices are in compliance with Code requirements, and then to evaluate those practices judged not to be in compliance to assess the degree of severity of non-compliance - that is, its significance. Significance is assessed relative to the actual or potential harm to persons or the environment.

As part of the assessment process, auditors categorize their audit findings into the following levels of compliance:

**Compliance** – where the auditor assesses that practices meet Code requirements.

**Not significant non-compliance** – where the auditor, upon reaching a non-compliance conclusion, assesses that the non-compliance event or condition, or the accumulation of a number of non-compliance events or conditions and the consequences of the non-compliance, are not significant.

**Significant non-compliance** – where the auditor, upon reaching a non-compliance conclusion, assesses that the event or condition, or the accumulation of a number of non-compliance events or conditions, is significant.

Included in this category are situations where non-compliance has resulted in harm to persons or the environment, even if remedial action has already mitigated the consequences of the non-compliance to a minor level.

Significant non-compliance also includes situations where potential for harm is probable, that is, harm has not yet occurred as a result of non-compliance, but there is a strong likelihood that it will. “Harm,” in Board audits, is defined as an adverse change from existing conditions that affects person(s) or the environment, and is brought about as a result of non-compliance.

**Significant breach** – where the auditor, upon reaching a non-compliance conclusion, assesses that significant harm has occurred or is beginning to occur to persons or the environment as a result of the non-compliance event or condition. A significant breach can also result from the cumulative effect of a number of non-compliance events or conditions.



Identification of a possible significant breach requires the auditor to conduct tests to determine the extent of the breach. If it is determined, after conducting tests, that a significant breach has occurred, the auditor is required by the *Forest Practices Board Regulation* to immediately advise the Board, the person being audited, and the three ministers.

## **Audit opinion**

To reach an overall opinion, assessments are made at various levels. In all cases, an assessment is made of a forest practice or group of forest practices, followed by assessments at each forestry activity level (e.g., roads constructed).

If all of the forestry activities subject to audit are in compliance with the Code, in all significant respects, the overall opinion reflects this conclusion — and is referred to as a “clean opinion.” The use of the words “in all significant respects” recognizes that there may be minor instances of non-compliance that either may not be detected by the audit or may not be worthy of inclusion in the audit report.

In situations where significant non-compliance is identified, the type of overall opinion is dependent upon the magnitude and pervasiveness of the non-compliance.

A “qualified opinion” is appropriate when the significant non-compliance is neither pervasive nor of a sufficient magnitude to warrant an overall negative conclusion. The words “except for” are used to draw attention to the details of the significant non-compliance to “qualify” an overall opinion of compliance with Code requirements.

An overall negative conclusion (“adverse opinion”) is appropriate when significant non-compliance is sufficiently pervasive or of sufficient magnitude to warrant an overall negative conclusion. An adverse opinion would either indicate that, overall, the forest activities subject to audit were not in compliance with Code requirements or a particular forest activity was not in compliance with Code requirements.

## **C. Report from the Auditor**

### **1. Introduction**

The Forest Practices Board selected Forest Licence A15385 held by Finlay Forest Industries Inc. for an audit of road and timber harvesting practices. The licence was selected randomly from the population of major forest licences in the Prince George Forest Region, and not on the basis of location or level of performance.

Forest Licence A15385 is located in the Mackenzie Forest District, within the Mackenzie Timber Supply Area, and is bounded by the Omineca Mountains on the west and the Rocky Mountains on the east, and includes most of Williston Lake, as shown on the attached map.

According to the recent Timber Supply Review, the Mackenzie Timber Supply Area contains 6,130,604 hectares of Crown land, of which approximately 1,160,581 hectares (19 percent) is classified as operable, productive forest land. The allowable annual cut for the licence is 1,174,342 cubic metres, which is about 40 percent of the total allowable annual cut in the Mackenzie Timber Supply Area.

The licence, managed as one division from Mackenzie, has five operating areas. The Osilinka/Mesilinka operating area provides about 50 percent of the allowable annual cut for the licence, with the rest each comprising 20 percent or less each. All of the operating areas have mountainous terrain, and three are accessible only by air or water.

### **2. Audit scope**

We assessed the timber harvesting and road construction, maintenance, and deactivation practices of Finlay Forest Industries Inc. on Forest Licence A15385 for their compliance with Code requirements (including transitional provisions) and the prescriptions set out in operational plans such as silviculture prescriptions and logging plans. In addition, we examined operational planning documents to verify that:

- approved operational plans (e.g., silviculture prescriptions and logging plans) were in place for timber harvesting and road construction, maintenance, and deactivation operations;
- approved operational plans were consistent with the approved forest development plan; and,
- the operational plans were appropriate for the sites examined.

All timber harvesting and road construction, maintenance, and deactivation activities for the period January 1, 1996, to September 15, 1996, were included in the scope of the audit. This covered:

- the harvesting of 59 cutblocks;
- the construction of 128.2 kilometres of road;
- the deactivation of 49 roads within cutblocks; and,
- the maintenance of approximately 2,986 kilometres of road for which the company was responsible.

Section 3 describes our audit of these activities, and the results. The Board's audit reference manual, "Reference Manual – Compliance Audits, Version 1, September, 1996," sets out the standards and procedures that were used for the audit.

### **3. Audit findings**

Our audit work on selected roads and cutblocks included assessments from the air using helicopters and ground-based procedures, details of which are provided below.

- Ground-based audit of timber harvesting practices on 25 cutblocks and assessments from the air by helicopter of all 59 cutblocks.
- Ground-based audit of selected sections of 9 new roads. The full length of the 9 new roads, totaling 73.5 kilometres (57% of all new roads), was assessed from the air by helicopter.
- Ground-based audit of road deactivation practices on 17 roads within cutblocks and assessments from the air by helicopter of all 49 deactivated roads within the road deactivation population.
- Ground-based procedures of road maintenance on 13 randomly selected road sections totaling 110.2 kilometres. In addition, we assessed an undetermined portion of the road maintenance population from the air by helicopter and held discussions about road maintenance activities with company staff.

In the cutblocks and roads audited, we identified five significant non-compliance situations involving:

- two stream crossings on roads constructed during the winter;
- maintenance of inactive and 1996 roads built in the winter; and
- harvesting practices around non-fish-bearing streams and unclassified watercourses.

We determined that these do not represent significant breaches because significant harm to persons or the environment had neither occurred nor was beginning to occur. These significant non-compliance conditions are described below.

### **3.1 Stream crossings on roads built in the winter**

We identified two independent situations of significant non-compliance involving stream crossings on roads constructed during the winter where non-compliance has affected streams.

#### **i) Cutting Permit 210 - Block 201**

An S-6 stream (non-fish-bearing stream, less than or equal to 3 metres in width) crossing a road constructed during winter was incorrectly mapped. Consequently, no culvert was installed where the stream intersects the road, causing the diversion of the stream down a ditch. The stream passed through a road culvert approximately 100 metres away from the location of the original channel, and eventually met up with the original channel (about 50 metres from the road culvert) where the stream left the cutblock.

Water from the diverted stream and the ditch eroded approximately 103 metres of the ditch length. This resulted in sediment being transported by the stream into an unnamed tributary of the McDougall River. The reach of this unnamed tributary is classified as S-2 (fish-bearing, greater than 5 metres and up to 20 metres in width) and supports a known population of rainbow trout and other local fish species. The McDougall River, which is about 7.8 kilometres downstream, is also fish-bearing.

The impact on fish spawning and rearing habitat is confined to approximately 70 metres of channel length, which is less than 1 percent of the length of the unnamed tributary of McDougall River. Although the impacted section of the S-2 stream reach does not contain high quality spawning habitat, patches of spawning-sized gravel located between groups of boulders were covered by the sediment. In addition, a back channel fish refuge and rearing area, adjacent to where the diverted S-6 stream and the unnamed tributary meet, has been filled in by the transported sediment.

#### **ii) Cutting Permit 641 - Block 6117**

An unmapped S-6 stream (non-fish-bearing, less than or equal to 3 metres in width) was intercepted by a road constructed in the winter. Because a culvert was not installed, the water from this stream, combined with ditchwater, eroded sediment from the road subgrade and ditch over a length of 82 metres.

This sediment was transported into an unnamed tributary of Gopherhole Creek. The unnamed tributary, with an average gradient of approximately 18 percent, is classified as S-5 (non-fish-bearing, greater than 3 metres in width). Gopherhole Creek, which is approximately 1.7 kilometres downstream, supports known populations of rainbow trout, bull trout, and other fish species.

Approximately 75 metres of the tributary channel (200 to 300 square metres), or about 5 percent of total channel length, were affected by localized accumulations of transported sediment. An unknown quantity of sediment was also transported further downstream. We could not determine if these sediments reached Gopherhole Creek.

The main areas of the Code to which the non-compliance relates are Sections 45(1) and (4) of the *Forest Practices Code of British Columbia Act* and Section 12(1) of the *Forest Road Regulation*.

### **3.2 Maintenance of inactive and 1996 roads constructed during the winter**

Our audit of the road maintenance activities identified two separate situations of significant non-compliance.

#### **i) Maintenance - general**

Of the 13 road sections we examined, we found eight in which there were one or more instances of not significant non-compliance with the road maintenance requirements of the Code. Non-compliance with road maintenance requirements was also noted on the roads that we assessed from the air by helicopter, e.g., ponded ditches. All of the non-compliance was on inactive or 1996 roads built in the winter. Examples of the types of non-compliance we noted include the following:

- crushed or damaged culverts
- blocked culverts
- ponded ditches that were rendered ineffective through slumps and cutslope failures
- road surface and ditch erosion
- poor visibility due to lack of brush control
- inadequate road drainage
- rutting of the road surface
- slumping fill slopes

The impact on each road section from the above non-compliance was not significant. In our opinion, however, the frequency of the non-compliance is significant. Harm could come to persons or the environment if these forest practices continue in the current manner.

## ii) Cutting Permit 180 - Block 145

A blocked culvert on CP 180 Block 145 diverted an S-6 stream (non-fish-bearing, less than or equal to 3 metres in width) down the ditch, which in turn resulted in the erosion of sediment along 117 metres of ditch.

The sediment was transported down the ditch to a second S-6 stream, and subsequently deposited into a fisheries sensitive zone (a back channel) of a reach of Mugaha Creek. The impact on fish habitat from this sediment erosion was confined to a portion of the back channel of Mugaha Creek (approximately 300 square metres), which is cut off from the main channel by a beaver dam.

Mugaha Creek, itself an S-2 stream (fish bearing, greater than 5 metres and up to 20 metres in width), is known to support populations of rainbow trout, bull trout, and various other fish species. Localized impacts included reduced fish-rearing habitat area, reduced storage capacity for natural sediments in the back channel with some minor increase in main channel sediment input from the back channel during future freshet events.

The main areas of the Code to which the non-compliance relates are Sections 63(1) and (2) of the *Forest Practices Code of British Columbia Act* and Sections 16 and 17 of the *Forest Road Regulation*.

### 3.3 Harvesting practices around non-fish-bearing streams and unclassified watercourses

Of the 25 cutblocks examined, 13 contained one or more watercourses identified by Finlay Forest Industries Inc. as being either a non-fish-bearing stream (S-5 or S-6) or an unclassified watercourse for which specific management practices were prescribed in approved operational plans (silviculture prescriptions and/or logging plans).

Of the 13 cutblocks with non-fish-bearing streams or unclassified watercourses, 11 contained one or more instances of not significant non-compliance with the stream protection requirements set out in approved operational plans. Examples of the types of non-compliance we noted include:

- failure to accurately identify all non-fish-bearing (S-5 or S-6) streams on operational plans;
- inadequate marking of machine-free zones and riparian management area boundaries;
- failure to fall and skid away from non-fish-bearing streams;
- failure to use only approved stream crossings;
- failure to respect machine-free zones;
- deposition of an unacceptable amount of slash into streams that have the potential to transport debris; and
- failure to comply with the stream and/or unclassified watercourse management prescriptions contained in approved operational plans.

The impact on each individual non-fish-bearing stream or unclassified watercourse was not significant. In our opinion, however, the non-compliance is significant because of its frequency. Harm could come to the environment if the manner in which these forest practices are conducted continues.

The main areas of the Code to which the non-compliance relates are Sections 45(1) and 67(2)(a) of the *Forest Practices Code of British Columbia Act* and Sections 5(1), 7(1), 8(1), 11, 12(1), 15, and 16(1) of the *Timber Harvesting Practices Regulation*.

#### **4. Audit opinion**

In my opinion, except for the significant non-compliance situations described below, the timber harvesting and road construction, maintenance, and deactivation activities carried out by Finlay Forest Industries Inc. on Forest Licence A15385 from January 1, 1996, to September 15, 1996, were in compliance, in all significant respects, with the road and harvesting requirements of the Code as of September 1996.

As described in section 3, the audit identified the following situations of significant non-compliance, as described below.

1. An S-6 stream (non-fish-bearing, less than or equal to 3 metres in width) crossing a road constructed in the winter was incorrectly mapped. Consequently, no culvert was installed where the stream intersects the road, causing the diversion of the stream down the ditch, and erosion of approximately 103 metres of the ditchline.

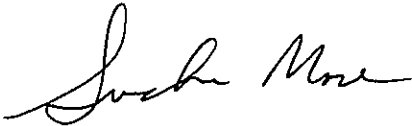
This resulted in sediment being transported into an unnamed tributary of the McDougall River. The impact on fish spawning and rearing habitat is confined to approximately 70 metres of channel of the unnamed tributary, which is classified as S-2 (fish-bearing, greater than 5 metres and up to 20 metres in width) and supports a known population of rainbow trout and other local fish species.

2. An unmapped S-6 stream (non-fish-bearing, less than or equal to 3 metres in width) was intercepted by a road constructed in the winter. Because a culvert was not installed, the water from this stream, combined with ditchwater, eroded sediment from the road sub-grade and ditch over a length of 82 metres. This sediment was transported into an unnamed tributary of Gopherhole Creek which is about 1.7 kilometres downstream and known to support fish populations. Approximately 75 metres of the unnamed tributary channel were affected by localized accumulations of sediment.
3. Inadequate maintenance of inactive and 1996 roads constructed in the winter represents an area of risk. Harm could come to persons or the environment if these forest practices continue in the current manner.

4. A blocked culvert on CP 180 Block 145 diverted an S-6 stream (non-fish-bearing, less than or equal to 3 metres in width) down the ditch, which in turn resulted in the erosion of sediment along 117 metres of ditch. The sediment was transported down the ditch to a second S-6 stream, and subsequently deposited into a back channel fisheries sensitive zone of a reach of Mugaha Creek. The impact on fish habitat was confined to a portion of the back channel of Mugaha Creek (approximately 300 square metres), which is cut off from the main channel by a beaver dam.
5. Inadequate protection of non-fish-bearing streams and unclassified watercourses represents an area of risk. Harm could come to the environment if these forest practices continue in the current manner.

The significant non-compliance described in this opinion was neither sufficiently pervasive nor of a sufficient magnitude to warrant an overall negative opinion.

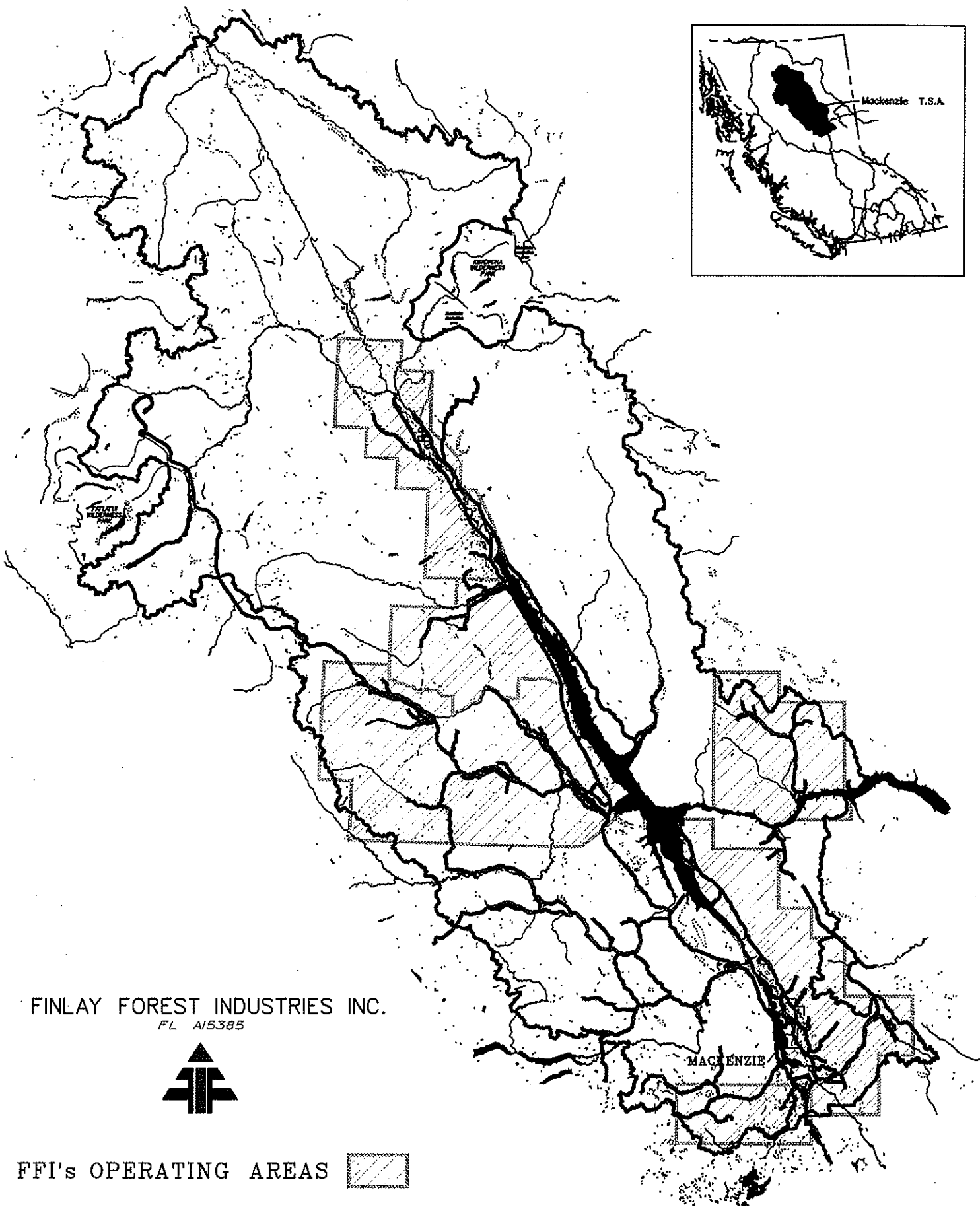
Sections 2 and 3 of this report from the auditor describe the basis of the audit work performed in reaching the above qualified opinion. The audit was conducted in accordance with the auditing standards of the Forest Practices Board. Such an audit includes examining sufficient road and timber harvesting practices to support an overall evaluation of compliance with the Code.



Sucha More, CA  
Auditor  
Forest Practices Board

Victoria, British Columbia  
January 22, 1997





FINLAY FOREST INDUSTRIES INC.  
FL A15385



FFI's OPERATING AREAS 