Contractors' TIMBER HARVESTING MANUAL

South West Native Forests

Forest Products Commission WESTERN AUSTRALIA

Government of Western Australia

54

CONTRACTORS' TIMBER HARVESTING MANUAL

SOUTH WEST NATIVE FORESTS

Forest Products Commission
WESTERN AUSTRALIA

Forest Products Commission (FPC)
Locked Bag 888, Perth Business Centre WA 6849

TABLE OF CONTENTS

PREFACE

This edition of the "Contractor's Timber Harvesting Manual for South West Native Forests in Western Australia" has been written specifically for Harvesting Contractors employed by the Forest Products Commission (FPC). It replaces the "Manual of Management Guidelines for Timber Harvesting in WA" (1999) with respect to harvesting operations in South West native forests and incorporates all conditions necessary to meet the Code of Practice for Timber Harvesting.

The Manual may be amended from time to time as developments, legislative changes and improvements are identified and implemented. Amendments will be applied from the date of notification to harvesting contractors.

The Manual will be distributed to all FPC contractors, be available on the internal and external FPC Website and available for purchase by the public at FPC offices in Rivervale, Bunbury, Harvey and Manjimup.

Dr Paul Biggs
GENERAL MANAGER
FOREST PRODUCTS COMMISSION

January 2003

SCOPE

This manual is to be used and implemented by all contractors working for FPC within the South West Native Forest area. Performance to manual goals and standards and procedures form an integral part of contractual requirements.

This Manual will provide background, applicable legislative requirements, and goals for each section. In addition to this information, Operational Controls will be provided to achieve the defined goals. Operational Controls are procedures or guidelines, and/or operational/management activity that help ensure that FPC and the Harvesting Contractor meet legislative and forest management requirements.

The purpose of this Manual is to ensure the goals are consistently met through the implementation of operational controls throughout the South West native forests. It will also provide a source of information for external parties wishing to review and assess. It will be the document that FPC and its harvesting contractors will be audited against.

While the Code of Practice for Timber Harvesting in Western Australia (to be revised) is a complimentary document to this Manual, Harvesting Contractors no longer need to use both the Manual and Code to ensure contractual requirements are being fulfilled. If the requirements within this Manual are being met the Harvesting Contractor will automatically fulfil the Code requirements. This is a deviation from the past system that required operators to use both documents to ensure compliance.

SECTION 1

Principles of Native Forest Management

1: PRINCIPLES OF NATIVE FOREST MANAGEMENT

1.1 NATIVE FOREST MANAGEMENT FRAMEWORK

Native forest management principles are based upon a framework provided by the Forest Management Plan, prepared in accordance with Part V of the Conservation and Land Management Act (1984). The framework used in the Forest Management Plan being developed by Department of Conservation and Land Management (CLM), is reflected in the current Environmental Management System used by the Forest Products Commission. The principles of the framework are to maintain and enhance biological diversity; sustain productive capacity of ecosystems; maintain forest ecosystem health and vitality; protect and sustain soil and water resources; sustain natural and cultural heritage values and contribute to socio -economic benefits for the Western Australian community. The Forest Products Commission is not responsible for setting these principles but ensuring any operations they control comply with the requirements.

The Policy Statement for "Management of the Environment" (see below) specifically states the environmental commitments that are managed through the Environmental Management System. This is discussed in more detail in Section 4.

1.2 POLICY STATEMENT – MANAGEMENT OF THE ENVIRONMENT

Vision

An environmentally sustainable and commercially viable forest products industry providing economic and social benefits to the people of Western Australia.

Mission

To contribute to Western Australia's economic and regional by growth:

- Developing the sustainable use of the State's native and plantation timber resources.
- Promoting innovation and local value adding for these resources.
- Achieving appropriate returns to the State for the use of publicly-owned and FPC-managed timber resources.

Values

The FPC's values have been defined as:

- **Achievement:**
  We will deliver best practice service.
- **Innovation:**
  We will be creative and innovative in meeting our objectives.
- **Leadership:**
  We will provide leadership to assist in the development and restructure of the timber industry.
- **Customer focus:**
  We will understand and meet our customers' needs.

- **Environmental responsibility:**

  We will adhere to ecologically sustainable management.

- **Accountability:**

  We will adhere to processes that are understood and measured.

- **Integrity:**

  We will act honestly and ethically in accordance with the Commission's Code of Conduct.

Objectives and strategies

We operate profitably, consistent with our planned targets from the use of forest products while ensuring the long-term viability of the forest products industry and the ecologically sustainable management of indigenous forest products. We practise environmentally sound management of plantations. We maximise regional industry and employment opportunities. We provide a safe, productive and supportive work environment. We deliver results to achieve these outcomes through:

- Production and promotion
- Business performance
- Community support
- Community service obligations

SECTION 2
Legal Obligations

2: LEGAL OBLIGATIONS

Contractors need to be aware of the legal obligations covering their operations. Generally, compliance with this Manual will ensure legal compliance; although there may be specific areas of operation for which the contractor will need to ensure compliance with the following Acts:

Commonwealth Legislation

Australian Heritage Commission Act (1975)
Native Title Act (1993)

Western Australian Legislation

Aboriginal Heritage Act (1972)
Bush Fires Act (1954)
Conservation and Land Management Act (1984)
Country Areas Water Supply Act (1947)
Dangerous Goods (Transport) Act 1998
Environmental Protection Act (1986)
Explosives & Dangerous Goods Act (1961)
Forest Management Regulations (1993)
Forest Products Act (2000)
Heritage of Western Australia Act (1990)
Metropolitan Water Supply, Sewerage & Drainage Act (1909)
Native Title (State Provisions) Act (1999)
Occupational Safety and Health Act (1984)
Soil and Land Conservation Act (1945)
Timber Industry Regulation Act (1926)
Wildlife Conservation Act (1950)

Other Legal Obligation

Forest Management Plan
Ministerial Conditions

2.1 SPECIFIC LEGAL REQUIREMENTS

2.1.1 Timber Industry Regulation (T.I.R.) Act

1. The Timber Industry Regulations Act (1926-1969) provides regulations to ensure health and safety of personnel involved in the timber industry. This Act is in the process of being repealed (cancelled) and absorbed in the Occupational Safety and Health Act (1984).

2. District Inspectors now work under a Controlling Officer from The Department of Consumer & Employment Protection - WorkSafe Division (formerly WorkSafe Western Australia). These inspectors are based in Perth and Bunbury and can be contacted by the harvesting contractor on matters related to health and safety in the timber industry.

2.1.2 Forest Management Regulations (1993) - registration of timber workers, identification codes and log timber removed from private land

1. Parts 2 and 4 of the Forest Management Regulations (1993) detail the requirements for registration of timber workers registration of identification codes for persons who fell trees on State forests and timber reserves and identification of log timber removed from private land.

2. All fellers employed by the contractor must hold a current feller's identification code under the provisions of **Part 4 of the Regulations**.

3. Under Part 2 of the Regulations, only persons in possession of a current Timber Workers Certificate of Registration may be employed in timber harvesting and transport of forest products. One-off Minor Production Contract holders are exempt from this requirement.

2.1.2.2 *Registration of Timber Workers*

1. The Forest Management Regulations require that:

   (a) All persons engaged in timber harvesting in a State forest or timber reserve be registered through the FPC. The only exceptions to this requirement are persons who operate under a Minor Production Contract, or persons who collect public firewood.

   (b) Applications for registration are made on the approved form (FPC014).

   (c) Applications for renewal of registration are made on the approved form (FPC014A).

   (d) The General Manager of the FPC keeps a record of all persons registered as timber workers.

   (e) Each worker carry his/her registration certificate (or a copy) at all times whilst working on State forests or timber reserves, and produces the certificate for inspection by a Forest Officer or FPC Authorised officer when required.

2. Timber workers may be registered in one or more of several categories, as listed on the application form (FPC014). Registration in any category is subject to evidence of appropriate qualifications. At present, appropriate qualifications in most timber worker categories may be obtained through the Forest Industries Training Services, an organisation based in Bunbury, which is recognised by both FPC and WorkSafe Division of the Department of Consumer and Employment Protection.

3. Registration in any particular category is classed as either full, or probationary. Full status means the applicant is able to produce documentary evidence acceptable to the General Manager that a certain minimum skill level has been reached in the particular category. Full status can also be awarded in categories where no formal training

or testing has been developed, to applicants of "some standing" in the particular category.
Probationary status applies to applicants who are new to the job and in the process of being trained, or who are waiting to be formally tested. Probationary status shall not extend beyond approximately six months, by which time a timber worker shall be able to satisfy the requirements of full status. If not, the person's registration shall be cancelled.

4. Registered timber workers will be invited by FPC to renew their registration every three years. A notice will be sent by mail from FPC's Head office approximately two months before the annual expiry date for each individual timber worker.

5. Registration, or renewal of registration, can only be affected following receipt of the appropriate fee after which a "Certificate of Registration as a Timber Worker" will be forwarded (FPC430).

2.1.2.2 *Identification Codes for Tree Fellers*

The Regulations, Part 2 and 4, require that all persons who fell trees on State forest or timber reserve, including persons who operate harvesting machines which fell trees, be registered and given an "identification code".

These identification codes must then be recorded on Delivery Notes.

2.1.2.3 *Identification of Log Timber Removed from Private Land*

The Regulations require that:

(a) Log timber felled on and removed from private land for processing at a sawmill be distinctly marked with an identification code unique to the owner or owners of that land.

(b) Application for an "owner's identification code" be made by the owner or occupier of private land, or by any other person who intends to remove log timber from that land for processing at a sawmill, on the approved form (FPC083, 1993).

(c) The General Manager of FPC register an approved "owner's identification code", upon receipt of the appropriate fee.

2.1.3 Forest Management Regulations - DRA Permits

1. No vehicle, truck or harvesting machine may enter a Disease Risk Area (quarantine area) without a permit signed by a Forest Officer from CLM. This includes vehicles and trucks driven by FPC and contractor personnel.

2. All vehicles/machines operating inside a DRA must carry a DRA entry permit at all times, and be prepared to show the permit to a Forest Officer (CLM) or FPC Authorised Officer, on demand.

3. In situations where a number of vehicles/machines belonging to or associated with a single harvesting contractor need to enter a specific DRA, the local CLM District may issue a single DRA entry permit to that harvesting contractor. A copy of this permit must be kept in every vehicle/machine

belonging to or associated with that harvesting contractor that enters the DRA.

4. The driver or operator of every vehicle/machine entering DRA under permit must be familiar with and abide by the conditions printed on the permit document.

2.1.4 Infrastructure - fences, gates, telephone lines

1. A contractor shall not cut through, break down or otherwise interfere with any fencing or other improvements erected upon or adjacent to the forest areas.

2. A contractor shall keep closed all gates used and shall take all necessary action to prevent the ingress or egress of stock into or from any forest areas enclosed by fences which may have been damaged as a result of his/her harvesting operations.

3. A contractor shall at their own expense and without delay make good any damage to fences, telephone lines or other improvements, resulting directly or indirectly from their operations.

2.1.5 Dangerous Goods Act – Transport and Storage

1. Harvesting Contractors are required to ensure they comply with the Dangerous Goods Act (1986) for both Transport and Storage.

2. Some of the commonly used goods that come under the Act are unleaded fuel, cleaning agents, some oils/lubricants and diesel. (In the case of diesel the Dangerous Goods Act only applies when it is being stored, not transported).

3. Harvesting Contractors must check, before transporting or storing, more than one "44 Gallon Drum" of the above substances, whether they require a permit from the Department of Minerals and Energy. Unleaded fuel and cleaning agents and certain oils/lubricants are the most likely substances that require care under this act.

4. Compliance with the Dangerous Goods Act, however, does not mean the storage of substances will comply with the Environmental Protection Act (1986). Requirements that need to met under The Environmental Protection Act are detailed in the Section 4 "Environmental Management"

2.1.6 FPC Requirements - Employees And Control of Work Hours

1. Within 48 hours of the commencement of an operation the contractor shall advise an FPC Authorised Officer, either verbally or by notice in writing, the name and address of any employee who is engaged by the contractor in cutting and/or removal of forest products or who for any reason ceases to be engaged by the contractor in cutting and/or removal of forest products.

2. The FPC through an Authorised Officer, reserves the right to limit or otherwise control the hours of work and days of work of all personnel working in the forest. A contractor will take due note of any instruction from an FPC Authorised Officer in this regard and such instruction will be deemed to apply until revoked and will apply equally to the contractor and any of his/her employees.

3. Responsibility for exercising strict supervision and control over the operations of all workers employed by the contractor resides with the contractor.

SECTION 3
Safety

3: SAFETY

BACKGROUND

The Occupational Safety and Health Act (1984) sets objectives to promote and improve occupational safety and health standards, while the Occupational Safety and Health Regulations (1996) provides more supportive detail on the requirements. The major provisions of the Act are general duties, resolution of issues, safety and health representatives, safety and health committees and enforcement of Act and Regulations.

FPC requires full compliance with the "Safety & Health Code for Native Forest/Hardwood Logging and Plantation Logging (FIFWA) (Safety and Health Code)". This Code provides the Harvesting Contractor with the responsibilities of the Principal (FIFWA), the Contractor and Employee. It also details the work place safety guidelines for:

1. Log Landing Standards
2. Hazard Management
3. Safe Work Practices
4. Mobile Plant Use
5. Cable Logging
6. Personal Vehicles
7. Haulage
8. First Aid/medical requirements
9. Personal Protective Equipment
10. Fire Safety
11. Communication
12. Standard Signals
13. Manual Handling
14. Fatigue Management.

Specific operational controls have been written in this Manual to cover the direct relationship between FPC and the Harvesting Contractor (including its employees) in addition to full compliance with the Safety and Health Code.

LEGAL OBLIGATIONS

1. (a) A contractor shall comply in all respects with the provisions of the Occupational Safety and Health Act 1984 (the OSH Act) and all Acts and regulations of the State of Western Australia applicable to the contractor's operations under his/her contract for service to FPC.

   (b) In relation to the OSH Act the contractor shall ensure, as far as practicable, that the workplace is free of hazards by having a "safety management program" that includes:

      (i) the provision and maintenance of appropriate workplaces, plant and systems of work;

      (ii) the provision of appropriate information, instruction, training to and supervision of employees;

      (iii) consulting and co-operating with health and safety representatives and committees where appropriate; and

(iv) provision of adequate protective clothing and equipment in accordance with the Safety and Health Code.

GOALS

1. To promote and secure the safety and health of people at work in harvesting operations

2. To minimise the risk of hazards for people at work in the harvesting industry

3. To reduce, eliminate and control hazards in the harvesting industry

4. To foster cooperation and consultation on health and safety matter between principals, FPC, contractors and in-forest workers in the harvesting industry

5. To enable the harvesting industry to self regulate occupational safety and health in conjunction with legislation.

(Safety and Health Code for Native Forest/Hardwood Logging and Plantation Logging, 1997)

OPERATIONAL CONTROLS

1. The contractor and his/her employees shall comply with the "Safety and Health Code for Native Forest/Hardwood Logging and Plantation Logging" (Safety and Health Code) or any subsequent or replacement booklet or document which may be published from time to time.

2. At each site the Harvesting Contractor will have the "Safety and Health Code", accessible to all employees.

3. All employees will have the required knowledge and skill to access and implement the standards in the Safety and Health Code.

4. An FPC Authorised Officer and/or an Inspector from The Department Consumer and Employment Protection (WorkSafe) may require a contractor to provide and install suitable signs on inforest and/or public roads to warn road users of the presence of felling, extraction and delivery operations.

5. A contractor shall, at the request of FPC, be available to participate in the investigation of accidents and safety inductions

6. The contractor shall comply with the guidelines (as may be amended from time to time) in relation to the respective obligations of any additional requirements of FPC.

7. The contractor will participate in any audits/monitoring being completed by FPC personnel. Some of the areas that an FPC Authorised Officer will assess are outlined in Appendix 6.

This summary is in no way exhaustive and is not intended as a checklist for compliance with Occupational Safety and Health Act, merely as background information for the contractor.

INFOREST HAZARDS

The Harvesting Contractor will comply with the specific steps and responsibilities outlined in the matrix "RESPONSIBILITIES FOR MANAGING IN-FOREST HAZARDS'. To assist in the SIX STEP action sequence, the following information is provided.

Six Step Action

Step 1: Assessment and identification of hazards by FPC's tree markers

During tree marking, the treemarker looks for unusual or particularly threatening hazards on trees to be harvested, and marks such trees with white paint (the same paint used for treemarking). The mark made is usually an upward pointing arrow indicating the presence of an overhead hazard. Areas that are clearfelled will not have treemarkers completing this step.

Step 2: 'Handing over' of site to FPC contractor from FPC

An FPC Authorised Officer is responsible for starting the contractor on the particular site. The written mechanism for doing this is with a 'Pre Harvesting Operation Hazard Identification and Site Handover Sheet' (FPC 111) that will summarise any hazards and steps that need to be taken to remove hazards before harvesting may occur.

Step 3: Assessment and identification of hazards by the harvesting contractor or mining company

Other than on minesites, the contractor's supervisor will, after the site is 'handed over' to the contractor, assess the site and identify hazards considered to be particularly threatening, whether or not the site has been treemarked by FPC. Emphasis will be on trees around log landing sites where activity is most concentrated.

On minesites where the mining company carries out activity prior to harvesting, a company representative will similarly assess the site and identify any particularly threatening hazards prior to 'handing' the site to FPC to arrange for timber harvesting to be carried out by a harvesting company. In these cases, hazards identified are marked with yellow and black striped tape.

Step 4: Assessment and identification of hazards by the tree feller following felling

Immediately after trees are felled, new overhead hazards are sometimes created. Tree 'hangups' are typical. If such hazards cannot immediately be removed, by a nearby skidder for example, then the feller will mark the hazard with red and white striped hazard tape, to alert the machine operators in particular.

Step 5: *Assessment and identification of hazards by machine operators following log extraction*

In a similar fashion to steps taken by the tree fellers, machine operators involved in log extraction will use red and white striped hazard tape to highlight hazards remaining after log extraction. Harvesting contractors are required to remove hung trees and other forms of hazards upon completion of the area. If removal of these hazards are not safe then they will remain highlighted with red and white striped hazard tape. The contractor's supervisor will also make a final assessment of the site before handing the site back to FPC for subsequent regeneration, and ongoing forest management activities.

Step 6: *'Handing back' of Site from Contractor to FPC*

This refers to the 'handing back' of a completed site by the contractor to the FPC Authorised Officer. Again the Harvesting Operation Handover and Progress Certification Sheet – Native Forests (FPC 104) and Pre-Harvesting Operation Identification and Site Handover Sheet (FPC 111) is the formal mechanism for doing this.

RESPONSIBILITIES FOR MANAGING IN-FOREST HAZARDS

Organisation/Person	(1) Jarrah	(2) Karri (C/Fell)	(3) Karri (Thinning)	(4) Karri (S/Tree)	(5) Ground Salvage Only	(6) Minesite (C/F)	(9) Track Construction (involving clearing or felling of trees)
(a) FPC Tree Marker	1	-	1	1	-	-	-
(b) FPC Coupe Manager	2	2	2	2	2	2	2
(c) Mining Company	-	-	-	-	-	3,6	-
(d) Contractor Supervisor	3,5,6	3,6	3,5,6	3,5,6	3,5,6	3,6	3,6
(e) FPC Roading Officer	-	-	-	-	-	-	1,5
(f) Feller	4	4	4	4	-	4	4
(g) Machine Operator	5	5	5	5	5	5	5

Action

1. As far as is practicable, assess trees and identify hazards using white paint (eg. by upward facing arrows on tree trunks).
2. "Hand" site to contractor.
3. As far as is practicable, assess trees and identify hazards using white paint (eg. by upward facing arrows on tree trunks).
4. As far as is practicable, assess and identify hazards resulting from felling operation using red and white striped hazard tape (ie. for hazards which cannot be immediately and safely removed).
5. As far as is practicable, assess and identify hazards remaining after log extraction operation using red and white striped hazard tape (ie. for hazards which cannot be immediately and safely removed).
6. "Hand" site to FPC.

BLASTING

Blasting is used occasionally for roading and tree removal. The following section is not fully comprehensive of the procedures for blasting but provides Harvesting Contactors the information required to ensure they can operate in safety and take appropriate action when in the vicinity of blasting operations.

1. FPC contractors shall notify the supervising FPC Authorised Officer of all likely blasting within five working days prior to commencing each job.

2. FPC Authorised Officer shall notify all persons in the vicinity, especially neighbours, that blasting is to be expected, and shall inform them of the signals that will be used.

3. All persons in the vicinity shall be advised that blasting is to be expected and they shall be informed of the signals to be given prior to a shot being fired.

4. The shotfirer shall ensure that all surplus explosives or equipment are removed from the site and that all personnel are cleared from the danger area.

5. To give adequate warning prior to firing, a recognised code of signals must be followed and in order to provide greater uniformity of signalling throughout Western Australia it is recommended the following procedure be adopted.

6. It is essential that warning signals can be heard by all persons likely to be affected by the blast. This includes neighbours.

7. When satisfied the charge is ready to be fired and that all precautions have been taken, the shotfirer, immediately before lighting the fuse or connecting to the exploder, shall give the caution 'ready to fire' or sound three short blows on a siren.

8. When satisfied that the area is vacated and safe the shotfirer shall prepare the fuse or connect the leads to the exploder and immediately before lighting the fuse or operating the exploder shall give the warning 'fire' or sound one short blow.

9. When the fumes have dispersed and it is considered all charges have fired then the shotfirer alone shall examine the site to ensure the charges have in fact completely exploded. If satisfied this is so he shall give the call 'all clear' or sound one long blow.

10. In summary, the audible signals used for the above warning system are;

Ready to Fire	-	Three short blows
Fire	-	One short blow
All clear	-	One long blow

Note:	One short blow	-	1 second
	One long blow	-	5 seconds.

11. Only when the 'all clear' has been signalled by the shotfirer may work commence around the blast area.

12. In all situations where other activities are taking place in the more immediate vicinity, or where traffic or people could chance upon the blasting site, full warning procedures are to be followed – as specified by the Explosives and Dangerous Goods Branch of the Department of Mineral and Petroleum Resources (WA). This may entail additional assistants or flagmen, warning signs and/or red flags.

SECTION 4
Environmental Management

4: ENVIRONMENTAL MANAGEMENT

4.1 ENVIRONMENTAL MANAGEMENT SYSTEM (EMS)

BACKGROUND

The Forest Products Commission has been accredited with the Environmental Management System (EMS) that conforms to international standard ISO 14001. The EMS is a process of environmental management that commits FPC to comply with an environmental policy and to continuously improve both its environmental system and performance. The environmental policy for FPC is located in "Principles of Native Forest Management" (Section 1).

The EMS model follows the principles of:

Commitment to the EMS and definition of it's Environmental Policy.

Planning to fulfill the requirements of its environmental policy.

Implementing the necessary mechanisms to achieve the Environmental Policy, objectives and targets.

Measuring, monitoring and implementing corrective action to maintain and improve its environmental performance.

Review and improvement of its environmental management system, with the objective of improving overall environmental performance.

Contractors are not required to have their own EMS, understand the full EMS or try to interpret what is required to comply with the EMS. It is FPC's responsibility to communicate the procedures and activities to contractors that will ensure compliance with the EMS.

GOALS

1. Harvesting Contractors will:

    - Be aware of the commitments of the FPC Environmental Policy;
    - Understand the significant impacts their operations can have on the environment;
    - Understand the environmental objectives FPC is trying to achieve and comply with relevant legislation;
    - Implement all operational controls to protect the environment; and
    - Be able respond to environmental emergencies in the specified manner.

OPERATIONAL CONTROLS

1. Contractors must have the knowledge and skill to behave in an environmentally responsible manner.

2. A contractor shall comply with all other requirements notified by an FPC Authorised Officer for the purposes of environmental protection.

3. A contractor will be instructed by FPC staff on exactly what is needed to comply with the EMS requirement. This will be achieved by FPC conducting on site 'environmental inductions' that cover:

   (i) Environmental Policy;

   (ii) Activities that significantly affect the environment;

   (iii) Procedures (operational controls) that need to be followed to reduce the impact on the environment; and

   (iv) Description and contact procedure for emergencies.

4. The contractor is required to make his/her staff available, as directed by FPC staff, for environmental inductions.

5. If the contractor implements all of the procedures and management practices from this Manual correctly, they will be complying with the EMS. However, the EMS is committed to continuous improvement and the contractor should expect practices to be modified from time to time as operational controls are altered to achieve a more acceptable environmental outcome.

6. Non compliance with the EMS will be investigated using an "EMS Incident Report" that is completed by FPC. The contractor may be required and is encouraged to participate in these investigations.

4.2 SOIL AND WATER CONSERVATION AND MAINTENANCE

4.2.1 Water

BACKGROUND

Uncontrolled harvesting operations could have a negative impact on water quality, through pollution by excessive soil particles, hydrocarbons (oil, diesel and lubricants), harvesting debris and litter. Salt risk areas are carefully managed during the planning stage to ensure that harvesting does not affect the water table adversely. There is the potential to increase water yield in catchment areas through the careful management of forest structure. Through the use of long term Harvesting Plans and careful operational controls, impacts on water quality and yield can be reduced to an acceptable level.

Road drains, culverts and soaks are designed to maintain natural drainage patterns and serve to prevent ponding of water, scouring of surfaces and increasing turbidity loading in streams.

During planning and implementation of harvesting operations, measures must be taken to protect water from unnatural increases in:

1. *Sedimentation* (the deposition downstream from a source of disturbance, of material across the full range of particle size).

2. *Siltation* (the deposition of particles larger than clay but smaller than sand).

3. *Turbidity* (discolouration of water due to suspended silt, clay or organic matter).
4. *Salinity* (the salt content of the water)

Many catchments in State forest are harnessed, that is the water from such catchments is collected in man-made reservoirs for industrial and/or domestic use. It is therefore essential that effective water protection measures be undertaken during all phases of harvesting.

Harvesting operations adjacent to reservoirs require special treatment to prevent turbidity, and care must be taken during all stages of harvesting. The following checklist of rules and guidelines must be observed by the contract supervisors.

LEGISLATIVE REQUIREMENTS

There are a number of Acts and Ministerial Conditions that cover the protection of water resources. It is imperative that Harvesting Contractors comply with the following requirements in addition to Section 4.3.3 Pollution.

GOAL

1. To protect water resources located within the intermediate and rainfall zone.

2. To protect aquatic ecosystems sensitive to rises in saline groundwater in second order catchments with a high salt risk.

3. To minimise stream turbidity and sedimentation during harvesting operations.

4. To not contaminate water and soil with chemicals (including oil, diesel and lubricants).

OPERATIONAL CONTROLS

1. The harvesting contractor needs to ensure only the demarcated areas of trees are harvested because the areas that have been excluded from harvesting often form an important role in protection of water quality and other values. Any variation from an agreed harvesting plan must be reported to the FPC Authorised Officer immediately.

2. A contractor shall take any special measures prescribed by an FPC Authorised Officer for the protection of water purity in water courses in or adjacent to forest areas in which he/she is working.

3. A contractor shall ensure that no timber harvesting machinery or vehicles enter stream reserves other than authorised crossings

4. A contractor shall ensure that no trees are deliberately felled into stream reserves. Trees leaning into stream reserves may only be felled by employing tree jacks. Where trees accidentally fall into stream reserves the crowns of those trees should be left in the stream reserve.

5. A contractor shall ensure that culverts and road drains affected by this operation be kept clean of soil, slash or other debris likely to obstruct the

flow of water. Damage caused to roads by a failure to carry out this instruction will be regarded as damage covered by (Section 9.3 point 2).

6. No harvesting may take place within 500m of the high water mark of any reservoir without prior notification by the FPC to the relevant Water Corporation office.

PROTECTION OF WATER RESERVOIRS

1. Visible turbidity results from soil disturbance and surface erosion on either roads or access tracks. Excessive soil disturbance can occur when the soil is saturated or when powdering of the soil occurs during summer.

2. Roads adjacent to reservoirs shall not be used for hauling if they are likely to become heavily powdered during summer operations.

3. A favourable time for harvesting can be late spring, when the ground is moist but not saturated. This prevents powdering of soil and subsequent turbid runoff.

4. The opportunity for surface erosion to occur is greatest immediately after the disturbance, and decreases with time. Any control measures prescribed to minimise erosion must be well planned and implemented as soon as possible following the disturbance.

5. Winter harvesting adjacent to reservoirs shall be minimised or excluded where possible.

6. Undisturbed filter strips adjacent to reservoirs and major creeks are required to filter water runoff. Depending on topography, the filter strips may need to be wider than the applicable minimum prescribed stream reserve width. The appropriate width will be determined during the coupe planning process by the FPC.

7. Harvesting shall cease within 40 m of reservoirs if turbidity is likely to occur from excessive soil disturbance or erosion caused by the operation.

8. Ablutions shall not occur within 100 m of water reservoir or tributary streams and will be buried to a minimum depth of 15 cm.

4.2.2 Soil

BACKGROUND

Soil productivity can be significantly affected by compaction and disturbance. Compaction reduces the amount of oxygen held in the soil, penetration of water into the surface and restricts root growth of seedlings and established vegetation. The surface of the soil (A horizon) holds a significant proportion of the organic matter and nutrients required by plants to grow. Mixing the top layer of the soil, with the lower horizon of the soil, will affect plant growth and soil productivity.

Erosion of the surface soil not only affects water quality by increasing turbidity and stream sedimentation, it removes the productive horizon of the soil and can potentially reduce site productivity.

Soil damage is specifically defined in this manual as either:

- A horizon (topsoil) removed;
- A horizon (topsoil) mixed with the B horizon (subsoil usually containing clay);
- Severe compaction that will affect germination or growth of plants.
- A combination of the above.

In selectively harvested forest (ie jarrah forest, karri thinning) and karri seed tree operations, soil damage must not exceed 10% in area of any single feller's block or sub coupe, including the landing.

In clearfell situations (ie karri forest) the acceptable limit of soil damage is 20%. Where a "partial cut" or "pre- harvesting" is allowed as part of the clearfell operations a limit of 5% is set for a "partial cut", thus allowing for additional damage up to 15% for the combination of final cut and landings.

GOAL

1. Maintain site productivity and biodiversity within operational areas through management of soil and erosion during harvesting.

2. To minimise stream sedimentation and turbidity due to soil disturbance and surface erosion of exposed soil.

3. The goal of rehabilitation is to establish indigenous native vegetation cover of both understorey and overstorey species. While original site productivity (from a timber production viewpoint) may not always be regained, rehabilitation will ensure the area contributes to other forest values.

4. The success rate of rehabilitation will be determined as 60% stocking at the rate of 2500 understorey seedlings/ha and 625 overstorey seedlings/ha.

OPERATIONAL CONTROLS

1. A FPC Authorised Officer may prohibit all felling, extraction, loading and hauling or particular methods or equipment associated with the operation if the activities are causing or are likely to cause excessive soil damage.

2. If an FPC authorised Officer considers that soil damage is approaching the specified limit in a fellers block then he/she must survey the fellers block using the appropriate soil damage survey technique. If the results of this survey confirm that the level of soil damage has been exceeded or are likely to be exceeded if the operation continues the FPC authorised Officer will stop the operation. This may be at the fellers block or coupe level.

SOIL DAMAGE

If extraction is stopped in a feller's block because of excessive soil damage then it cannot recommence in that block until the FPC Authorised Officer decides that the soil is dry enough. This decision cannot be made until the local Soil Dryness Index exceeds 500 in Northern and 250 Southern forest.

EROSION CONTROL

1. Harvesting contractors must be aware of the potential for soil erosion along firebreaks, extraction tracks and roads during wet weather.

2. Erosion control work will be carried out at any time during the course of harvesting, if rainfall is imminent. Erosion work will be carried out on at the cessation of extraction if rainfall is imminent.

3. When extraction is completed in any feller's block or during temporary cessation of extraction, and prior to machinery leaving, interceptor banks and drains must be constructed across all extraction tracks and disturbed firebreaks with exposed soil, to the standards tabled below.

4. The purpose of these standards is to reduce the speed of water running uninterrupted down extraction tracks, firebreaks and temporary roads. The erosion control specifications are designed to reduce flow and turbidity.

EROSION CONTROL BARRIERS

Specifications for Spacing of Erosion Barriers (metres)		
Slope	**On lateritic gravelly Soils**	**On all other soils**
0-2°	Nil	Nil
3-5°	200	100
6-10°	100	50
11-15°	60	30
16°+	30	15

Specifications for Size and Angle of Erosion Barrier			
Size		**Angle**	**Water Dispersal**
Height	**Width**		
40 cm	40 cm	3%-5%°	Water directed from extraction track into nearby vegetation or trash that can slow the movement of water.

REHABILITATION OF SNIG TRACKS, LANDINGS AND AREAS DENUDED OF VEGETATION WITH SOIL DAMAGE

AREAS TO BE REHABILITATED

1. A contractor shall, at his expense, when so required by an FPC Authorised Officer, repair all soil damaged by timber harvesting. Rehabilitation work shall be carried out during the summer following harvesting to the satisfaction of an FPC Authorised Officer.

2. A contractor shall at his/her expense carry out any measures specified by an FPC Authorised Officer to prepare denuded areas for revegetation. These areas shall include landings, snig tracks, gravel pits and temporary roads used during the timber harvesting operation.

3 If a contractor fails to repair soil damage as required by an FPC Authorised Officer, any necessary work may be done by an FPC Authorised Officer at the contractor's expense and the money expended may be deducted from the contractor's payment under (Section 9.3 point 2).

4. All seed and fertiliser cost will be borne by FPC.

TIME PERIOD FOR REHABILITATION TO OCCUR

1. Rehabilitation of landings will be completed within two years of signing over and final product removal from landings.

2. Major snig tracks will be rehabilitated at time of landing rehabilitation on duplex soils operated under dry or wet conditions.

PREPARATION OF REHABILITATION AREAS

1. The specifications for preparation of landings and snig tracks before seeding shall be:

- Concreted or Dissected Laterite Close to Surface

  On landings with an underlying rock or laterite present, the surface shall be scarified to a depth of 100mm (unless rocky underlayer is closer to the surface).

- Duplex soils Operated in *Dry Conditions*

  On duplex soils, landings and major snig tracks operated on in *dry soil* will be scarified to a depth of 200mm using any suitable machine or implement to facilitate germination of seed.

- Duplex/Deep Loam Soils Operated in *Wet Soil Conditions (including bush stockpiling).*

  On duplex soil operated on *in wet* soil conditions, reserved overburden (not topsoil) shall be respread onto the landing and any irregularities bladed out. All major snig tracks will be bladed level at the same time in dry soil (generally between November and April).

  Top soil (from stockpiling) will be spread evenly over the surface of the landing.

  Landings and snig tracks will then be ripped to a depth of 500mm using one metre spacing and a winged ripper (this will be tested by using a 8mm rod that can be pushed by hand to a depth of 500mm in the rip lines and to a depth of 200mm over 60% of the remainder of the landing).

REVEGETATION OF AREA

1. Revegetation will be achieved by sowing, into recently ripped/scarified landings in autumn before the first rains, with seed of species specified by FPC (as determined by CLM). Selection shall be based on indigenous species to the *local* area. The rehabilitated area is to be simultaneously fertilised with 250kg/ha of di ammonium phosphate.

2. If the Harvesting Contractor believes the proposed rehabilitation area already meets the success criteria, before any preparation/seeding, then the contractor needs to obtain approval from the FPC Authorised Officer to have the area excluded from preparation. The landing/snig tracks will then be signed off.

3. If the area has not been successfully re-established after rehabilitation, the harvesting contractor will be required to take the following action as directed by the FPC Authorised Officer:

    - If a landing is not stocked with understorey but is stocked with overstorey, no remedial action needs to be taken.
    - If the landing is stocked with understorey but not with overstorey, and the FPC Authorised Officer believes it is due to the contactors methods of rehabilitation, infill planting is to be arranged for the following winter at the rate of 625 overstorey seedlings/ha, at the contractors expense.
    - If the landing is not stocked with understorey or overstorey seedlings, and the FPC Authorised Officer believes it is due to the contactors methods of rehabilitation, the landing will be re scarified, re sown with understorey seed and planted with overstorey seedlings at the rate of 625 seedlings/ha in the following winter; at the contractors expense

4.3 HEALTH AND VITALITY MAINTENANCE

The most significant disease affecting forest management is *Phytophthora cinnamomi*, commonly referred to as "Dieback". Other noxious and environmental weeds may also be spread between operations if machinery and equipment is not cleaned down of soil and vegetative matter.

4.3.1 Phytophthora cinnamomi

BACKGROUND

"Dieback" is the destructive root disease that is caused by a fungus (*Phytophthora cinnamomi*). The disease spreads very slowly uphill but quite rapidly across and downhill. The disease lives in plant material and soil so any animal, person or vehicle that is carrying soil or plant material (even the smallest amount) might spread the disease to new places as they shift locations. These new infections will grow, spread and cause increased destruction of plants from the disease.

For full information on management of *Phytophthora cinnamomi* harvesting contractors need to consult "*Phytophthora cinnamomi.* and disease caused by it - Volume 1 Management Guidelines" (Dept of CLM).

The following points provide a brief overview of this document.

- Vehicles and machines must be kept clean of all soil and root material if they are not to be responsible for spreading disease. Removing all soil and plant material by washing, brushing or other means is termed making the vehicle/machine "clean".

- Forest areas determined to have the disease are referred to as "infested". Forest areas that do not have the disease, are referred to as "uninfested". In some areas, it is difficult to tell if the disease is present or not, so it is called "uninterpretable".

- When an area is uninfested (or maybe uninterpretable) the CLM will decide if an area can be protected from the disease during harvesting activities. These areas are referred to as "protectable areas" and to make sure the disease is not introduced, *all vehicles and machines that enter must be 'clean'*. Areas that have not been classed as 'protectable' (meaning it is very unlikely you can keep the disease out) are called 'un-protectable'.

- All the information on how the contractor is required to manage the disease in the harvesting area is provided by an FPC Authorised Officer in a document called the "Hygiene Plan" that has been approved by CLM.

GOALS

CLM specifies the Management Objectives for *Phytophthora cinnamomi* as:

1. Identify uninfested protectable areas prior to operational activities and manage access by people and machines to minimise the establishment of new centres of infestation.

2. Manage already infested and protectable areas in a manner that sustains an appropriate level of environmental and social benefits (refer to CLM Policy Statement No 3 1998).

The Harvesting Contractor will comply with the above objectives if the Hygiene Plan is implemented in full and the following Operational Controls are implemented correctly.

LEGAL OBLIGATIONS

It is an offence under the Forest Management Regulations to:

1. Enter, use or move a potential carrier (soil, plant material) in a risk area or disease area contrary to instruction or direction.

2. Not have written authority to enter a Risk Area or Disease Risk Area (DRA) with them at all times in the required areas or produce it when requested by an FPC Authorised Officer/CLM Forest Officer.
3. Not provide information to an FPC Authorised Person/Department of CLM Forest Officer on occurrence or suspected occurrence of the forest disease.

4. Not stop, when requested, for inspection of the vehicle/machine.

5. Not follow directions to clean down when requested by an FPC Authorised Officer/Department of CLM Forest Officer.

OPERATIONAL CONTROLS

DEMARCATION OF HYGIENE CATEGORIES

1. Dayglo orange tape, (that may look pink upon fading), is used to mark the boundaries between infested, uninfested and interpretable forest.

2. Under no circumstances will hygiene boundary lines be crossed. The Dayglo orange tape will often form a harvesting area boundary and shall also be marked with white crosses or maybe white tape (temporary exclusion zone).

3. If the Harvesting Contractor comes across Dayglo orange tape inside an area he/she believes was one hygiene category, that is in a protectable category, the Dayglo orange tape shall not be crossed. In those circumstances the Contractor must contact the FPC Authorised Officer to determine the management for the area.

RISK AREA OR DISEASE RISK AREA (DRA) AUTHORITY

1. FPC Authorised Officers will provide the Harvesting Contractor with the necessary written authority from a Dept of CLM office to enter a Risk Area or Disease Risk Area.

2. While it is the responsibility of FPC to provide the written authority, the harvesting contractor must not commence without a CLM authority (DRA permit) under any circumstances, as he/she will be committing an offence under the Forest Management Regulations.

3. The 'authority' must be carried at all times and produced upon request by a CLM officer or FPC Authorised Officer.

4. Areas that require this authority are signposted with "NO ENTRY WITHOUT WRITTEN AUTHORITY"

ROADS

1. Roads may be permanently or temporarily closed for hygiene control measures. The harvesting contractor will not open any roads indicated as closed in the Hygiene Plan or with a ROAD CLOSED sign in the field without FPC Authorised Officer consent (and alteration of the Hygiene Plan with the Department of CLM authorisation).

2. Some roads may become closed when vehicles pick up and move soil. These roads are signposted with "ACCESS BEYOND THIS POINT IS

RESTRICTED TO A TIME WHEN VEHICLES WILL NOT PICK UP SOIL.". Harvesting contractors must comply with this requirement at ALL times.

ENTRY INTO PROTECTABLE AREAS - CLEAN DOWN

1. All entry points into protectable areas will be used to clean down vehicles and machines. Clean down points must be clearly signed with, have a clean down point, a gate and a turnaround point suitable for trucks.

2. The standard of clean down of vehicles will be determined by inspection of vehicles, plant and equipment for:

   - Clods of soil and/or
   - Plant roots and material
   - A slurry consisting of soil or water.

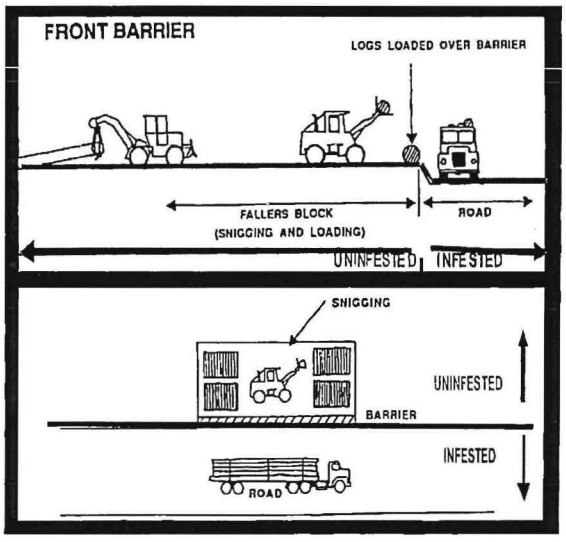
   It does not include dust or grime adhering to the sides of vehicles.

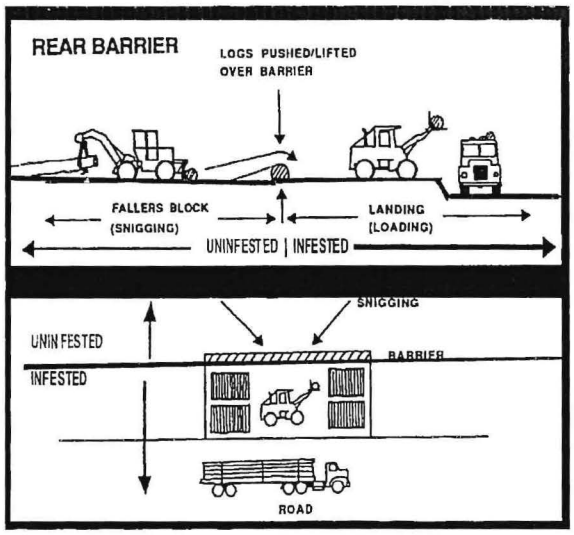
SPLIT PHASE WORK METHODS

1. Split Phase Work Methods are the separation of tasks during an operation in time or space that minimise the chance of spreading the disease.

2. Split Phase Work Methods will be implemented in accordance with the Hygiene Plan.

3. Figure 1 (take from Volume 1 Management Guidelines pg 53) demonstrates the two main method of split phase activities during harvesting.





4. A "Front Barrier" is a physical barrier to the movement of machinery placed at the front of a log landing directly behind the soil disturbance caused by roading. The purpose of this practice is to minimise the risk of infested soil being moved from the road onto the landing. A log of 400mm diameter is required.

5. A "Rear Barrier" is a physical barrier to the movement of machinery placed at the rear of the log landing to separate the activity on the landing from the activity in the rest of the fallers block. All logs from the block are delivered to the landing by being lifted or pushed over this barrier. A log of 400mm diameter is required.

SOIL MOVEMENT DURING EXTRACTION

1. Some areas within the hygiene plan specify that there is to be no soil movement during extraction.

2. The FPC Authorised Officer or a CLM representative may determine that the snigging operation can no longer continue due to soil movement. The harvesting contractor must cease work when instructed and not recommence until approval is provided by the FPC Authorised Officer.

3. The FPC Authorised Officer will provide guidance on what constitutes "soil movement". Soil movement is when clods of soil or slurry (soil and water mixture) is being picked up by the vehicle or machine. It does not include dust and grime adhering to the vehicle or machine. Harvesting contractors are expected to cease work when they suspect they are moving soil in "no soil movement area", contact the FPC Authorised Officer and not recommence work until the FPC Authorised Officer has assessed whether soil movement is occurring.

MOVING BASIC RAW MATERIALS

1. Basic raw materials (BRM) refers to sand, gravel and soil used for roading, pot holing, site works etc.

2. The Hygiene Plan often requires the use of BRM that is certified "*Phytophthora*" free.
3. The harvesting contractor must NEVER use sources of BRM that has not had the hygiene status *certified* in areas, or adjacent to areas specified and in accordance with the Hygiene Plan. This includes even the smallest works, such as potholing.

TRAINING

If CLM or FPC determine that harvesting contractors require training in hygiene management they will attend at their own cost.

4.3.2 Other Pests and Diseases

2. A contractor will take any precautions nominated by an FPC Authorised Officer to prevent the introduction or spread of noxious and environmental weeds during his/her timber harvesting operation.

2. Clean down of machinery and equipment or other practices to prevent the introduction or spread of noxious and environmental weeds will occur before entering a new coupe or operation.

4.3.3 Pollution

BACKGROUND

Pollution is considered to be any off site material that has the potential to contaminate soil and/or water. This includes diesel, oil and lubricants (hydrocarbons) either discharged or spilt during harvesting activities and litter left on site. These are referred to as "contaminants" in the Operational Controls. In water catchment areas, pollution includes human waste (covered in Section 4.2.1 – Water Reservoirs).

GOALS

1. No contamination of water and soil with chemicals or hydrocarbons.

2. No on or off site pollution that can be attributed to operational areas.

OPERATIONAL CONTROLS

1. A contractor is expected to have his/her work area in a tidy and orderly condition at all times, particularly when leaving the area. If a subsequent clean-up is required the work will be done at the contractor's expense.

2. A contractor shall dispose of all litter, food scraps, refuse, unserviceable equipment or machinery, or other debris resulting from his/her operations in the forest areas at such place and in such manner and time as FPC Authorised Officer shall direct.

3. The discharge of used engine oil onto the ground in any forest area is not permitted. If a subsequent clean-up is required the work will be done at the contractor's expense.

4. Fuelling of vehicles and machinery and replacement of hydraulic oils, on site, will be completed within a contained area that is relatively impervious. A 'contained area' means that if a spill occurs, it cannot flow more than a metre in any one direction from the point of the original spill. 'Relatively impervious' means that the spill cannot soak into the soil more than 50cm before the spill can be contained. To estimate this the following examples are supplied;

   Example 1 If a vehicle is being filled and the nozzle falls out of the vehicle, how much diesel is likely to be split on the ground. If it is hand pumped and a maximum of 5 litres will be spilt on clay soil, and be cleaned up immediately, it is unlikely to soak into the soil more than 50cm. However, if the soil is sandy it will move through the profile before it can be cleaned up. Consequently, on sandy soil the operator would need to ensure there is material underneath the area of fuelling eg black plastic or crushed lime to ensure a potential spill will not cause more than 50cm of contamination.

   Example 2. If a fuel trailer containing diesel does not have a hand nozzle with an "automatic off" (if there is no pressure on the nozzle handle, it will close) then there is the potential for a spill caused by the nozzle falling onto the ground and draining a significant quantity of fuel. If the nozzle is left without the automatic off, then the fuel trailer will need to be bunded and the area underneath the tank made impervious. A simpler solution, however, is to remove the risk and have an automatic off switch on the nozzle (as required by the Dangerous Goods Act if greater than 1000L of diesel is stored)

   Any spillage of oil, diesel or lubricants greater than 5 litres must be reported to the FPC Authorised Officer (who will prepare an EMS incident report).

   CONTAINED SPILLS

   1. A 'contained spillage' is one that is not running off site from the original spillage location. If there is a contained, spill of 5 litres or more of oil, diesel or lubricants concentrated in one location, the spill must be cleaned up immediately. If this is not possible the spill must be cleaned up by the end of the working day. The area of contaminated soil will need to be dug up and placed in an impervious, sealable container for removal.

   2. The contaminated soil may be stored on site in an impervious and sealable container (for later disposal off site) or preferably, contaminated soil shall be moved from the site at the end of the day. Disposal of contaminated material must be in accordance with EPA regulations. Contaminated soil must NOT BE BURIED.

3. Some spills, particular hydraulic oil under pressure, may be spread over a large area and there may be no one area with more than 5 litres of oil. These spills will need to be reported to the FPC Authorised Officer, but removal of contaminated soil (with less than 5 litres in one location) will not be required, even though the total volume of oil could be 20 litres or more.

4. Spills that are classed as "Emergencies" need to comply with the relevant plan.

UNCONTAINED SPILLS

1. An uncontained spill is one that moves off site from the original spill area. This may be a rapid or slow process. Methods to contain the spill must be employed immediately.

2. All uncontained spills need to be reported to the FPC Authorised Officer in charge of the harvesting operation..

3. Containment can be achieved by mounding soil, using absorbent material such as 'Oil Soke' or sand. Cleanup of contaminated soil or absorbent material needs to occur as per 'contained spills' once the spill is controlled.

4. Table drains need to be immediately blocked if contaminants are spilled into them and uncontained. Absorbent material is also acceptable to use if it contains the movement of contaminants. Contaminated soil, water and/or absorbent needs to be removed immediately from table drains and any soaks it has entered.

5. Spills that are classed as "Emergencies" need to comply with the relevant plan.

4.4 BIOLOGICAL DIVERSITY CONSERVATION

4.4.1 Flora

A contractor shall comply with all requirements notified by an FPC Authorised Officer with respect to declared rare flora or protected fauna and as specified within the coupe management folder.

4.4.2 Fauna

BACKGROUND

Habitat conservation forms an important role in fauna management. Habitat conservation is achieved by reserving areas of forest during the planning stage in addition to ensuring the critical elements of habitat are conserved over areas that have been harvested. Examples of these reserved areas, or permanent exclusion zones (PEZ) are stream zones or diverse ecosystems. "TEAS" (Temporary Exclusion Areas) strips are areas that have been temporarily protected from harvesting and add to the value of fauna habitat.

One of the critical elements of fauna habitat is the existence of hollows in logs or trees. Hollows in trees are critical for fauna to be able to breed without the predation of introduced species. While many species of fauna use logs for refuge there are some species that cannot protect their young adequately when breeding on the ground. Tree habitat also forms an essential role for many bird species both in terms of a food source (insects) and breeding other requirements. This is why its believed the marking of "habitat trees" in harvested areas plays an active role in maintaining fauna habitat and structural diversity in harvested areas.

"Habitat Trees" may be of two types; those that currently offer refuge for fauna and those that may develop suitable refuges for fauna in the future. The habitat tree is identified by having obvious signs of use by fauna (such as scratch tracks from possums), visible holes and/or broken branch stubs with the potential to develop hollows. Habitat 'trees' may also come in the form of Balga (grass trees) that form an important refuge for ring tail possums.

Ground habitat is found in hollow logs and stumps and mainly used by Chuditch (native cat), Brushtail Possum and Quenda (bandicoot).

GOALS

1. To ensure the sustained availability of suitable refuge sites, particularly for hollow dependent fauna, through the retention of a sufficient number of trees, Balga and ground logs within timber harvesting coupes.

2. To provide for recruitment of habitat trees over time.

OPERATIONAL CONTROLS

1. Habitat trees are marked for retention with an "H" in white paint on two or three sides and shall not be disturbed or damaged during harvesting operations. Felling and extraction activities shall neither damage the crown nor remove bark from the bole (as per crop trees – see 7.2 Crop and Habitat Tree Damage and Protection).

2. Ground habitat logs or stumps may be identified by an "H" in white paint and each side and shall not be disturbed. Permission to disturb logs or stumps must be obtained from an FPC Authorised Officer. If permission is obtained they must not be pushed into heaps.

3. Under no circumstances will any 'skirts' of Balga (grass trees) be lit by contractors or pushed over.

4. Harvesting contractors shall comply with any special management requirements for fauna specified in the Harvesting Coupe Folder.

5. Tops and other residues larger than 7.5 cm diameter and 1 metre length are to be removed for at least 1m around habitat trees groups and ground refuge sites, to ensure subsequent protection from fire.

6. Harvesting debris shall not be placed beneath the crowns of retained habitat trees.

7. Failure to comply with any of the above requirements will be reported as an EMS Incident.

8. A contractor shall not interfere with any activities taking place to control feral animals and comply with any requirements of the feral program within harvesting areas.

9. If, during the course of operations the contractor notices any occurrence of rare or endangered 'flora or fauna', it must be reported to the FPC Authorised Officer.

4.5 MAINTENANCE AND ENHANCEMENT OF LONG TERM SOCIO-ECONOMIC BENEFITS TO MEET THE NEEDS OF SOCIETIES:

4.5.1 Cultural, social and spiritual needs and values

4.5.1.1 *Cultural Values*

BACKGROUND

"Culture" in this section refers to the indigenous and non indigenous heritage values. Areas that are due to be harvested must be checked for non indigenous and indigenous sites. FPC will consult with local indigenous communities to develop harvesting plans that incorporate the values relating to traditional laws, customs and other cultural practices. The result of non-indigenous and indigenous site checks, in addition to other requirements from indigenous consultation, will be encompassed in the harvesting plan for each area.

Variations in the harvesting may include the additional permanent exclusion zones around sensitive sites or values, varying the width of temporary exclusion areas, protecting 'significant' trees, defining felling direction, extraction patterns and varying thinning intensity, residue removal and tops disposal.

GOALS

1. Indigenous and non indigenous sites will be protected.

2. Advice and consultation will be provided to representative indigenous bodies.

3. Harvesting will be implemented in a manner that recognises important features of archaeological, historic, cultural or natural interest.

LEGAL OBLIGATIONS

1. Compliance with the Australian Heritage Commission Act (1975), Heritage of Western Australia Act (1990), Aboriginal Heritage Act (1972) and Native Title Act (1993).

2. Destruction or damage of any indigenous or non indigenous sites is a legal offence and will be treated as such if Harvesting Contractors have not followed management instructions.

OPERATIONAL CONTROLS

1. The Harvesting Contractor will be provided with a Harvesting Coupe Folder that will indicate any areas that are required to be protected for cultural purposes or management practices that will vary from standard requirements.

2. If a Harvesting Contractor, in the course of his/her activities, observes non indigenous sites eg historical landmarks such as old formworks, telegraph poles etc or indigenous site eg artefacts, modified trees, stone arrangements, that appear to have significant value, he/she shall bring such observations to the attention of the FPC Authorised Officer.

3. Harvesting Contractors will attend any cultural training deemed necessary by FPC or the Dept of CLM at their own cost, with the exception of the provision of materials and cost of staff conducting the course.

4.5.1.2 *Visual Values*

BACKGROUND

Visual resource management is based on the belief that the landscape quality is a resource in its own right and should be managed with other values such as fauna and flora. Harvesting can severely impact on the visual landscape without adequate planning and management.

FPC must comply with the CLM Policy Statement on Visual Resource Management on Lands and Water Managed by CLM. Occasionally, requirements of this Policy will influence the management practices of harvesting operations in some areas, particularly those of identified high visual value (based on visual quality, land use, historic features, access and volume of use).

Harvesting contractors will usually see a significant difference in management of Visual Landscape Management (VLM) A zones (the highest landscape value) and some differences in the Visual Landscape Management (VLM) B zones (second highest landscape value) and occasionally some differences in the Visual Landscape Management (VLM) C zone (lowest landscape value).

Variations may include changes in gap size, thinning intensity, retention of understorey elements and other changes specified by the CLM at the planning stage.

GOALS

1. To ensure all uses and activities are planned and implemented to complement rather than detract from the visual qualities of the landscape.

2. To implement harvesting in a manner compatible with the visual resource management (VLM) objectives specified to the VLM zone.

OPERATIONAL CONTROLS

The harvesting contractor will comply with all visual resource requirements specified in the Coupe Harvesting Folder.

4.5.1.3 *Community Relations*

BACKGROUND

From time to time members of the local or wider public may enter harvesting operation sites. Safety of all personnel involved in the harvesting operation and coupe management is paramount. The safety of visitors to the coupe must be considered in all aspects of the operations.

FPC and its harvesting contractors are responsible for the safe working of the harvesting coupe. The Police are responsible for maintaining law and order and ensuring that people can go about their lawful activity without interference from others.

OPERATIONAL CONTROLS

1. FPC Authorised Officers may bring invited visitors to the site for various reasons. FPC is responsible the safety of invited guests and conduct but if the harvesting contractor feels safety is being compromised then he/she shall advise the FPC Authorised Officer.

2. If harvesting contractors wish to bring visitors to the site they shall inform the FPC Authorised Officer in charge of the harvesting operations. In these cases the harvesting contractor is responsible for the visitors' safety at all times.

3. Members of the public may arrive unannounced at harvesting operations. If this occurs, the harvesting contractor shall contact FPC and advise that people are on site and that work is or may be affected by their presence. If there is any concern about the safety of the harvesting crew or the members of public on site the harvesting contractor shall cease work until FPC representative arrives.

4. At all times the harvesting contractor must;

   (a) be courteous to all parties;

(b) contribute to effective communication and liaison with all parties; and

(c) not manage members of the public directly without FPC permission.

4.5.2 Research and development to improve forest management

4.5.2.1 *Scientific Plots*

BACKGROUND

Scientific plots are essential for obtaining both short and long term information on a variety of forest management practices. Damage to scientific plots is not only a financial cost but it can cause irretrievable loss of information on past forest management practices and their effect on the future.

GOAL

1. Scientific plots will be protected during operational activities.

OPERATION CONTROLS

1. Scientific plots requiring exclusion from harvesting will be marked by an FPC Authorised Officer with painted white crosses. Harvesting contractors will not carry out any activities within these areas, including extraction unless authorised by an FPC Authorised Officer.

2. Over 230 permanent increment plots are located throughout the karri forest. These plots range in size from 30m by 30m to 70m by 70m and are identified in the field by five star pickets, one at the plot centre and one at each corner. All trees within the plot are tagged. Harvesting contractors must take care not to disturb these plots and maintain a distance of 25 m from plots. If the plot has not been marked with white crosses by FPC then contractors must maintain at least a 25 m buffer around the plot until an FPC Authorised Officer can demarcate the plot.

SECTION 5
Harvesting Operations

5: HARVESTING OPERATIONS

BACKGROUND

The sections on "Principles of Native Forest Management", "Safety and Health" "Environmental Management" and "Silviculture" outline the number of different requirements that need to be met during harvesting operations. Each of these sections outline the goals to be achieved. At the same time felling, extraction, loading and haulage must meet contractual requirements to the customer. None of the goals and operational controls outlined in the previous section must be compromised in order for the Harvesting Contractor to meet production targets. Any changes to the specified operational controls need to be approved by an FPC Authorised Officer or.

GOAL

Harvesting operations will be completed in accordance with the Timber Harvesting Plan meeting all silvicultural, safety and health and environmental requirements.

5.1 PRE HARVEST INDUCTION

BACKGROUND

The pre harvest induction is designed to allow the Harvesting Contractor to obtain all the information necessary to meet the forest management requirements of a specific coupe. The written information is provided in a "Coupe Harvesting Folder" and will be handed over during the verbal induction provided by an FPC Authorised Officer. The induction will cover the following areas:

Coupe Base Map Scale 1:25000
Interpreters Report
Hygiene Plan (include Hygiene Management Map showing road location and Concept Burn plan)
Non Indigenous Cultural Sites Records
FPC 109 (Pre harvest Checklist/Harvest Authorisation, include Fauna Predictive Form)
FPC 709 (LOIS Operation)
FPC 104 (Coupe handover and Certification)
FPC 105 (Inspection and Action)
FPC 107 (Crop Tree Damage Survey)
FPC 108 (Soil Damage Survey)
Hygiene Compliance Record
Rare Flora Report
Coupe Control Map

White painted crosses facing into the cutting area will show the coupe boundaries. These are management boundaries which may, but do not necessarily, coincide with the boundaries of formal or informal reserves such as stream zones, old growth forest or diverse ecotype zones.

UNDER NO CIRCUMSTANCES WILL A HARVESTING CONTRACTOR CONDUCT ANY OPERATION PAST THE WHITE CROSSES WITHOUT SIGNED APPROVAL FROM AN FPC AUTHORISED OFFICER.

Failure to observe white crossed coupe boundaries is considered a serious offence, and will be reported as an EMS Incident (See Section 9.1). Continued failure to observe coupe boundaries will be considered a Breach of Contract.

GOALS

1. All specific management requirements before commencing a harvesting operation will be covered by an induction conducted by an FPC Authorised Officer with the contractor. This will involve reconnaissance in the field to indicate any special requirements and show locations of coupe management boundaries.

2. Coupe boundaries (white crossed boundaries) will be identified and will not be crossed during the harvesting operation.

OPERATIONAL CONTROLS

1. The harvesting contractor must make a representative available to undertake a pre harvesting induction.

2. The contractor must not commence harvesting operations until a pre harvest induction has been completed by the FPC Authorised Officer.

3. The harvesting contractor must keep the Harvesting Coupe Folder accessible to all crew members affected by the management requirements. Necessary inductions of crew members must be completed before the operation commence.

4. The Harvesting contractor must ensure all coupe demarcation boundaries (particularly white crossed coupe boundaries) are clearly identified and all harvesting crew members instructed of their location.

5. A Harvesting contractor must ensure that all crew members have been briefed on Hygiene Plan requirements. This should occur before entry into the coupe if it is a "clean upon entry" requirement.

6. A Harvesting contractor must demarcate fellers blocks and identify additional hazards not documented on the FPC 111 (Hazard Identification Handover).

7. Harvesting contractors must report <u>all</u> crossings of coupe management boundaries (white crossed boundaries) to the FPC Authorised Officer.

5.2 SHUNT CONSTRUCTION

BACKGROUND

"Access" refers to any major roads, tracks or shunts used during a harvesting operation.

FPC will determine the condition and standard based on safety, environmental and economic considerations.

Harvesting contractors may be required to construct 'shunts'. A shunt is a temporary access from existing roads to ensure effective extraction.

GOAL

To minimise the construction of shunts in harvesting operations and contain operations to designated access routes.

OPERATIONAL DETAILS

1. A contractor and all persons authorised by him, in carrying out all aspects of an operation, shall follow and use only such paths, tracks and roads in the forest areas as may be indicated to him by an FPC Authorised Officer.

2. A contractor must ensure that all major roads as nominated by an FPC Authorised Officer are left open at the cessation of work each day, or if required, during the day, to allow access for fire control and administrative purposes. All other roads and tracks in a coupe or sub-coupe may be blocked in the course of harvesting operations but access must be restored to the satisfaction of an FPC Authorised Officer upon completion of harvesting.

3. All tops, slash and other debris generated by the operation shall be cleared from roads, firebreaks, landings and harvesting tracks or as directed by an FPC Authorised Officer.

4. No shunts will be constructed without FPC approval.

5. An FPC Authorised Officer will jointly determine the location of a shunt. This shall be marked with a blue and white striped tape with a right angle T to indicate the end of the shunt.

6. Construction of the shunt will be to specified standards provided by the FPC Authorised Officer and at the contractor's expense.

7. Shunts that require rehabilitation due to soil damage will be rehabilitated within two years of closure (see Section 4.2.2)

8. Under no circumstances will the Harvesting Contractor access gravel pits for pot holing or other uses until the hygiene status of the pit has been determined and the gravel use authorised by an FPC Authorised Officer.

5.3 SCRUB ROLLING – FOR TREEMARKING AND FALLER SAFETY

BACKGROUND

Scrub rolling refers to the practice of laying down understorey to enable access for treemarkers and/or for fellers safety. Scrub rolling for treemarking is completed when scrub density and height makes foot access and visibility too limited to complete treemarking. Scrub rolling in this instance is only to provide walking access lanes, while scrub rolling for fallers safety is usually more extensive and is dependant on the fellers' need.

GOALS

1. To complete scrub rolling for treemarking in adequate time to allow FPC Authorised Officers to stay ahead of fallers operations.

2. To complete scrub rolling for fallers in adequate time to allow fellers to stay ahead of harvesting operations.

OPERATIONAL CONTROLS

1. If pre-felling scrub rolling is required by the contractor for safety and felling reasons, it will be carried out by the harvesting contractor at the contractor's expense.

2. Scrub rolling needs to be completed in sufficient time for all operations in the authorised coupes to proceed with safety.

3. In the event that scrub rolling needs to be carried out for safety reasons and access for tree markers, then scrub rolling will be carried out at the contractors expense. The scrub rolling must be completed in time for treemarkers to remain sufficiently ahead of harvesting operations. Contractors will be paid at a separate rate for pre harvesting scrub rolling if only required for treemarking purposes.

4. If there is any unresolvable difference in opinion between the harvesting contractor and the FPC Authorised Officer with respect to the allocation of scrub rolling cost (for tree marking or safety reasons) the final decision will lay with the FPC Safety Officer.

5. When scrub rolling scrub shall be rolled flat rather than bladed out. Limited blading out is acceptable up to 1m from trees to be felled.

6. Scrub Rolling will be completed in compliance with the Hygiene Plan.

7. Scrub rolling will minimise disturbance to soil and established jarrah lignotubers.

8. Scrubrolling must avoid damage to trees. Crop tree damage will not exceed 5% for the total harvesting operation (see Section 7.2). If excessive crop tree damage occurs during scrub rolling it will be impossible for harvesting operation to comply with the required standard. It is recommended that there should be less than 2% crop tree damage occurring at the scrub rolling phase. Excessive damage will be reported as an Incident under the EMS (see Section 9.1).

9. Balga and potential habitat trees will no be pushed over during the scrub rolling operation.

10. Scrub rolling can have a significant impact on the environment and should only be used on a needs basis, not as a standard operation practice.

5.4 LOG LANDING LOCATION, PREPARATION AND DRAINAGE

BACKGROUND

Landing location, preparation and drainage can have a significant influence on the environment, safety and efficient management of the extraction and loading process.

GOAL

1. While providing a safe working area, the number, size and environmental impacts of landings will be minimised.

OPERATIONAL CONTROLS

1. Landings must, whenever possible be located on old landing sites from past harvesting activities or in natural openings.

2. Landings must comply with Hygiene Plan requirements. The requirement for landings eg. rear or front barriers, needs to be considered in the planning phase to ensure suitable sites are chosen.

3. Landings must be planned and marked (using the same techniques for extraction tracks) by the contractor, subject to approval by the FPC Authorised Officer.

4. Landings should be flat, however, slightly sloped landings are ideal when they direct drainage into a managed drainage system eg table drains entering soaks.

5. Slopes greater than 8 degrees shall be avoided.

6. Landing drainage, particularly on sloping sites, needs to be considered during planning stages. The surface of the landing needs to ensure that water flow off the landing is into designed table tables and does not cause excessive ponding or surface water erosion, eg. using a diversion mound to direct and slow the movement of water on the landing surface.

7. Landings should not be located in front of large table drains, or drainage batters, thus avoiding making loading away from the landing difficult, and avoiding damage to the designed off coupe drainage.

8. Landings shall not be located on stream reserve boundaries unless approved by FPC Authorised Officer. Coupe layout should allow for landings to be at least 20m upslope from stream reserve boundaries.

9. Landings shall be kept as small as possible and only one landing should be allocated to each feller's block or sub-coupe.

10. Landings must, whenever possible, be positioned in existing gaps in the forest, to minimise loss of crop trees and areas with natural regeneration eg jarrah lignotubers. Landings established and used in dry soil conditions should only "lay over" jarrah lignotubers.

11. Cleared debris must be removed from the landing to a minimum distance of 50 metres along snig tracks behind the bush landing, at least 5 m away from retained crop trees.

12. Logs used in bush landing construction must be less than second grade sawlog in quality. The FPC does not charge stumpage for such logs. Whenever possible, logs used in bush landing construction shall, upon completion of harvesting, be sold as firewood, charcoal logs, or other low grade industrial wood products.

13. For landings on deep loam soils or duplex soils (not lateritic soil type), which are operated on in wet conditions, the topsoil must be removed, to a maximum of 100mm depth, and neatly stockpiled to one side to avoid mixing with subsoil horizons. This topsoil must be protected and not mixed or covered with harvesting debris.

    On all other soil types removal of understorey scrub vegetation and topsoil is not permitted unless written approval is given an FPC Authorised Officer.

14. Landings can be closed at any time by an FPC Authorised Officer if he/she considers hygiene, soil disturbance or erosion requirements are not being met.

5.5 FELLING

BACKGROUND

The Forest Products Commission has an interest in felling techniques and methods to ensure that removal of forest products is achieved in a safe manner with minimal damage to retained trees and maximum utilisation of forest products.

GOAL

1. To safely fell the correct trees, in the right location, with minimal damage to standing trees while maximising forest product utilisation.

OPERATIONAL CONTROLS

FALLERS BLOCK

1. The Harvesting Contractor is responsible for marking fellers block in orange tape and recording feller details.

2. Control of felling is by the system of fellers' blocks, ie the allocation of areas of forest in approved coupes or sub-coupes to individual fellers or individual tree harvesting machines.

3. The size and shape of a feller's block can vary, depending on the quality of forest, terrain, access or other factors.

4. Normally, all products in a feller's block will be extracted to a single landing, on the edge of that block.

FELLING

1. Trees to be retained or removed will be marked or otherwise indicated by an FPC Authorised Officer (Section 7.1). All other trees in the coupe are to be felled if in the opinion of an FPC Authorised Officer, they contain a forest product designated under the conditions of the contract.

2. All trees felled must be utilised to the satisfaction of an FPC Authorised Officer

3. A contractor shall not fell, damage or utilise any tree marked for retention (see Section 7.2)

4. If a contractor wishes to remove a marked tree to assist in the operation, for example to widen vehicle tracks or extend landings, approval needs to be obtained from the FPC Authorised Officer. Crop or habitat tree markings (white paint) will be removed and initialled by the FPC Authorised Officer.

5. Trees leaning out of the coupe and across the coupe boundary must not be felled unless specifically marked for removal by an FPC Authorised Officer with a yellow paint mark. Trees leaning into road, stream, amenity reserves, National Parks or Conservation Reserves authorised for removal may only be fallen using approved tree jacking systems.

6. Trees outside of the coupe that need to be felled for safety reasons, must be treemarked by a CLM Forest Officer as required under Forest Management Regulation 20.

   A contractor shall incur penalties at rates determined by the General Manager for any wood contained in any trees illegally felled by him. Such trees shall remain the property of FPC.

7. Where standing trees marked for retention are damaged by the contractor they shall be liable for such damage at rates determined by the General Manager. Such damaged trees shall remain the property of FPC.

8. Crop trees that have had more than approximately 50% or more of their tops damaged should be felled after the FPC Authorised Officer has removed crop tree marking.

9. Trees which have been scarfed or part-scarfed shall not be left standing. If this is not possible, eg because of a mechanical breakdown, the harvesting supervisor on the site and/or a FPC Authorised Officer must be informed immediately. Arrangements must then be made to fell the tree at the earliest possible opportunity.

10. "Hangups" shall be dislodged and cut-off tops shall not be left leaning against standing trees.

11. All fellers employed by the contractor must hold a current feller's identification code under the provisions of Part 4 of the Regulations.

STUMP HEIGHT

1. Trees shall be felled so that the stump height balances the need for maximum safety and utilisation.

2. Stumps must be as low to the ground as possible, provided safety is not compromised.

3. For a solid mature tree, the stump shall not be higher than approximately 45cm above the ground at the base of the tree on the uphill side. (45cm is approximately "knee height"). Where mechanical harvesters are being employed the maximum stump height should be no more than that required to effectively operate the felling head.

4. For solid regrowth trees, including trees cut for poles or mining timbers, the stump shall not be higher than approximately 7cm above the ground at the base of the tree on the uphill side.

5.6 IN-FOREST TREATMENT BY FALLERS

BACKGROUND

"In-forest treatment" refers to the process of applying sawcuts to a felled tree in order to prepare logs ready for measurement, prior to transport.

In integrated harvesting operations it is theoretically possible for over 20 different log product types to be produced by the one harvesting contractor from the one area at the one time.

It is essential for harvesting contractors to have a sound understanding of:

(i) The specifications of the various log products.

(ii) Relative value of different products

(iii) The relative priorities for production of the different log products.

(iv) The basic rules to be observed in producing logs from trees that have the potential to produce more than one log product.

Terms used in this process include "crown cutting", "long butting", "queen cutting", "docking" and "trimming". Definitions of these and other terms may be found in the "Log Faults" booklet by Clarke and Ellis (1989).

To assist harvesting contractors and FPC staff involved in timber production, "In-Forest Log Treatment" guidelines have been written. These guidelines, reproduced below, are particularly relevant to operations required to produce both first and second grade sawlogs.

GOAL

1. To maximise utilisation of forest products.

OPERATIONAL CONTROLS

1. All logs shall be trimmed to remove all limbs flush with the log including epicormic twigs and branches with foliage attached.

2. All felling, trimming and crosscutting shall be carried out to ensure maximum log utilisation to current log specifications as laid down by the General Manager. Where in the opinion of an FPC Authorised Officer log preparation results in excessive waste, a contractor shall be liable for payment for such waste at rates determined by the General Manager.

3. A contractor may be liable to pay FPC for all wood not cut in accordance with this Manual and in accordance with an FPC Authorised Officers' instruction at rates determined by the General Manager.

4. At the stump, after felling a tree, the feller must attempt to crown cut the tree at a point either:

   (i) where the crown end of the log displays 30% millable wood (this corresponds to the minimum standard for a second grade sawlog), or

   (ii) if the wood quality is better than the 30% millable limit, where the diameter under bark reaches the minimum crown end diameter specified in the applicable contract of sale, or

   (iii) where an unacceptable bend occurs, beyond which there is insufficient log length to make a saleable product.

5. At the stump, the butt end of a felled tree must not be docked if it displays a minimum of 30% millable wood or more. If the butt end does not display a minimum of 30% millable wood, the faller must attempt to dock the butt end of the log at a point corresponding to 30% millable wood.

   (i) No further docking of logs in the bush is permitted without the approval of the FPC Authorised Officer.

   (ii) All logs meeting the above standard must be snigged to a landing before further treatment.

MULTIPLE GRADE ("BOLE SAWLOG")

1. Each tree bole felled must contain at least one 2.1 m length of second grade sawlog.

2. The "top" of each tree felled will be cut at "crown break" then, as necessary, crowned off to a point corresponding to 30% millable wood and a minimum of 1.2m of straight wood at the crown end.

3. The "bottom" of each tree felled will be long butted to 25% millable wood.

4. No shattered wood is permitted.

5.7 EXTRACTION

BACKGROUND

Extraction or transporting of forest products to a processing point eg landing is an activity that can have significant effects on the environment, damage to standing trees and production rates.

Soil can be significantly effected by extraction due to mixing and compaction. Temporary clearing of vegetation along extraction tracks can increase surface run-off and erosion causing turbidity.

Consequently, extraction can have a significant effect on soil damage and water turbidity (see Section 4.2). Excessive soil erosion and the creation of extraction tracks could potentially increase the cost to the harvesting contractor through the increased requirement of erosion barriers (see Section 4.2.2) and rehabilitation of damaged soil on extraction tracks. The soil carrying capacity of extraction machinery also provides the potential for the spread of dieback when compliance with hygiene requirements does not occur.

GOAL

1. To minimise soil and crop tree damage while maintaining effective extraction of forest products.

OPERATIONAL CONTROLS

1. Extraction track patterns in individual feller's blocks or sub coupes must be planned, and may be physically demarcated, if necessary, by the contractor. Extraction tracks shall adopt a herringbone pattern leading downhill whenever possible. Extraction tracks may be indicated using red and white flagging tape together on individual trees or bushes.

2. No extraction machine may enter a road, stream or amenity reserve without the specific approval of an FPC Authorised Officer. Where approval is given, for example to remove a dangerous or leaning tree which has been felled, the extraction machine must make maximum use of winches, and take every effort to minimize disturbance to ground covering vegetation.

3. An FPC Authorised Officer may determine the priority of extraction of products from time to time. A contractor shall comply with an FPC Authorised Officer's expressed priority of extraction. This priority may be expressed as type of log, point of removal, hygiene requirements, and/or deadline for delivery.

4. All extraction is to be carried out without damage to retained standing trees. Where standing trees marked for retention are damaged by him, a contractor shall be liable for such damage at rates determined by the General Manager. Such damaged trees shall remain the property of FPC.

5. An FPC Authorised Officer may, at his/her discretion, prohibit all extraction or particular methods of extraction or particular items of equipment used for extraction, at such times and places as in his/her opinion are causing, or are likely to cause, excessive soil damage or excessive crop tree damage. A contractor shall not carry on extraction at such times or such places, or by methods or equipment which a FPC Authorised Officer has prohibited, until such prohibition has been revoked by a FPC Authorised Officer.

6. At the completion of extraction or during temporary cessation of extraction, erosion control work must be completed. All extraction tracks and temporary roads subject to erosion will have cross drains installed as prescribed by Section 4.2.2.

5.8 LANDING MANAGEMENT AND LOG SEGREGATION

5.8.1 Treatment of Logs on Landings

BACKGROUND and GOAL (see Section 5.6) "In-forest Treatment - Fallers"

OPERATIONAL CONTROLS

1. On the bush landing, all docking will be the responsibility of the FPC Authorised Officer. This does not mean that he must be present every time the harvesting contractor wishes to dock a log. Rather, the FPC Authorised Officer will ensure the harvesting contractor's employees fully understand the

difference between the various log products, and the value and importance of sensible docking to maximise length and minimise waste.

2. On the bush landing, docking will be minimised in an attempt to:

   (a) maintain a greater average sawlog length, and

   (b) reduce the volume of docked waste at log landings.

3. If docking is thought to be necessary, the following rules shall apply with respect to the production of first grade and second grade jarrah sawlogs.

   (a) For logs less than or equal to 5.0 metres in length:

   Attempt to sell the log unaltered as a first grade sawlog. (ie a log with a minimum of 50% millable wood as assessed on the worst end face).

   If the log cannot be sold as a first grade sawlog, consider docking up to 0.6m from one end only to produce a first grade sawlog.

   If it is considered that more than 0.6m needs to be docked to produce a first grade sawlog, sell the whole log as a second grade sawlog.

   (b) For logs greater than 5.0 metres in length:

   Attempt to sell the log unaltered as a first grade sawlog.

   If the log cannot be sold as a first grade sawlog, consider docking up to 0.6m from one end only to products a first grade sawlog.

   If it is considered that more than 0.6m needs to be docked to produce a first grade sawlog, consider docking to produce a short second grade sawlog and a longer first grade sawlog, or vice versa.

4. If docking is thought necessary for karri and marri logs, the following rules shall apply:

   (a) Karri first grade sawlogs - no docking is to be undertaken if the resulting second grade sawlog is less than 3.0m in length. The log length considered for the production of both first and second grade sawlogs shall not be less than 6.0m prior to docking.

   (b) Karri second grade sawlogs - where potential second grade sawlog is evident in otherwise chip or third grade logs, docking shall be done to produce second grade sawlogs down to the minimum 2.4m length.

   (c) Marri sawlogs - the docking of marri logs to produce sawlogs shall be attempted if the lower grade product remaining is no less than 3.4m in length. The minimum log length considered for docking to produce a sawlog shall be no less than 6.0m. In the situation where there is no marri chip market the docking should be completed to maximise sawlog recovery (that is, the minimum chip log length does not need to be obtained.

5. Where log products of lower quality can be sold, the rules listed above shall be adjusted to accommodate the minimum specification for those log

products. For example, both the butt end and crown end of logs prepared at the stump will need to correspond to the minimum standard for the lowest quality log product, thereby replacing the 30% millable specification listed above.

MULTIPLE GRADE ("BOLE SAWLOG")

1. Bole sawlogs are not to be cut into multiple lengths on the landing.

2. The only exception to the above rule is when bole sawlogs need to be cut to facilitate loading on trucks eg logs are too long. In this situation the separated logs need to be clearly marked by the landing operator to ensure the mill is able to account for the full bole sawlog on delivery.

5.8.2 Log Segregation on Bush Landings

BACKGROUND

"Log Segregation" is the practice of sorting or separating logs on a bush landing into different products prior to loading out.

Log segregation is an integral part of in-forest treatment, hence requires the same knowledge of product specifications and relative product values or priorities.

Correct log segregation with clearly marked product types enables harvesting contractors and FPC to demonstrate efficient and effective utilisation of wood resources to external bodies.

GOAL

1. To clearly mark and segregate different forest products to ensure efficient loading of correct products and to demonstrate competent management of wood resources.

OPERATIONAL CONTROLS

1. Log segregation is the responsibility of qualified harvesting contractor personnel, however, an FPC Authorised Officer may be required to mark or brand doubtful logs prior to loading out.

2. Different grades of logs may need to be marked for identification purposes, either on a bush landing or on a truck. Lumber crayon shall be used as follows:

    - FPC Authorised Officer - yellow lumber crayon or yellow paint
    - Contractor personnel - white lumber crayon or white paint
    - First grade sawlogs - number "1"
    - Second grade sawlogs - number "2"
    - Third grade sawlogs - number "3"
    - Chiplogs - "CHIP"
    - Charcoal logs - "CHAR"
    - Bole Sawlog – "BS"
    - Bole Residue log – "BR"
    - Residue log -"R"

5.9 LOADING AND DELIVERY

BACKGROUND

The safe loading practices of forest products that meet specifications to approved customers is of significant interest to the Forest Products Commission. While FPC do not specify the type of trucks and loading systems used, it will monitor and ensure loading and delivery methods meet required regulations with minimal environmental impact.

GOALS

1. Loading and delivery will be conducted in a manner that meets safety, product specification, environmental and regulatory requirements.

OPERATIONAL CONTROLS

1. An FPC Authorised Officer may determine the priority of loading and delivery of forest products from time to time. A contractor shall comply with an FPC Authorised Officer's expressed priority of loading. This priority may be expressed in type of log, point of removal, hygiene requirements and/or deadline for delivery.

2. FPC, at all times, maintains control to and from the workplace on designated harvesting roads.

3. The standard of road constructed by FPC will be consistent with safety, environmental and economic objectives. Contractors will be expected to operate truck configurations that match the standard of road construction.

4. Harvesting contractors engaged by the FPC to transport log resource from native forest may be required under contract to provide trucks that are fitted with approved Central Tyre Inflation (CTI) systems or similar system. As a minimum requirement the system must be fitted to the drive wheels of such vehicles.

   The tyre pressure schedule applicable is as follows, or as amended by the Tyre and Rim Association of Australia.

   Tyre Pressure Schedule (applicable to standard 11.00 tyres fitted to standard road trains)

Laden on Highway	100 psi	max speed 100 kph
Unladen on Highway	50 psi	max speed 100 kph
Laden off Highway	50 psi	max speed 50 kph
Unladen off Highway	30 psi	max speed 70 kph
Start up Laden off Highway	30 psi	max speed 15 kph.

   Contractors must provide training in the correct use and full understanding of the CTI system and enforce the correct use of the system.

5. Access to the loading points within the forest areas may be restricted by an FPC Authorised Officer at any time by:

   (a) nomination of the route to be followed by loaded and empty trucks when entering and travelling through areas controlled by FPC;

   (b) nomination of hours of any day during which work may be carried out;

   (c) nomination of the days of the week during which work may be carried out; and

   (d) suspension of delivery because of disease control requirements, road conditions and/or weather conditions.

6. Loading and delivery of logs and other forest products shall be carried out with a minimum of damage to standing trees. Where standing trees marked for retention are damaged by him a contractor shall be liable for such damage at rates determined by the General Manager. Such damaged trees shall remain the property of FPC.

7. A FPC Authorised Officer may at his/her discretion prohibit loading and delivery or particular methods of loading and delivery at such times and places as in his/her opinion are causing, or are likely to cause, excessive soil damage, excessive crop tree damage and/or excessive road damage. A contractor shall not carry on loading and delivery at such times or places, or by methods or equipment which an FPC Authorised Officer has prohibited under this subsection, until such prohibition has been revoked by a FPC Authorised Officer.

8. Trucks used for haulage will comply with all regulatory requirements.

9. Truck drivers are responsible for the safe loading of their trucks in regard to overloading, overwidth and height, overlength and load security and are responsible for the loss of a load or part thereof.

10. Protruding limbs, loose bark or trailing debris of any kind on trucks is not permitted and must be removed by the driver before leaving the loading point or immediately when noticed "en route".

11. The driver shall stop and check the safety of the load at least once while travelling to his/her destination. The driver must stop and check the safety of the load before entering a major public road.

12. The loss of any log or logs from a load during hauling must be recovered promptly by the contractor and any cost incurred in the recovery is the responsibility of the contractor. If the log or logs have fallen into unharvested forest either in or outside the harvesting coupe retrieval can only occur following the approval of the FPC Authorised Officer.

13. Speed limits as laid down by the Police Department will apply on both public and forest roads. The General Manager reserves the right to introduce lower speed limits on any or all forest roads in the interests of greater safety of operation or to lessen damage to the road. All speed limits must be adhered to.

Where drivers come under notice of an FPC Authorised Officer for speeding on forest roads, or are persistent offenders, such offence may be regarded as grounds for the FPC Authorised Officer to raise objection to the continued employment of that person in the forest. In addition it may be regarded as a breach of contract.

14. A FPC Authorised Officer and/or Inspector under the Occupational Safety and Health Act may require a contractor to provide and install suitable signs on roads to warn road users of the presence of log hauling trucks.

15. Standard double-sided reflective warning triangles shall be carried by all haulage vehicles and shall be displayed, if a vehicle breaks down, as follows:

    (a) one triangle 100-150 metres in front of the vehicle and 1.5 metres out from the road edge on the same side as the vehicle;

    (b) as for (a) but to the rear of the vehicle;

    (c) one triangle alongside the mid point of the vehicle on the side nearest the centre of the road.

16. A Contractor must obtain the necessary Main Roads Western Australia and local municipality authorisation for any public road used during transportation.

17. When haulage takes place on privately maintained roads, any road user regulations or road maintenance charges in force for such roads must be adhered to strictly.

18. On dusty roads, drivers are to keep a suitable distance apart to allow other traffic and road repair crews better visibility.

19. The contractor shall obtain the name of the coupe or operation from which the logs will be removed before removal.

20. The Contractor must ensure all truck drivers know the exact name of the coupe or "operation" from which their load of logs has been extracted. A diamond shaped yellow sign, with sides 400mm long with 50mm black lettering shall be placed at a height of 1.8m at the coupe entrance or on the log landing by the contractor (sign supplied by FPC).

21. When logs are being sold by individual measurement to a customer, the FPC's harvesting contractor is responsible for measuring individual logs and must record the following information on the end of each log measured :

    (i) The complete D/Note number

    (ii) Log Number (for that D/Note)

    (iii) Length

    (iv) Diameter

    The Delivery Notes shall be completed with the correct measurement details against each log number.

22. Individual measurement is not required for mills that receive forest products by weight or bin measurement.

23. The FPC Authorised Officer may stop haulage on any road in State Forest if, in his/her opinion, continued haulage is likely to result in damage to the road, excessive turbidity in adjacent streams or the spread of *Phytophthora cinnamomi*.

24. Traffic control signs must be supplied and erected along log hauling routes by the contractor as required by the FPC Authorised Officer and in conformance with the Main Roads of Western Australia requirements.

5.10 CLOSURE OF LANDING

BACKGROUND

"Closure of Landing" occurs when extraction of all saleable products has been completed and the harvesting contractor wishes to leave the fallers block or operational area. "Residue" refers to any products that meet specifications but are currently unsaleable due to lack of a market. Residue may be left within the harvesting area on the landing. This section deals with how to close a landing and leave residue forest products on the landing.

GOAL

1. To prepare the landing to enable future saleable products to be accessed with ease, protect surrounding crop trees and future saleable products from fire and present the landing in a manner that allows future customers, FPC, and auditors a clear picture of products on the landing.

OPERATIONAL CONTROLS

1. At the completion of loading out, the contractor must ensure that all unsaleable log products generated on the landing during the harvesting operation, are neatly stacked at the front and middle of the landing.

2. Any residue must be stacked in common product groups and marked with their product type. For example. If there are residual third grade and Charcoal logs on the landing then the second grade logs need to be stacked together and the occasional log marked with "3" in the same manner the stacked charcoal logs will be marked with "CHAR" (including separate piles of "green" Charcoal logs.

3. The stacking of products needs to be completed in a manner that will enable rehabilitation of the landing to occur with minimal movement of log products.

4. Stacks shall not be closer than 5 meters from any retained crop trees.

5. Any remaining log debris (eg long butts) and debris greater than 75 mm diameter and 2.5 meters in length is to be removed form the landing to a minimum distance of 50 meters along snig tracks behind the landing.

6. The rear of the landing shall be blocked off with low value residue products to stop access to extraction tracks.

7. ALL litter will be removed from the landing and surrounding area.

8. At the completion of extraction, loading and cleanup the landing will be signed off as complete (using FPC104) by the FPC Authorised Officer.

5.11 STOCKPILING

BACKGROUND

Bush stockpiling is the practice of stockpiling unprepared logs in the forest to supplement mill stockpiles and is important in native forest harvesting operations. Stockpiling is not the process of stacking residue logs for future sale. Bush stockpiles are not designed to replace mill stockpiles, but are to enable the harvesting contractor to continue log haulage during periods of the year when extraction is not permitted. Mill stockpiles will always be preferred to bush stockpiles.

Stockpiles DO NOT refer to residue products on a landing.

GOAL

1. To comply with any stockpiling requirements specified by FPC and CLM

OPERATIONAL CONTROLS

1. The contractor must obtain permission for bush stockpiling from the FPC Authorised Officer. Bush stockpiling of native forest sawlogs shall not start before the onset of cooler weather in early autumn, which coincides with a reduction in activity of the bardi grub (*Phoracantha semipunctata*).

2. The location of bush stockpiles must be approved by the FPC Authorised Officer. Bush stockpiles must be located in areas accessible in all weather conditions.

3. All native forest sawlogs in bush stockpiles shall be removed to a mill by 15 October in any year.

4. A firebreak of 4m width must be constructed around every bush stockpile.

5. Stockpiles must be registered and documented by the FPC Authorised Officer.

6. Harvesting contractors shall assist in determining estimated quantities by product type for each landing, and location of landings.

7. If landings for bush stockpiles are to be used in wet soil conditions (even when harvesting is in dry soil), they must comply with requirements specified in Section 5.4, point 13.

SECTION 6
Administration

6: ADMINISTRATION

6.1 CONTRACTS FOR HARVESTING AND SALE OF FOREST PRODUCTS

This section provides some basic background information to help contractors understand how contracts originate.

6.1.1 Harvesting Contracts

Part 8 of the Forest Products Act 2000 refers to "production contracts", meaning contracts for management, harvesting or sale of forest products.

This is where a harvesting company or organization is contracted to FPC, to supply one or more types of forest products from State forest or other land accessed by FPC, including private property, as planned and directed by FPC. In this case "supply" may involve one or more of the following:

(i) "Production" of the forest products (ie felling, extracting, preparing and sorting).

(ii) Individual log measurement on the bush landing.

(iii) Loading.

(iv) Hauling.

Contractors may be engaged by FPC through:

(i) Acceptance of a tender following a public advertisement or

(ii) Acceptance of a quote requested by FPC for a specific task.

Harvesting Contracts are generally numbered according to:

(i) Year the contract was signed,

(ii) Species or category of species of timber involved, and

(iii) Number of the contract in that particular year. For example, Contract 99/H1 was commenced in 1999, it involves hardwood timber species, and it was the first contract signed in 1999.

6.1.2 Contract of Sale

This is where a customer contracts to buy a specified quantity of forest products from FPC. Products sold under a Contract of Sale are usually supplied by a FPC contractor under a Harvesting Contract. Contracts of Sale are entered into:

(i) After an agreement is reached between a customer and FPC (private treaty contract) or

(ii) after a specified quantity of products is sold following an auction or following a call for tenders or proposals.

Contracts of Sale are identified by a four digit number.

In all Contracts of Sale FPC recoups at least the following:

(i) The cost of production and delivery (as per the Harvesting Contract).

(ii) A component to cover administration of the contract.

(iii) A component for roading,.

(iv) A component for "in-forest-costs" (ie the cost of managing the harvesting operations in the field).

(v) Stumpage to cover the cost of growing.

6.1.3 Minor Production Contract

A "Minor Production Contract" (MPC)is an agreement by FPC to sell a small one-off quantity of forest products under cash pre-paid arrangements. MPC's replace the former "Forest Produce Licences".

6.1.4 Stumpage-Free Timber

The Forest Products Act does not provide authority for either the Minister or the General Manager of FPC to waive the payment of stumpages on any timber harvested on Crown land.

6.2 DELIVERY NOTES (D/NOTES) & LOIS

BACKGROUND

"L.O.I.S." is the FPC's "Logging Operations Information System", a computer system designed to handle the data processing and recording requirements for all aspects of FPC's native forest and plantation harvesting activities.

All payments and invoices to harvesting contractors and forest product customers are based on this system.

Delivery Notes are the mechanism for authorising the transport of forest products and are the source of information which enables contractors to be paid and customers to be invoiced.

OPERATIONAL CONTROLS

DELIVERY NOTES

1. The key to recording movement of forest products is the Delivery Note. This is a one page document (in quadruplicate) which must be completed for each and every truck load of forest products carted from State forest or any other land on which FPC manages the harvesting operation. If two different products are carted at one time, two D/Notes must be completed, one for each product.

2. "Operation" numbers, information on "Work Descriptions", "Harvesting Contractor Number", "Fellers ID code(s)" and "Product Descriptions" all provide essential information to allow the accurate and efficient payment of harvesting contractors.

How to find Coupe Operation Details

1. Operational information is provided through the Harvesting Management Folder from FPC. The operational information may be found on the Coupe Base Plan or a copy of the FPC109.

2. Harvesting Contractors are required to provide signs showing landing numbers and coupe operation codes.

Completion of Delivery Notes

1. All payments to contractors and invoices to customers are based on the original copies of the Delivery Notes, therefore great care must be taken by truck drivers to neatly and correctly complete all relevant parts of the D/Note before leaving the bush landing.

2. Failure to fill out D-notes correctly is a serious offence.

3. The Forest Management Regulations 1993, Parts 5, 6 and 7, cover the use of log delivery notes.

4. *Detailed instructions for completion of D/Notes are written on the inside front cover of every D/Note book.* Damaged D/Notes must be kept in D/Note books, and completed books must be promptly returned to an FPC office, preferably the office from which the books were issued.

Authorising Delivery Notes

There are spaces on Delivery Notes for four signatures:

- *Loader operator*: there must always be a loader driver's signature.
- *Truck driver*: there must always be a truck driver's signature.
- *Customer*: there must always be a customer's signature, normally that of the loader driver at the customer's mill landing. Before signing the D/Note however, the customer's representative must agree with all details written on the D/Note by the contractor, in particular the product species and type, the date, and the number of logs (for individual log volume measure).
- *Forest Officer*: a Forest Officer can check and sign a D/Note at the bush landing, whilst the truck is en route, or at the customer's mill landing. The Harvesting Contractor is required to comply with requests for D/Notes to be checked.

Delivery Note Discrepancies

If there is any discrepancy requiring alteration, both parties (the contractor and the customer) must initial the alteration, without obliterating the original details. If the delivery of the logs is the responsibility of the customer, then the truck driver, who is either directly or indirectly employed by the customer, must sign the D/note, at the bush landing, on behalf of the customer. Again, any discrepancy requiring alteration must be initialled by both parties.

DISTRIBUTION OF DELIVERY NOTES

1. In principle, the copies of a D/Note must not be separated until all details, including the quantity of logs on the load, have been written on the D/Note, to the agreement of both the contractor and the customer.

   Then, the four copies are distributed as follows:

   (i) Original (white) copy: FPC; This is the copy which is entered into FPC's computer system and upon which contractor payments and customer invoices are based.

   (ii) Duplicate (pink) copy: Customer.

   (iii) Triplicate (green) copy: Contractor.

   (iv) Quadruplicate (yellow) copy: stays in book as backup copy only.

2. In some cases, the original (white) copy will be handed by the truck driver to the customer's representative, for later forwarding to FPC. In other cases FPC will require the contractor to retain the original copy for later forwarding to FPC.

3. The duplicate (green) copy is normally retained by the truck driver who is normally directly or indirectly employed by the harvesting contractor. If however the delivery is the responsibility of the customer, then either:

   (i) the contractor's representative may take the duplicate (green) copy before the truck leaves the bush landing, or

   (ii) FPC must arrange for a photocopy of the original copy of the D/Note to be forwarded to the harvesting contractor (the duplicate in this case being retained by the trucking company).

4. Completed D/Note books must be promptly returned to an FPC office, preferably the office from which the books were originally issued. New books may not be issued unless used books are returned.

LOIS INPUT DOCUMENTS

1. A number of documents are processed in LOIS, including Delivery Notes and other forms that alter original input information. Contractors experiencing any problems with D/Notes or with payments should contact their nominated FPC Authorised Officer in the first instance.

2. FPC's Business Operations Branch maintains and indexes, through LOIS contractors rates and prices to customers.

3. Harvesting contractors can obtain copies of their rates from the LOIS System Support Officer in FPC Rivervale. General LOIS phone enquiries can be directed to SW Native Forest offices at Harvey, Nannup or Manjimup, or to LOIS staff in Bunbury and Rivervale.

SECTION 7
Silviculture

7: SILVICULTURE

BACKGROUND

Silviculture refers to the practice of managing the forest for multiple values. The values that need to be managed for are described in Section 2 Principles of Native Forests Management and Section 4 Environmental Management.

The basic principles for treemarking and silviculture in the South West Native Forest are as follows:

JARRAH

- Promote growth (thinning)
- Release Regeneration (gap creation in Jarrah)
- Establish Regeneration (shelterwood in jarrah)

KARRI

- Promote growth through one or more thinnings in immature even aged stands.
- Regeneration in single storied mature stands through seed trees and/or planting
- Manage mixed karri stands to retain all tree species in the long term.

While maintaining and/or enhancing other values eg cultural, biological diversity values, soil and water, and health and vitality (refer to Section 4.0 Environment).

The FPC is responsible for treemarking and implementing silvicultural practices in accordance with silvicultural guidelines.

The silvicultural activities that may require work by the contractor, or influence their harvesting operations are covered in the next sections.

GOAL

1. To manage the forest available for wood production in a way that wood products can be sustained indefinitely.

7.1 TREE MARKING

BACKGROUND

All jarrah and some karri stands are treemarked (usually for retention, see below) before harvesting begins. The forest is a complex mosaic of different structures and conditions so a fixed prescription is not appropriate. However, the treemarker will apply the basic principles of silviculture to achieve one of the silvicultural objectives described in Section 7 although across an area of forest there will be a mosaic of silvicultural objectives.

Tree marking is the system used to retain trees for future use and values. A "crop tree" is a tree with the capacity to grow vigorously into high value products. "Cull trees" are trees of no to little value but still creating competition for crop trees or regeneration.

"Marking for removal" is where trees to be felled are marked and unmarked trees are left standing. "Marking for retention" involves marking all trees that are not to be felled. The unmarked trees can then be felled if they do not damage the marked crop trees in the process.

The FPC Authorised Officer will decide which method is to be used depending on the structure of the forest being harvested, and other practicalities. Once this decision is made, the *tree marking method will not be changed* within an individual fallers block.

TREEMARKING INDIVIDUAL TREES FOR RETENTION

1. Individual trees may be marked for retention using only white paint.

2. Trees marked for retention with paint will be painted at least 1.5m above the ground, with a band about 2cm wide completely around the tree.

3. Habitat trees and logs will also be marked for retention with white paint in the form of a large "H".

MARKING FOR REMOVAL

Individual trees may be marked for removal using yellow tape or paint. An arrow may be used to indicate the desired direction of the fall if the treemarker is concerned about other crop trees or values.

Trees marked for removal with an axe must be blazed on two sides at a comfortable height and toemarked to indicate the desired direction of fall. This method must be used by CLM Forest Officers to approve falling of trees across sensitive boundaries.

TREE MARKING GROUPS OF TREES FOR RETENTION

A group of trees may be marked for retention by using double white painted brands around trees along the perimeter of the group. At least one tree in every 10m of perimeter will be marked.

GOAL

1. Treemarking will create a stand structure most suited to the particular stage of development of the stand.

2. Ensure contractors can identify trees for protection and further treatment.

OPERATIONAL CONTROLS

1. In areas where trees are marked for removal NO OTHER TREES MAY BE FELLED.

2. In areas where trees are individually marked for retention, fellers must cut any other tree containing useable products under the terms of the relevant contract.

3. The harvesting contractor must be advised by a FPC Authorised Officer of areas containing groups marked for retention. The harvesting contractor will not move machinery or fall any trees within the boundary of group retention.

7.2 CROP AND HABITAT TREE DAMAGE AND PROTECTION

BACKGROUND

Even with best practices in treemarking for silvicultural objectives, sustainable forest management it will not succeed if crop trees/habitat trees are damaged to the point that future growth, viability and product value are reduced.

Crop tree or habitat tree damage is defined as physical damage resulting in one or more of the following:

(a) Exposure of more than 100cm^2 of cambium on the bole of a crop tree.

(b) Felling, breaking, or uprooting of a crop/habitat tree, or

(c) Removal of more than 30% of the crown of a crop/habitat tree

GOAL

1. Less than 5% of crop and habitat trees will be damaged during the harvesting operation.

OPERATIONAL CONTROLS

1. Harvesting contractors must make every effort during all phases of harvesting to protect marked crop trees from physical damage.

2. Regular assessments of crop tree damage will be carried out by an FPC Authorised Officer. Copies will be forwarded to the harvesting contractor.

3. If more than 5% of crop/habitat trees assessed are damaged, then the harvesting contractor will receive an EMS Incident Report. If the harvesting contractor continues to receive EMS Incident Reports for crop tree damage it will be considered a Breach of Contract. The contractor may be charged for all damaged trees in that feller's block at rates determined from time to time by the General Manager.

7.3 TOPS DISPOSAL

BACKGROUND

As well as avoiding physical damage, harvesting contractors must ensure that all harvesting debris created by a harvesting operation is removed from the base of trees marked for retention. This task is commonly known as "tops disposal".

The purpose of tops disposal is to protect crop trees, habitat trees and logs from damage during future fires. Larger size debris close to the bole of a tree or habitat log will create excessive, long lasting heat during and after the fire. The heat from burning debris can cause damage to the "cambium" (the growing part of tree under the bark) and this can introduce disease, damage the survival of the tree and degrade the high value product at the base of the tree.

"Debris" is considered anything over 7.5cm in diameter and 1m in length.

GOAL

1. To protect crop trees, habitat trees and habitat logs from the potentially damaging effect of fires.

OPERATIONAL CONTROLS

1. The harvesting contractor will remove debris (woody material >7.5cm diameter and 1 m length) for a distance of 1 m from crop/habitat trees or habitat logs. This will be completed without damaging the marked tree or habitat log and to the satisfaction of the FPC Authorised Officer.

2. Tops disposal must be completed before a feller's block or sub-coupe is certified as complete on the FPC 104. Harvesting Contractors shall encourage fellers and skidder drivers to carry out tops disposal during the course of the harvesting operation.

3 Trees that require tops disposal will be highlighted by an FPC Authorised Officer using blue flagging tape if he/she considers the block has not been completed to a satisfactory standard. This may also be recorded on the FPC 105. If the FPC Authorised Officer considers most of the block incomplete, he/she will instruct the harvesting contractor to return and complete tops disposal before the area is re-inspected and certified.

4. If the contractor fails to complete tops disposal after instruction, FPC reserves the right to complete the works and charge the contractor.

7.4 SILVICULTURAL TREATMENTS IN JARRAH

BACKGROUND

Silvicultural treatments may occur during or after harvesting. Some silvicultural treatments, such as disturbance for shelterwood regeneration and banksia scrub rolling are more efficiently carried out during the harvesting operation.

Silvicultural treatments following harvesting which may be completed by a harvesting contractor

Are:

(a) Removal of cull trees and understorey such as banksia to remove competition from crop trees and established regeneration.

(b) Soil disturbance to provide for seedling establishment in shelterwood areas.

In some jarrah gaps and thinning areas (see Background Section 7.0 "Silviculture") there are too many trees left standing to maximise growth on desired trees or to provide for release of regeneration. Removal of cull trees may be through notching and herbicide injection, felling with or without herbicide or machine pushing of culls. Removal of

understorey such as banksia may also be desired to reduce competition to the growing and establishing stand.
To establish regeneration in shelterwood harvested areas the soil may also require specific disturbance. Jarrah seedlings will establish more readily on disturbed soil and harvesting machinery may be able to provide this. Excessive soil disturbance however needs to be avoided as this will impinge on other biodiversity values.

GOAL

To complete post harvest silvicultural treatments to remove competition from crop trees and to
provide for jarrah regeneration release and establishment.

To maximise the integration of silvicultural treatments with harvesting operations.

7.4.1 Treatments Using Notching to Reduce Competition

OPERATIONAL CONTROLS

The contractor will be required to comply with specified requirements in Silvicultural Guideline 1/95,"Silvicultural practice in the Jarrah Forest" (CLM) and any additional specifications from an FPC Authorised Officer. The following operational controls are only provided to give a broad outline of the work required.

Work will generally not be permitted to occur during the months of January, February, June and July.

The FPC Authorised Officer may stop treatment at any time due to unsuitable weather conditions.

TREATMENT OF THINNING GROUPS

1. The contractor will release individual crop trees by removing cull trees to a distance of 4 metres by notching with herbicide (usually glyphosate). Retained marked trees, that are not crop tree standard, will not require removal of surrounding culls.

2. Free standing cull trees of the same species as the crop tree and within one metre of the crop tree will be felled without herbicide application.

3. A stump with several leaders with one marked as a crop tree will not have other leaders treated.

4. Culls within 5 metres of habitat trees will not be treated.

5. Areas of high visual resource value or adjacent to burn boundaries will be treated by felling and treating stumps with herbicide immediately after felling.

TREATMENT OF GAP AREAS

1. Gap Areas – Small (0.25-2 ha). Remove all unmarked non crop trees less than 50 cm in diameter and unmarked *Banksia grandis* and sheoak.

2. Gap Areas Greater than 2 ha. Remove as above but only remove sufficient culls to bring total overwood density to 5 m2 or less.

7.4.2 Treatments Using Machines To Reduce Competition

OPERATIONAL CONTROLS

TREATMENT OF GAPS

(a) Machine pushing of culls will be restricted to trees less than 30 cm in diameter and concentrated on patches where complete gap creation can be achieved with minimal pushdown.

(b) Machine pushing will only be applied in dry soil conditions, soil disturbance must be minimised.

(c) Attempt to break off rather than push out jarrah stems.

(d) Machine pushing will comply with the hygiene plan.

(e) No damage must occur to crop trees or marked habitat (including trees, balga and logs)

(f) No pushing is to occur within groups of crop trees.

(g) No disturbance is to occur within 5 metres of habitat trees or groups.

(h) No pushed debris is to be left within 1 metre of trees marked for retention.

(i) When pushing banksia thickets, 20% is to be retained as isolated individuals.

(j) Do not push down thickets of sheoak where there are no jarrah stumps to indicate it was previously a jarrah dominated site.

TREATMENT OF SHELTERWOOD

(a) Treat as for gaps above.

(b) In areas where there is severe understorey rootstock competition, remove competing rootstock understorey in swathes at least 3 metres wide and not more than 10 metres apart, preferably using a tracked machine with rake blade.

(c) Do not establish swathes within 3 metres of retained trees.

(d) Install erosion barriers at the appropriate intervals. (see section 4.2.2)

(e) Where the density of culls is high (greater than 12 m2/ha) treatment should be deferred until more produce can be removed.

7.5 JARRAH PRE HARVESTING BURNING (ADVANCED BURNING)

Pre harvest burning is completed to protect retained trees in post harvesting burns and evaluate advanced growth. When jarrah lignotubers are dormant and difficult to identify fire will stimulate growth and increase visibility of jarrah lignotubers. Advanced burning may also contribute to the maintenance of habitat diversity during harvesting and subsequent operations for fauna species such as ring tail possums.

FPC is not obliged to carry out advanced burning for access, hazard reduction or faller safety. In the absence of advance burning and the existence of heavy understorey, scrub rolling may need to be completed to achieve hazard reduction for faller safety (see Section 5.3).

7.6 JARRAH BURN PREPARATION POST HARVEST

BACKGROUND

Burn preparation for harvested jarrah coupes may be required to be completed by the harvesting contractor. Jarrah burns may be completed to assist with regeneration establishment (in shelterwood areas), to release regeneration (in gaps that have not been recently burnt) and to reduce the fuel load after harvesting (tops burning).

Jarrah burn preparation may need to be required to be completed by harvesting contractors when it is necessary to reduce the amount of large logging debris adjacent to proposed burn boundaries. This is achieved by "pull in" operations that pull or lift large logging debris in a manner that does not 'push in' other smaller logging debris, disturb soil or damage lignotubers.

GOAL

1. Improve burn security

2. Reduce mop up requirements following implementation of the silvicultural burn.

OPERATIONAL CONTROLS

PULL-IN

(a) Logging debris greater than 150mm diameter will be pulled or lifted in from the burn boundary for a distance of 20m.

Debris pulled in/lifted will not be put within crop tree protection limits (Section 7.2)

Debris less than 150mm diameter will be pulled in 20m if it is in heaps and separated by less than 2 metres.

Where windrows can not be avoided they shall be broken by a 10m distance every 40m.

This work will be completed at the contractors expense.

(b) Pull in all unsaleable ground residue log material not caused by the contractors operations for a distance of at least 20 metres from the inside edge of the boundary road or track
This work will be paid for by the FPC at hourly rates as accepted by the General Manager from time to time.

7.7 KARRI BURN PREPARATION POST HARVEST

BACKGROUND

Burn Preparation for harvested karri coupes may need to be required to be carried out by harvesting contractors. Karri burns are completed to achieve an intensity that will reduce logging debris created during the harvesting operation and provide soil conditions receptive to regeneration.

Burn preparation is completed to reduce the likelihood of fire escaping during the burn and reduce the cost of burn suppression activities.

GOAL

1. Improve burn security.
2. Reduce cost of karri regeneration burns.
3. Protect retained trees from fire damage.

OPERATIONAL CONTROLS

SCRUB ROLLING

1. Areas may require scrub rolling in preparation for burning. (see section 5.3 for Scrub Rolling)

2. The contractor must be available to complete areas specified by the FPC Authorised Officer in time for the burning program to commence.

STAG REMOVAL

1. The contactor may be required to complete stag felling and removal of non-merchantable trees by felling, pushing or explosives (by registered shot firer).

2. The contractor must notify FPC the day before explosives are to be used, on the day they are planned to be used and immediately prior to blasting. No blasting is allowed on days with forecasts of Very High or Extreme Jarrah Forest Fire Hazard.

PUSH-IN

1. All harvesting debris over 200mm and 2 m long will be pushed in from the inside edge of the coupe boundary track edge, to a depth of 20m.

2. Windrows will have a 5m gap every 40m of windrow for future machine access.

3. Large logs on steep slopes will be aligned up and down the slope to avoid rolling.

4. Depositing of soil in windrows and soil disturbance must be kept to a minimum.

5. No debris will be pushed into streams.

6. All marked residue logs on landings are to be left in the middle and front of the landing.

7. All debris to be pushed into heaps on the sides of the landings.

8. All work will be completed in accordance with the Hygiene Plan.

ROUGH HEAPING AND WINDROWING

1. The contractor may be required to "rough heap' or windrow debris in some coupes or parts of coupes where marri has been retained and on difficult burn boundaries.

2. Heaps and windrows will be constructed as tightly as possible and exclude soil. Windrows will be separated by a 10 metre break every 40 metres.

3. Heaped or windrowed debris will not be placed closer than 10 metres to the base of retained trees or clumps.

4. No machine activity will occur within clumps of retained trees as directed by an FPC Authorised Officer.

5. Soil disturbance will be limited to scarifying of the soil surface only unless otherwise directed by an FPC Authorised Officer.

Note: Push in, rough heaping and windrowing must be completed with a suitable tracked machine fitted with a rake blade. Prior to commencing operations machines will be inspected by an FPC Authorised Officer for their appropriateness.

PRE BURN COUPE AND TRACK BOUNDARY PREPARATION.

1. Coupe boundary tracks and internal boundary tracks will be 6 m wide and in a condition that is accessible to a 4x4 heavy duty fire truck with vehicle turn around points as determined by the FPC Authorised Officer.

2. Internal boundary tracks will be constructed to divide the coupe into areas of approximately 20ha and constructed to the above access standards.

3. All tracks will be constructed to minimise the risk of soil erosion, taking into account factors such as angle across the slope and need for erosion barriers.
4. All work will be completed in accordance with the Hygiene Plan.

7.8 KARRI PLANTING PREPARATION POST BURNING

BACKGROUND

Once a karri regeneration burn has occurred, a number of activities are required to be completed prior to the coupe being ready for planting in the following winter. These activities include:

- Heaping/ windrowing areas where large amounts of unburnt debris will reduce the plantable area and make access for planting difficult.
- Ripping soil to rehabilitate soil damage from harvesting and improve soil conditions for seedling establishment.
- Constructing access tracks to assist planting crews.

GOAL

To ensure harvested areas have suitable soil conditions and access to maximise planting efficiency and effectiveness.

OPERATIONAL CONTROLS

1. All work will be completed in accordance with the Hygiene Plan
2. All work will be completed during the summer and autumn period December to May.
3. Pollution control will conform to section 4.3.3

HEAPING/WINDROWING

1. Rough heaping or windrowing may be required where a high proportion of log debris remains after the regeneration burn. An FPC Authorised Officer will inspect coupes post burning to determine this requirement.
2. The specifications for this work are the same as for pre burn rough heaping above.

RIPPING

1. Where required rip lines will be 2 metres apart to a depth of 0.5 metres along the contour with a fall of no more than 5 metres in every 100 metres (3 degrees) during dry soil conditions with ripping tynes.
2. Ripping is to be confined to those areas where soil damage has been incurred or to areas where soil compaction has resulted from frequent machine movements.

ACCESS TRACKS

1. Access tracks will be flat bladed 3 metres wide and positioned to reduce the risk of soil erosion (across contour, with erosion banks, drains etc) and spaced 200 metres apart throughout the coupe.

7.9 KARRI PLANTING AND FERTILISING

BACKGROUND

Planting karri seedlings from a similar genetic source is the usual regeneration method used in areas where seed trees have not been retained or in seed tree areas that have not successfully achieved target stocking levels. Mixed forest type will include planting of other seedling species such as jarrah.

Fertilising is applied to supplement available nutrients mainly P and N where broadcast regeneration burns have not been applied. Fertilising can be completed any time following planting until early spring. It needs to be applied early enough for the nutrients in the fertiliser to leach into the soil profile and be available to seedling roots. If applied too late in the season rainfall will be inadequate for this to occur.

GOAL

To achieve target stocking of karri and mixed karri/ jarrah forest types following seedling establishment from planted seedlings.

To fertilise seedlings as required following planting to assist establishment and growth of seedlings.

OPERATIONAL CONTROLS

PLANTING

1. The planting program will be completed between the 1st June and the 5th August (although dates may vary slightly due to seasonal variation).

2. Records of collected seedlings, fertiliser, twice daily stocking rate checks, corrective actions, receipts of returned trays and progress sheets of completed work sites will be maintained.

3. Seedlings will be pre ordered, collected and protected during transport to the planting site eg transporting seedlings under a covered trailer.

4. Seedlings will be placed in field dumps protectable from the elements such as wind, water logging and frost.

5. Only seedlings meeting required specifications will be planted at approximately 2200 seedlings/ha unless otherwise directed by an FPC Authorised Officer.

6. Only a potti putki planting spear will be used to plant seedlings.

7. A field supervisor will be nominated to provide daily supervision and monitor planting standards.

8. An FPC Authorised Officer may stop work if the soils are considered too dry (usually after 7 days without rain)

FERTILISER APPLICATION

1. Fertilising may occur at any time after planting but must be completed by 1 October unless otherwise directed by an FPC Authorised Officer.

2. Only those areas nominated by an FPC Authorised Officer will be fertilised.

3. All seedlings in areas nominated will have fertiliser applied, the fertiliser being placed 15-20 cm on the downhill side of each plant using a potti putki spear.

4. The amount of fertiliser to be applied to each tree will depend on the fertiliser being used and will be determined by an FPC Authorised Officer prior to fertilising commencing.

SECTION 8
Fire Prevention and Suppression

8: FIRE PREVENTION AND SUPPRESSION

BACKGROUND

FPC does not have a role in fire prevention and suppression, although it may assist CLM when requested. FPC supports CLM in the need for harvesting machinery and personnel to be available for fire suppression and prevention.

GOAL

1. To ensure contractors are made available to attend CLM training and fires.

2. To provide the skills and knowledge to carry out on site fire suppression activities with contractor supplied equipment.

OPERATIONAL CONTROLS

1. Particular attention must be paid to the Sections of the Conservation and Land Management Act and the Bush Fires Act and to regulations made under those Acts for the purpose of controlling fires. In particular all vehicles and equipment used by a contractor must be equipped to meet the fire prevention requirements of those Acts.

2. No fires are to be lit in any forest area without the express permission of the CLM.

3. A contractor shall take all necessary precaution to prevent the occurrence or spread of fire in any forest area. A contractor shall be liable to the General Manager for suppression costs and damage caused within the said areas or on any State forest, timber reserve or Crown land by any fire on, or extending from, the said area unless the contractor can prove to the satisfaction of the General Manager that such fire or fires, without any act or omission on the part of the contractor, originated outside the said area and/or arose through some cause beyond their control.

4. A contractor and all his/her employees shall co-operate with officers of the CLM in preventing and suppressing bushfires and shall, when called upon by a CLM Forest Officer, act under his/her instructions in fire fighting or preventing outbreaks of fire.

5. A contractor shall not use or permit the use of any chainsaw or other internal combustion engine in any forest area unless the engine is fitted with an exhaust system of a type and design approved by the General Manager. The exhaust system must be inspected regularly by the contractor to ensure that its efficiency is maintained. Spark arresters of a YUBA or equivalent type must be fitted to all petrol and diesel engines other than turbo charged diesels.

6. Every timber harvesting machine involved in felling, extraction or loading must carry a suitable fire extinguisher (Bush Fires Reg 37).

7. The contractor shall keep all timber harvesting machines free of accumulated combustible material, particularly the spaces between the engine and engine guards.

8. The contractor may establish in any forest area not more than one dump of fuel per harvesting unit on a site and of a size approved by an FPC Authorised Officer. The ground around such dump shall at all times be clear of all vegetation or inflammable debris for a distance of not less than six metres. Storage will not exceed "Minor Storage" limits set in the Dangerous Goods Act (1961) and comply with all environmental requirements (see section 4.3.3 – Pollution).

9. Smoking shall not be permitted within six metres of the closest point of a fuel dump.

10. A FPC Authorised Officer may prohibit any or all types of timber harvesting operations at such times and for such periods as is necessary when in the FPC Authorised Officer's opinion such action is warranted by the CLM fire danger ratings.

11. A harvesting Contractor, at the direction of an FPC Authorised Officer (on instruction from CLM) may be suspended for the whole or part of the duration of a fire event .

12. If a fire starts in a contractor's work site, the contractor's crew must immediately endeavour to suppress the fire with their own equipment under the leadership of the timber harvesting supervisor. As soon as a CLM Forest Officer or an FPC Authorised Officer arrives at the fire, the contractor's crew must work under the direction of that Officer. The whole of the contractor's manpower will continue to operate under the CLM control until relieved or until the fire is declared safe by the Officer directing the fire suppression operation. Costs incurred by the contractor must be borne by the contractor.

13. If a fire starts outside a contractor's work site but within the forest area the provisions of point 12 above will apply. However, if in the opinion of the CLM Forest Officer or FPC Authorised Officer the fire was not caused by or did not arise from any negligent act or omission or any want of co-operation on the part of the contractor or any of his/her employees, the costs incurred by the contractor in fighting the fire will be borne by the CLM. Certification for payment will be by the CLM Forest Officer directing the operation. In the event of dispute, the General Manager's decision will be final.

14. A contractor and his/her crew(s) working within a forest area will not normally be called on to fight fires outside the forest area, but if this is necessary, the provisions of the Conservation and Land Management Act and the Bush Fires Act will apply.

    The Executive Director and/or General Manager will accept no liability for the loss or damage by fire, however started, of any equipment or property owned or operated by a contractor or any of his/her employees, except for loss or damage by fire to equipment or property owned or operated by a contractor or any of his/her employees which is being hired and used by CLM to assist in suppressing wildfires.

    A contractor must provide, as required by the CLM, details of his/her resources which may be required to assist CLM in forest or plantation wildfire suppression activity, including being placed on standby on a roster system during the fire season.

FIRE FIGHTING EQUIPMENT

1. A contractor will at all times, at the contractor's own expense provide on-site and maintain in good working order to the satisfaction of an FPC Authorised Officer, fire fighting hand tools and equipment complying with the current CLM specifications on the following basis:

2. For every five men or part thereof employed in the forest area (excluding personnel engaged solely in log delivery operations):-

   (i) Chainsaw

   (ii) knapsack sprays with water

   Knapsack sprays and chainsaws provided as part of the normal equipment for fellers under the Code will be considered as equipment for this purpose.

3. One fire suppression unit for each group of ten workers employed on the contract at any one forest area worksite (excluding personnel engaged solely in log delivery operations) with a minimum of one unit on each worksite.

   This fire suppression unit will be of a standard acceptable to the FPC Authorised Officer, and shall be similar to the standard 450 litre patrol unit currently used by the CLM.

   The unit will be either the "slip-on" type mounted on its own prime mover, or mounted on a trailer which must be capable of being towed by the contractor's **onsite** machinery.

4. The contractor will at all times and at his/her own expense maintain each of the fire suppression units specified in point 3 above to an operational standard acceptable to an FPC Authorised Officer. If in the opinion of an FPC Authorised Officer the condition of a unit makes it unsuitable for fire suppression he/she may either:

   (i) suspend operations until the unit is repaired to his/her satisfaction; or

   (ii) arrange the repair of the unit to his/her satisfaction and the supply of a replacement unit all at the contractor's expense until such time as the contractor's own unit is passed as suitable.

   TRAINING

   1. The harvesting contractor will make available, upon request from CLM, personnel to attend the following courses.

      (i) Fire fighter - requiring approximately six day's training in the first year, then three day's practical training each year thereafter.

      (ii) Machine operating fire fighter - requiring approximately six day's training in the first year, then one day's training each year thereafter.

      (iii) Tree-felling firefighter - requiring approximately four day's training in the first year, then one day's training each year thereafter.

      (iv) Low loader driver - requiring approximately one day's training in the first year only.

2. The responsibility for providing the above and all other fire control training lies with CLM. This means CLM will provide staff, written material and sites for fire control training at no cost to the contractor and in reasonable proximity to a contractor's work sites.

3. All mobile plant operating personnel not included in points 1 and 2 above must be trained to be able to assist in extinguishing fires which may start at the work site. This requires approximately three days training in the first year only. The contractor will cover the cost of wages but not of the training.

   All in-bush personnel will receive basic fire awareness training. This requires approximately one day's training in the first year only. The responsibility for providing basic fire awareness training lies with the contractor, although CLM will provide written training material at no cost. The contractor is also required, under Duty of Care principles, to keep records of such training provided to his/her bush employees.

4. Harvesting Contractors will not perform roles in a fire situation, even upon request from the CLM, unless they have received the appropriate training for the role they are requested to undertake.

SECTION 9

Checking and Corrective Action

9: CHECKING AND CORRECTIVE ACTION

9.1 ENVIRONMENTAL INCIDENT REPORTS (EMS 1)

BACKGROUND

A method of reporting EMS non conformance is required by FPC to maintain EMS 14001 certification. Investigating and reporting things that have not gone to plan is an important tool for ensuring performance is maintained and potential improvements identified. Incident Reports are activated for non compliance with the manual or in the event an environmental impact has being deemed as unacceptable by FPC or another party.

Not all incidents are the direct result of harvesting contractors activities and may be attributed to a variety of causes. An Incident Report does not automatically mean a contractor is at fault. The main purpose of the report is to ensure the environmental impact is reduced or fixed and to minimise the chance of the incident happening again in the future.

GOAL

1. All unacceptable environmental impacts will reported, have appropriate remedial action (corrective action) to reduce the impact and any identified preventative action implemented to ensure the chance of the incident being repeated is reduced.

OPERATIONAL CONTROL

1. Incident reports are completed by FPC staff but contractors may be asked and encouraged to assist with the investigation, contractors are required to make themselves available for the investigation.

2. A copy of the *Incident Report* will be issued to contractors who have contributed to environmental impacts by not following specified procedures.

3. Contractors are required to implement any preventative action (instructions to ensure the incident is not repeated)

4. These reports may be used to initiate a Breach of Contract and in future assessment of contracts if there is consistent evidence of non-compliance with written procedures designed to protect the environment.

9.2 HARVESTING INSPECTIONS

BACKGROUND

The contractor's must check harvesting standards periodically on a feller's block basis to ensure harvesting standards are maintained. FPC Authorised Officer will regularly accompany the contractor's foreman or supervisor on these inspections to monitor standards and also conduct separate inspections.

Aspects of harvesting to be inspected include:

- safety hazard management
- stump height
- in-forest treatment of logs
- trees indicated for removal but not felled
- trees felled but not removed
- damage to retained (crop) trees by felling and/or extraction
- extraction pattern
- soil damage
- *Phytophthora cinnamomi* hygiene
- tops disposal
- protection of stream zones and other reserves
- erosion control structures.

There are three types of formal inspection of a harvesting operation:

1. Contractor Inspections of a harvesting operation with the specific intention of feller block certification by harvesting contractor.

2. FPC Inspections of all aspects of a harvesting operation by FPC Authorised Officers (FPC 105, FPC 111).

3. Audit inspections carried out by Conservation Commission, CLM, FPC or other contracted auditors with the intention of measuring specific performance against defined standards.

GOAL

1. To monitor harvesting operations against defined standards. To implement required action to rectify any monitored operations not meeting defined standards.

OPERATIONAL CONTROLS

CONTRACTOR INSPECTION

1. This inspection must be regularly carried out on a systematic basis by the contractor, in order to formally certify that the operation has been completed to FPC's standards.

2. The unit area in these inspections is the feller's block. Inspections must be carried out with sufficient regularity to ensure a large backlog of non-certified feller's blocks does not eventuate. As a general guide, fellers' blocks must be inspected and certified as complete within four working days of completion and no more than three completed fellers' blocks shall be uncertified at any point in time for a given operation.

3. The contractor must use only white lumber crayon to initial/date stumps and cross unmerchantable timber. These markings will indicate that the area has been inspected. Yellow flagging tape must be used to indicate trees to be felled and logs to be cut and/or snigged.

4. Any abnormal safety hazards remaining following completion of harvesting must be noted and recorded. The progress of these inspections must be recorded on the FPC 111.

5. One of these forms must be kept by the contractor in charge of each harvesting operation. This form is the official permanent record of the progress of completed harvesting.

FPC INSPECTIONS

1. FPC staff will also carry out inspections of fellers' blocks. A FPC Authorised Officer will spot check and sign the FPC 104 at an appropriate frequency, depending on the quality of the work and also complete a FPC 105 at frequent intervals. Both these forms can be found in Appendix 1.

2. The FPC 105 checks a number of key performance requirements. Copies of these forms are supplied to the Harvesting Contractor. Any action items that require attention are highlighted. Any environmental requirements that have not been achieved will be referred to the EMS Incident Report system. The form FPC 105 has been recently modified to include when action is completed. Information on completed items needs to be provided to the FPC Authorised Officer so action can be recorded as completed on the FPC coupe file.

3. The FPC 104 is also to be used as the formal mechanism for the "handing over" of a site (operation) from FPC to a contractor, and the "handing back" of the site from the contractor to FPC after the completion of the operation. This process helps ensure both FPC and the contractor fulfil their responsibilities.

4. When handing over a site to a contractor, the FPC Authorised Officer must discuss with the contractor the hazards on the site, and the steps FPC has taken or will take to identify or control those hazards (see guidelines in section 3). A FPC 111 will be used to summarise the discussion and a record of the comments will be made.

5. The site will be considered complete and accepted back by FPC when all felling, extraction, loading out, erosion control work and post harvesting coupe preparation work is completed. FPC 104 must be handed in to FPC at the completion of the operation.

6. FPC will accept the handing back of a site before landings are rehabilitated and before certain log products are loaded out (eg green firewood logs, third grade sawlogs) as recorded on the FPC 104.

7. Records of required landing rehabilitation.

9.3 Breaches of Manual

1. The practice instructions of this Manual shall be observed by all contractors participating in any timber harvesting operation under contract to FPC. If any such person breaches this Manual, such a breach may be regarded as grounds for FPC Authorised Officer raising objection to the continued employment of that person in the forest. In addition, it may be regarded as a breach of the contract.

2. All operations carried out by, or on behalf of, a contractor in forest areas shall be carried out as directed by FPC Authorised Officer. **Any monetary penalties for breaches of this Manual or for damage to or waste of timber in breach of the instructions of this Manual will be deducted from any money due to the contractor, or failing that from the contractor's deposit.**

9.4 Log Quality Adjudication

1. Although FPC's harvesting contractors are required, under the terms of their contracts, to carry out all initial preparation, grading and segregation of log into the various products, the FPC Authorised Persons in charge are ultimately responsible for all log quality standards.

2. Once logs have been carted by an FPC contractor to a customer's landing, **and** unloaded, the customer may request FPC to downgrade or reject any or all of the logs if the customer believes the logs are below specification. A customer must not reject a whole or part truckload of logs **before** unloading. THIS NOTIFICATION TO FPC MUST BE RECEIVED WITHIN 10 DAYS OF DELIVERY, AFTER THIS DATE THE PRODUCT WILL BE CONSIDERED ACCEPTED BY THE CUSTOMER.

3. FPC must notify the harvesting contractor WITHIN 5 DAYS OF NOTIFICATION from the customer.

4. The conditions for acceptance by FPC of a request by a customer to downgrade or reject logs are:

   (a) FPC is responsible for setting and applying the log specification prior to delivery ie the logs were not selected in the first place by the buyer.

   (b) The source of the logs is clearly identifiable (ie the logs, including logs measured by weight, are clearly marked with the complete D/Note number and a coupe name and number) and the contractor involved is identifiable. The customer is responsible for identifying such logs.

   (c) The logs have been correctly measured and recorded on an FPC log delivery note.

5. Adjudication of all logs challenged by a customer is carried out by the General Manager, through specifically nominated "Authorised Persons" under the Forest Products Act 2000.

6. Authorised Persons, when carrying out routine inspection of logs at customers' landings, will not normally be accompanied by harvesting contractor representatives. However, if more than approximately ten cubic metres (or tonnes) of logs are likely to be officially downgraded or rejected, then the inspecting officer shall arrange to have a representative of the relevant harvesting contractor in attendance.

7. The reasons for the downgrading or rejection of the logs will be immediately discussed with the harvesting contractor.

8. It is acceptable to have parts of logs downgraded or rejected at a customer's landing. It is also acceptable for a log to receive some treatment such as docking or delimbing in order to bring it up to specification.

9. In each case the task of cutting a log shall be carried out by a representative of the contractor who is accompanying the Authorised Person. For practical purposes, however, especially if only a small number of logs or a small amount of cutting is required, the work may be carried out by the customer or the Authorised Person.

10. If a lot of log treatment work is necessary, the Authorised Person may adjudicate that all logs in a parcel be returned to the bush landing for treatment by the harvesting contractor and redelivery.

11. All decisions on logs challenged by a customer must be indicated on the logs by the Authorised Person using yellow crayon or Rejected logs or part logs shall be clearly marked with an "R". Logs inspected by the Authorised Person and found to be acceptable may be marked with an "OK".

12. It is FPC's responsibility, through the relevant contractor, to remove all rejected material from a customer's landing to either the operation from which the logs originated, or to another customer as directed by FPC.

13. Contractors must act promptly to remove reject logs from customers' landings, as instructed by the Authorised Person. MAXIMUM PERIOD FOR THE HARVESTING CONTRACTOR TO REMOVE REJECT LOGS AFTER NOTIFICATION FROM FPC IS 10 DAYS.

14. Credit Notes and Adjustment Notes issued for rejected logs are processed through FPC's Logging Operations Information System (LOIS) in the same way as Delivery Notes

15. Logs rejected at the customers landing by an FPC Authorised Person maybe branded with:

    (a) an official brand signifying "not in accordance with the required specifications", and a brand identifying the FPC Authorised Person.

    (b) The logs are then weighed out as part of the tare weight of the contractor's truck. A Credit Note in this situation is unnecessary. This method is only applicable to customers with a weighbridge.

5. Authorised Persons must ensure that accurate log adjudication records are maintained. This may require the use of a "Log Adjudication Record Sheet".

9.5 Seizure of Forest Products

1. A FPC Authorised Person who believes forest products have been illegally taken or removed contrary to harvesting plan/permit may seize these forest products whilst on any public road or within any State forest or Timber Reserve.

2. When a person is found to be in possession of forest products in State forest, Timber Reserve or on a public road (having been stopped by a FPC Authorised Person) and is either unwilling or unable to satisfy the FPC Authorised Person of the manner in which he/she came to possess the forest products it will be considered a committed offence. If required to do so, the person must show the FPC Authorised Person the forest products cut or obtained.

3. Forest products seized by a FPC Authorised Person must be clearly stamped or marked with:

    - A broad arrow
    - The word "seized" and the Officers name and date
    - A "Notice of Seizure" label (FPC143)

4. The broad arrow and "seized" wording, name and date are to be marked on the seized forest products with yellow timber crayon, but if crayon is not available then the seized products may be marked with any available marking material. Where the forest products seized is a whole or part of a stack then the products seized needs to be clearly identified.

5. The offender will be asked to sign a receipt for the seized products.

6. An interview will be conducted using standard procedures and a breach report submitted to the General Manager, FPC. A statement, signed by witness will be provided to the interviewee.

7. Once forest products are seized, the driver may unload the seized products and move off. In the case of logs, this will best be done at the mill landing. With firewood and other easily removable products, the driver may be asked to unload at a secure location eg FPC depot. The driver does not have to deliver the products to a nominated location but it is advisable to cooperate with the requested location.

8. The vehicle and cutting implements **cannot** be seized, **only** the forest products.

9. Once forest products are seized it is an offence for any person without written authority of an FPC Authorised Person to cut, injure, destroy, remove or interfere with seized products.

10. Any person who aids, abets, counsels or procures or is directly or indirectly concerned in the commission of the illegal removal of forest products is deemed to have committed the offence and will be interviewed independently by an FPC Authorised Person independent of the others considered to have committed the offence.

APPENDIX 1
Definitions

DEFINITIONS

In this Manual, unless the context requires otherwise, the following definitions apply:

catchment - an area draining into a given waterway or reservoir.

cleandown - the process by which soil and other material is removed from vehicles and machinery. Water, air and brushes may be used for cleaning down, depending on whether mud, dust or vegetable matter is to be removed.

contract - a contract in which the General Manager contracts with any person for that person to harvest log timber and to deliver that timber to the buyer.

contractor - a person who contracts with the General Manager of FPC under a contract to harvest and deliver, including any servants, agents, employees or subcontractors of that person.

coupe - an area that is specifically set aside for the purpose of timber harvesting in a timber harvesting plan.

delivery - the cartage of forest produce from loading points in or near the forest area to a nominated delivery point.

extraction - the movement of forest produce from the position at which it is felled or cut to a position where it may be loaded onto a vehicle.

feller's block - a cutting area, within a coupe, allocated to a single feller or tree felling machine.

forest areas - any area of land under the ownership, management or control of the Executive Director on which trees are growing, including firebreaks, roads and tracks.

Forest Officer - a forest officer as defined in the CLM Act. For harvesting operations this is CLM staff only.

forest products - any log or log product that may be removed by a contractor from an operation and includes sawlogs, poles, piles, chip logs, firewood, chips and any other product authorised by a contract.

FPC Authorised Officer - any FPC employee charged with the responsibility of supervising a harvesting operation.

FPC Authorised Person – under the Forest Products Act 2000 Part 9, means the General Manager or a staff member; or a forest officer under the CLM Act, who is authorised by the General Manager to exercise Enforcement Powers in relation to searching and seizing forest products, entry into sawmills and seizing forest products in relation to offences.

Harvesting Contractor – contractor employed by FPC to produce and/or deliver forest products under a Production Contract.

hygiene - actions that decrease the risk of the root rot disease pathogen being introduced, spread, intensified or surviving.

jarrah forest - any forest area dominated by the species *Eucalyptus marginata*.

karri forest - any forest area dominated by the species *Eucalyptus diversicolor*.

operation - any timber harvesting activity, under the control of the General Manager, authorised by a written contract between the General Manager and another party or by a Departmental Licence.

soil dryness index - a measure of soil moisture that reflects the flammability of heavy fuels. It indicates fire suppression difficulty.

soil movement - the movement of moist soil sticking to the wheels or tracks of machinery or vehicles.

stream reserve - a strip of vegetation of a specified width located along a particular watercourse from which timber harvesting is excluded.

sub-coupe - a cutting area situated within a self draining catchment. A sub-coupe may contain several fellers' blocks.

work - everything and anything that a contractor, under the terms of a contract, and this Timber Harvesting Manual, is required to do in regard to the felling of trees and the preparation, extraction and cartage of the produce therefrom.

APPENDIX 2

FPC Standard Bush Signs and Markings

SUMMARY OF BUSH SIGNS AND MARKINGS

Axe blaze on two sides of a tree with a "toemark" cut into the base of the tree

- Tree marked for removal, the toemark indicating the desired direction of fall
- White painted arrow indicating desired direction of fall

Tape Colour	Paint Colour	Crayon	Meaning
	White paint crosses on the side of a tree (permanent)		• Coupe boundary • Road reserve • Stream reserve • Amenity reserve • Special care zone • DEZ, PEZ, CAR
	Yellow paint blazes on three sides of a tree (permanent)		• Boundary between *Phytophthora cinnamomi* infested forest and uninfested forest, with the third painted blaze facing the infested forest. (Note: if considered necessary, the fourth side of the tree may be blazed and painted with a yellow cross. This may be necessary in situations where the uninfested forest is logged prior to the infested forest.)
Red flag tape (ie tape with ends able to move in breeze			• Ridge line
Orange flagging tape			• Feller's Block boundary
	White painted band around tree		• Tree marked for retention (crop tree or seed tree)
	White painted double bands around a number of trees in a rough circle		• A group of trees marked for retention (crop trees)
Red flagging tape and white flagging tape tied, one above the other, around a tree or bush			• Landing extremity • Major snig track
Yellow flagging tape tied around a tree			• Tree missed by feller, which must be felled (if considered by faller to be safe)
Yellow flagged tape tied around a log, or stick or bush adjacent to a log			• Log, missed by feller or skidder, which must be cut and/or extracted
		Yellow lumber crayon on a stump or log	• Used by a FPC Authorised Officer to instruct contractor and/or record inspection of a harvesting operation.
		White lumber crayon on a stump, log or tree	• Used by contractor supervisor or bush foreman to mark logs, instruct bush crew and/or record inspection of a harvesting operation. (Note: blue or black crayon may be used on light coloured species of wood such as pine.)

Tape Colour	Paint Colour	Crayon	Meaning
White and red striped tape tied around a tree or bush			• Hazard sign, used to indicate presence of a hazardous situation such as a tree hung-up, "widow-maker", etc
Yellow and black stripped tape			• Hazard identification completed by mining company
	White painted "S" on three sides of a tree		• Tree marked for retention as a seed tree
Dayglo orange flagging tape (looks pink) tied around a tree or bush, with knot facing P.c.-infested forest			• Initial P.c. line marked in field by interpreters
Blue flagging tape			• Used to indicate tree around which tops disposal is required
	Large white painted "H" on two sides of a tree or on a log		• Tree or log marked for retention for fauna habitat
Orange flagging tape or orange "X" line			• TEA strip boundary
Blue and white striped tape with T end			• Indicating shunt turnaround

APPENDIX 3
Log Specifications

FOREST PRODUCTS AND SPECIFICATIONS

1. Sawlogs

Sawlogs are logs prepared in the bush for cutting at a registered sawmill into sawn products such as sleepers, boards or scantling. Any log that is considered to be merchantable, that is, worth cutting into sawn products, may be classed as a sawlog. For commercial purposes several types of sawlogs are recognised, the most important being:

(i) **Native forest sawlogs**

- **Bole (Multiple Grade) Sawlogs (jarrah only)** – contained a minimum of one second grade sawlog, but may contain any combination of first, second or third grade sawlogs, short sawlogs, and residue logs.

- **First Grade Sawlogs** - the most common type of sawlog cut. The minimum length and minimum crown diameter under bark of a First Grade Sawlog is generally 2.1m and 200mm for jarrah, and 2.4m and 300mm for karri, and the minimum amount of millable wood in such a log is generally set at 50% as assessed on the worst end.

- **Second Grade Sawlogs** - sawlogs below the standard of First Grade Sawlogs. Unless otherwise indicated, the minimum standard of a second grade sawlog is 2.1m in length and 250mm in crown diameter under bark, with at least 30% of millable wood as assessed on the worst end.

- **Third Grade Sawlogs** - sawlogs below normal Second Grade Sawlog quality, that may be sold by the Commission. Third Grade Sawlogs have no minimum standard and selection of such logs from reject material on bush landings is the responsibility of the buyer.

- **Small Sawlogs** - sawlogs with diameters under bark of 150-200mm.

- **Short Sawlogs** - sawlogs of a specific quality and below a specific length, that may be sold for specific end uses.

- **Feature Sawlogs** - sawlogs with desirable features of grain, colour, shape or size, sold for specialty end uses. Two grades are recognized: "high" and "low".

2. Bridge and Jetty Timbers

Bridge and Jetty Timbers are hardwood logs intended for use in the construction of bridges, wharves and jetties. Bridge and Jetty Timbers must be of a consistently higher quality than sawlogs. Most Bridge Timbers are produced for use by Main Roads WA. There are four types of Bridge and Jetty Timbers.

- **Piles** - high quality straight logs, driven into the ground in bridges, wharves and jetties.
- **Stringers** - high quality straight logs, placed lengthwise on piles.
- **Corbels** - short lengths of high quality log, placed lengthwise on top of piles to support stringers.
- **Bedlogs** - logs placed lengthwise on the ground, used to support stringers.

Note: bridge and jetty timbers are originally produced from the forest as "unprocessed round timbers".

3. Poles

Poles are long, straight logs used in an upright position to support loads above ground. Poles are usually of smaller diameter than Bridge Timbers, but must be of a similar high quality. Most poles are products for use by Western Power in supporting transmission lines. The amount of defect allowable in poles can vary depending on whether or not the pole is to be treated with preservative. Species which have been accepted by Western Power are jarrah, marri, blackbutt, karri, and yellow stringybark.

Note: poles are originally produced from the forest as "unprocessed round timbers".

4. **Residue Logs**

- **Chip Logs** - chiplogs are marri and karri logs for conversion into woodchips and then high quality pulp and paper products.
- **Charcoal Logs** - charcoal logs are jarrah logs destined for conversion into charcoal at Simcoa's plant at Kemerton.
- **Domestic Firewood Logs** - firewood logs are harvested by FPC contractors and sold under Contracts of Sale as either "dry" or "green" logs. The predominant species used is jarrah.
- **Bole Residue Logs (jarrah only)** -

5. **Craftwood** - a term used to describe pieces of wood (except burls) remaining on the forest floor after the completion of an integrated harvesting operation. A piece of craftwood is generally small in size, but with certain features of grain, colour or shape that make it suitable for manufacture into craft items. Craftwood may be sold under a Minor Production Contract (MPC) to members of the public. One condition of an MPC for craftwood is that no piece of wood greater than 1.5 m in length may be sold. If a longer piece of timber is required and found, it must be inspected and branded by an Officer before it can be collected as craftwood.

6. **Fencing Material** - this includes a range of products used for fencing purposes or small domestic construction. It includes posts (split or round), struts, strainers, rails and small poles up to 6 m in length. A standard specification for fencing material when sold by contract is included in Specification 6.2.

- **Chopping logs and pegging logs** - logs used in the sport of log chopping.
- **Garden paving slabs or rings** - these are "biscuits" about 75 mm thick, cut from logs about 400 mm in diameter. Logs from which garden rings are cut are sold as third grade sawlogs.
- **Burls** - the dense outgrowths on the trunk of some trees. It is believed they result from a tree's reaction to attack from insects or viruses. Burls may be cut from felled trees only, and are sold by weight.
- **Forest debris** - leaves, branches, tree loppings or small cull trees may be sold to commercial users must pay prescribed stumpage and other charges.

Standard specifications for all native forest (hardwood) log products are reproduced below. These specifications may be used as a general reference by FPC Authorised Officers and contractors. However, because there may be small but significant variations to some log specifications in some Harvesting Contracts and Contracts of Sale, the specifications included in those Contracts must be checked and used as the official specification in every case.

The standard native forest (hardwood) log specifications reproduced below are:

(1) Multiple Grade ("Bole") sawlogs (jarrah only)
(2) First grade sawlogs (jarrah).
(3) First grade sawlogs (karri).
(4) Sawlogs (marri).
(5) Second grade sawlogs (jarrah).
(6) Second grade sawlogs (karri).
(7) Third grade sawlogs (jarrah and karri).
(8) Unprocessed round timbers suitable for preparation into bridge and jetty timbers.
(9) Unprocessed round timbers suitable for preparation into transmission poles and building poles ("long poles" and "medium poles").
(10) Bole Residue logs (jarrah).
(11) Large chiplogs.
(12) Small chiplogs.
(13) Residue chiplogs.
(14) Charcoal logs.
(15) Fencing logs.
(16) Domestic firewood logs.
(17) High grade feature sawlogs (including sheoak).
(18) Low grade feature sawlogs.
(19) Small sawlogs (karri).
(20) Jarrah small sawlogs).
(21) Marri industrial wood (suitable for mobile chipper).

1. **Multiple Grade ("Bole") Sawlogs (jarrah only)**

Species:	Jarrah (*Eucalyptus marginata*)
Dimensions:	
Length:	minimum 2.1m with an unlimited maximum (only cut to facilitate extraction & cartage)
Diameter:	minimum 200mm under bark, maximum unlimited.
Quality:	Each tree bole felled must contain at least one 2.1m length of second grade sawlog (ie minimum 250mm with at least 30% millable wood as determined by the Authorised Officer)
	The 'top' of each tree felled will be cut at 'crown break' (as per jarrah inventory specification) then, as necessary, 'crowned off' to a point corresponding to 30% millable wood & a minimum of 1.2m of 'straight wood' at the crown end.
	The 'bottom' of each tree felled will be 'long butted' to 25% millable wood.
	No shattered wood permitted.

2. **First Grade Sawlogs** (jarrah)

Species:	Jarrah.
Dimensions:	
Length:	Minimum 2.1m.
Diameter:	Minimum under bark 200mm.
Quality:	Minimum amount of millable wood - 50% as assessed on the worst end face by the FPC Authorised Officer.

3. **First Grade Sawlogs** (karri)

(a) *Normal Specification*

Species:	Karri.
Dimensions:	
Length:	Minimum 2.4m.
Diameter:	Minimum under bark 300mm.
Quality:	Minimum amount of millable wood - 50% as assessed on the worst end face by the FPC Authorised Officer.

(b) *Specification for Whittakers*

Species:	Karri.
Dimensions:	
Length:	Minimum 2.4m.
Diameter:	Minimum under bark 200mm.
Quality:	For logs above 300mm sedub: minimum amount of millable wood - 50% as assessed on the worst end face by the FPC Authorised Officer. For logs between 200 and 300mm sedub: minimum amount of millable wood - 90% as assessed by the FPC Authorised Officer; sweep to not exceed 50mm in any 3.0m length from log surface to the chord treated by a straight edge or tight cord over the length of the log; logs shall otherwise be of uniform shape; gum rings to be maximum of one complete ring on end face.

(c) *Specification for Auswest –Busselton*

Species:	Karri plus a small proportion of marri.
Dimensions:	
Diameter:	Minimum sedub: 200mm.
Length:	3.6, 4.2 or 4.8 metres or multiples thereof. Tolerances will be negotiated from time to time.
Quality :	For logs above 300mm sedub: minimum amount of millable wood - 50% as assessed on the worst end face by the FPC Authorised Officer.

For logs between 200 and 300mm sedub, sweep to be maximum of 50mm in any 2.4m length; rot to be maximum of 30% on worst end face, limbs, stubs and bumps to be maximum of one per lineal metre, dryside to be maximum of 50% of bole circumference; pinholes to be clean only, unacceptable if associated with rot; large swellings unacceptable; gum rings to be maximum of one complete ring on end face; gum pockets to be maximum of one per lineal metre.

(d) *Specification for Sotico*

Species: Karri plus a small proportion of marri.

Dimensions:
Length: Minimum SED 200mm under bark.
Diameter: Minimum length: 2.4 metres.

1. Quality for logs: Logs will meet the quality standards set by the FPC Authorised Officer by which with minimum SED at least 50% millable wood as assessed on the worst end face of 300mm will be available.

2. Quality of logs: Sweep shall not exceed 30mm from log surface to the chord created by a straight edge or tight cord over the length of the 200mm and 300mm log. Logs shall otherwise be of uniform shape.

Fungal decay not acceptable.

Double heart, limbs, overgrowths, drysides, shatters and saw cuts other than superficial not acceptable.

Borer damage, shakes and gum veins shall be present to a negligible extent only.

4. **Sawlogs** (marri)

Species: Marri.

Dimensions and Quality: Marri sawlogs are those logs selected as such by the buyer, although generally the dimensions will be:

Length: Minimum 2.4m.
Diameter: Minimum under bark 300mm.

5. **Second Grade Sawlogs** (jarrah)

Species: Jarrah.

Dimensions:
Length: Minimum 2.1m.
Diameter: Minimum under bark 250mm.

Quality: Minimum amount of millable wood - 30% assessed on the worst end face by the FPC Authorised Officer.

6. **Second Grade Sawlogs** (karri)

Species:	Karri.
Dimensions:	
Length:	Minimum 2.4m.
Diameter:	Minimum under bark 300mm.
Quality:	Minimum amount of millable wood - 30% assessed on the worst end face by the FPC Authorised Officer.

7. **Third Grade Sawlogs** (Jarrah and karri)

Species:	Jarrah and karri.
Specification:	FPC does not set any specification. Third grade sawlogs are logs that do not meet the second grade sawlog specification. Selection of third grade sawlogs is the responsibility of the log buyer.

8. **Unprocessed round timbers suitable for preparation into bridge and jetty timbers**

Species:	Jarrah.
Dimensions:	
Length	As required by the customer, but normally stringers are between 6.3m and 8.2m, piles are between 6m and 20m, and corbels are a standard 1.5m.
Diameter	As required by the customer, but normally stringers are between 520mm and 650mm underbark, piles are between 300mm and 700mm underbark, and corbels are between 480 and 530mm underbark.
Shape:	Logs for preparation into bridge and jetty timbers must be essentially straight and of uniform but minimal taper.
Quality:	Logs for preparation into bridge and jetty timbers must be essentially of sound wood, free of termite attack, internal rot pockets and heart rot. Acceptable defects include tight gum rings, included sapwood at the butt end, minor end splits or shakes, and some sound knots.
General:	Logs must be delivered to the preparation site as soon as possible after felling to avoid insect and fungal attack.

Note: This specification is based on MRWA specification No. 1261 of October 1986 for Supply of Untreated Round Timber and Department of Marine and Harbours specification for Supply of Timber Piles issued in March 1986.

9. **Unprocessed round timbers suitable for preparation into transmission poles and building poles ("long poles" and "medium poles")**

Species:	Jarrah, Marri, Blackbutt, Karri, Yellow Stringybark, radiata pine, or pinaster pine.
Dimensions:	
Length	For transmission poles ("long" poles) minimum 12.1m to a maximum of 21.5m. For building poles ("medium" poles) minimum 6.0m to a maximum of 12.0m.
Diameter	For transmission poles, limits vary depending on the pole length, but range from a minimum of 150mm at the crown end for 9.5m poles to a maximum of approximately 700mm at the butt end for 21.5m poles. For building poles, limits will vary, but will generally be between 100mm and 300mm.
Shape:	Logs must be sufficiently straight such that an imaginary line from the centre of the crown end to the centre of the butt end at the "groundline" remains within the confines of the log.
Quality:	Logs must be essentially of sound wood, free of termite attack, internal rot pockets and heart rot. Radiata and pinaster pine must be entirely free of fungal and blue stain attack. Acceptable defects include minor insect damage, minor mechanical damage, some surface checking, sound knots, spiral grain up to a maximum of 1 in 15, tight gum veins and minor end splits.
General:	Logs must be delivered to the preparation site as soon as possible after felling to avoid insect and fungal attack. Radiata and pinaster pine must be delivered within eight days of felling; karri and yellow stringybark within five days of felling.
Note:	The specification for transmission poles is based on Western Power pole specifications ES/39/86 (1987 revision), ES/37/86 (1987 revision), ES/8/99 and ES/11/89 (May 1989 revision). Any pole from 6.0m to 12.0m in length is referred to for stumpage purposes as a "medium" pole. A pole longer than 12.0m is referred to as a "long" pole

10. **Bole Residue Logs** (Jarrah)

Species:	Jarrah, and other hardwood species made available by FPC and acceptable to the buyer.
Dimensions:	Any dimensions acceptable to the buyer but generally:
Length:	Minimum 1.8m.
Maximum:	Unlimited.

Quality:

A bole residue log will generally contain more than 50% by volume of material suitable for fencing purposes (ie fence posts, rails, strainers and poles up to 6m in length).

A bole residue log will generally not contain millable material that conforms with the specifications of a bole sawlog or a first or second grade sawlog.

Quantity determination: Weight over certified weighbridge.

11. **Large Chiplogs**

Species: Marri and karri.

Dimensions:

Length: Minimum: 3.4m for marri, 2.1m for karri.
Maximum: unlimited.

Diameter: Minimum: 300mm.
Maximum: karri unlimited, marri 700mm.

Quality: Charcoal in any form or quantity is not acceptable.

Kinks, bends and sweep must not exceed 150mm in any 3m length.

Rotten wood must not exceed 50% of the log volume, as assessed on the worst end face.

End face shatter must not exceed 50%.

Test cuts are not permitted.

Limbs, spurs and other protrusions must be trimmed to a maximum of 75mm beyond the log surface.

12. **Small Chiplogs**

Species : Marri and karri.

Dimensions :

Length: Minimum: 3.0m.
Maximum: unlimited.

Diameter: Minimum: 75mm.
Maximum: 375 mm.

Quality: Charcoal in any form or quantity is not acceptable.

Kinks, bends and sweep are acceptable provided the log can efficiently pass through the mill debarker.

Rotten wood must not exceed 50% of the log volume, as assessed on the worst end face.

End face shatter must not exceed 50%.

Test cuts are not permitted.

Limbs, spurs and other protrusions must be trimmed to a maximum of 75mm beyond the log surface.

13. **Residue Chiplogs**

Preamble: Residue chiplogs are karri only chiplogs that do not meet the specification for a large chiplog or a small chiplog, but will fit through the "M50" line at the Diamond mill. Residue chiplogs will tend to be short butt logs, off cuts or crown logs.

Species: Karri only.

Dimensions:

Length: Minimum: 2.1m.
Maximum: unlimited.

Diameter: Minimum: 150mm.
Maximum: 900mm.

Quality: Charcoal in any form or quantity is not acceptable.

Rotten wood must not exceed 50% of the log volume, as assessed on the worst end face.

End face shatter must not exceed 50%.

Test cuts are not permitted.

14. **Charcoal Logs**

Species: Jarrah.

Moisture content : Any moisture content, ie, "green" or "dry" (see note below).

Dimensions :

Length: Minimum 1.8m.
Maximum as nominated by customer (currently 6.0m).

Diameter : Minimum underbark 150mm.
Maximum underbark 1200mm.

Preparation : Lateral projections (branches, limbs, bumps) must not exceed 150mm beyond the log surface.

Ends must be cut roughly square, and must consist of at least 50% by area of wood in one continuous piece.

Acceptable defects:

The following log defects are acceptable, provided the log can be safely handled and transported.

- Double heart.
- Charcoal.
- Pin holes.
- Shakes and splits.
- Dead wood.
- Gum in any form.
- Bends: up to a maximum of 200mm in any 3m length.
- Rotten wood up to a maximum of 25% as assessed by area of.
- Rot visible on worst end.
- pipe.

Unacceptable defects:

The following defects are not acceptable:
- Visible evidence of termite activity.
- Shattered wood.

Note: Charcoal logs must be segregated into "green" or "dry" logs. "Green" logs are those from which the bark has been physically removed. "Dry" logs are those from which the bark has fallen off or become separated by natural means at the time of harvesting.

15. **Fencing Logs**

Species: Jarrah, marri, blackbutt, wandoo or any other hardwood species made available by FPC and acceptable to the buyer.

Dimensions: Any dimension acceptable to the buyer but generally:

Length: Minimum 1.8m.
Maximum 6.0m.

Diameter: Minimum under bark 100mm.
Maximum under bark 300mm for rounds.
Maximum under bark unlimited for logs suitable for splitting or sawing into posts.

Note: Logs suitable for splitting will generally be supplied in standard post length, or multiples thereof. Logs for use in the round will generally be supplied in whole tree lengths.

Quality: *For Rounds*:

Any quality acceptable to the buyer, but generally:

- Straightness - maximum deviation of 50mm in any 1.8m length.
- Double heart – acceptable.
- Deadwood - acceptable if not associated with decay.
- Pin holes - acceptable if not associated with decay.
- Decay – unacceptable.
- Shattered wood – unacceptable.

- Gum - acceptable.

For logs suitable for splitting into posts:

Any quality provided the log is below the standard of a first grade jarrah sawlog. (The specification for a first grade jarrah sawlog is minimum diameter 200mm, minimum length 2.1m and minimum quality of "at least 50% of millable wood as assessed by FPC Authorised Officer").

16. **Domestic Firewood Logs**

Species: Jarrah, or any other species made available by FPC and acceptable to the buyer.

Moisture Content: Any moisture content; ie either "green" or "dry", (see note below).

Dimensions:
Length: Minimum 1.8m.
Diameter: Minimum under bark 150mm.
Maximum under bark 1200mm.

Unacceptable Defects:

- Decayed wood, if the proportion by volume is greater than 15%.
- Shattered wood.
- Double heart or spiral grain likely to hinder manual splitting of sawn blocks.

Note: Firewood logs must be segregated into "green" or "dry" logs. "Dry" logs are those cut from standing dead tress with most bark absent, or from logs that have been lying on the ground for at least three years. "Green" logs are all other logs.

17. **High Grade Feature Sawlogs**

(a) Species: Available native hardwood species, comprising jarrah, blackbutt and wandoo.

Dimensions and Quality: There are not set dimensions or quality specifications for high grade feature sawlogs. In general however, these logs are considered to be **first or second grade sawlogs** suitable for specialty timber uses with particularly desirable features or characteristics of grain, colour or size. The logs are not to be used for general purpose sawmilling.

Selection: Selection of high grade feature sawlogs is the responsibility of the buyer, after all other log products of higher value have been segregated. (Higher value log products would normally include premium grade sawlogs.) Buyers will be expected to personally select logs at bush landings, or to give the appropriate FPC Authorised Officer a clear indication of the species and characteristics of logs required so that logs can be efficiently segregated by FPC's contractors.

Note: There is no guarantee that the full contracted quantity of logs will be available in any one year to exactly meet the requirements of the buyer.

(b) Species: W.A. Sheoak (*Allocasuarina fraseriana*).

Dimensions
Length: Minimum 0.9m.
Diameter: Minimum 200mm under bark.

Shape: Bends are acceptable provided a minimum length of 0.9m of straight log is available between bends, and provided no more than 5% of any log is wasted when cutting out the bends at the mill.

Quality: A maximum of 15% by volume of defective wood is permissible, as assessed on the worst end face.

General: Logs will generally be supplied in bole lengths and must be delivered to the mill landing within five days of felling.

18. **Low Grade Feature Sawlogs**

Species: Available native hardwood species, comprising jarrah, karri, marri, blackbutt, wandoo and banksia.

Dimensions and quality: There are no set dimensions or quality specifications for low grade feature sawlogs. In general however, these logs are considered to be **low quality third grade sawlogs** suitable for specialty timber uses, with certain desirable features or characteristics of grain, colour, size or shape such as forks, flames, bends, unusual shapes, fire damaged and dry logs. The logs are not to be used for general purpose sawmilling.

Selection: Selection of log grade feature sawlogs is the responsibility of the buyer, after all other log products of higher value have been segregated. (Higher value log products would normally include premium, first and second grade sawlogs.) Buyers will be expected to personally select logs at bush landings, or to give the appropriate an FPC Authorised Officer a clear indication of the species and characteristics of logs required so that logs can be efficiently segregated by FPC's contractors.

Note: There is no guarantee that the full contracted quantity of logs will be available in any one year to exactly meet the requirements of the buyer.

19. **Small Sawlogs** (karri)

Species: Karri.

Dimensions: Minimum sedub 150 to 200mm.
Minimum length 2.4m.

Quality: Sweep shall not exceed 15mm in any 3.0m length from log surface to the chord created by a straight edge or tight cord over the length of the log.

Logs shall have a smooth, clean surface and be of uniform shape.

Fungal decay not acceptable.

Double heart, limbs, overgrowths, drysides, sawcuts other than superficial, borer damage, shakes, gum veins, shatter, epicormic growths and overgrowths are not acceptable.

20. **Jarrah Small Sawlogs** (Provisional)

Species: Jarrah.

Dimensions: Minimum sedub 150mm.

Maximum led will generally be in the range 300-350mm.

Minimum length 1.8m.

Maximum length will be governed by the requirement to restrict the length of log above the point where the diameter is 0200mm under bark, to less than 2.1m. (ie any portion of the bole suitable for sale as first grade sawlog is to be produced as such.)

Quality:

- Tight gum veins are acceptable in one half of log as assessed on end face.
- Sapwood is included in the measurement of sedub.
- Borer damage is acceptable when confined to the heart only.
- Rot must be confined to a radius of 15mm from centre of heart on minimum size log, increasing to 19mm radius on log of sedub 190mm.
- Double heart is not acceptable.

- Sweep shall not exceed 25mm from log surface to the chord created by a straight edge along any 1.8m length of log.
- Logs shall have a smooth, clean surface and be of uniform shape.
- Tight limbs surrounded by tight wood acceptable if confined to one half of the log in any 18.m length, (as assessed on end face).
- Logs to be delivered fresh to minimise degrade through drying.

It is intended that this specification be applied to that part of the log less than 200mm dub. The first grade jarrah sawlog specification provides the minimum quality parameters for the remainder of log length.

21. **Marri Industrial Wood Logs** (for Wesfi Chipper)

Species: Marri (*Eucalyptus calophylla*).

Dimensions:

Length: Minimum 2.1m.
Maximum unlimited.

Diameter: Minimum 100mm underbark.
Maximum 1,500mm.

Shape: Kinks, bends and sweep are acceptable provided the log can efficiently enter the chipper. As a guide, kinks, bends and sweep shall not exceed 150mm in any 3m length.

Quality:

- Rotten wood must not exceed 25% of the log volume, as assessed on the worst end face.
- End face shatter must not exceed 25%.
- Test cuts are not permitted.
- Limbs, spurs and other protrusions must be trimmed to a maximum of 75mm beyond the log surface.
- Charcoal embedded in the log is not permitted; charcoal on bark, and superficial charcoal on surface of the log, is permitted.

APPENDIX 4
Forms

FOREST PRODUCTS COMMISSION

PRE HARVESTING OPERATION HAZARD IDENTIFICATION AND SITE HANDOVER SHEET (NATIVE FORESTS)

FPC Authorised Officer: ..... CONTRACTOR REP: .....
DATE:
SUPPLY AREA: .....
OPERATION CODE:.....

1. ROADING (Attach map if required). Indicate road names

Approved Haul Routes: .....
.....
Scrub Rolling Needed ? .....
.....
Road surface, grading, machine work gravel ? .....
.....
Culverts, Maintenance required ? .....
.....
Harvesting/truck signage required ? .....
.....
Other Hazards ? .....
.....

2. TYPE OF HARVESTING

(a) Hand falling (b) Mechanical Harvesting
(c) Cable Log (d) Mechanical Forwarding

3. TREEMARKING

(a) Required (b) In progress (c) Completed
(d) Not required

DID TREEMARKERS IDENTIFY HAZARDS ? YES / NO

4. FIELD INSPECTION: Notes & action: .....
.....
.....
.....

Date site (operation) handed by FPC Person to Contractor: .....

Name of FPC Authorised Officer: ..... Signature: .....

Date site (operation) handed back by Contractor to FPC: .....

Name of Contractor's Rep: ..... Signature: .....

Name of Forest Authorised Person: ..... Signature: .....

Distribution: White Contractor
Green Monitoring Officer & Manager
Yellow Remains in Book at all times

DEPARTMENT OF CONSERVATION AND LAND MANAGEMENT

HARVESTING INSPECTION AND ACTION SHEET (NATIVE FORESTS)

Supply Area: _____ **Operation Code:** _____ **Contractor:** _____

FPC Authorised Officer: _____ **Contractor Representative:** _____ **Date:** _____

Aspect of Operation		Comments	Complies	ACTION REQUIRED	Action Complete
1.	**COUPE PREPARATION**				
1.1	Coupe Boundaries Demarcated				
1.2	TEAZ, PEAZ, Reserves Demarcated				
1.3	Coupe Signs				
2.	**ENVIRONMENT**				
2.1	Hygiene Practices (FPC 10)				
2.2	Soil Damage (FPC 108)				
2.3	Erosion Control Drains				
2.4	Top soil landings saved				
2.5	Landing ripped/rehabilitated				
2.6	Pollutants/Rubbish				
2.7	Road drainage free of debris				
2.8	Reserved areas undisturbed				
2.9	Habitat trees undisturbed				
3.	**SILVICULTURE**				
3.1	Crop Trees Damaged (FPC 107)				
3.2	Top disposal around crop trees				
4.	**UTILISATION**				
4.1	Trees not fallen				
4.2	Logs not extracted				
4.3	Crown logs not cut				
4.4	Long butting				
4.5	Docking standard				
4.6	Unsaleable logs stacked at front				
5.	**SAFETY (FPC 111)**				
5.1	Hazards identified/removed				
5.2	Personal Protective Equipment Worn				
5.3	Felling Techniques				
5.4	Landing Management				
5.5	Road warning signs (felling/trucks)				
5.6	Travelling vehicles have headlights on				
5.7	Road conditions – Visibility				
5.8	Loads chained down				
6	**ADMINISTRATION**				
6.1	DRA Permits				
6.2	TWR				
6.3	Fire equipment/Units				
6.4	Coupes identified for D/Note completion				
6.5	Log measurements				
7.	**OTHER**				
8.	**GENERAL COMMENTS**				

SIGNATURES: FPC: _____ CONTRACTOR: _____

Distribution:

White	Contractor
Green	FPC
Yellow	Remains in Book at all times

FOREST PRODUCTS COMMISSION

HARVESTING OPERATION HANDOVER & PROGRESS CERTIFICATION SHEET
(NATIVE FORESTS)

Operation Code: _____ Contractor: _____

Date of handover of site (operation) by FPC to Contractor: _____

Comments: _____

_____

_____

FPC Authorised Officer Name: _____ Signature: _____

Record of Progress
(to be completed for every feller's block and landing by contractor)

BLOCK			**LANDING(S)**			**FPC CHECK**	
Block No.	Date Completed	Contractor's Signature	Date Completed	Contractor's Signature	Comments	Date	Signature

Site (operation) completed and handed back to FPC on *(date)* _____

Contractor's Representative Name _____

Operation accepted by FPC as complete: FPC Authorised Officer Name _____

Signature: _____

_____

Distribution: Original: FPC
Copy: Contractor

FIELD ASSESSMENT OF SOIL DAMAGE

(FOR NATIVE FOREST)

TIMBER SUPPLY AREA..... FELLER'S BLOCK .....

BLOCK/CPT.....

CONTRACTOR DETAILS.....

COUPE.....

CUTTING PRESCRIPTION.....

.....

PLOT OF FELLER'S BLOCK (ATTACHED)

VISUAL ASSESSMENT.....%

PLOT OF FELLER'S BLOCK (ATTACHED)

SURVEY SUMMARY

1. Total area of feller's block (if applicable) _____ m^2
2. Area of landing (if applicable) _____ m^2
3. Extraction damage:

Sample line	Topsoil removed (m)	Mixing (m)	Compacted (m)	Undamaged (m)	TOTAL
1					
2					
3					
4					
TOTAL	(a)	(b)	(c)	(d)	(e)

Extraction damage = {[(a) + (b) + (c)] ÷ (e)} x 100 = ...%

4. Total damage = 2) + 3) = ...%

RECOMMENDATION

1. Operation can continue; survey to be repeated ..... (date)

OR

2. Fellers' block/compartment closed.

Date of assessment - .....

Officer compiling - .....

Distribution: 1. Contractor
2. FPC

FIELD ASSESSMENT OF CROP TREE DAMAGE

DISTRICT ..... CONTRACTOR

.....

BLOCK..... HARVESTING DETAILS

.....

OPERATION

.....

FELLERS BLOCK ..... DATE OF ASSESSMENT

.....

A. DAMAGE ASSESSMENT

Number of trees assessed ..... (minimum sample of 100 trees)

Number of trees damaged .....

Percentage of trees damaged .....%

B. COMMENTS

.....

.....

C. RECOMMENDATIONS

.....

.....

OFFICER COMPILING .....

Information for completing this form:

1. Damaged trees are those crop trees that:

   (a) have more than 100cm^2 of cambium exposed,
   (b) have been felled, broken in two or uprooted, or
   (c) have more than 30% of crown removed.

2. In "Harvesting Details" specify type of machinery involved and names of feller and skidder driver.

3. In "Comments" write down:

   (a) any environmental or other factors, that may have affected the result of the assessment, and
   (b) whether this assessment has indicated an improvement or worsening of performance by the contractor.

4. If in "Recommendations" it is recommended that the contractor be charged for crop tree damage, the total number of crop trees in the feller's block must be assessed and the total number of damaged crop trees determined.

5. Forward this form immediately to FPC Authorised Officer; copies to Bush Supervisor and Contract manager.

APPENDIX 5

Safety Inspection Information

ITEM	CONDITIONS TO INSPECT FOR
Road	• Log trucks restricted to authorised roads. • "Log trucks on road" signs in place. • Clear visibility on road verges, corners and intersections. • Trucks/vehicles able to pass safely on incoupe roads • Hazards created during road construction identified/removed. • Road surfaces not hazardous.
Communications	• Well being of fellers is checked at least every three hours. • A communication system. • Check in/check out system in place. • System for contacting emergency services in place.
Personal/Personnel Vehicles	• Vehicles travelling at appropriate speeds • Vehicle lights on when travelling • No fuel in cabs. • First Aid kit in every vehicle.
Qualifications and Training	• Timber workers are appropriately qualified • Trainee or probationary workers are being fully supervised. • All timber workers have basic first aid qualification. • Only trained personnel to be used in fire fighting requirements. • Timber workers are familiar with Safety and Health Code. • Timber workers have been trained in emergency procedures.
First Aid Kit	• Each vehicle has a First Aid Kit.
Personal Protection Equipment (PPE)	• Hearing protection. • Hard hats. • High visibility garment • PPE in good condition
In-Coupe Management	• Principal has provided contractor with appropriate plans. • Tree markers have identified and marked hazards. • Signs advising of harvesting operations – authorised entry. • Principal has advised contractor about hazards. • Fellers are able to gain reasonable access to trees and are able to create escape routes from trees to be felled • No dangerous or leaning trees over or near landings. • Logs stacked to prevent rolling. • Landings constructed on flat ground; if not, systems in place to avoid injury from rolling logs

	• Personnel/personal vehicles not parked on or below landings. • Contractor has marked hazards using paint and/or hazards tape prior to felling. • Hazards are marked if/when created during operation. • Hung-up trees are removed.
Tree Felling	• Fellers are carrying hazard tape • Fellers have suitable wedges and hammers. • Fellers have been audited within past 12 months. • 'Feller Ahead' warning signs in place. • Fellers working within 400 meters of personal transport. • No partly felled trees left standing. • Approved fuel containers being used. • Other operation 2 tree lengths from falling
Harvesting Machinery	• Free of debris. • ROPS/FOPS in place. • Not working within two tree lengths of felling operation. • When parked, has all equipment lowered. • Steps & rails in good order. • Daily inspections carried out. • Suitable fire extinguisher carried.
Log Trucks	• Suitable cab guards, or load restraining rack in place. • Driven with due regard to other road users and road conditions. • Travelling at appropriate speeds. • Personnel not in or on truck while loading. • Lights on when travelling.
Graders	• Lights flashing. • Warning signs both ends.
Cable Logging	• All operators are aware of guidelines in code. • The yarder is only operated by trained personnel • Rigging equipment regularly inspected/replaced if worn or damaged. • Standardised, written signals are issued and used by all employees.

APPENDIX 6

Product Grade Identification Markings

Product Grade Identification Markings

FPC Authorised Officer – yellow lumber crayon or yellow paint
Contractor personnel – white lumber crayon or white paint

Product Type	**Product Code**
First grade sawlogs	Number "1"
Second grade sawlogs	Number "2"
Third grade sawlogs	Number "3"
Chiplogs	"CHIP"
Charcoal logs	"CHAR"
Bole sawlogs	"BS"
Bole residue	"BR"
Residue	"R"