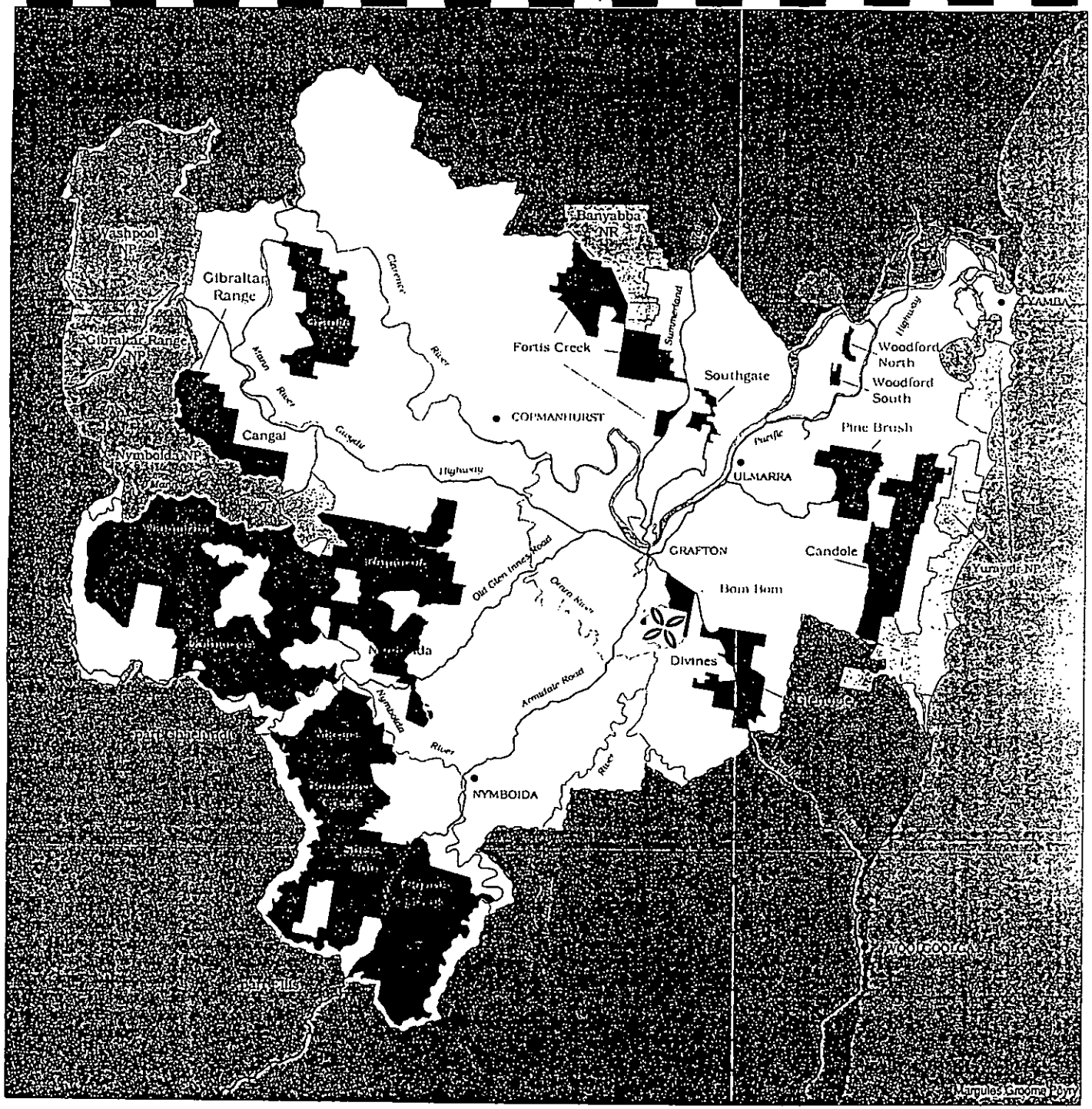
Divines

80

Grafton District
Northern Region

GRAFTON MANAGEMENT AREA



STATE FORESTS

NATIONAL PARKS

MANAGEMENT BOUNDARY

TOWNS

ROADS

RIVERS

0 20km N

LOCATION

COMPARTMENT 80

FIGURE 1.2

STATE FORESTS OF NSW
NORTHERN REGION - GRAFTON DISTRICT
HARVESTING PLAN-OPERATIONAL MAP

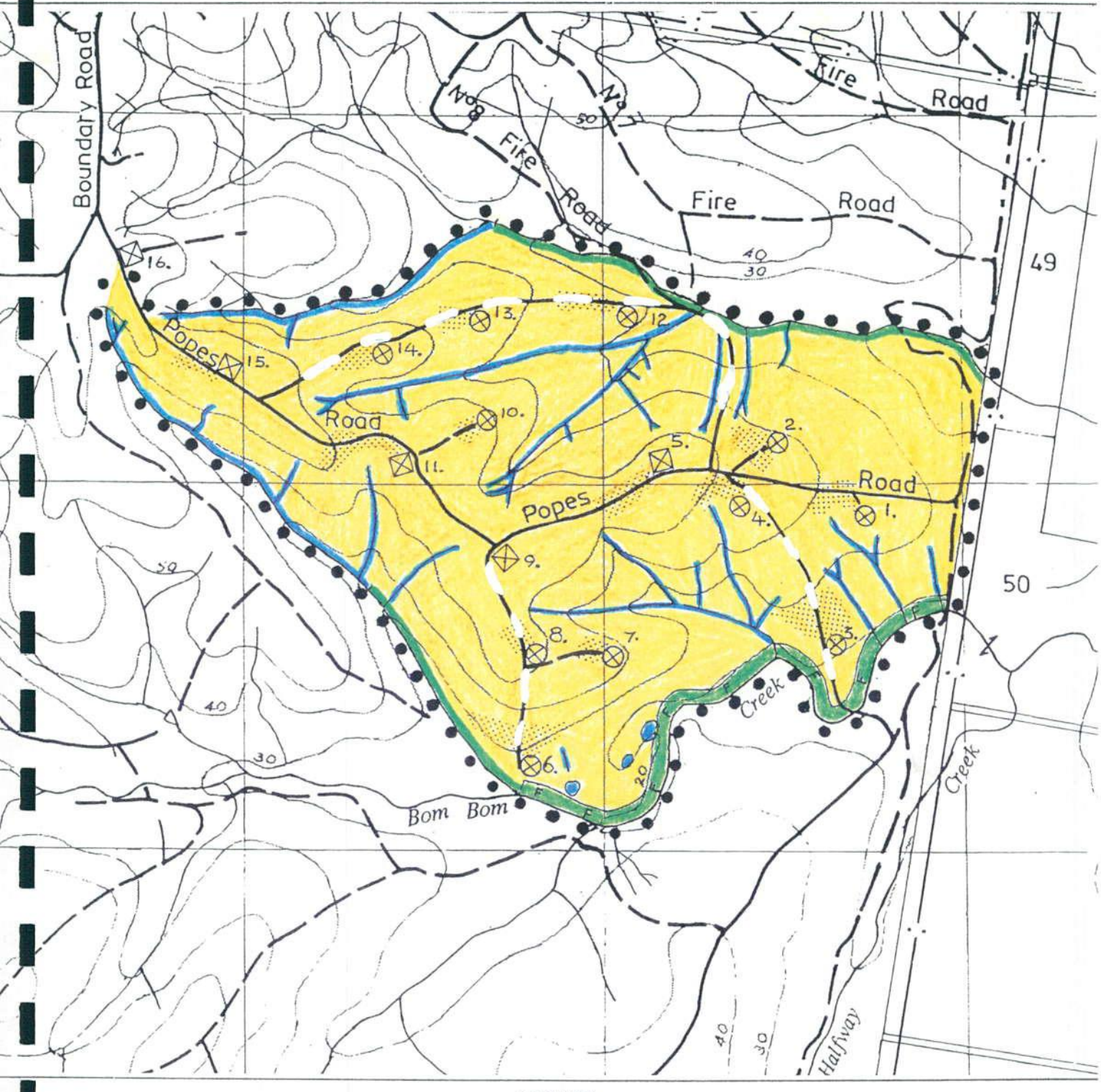
COMPARTMENT NUMBER...80

DIVINES STATE FOREST

GN

SCALE 1 : 15000 CONTOUR INTERVAL 10 m

0 0.5 1 km



LEGEND

BOUNDARIES

State Forest.....

Compartment .....

ROADS.....

Minor Roads.....

HARVEST AREA

Normal Prescriptions .....

Down-hill snigging .....

NON HARVEST AREA

Wildlife Corridor P.M.P.1.1.7.....

Riparian Zone.....

DUMP SITES

Dry Weather .....

Wet Weather .....

WATERCOURSES AND DRAINAGE LINES

Filter Strip .....

Filter Strip+ Protection Strip..

STATE FORESTS OF NSW
NORTHERN REGION - GRAFTON DISTRICT
HARVESTING PLAN-FOREST TYPE MAP

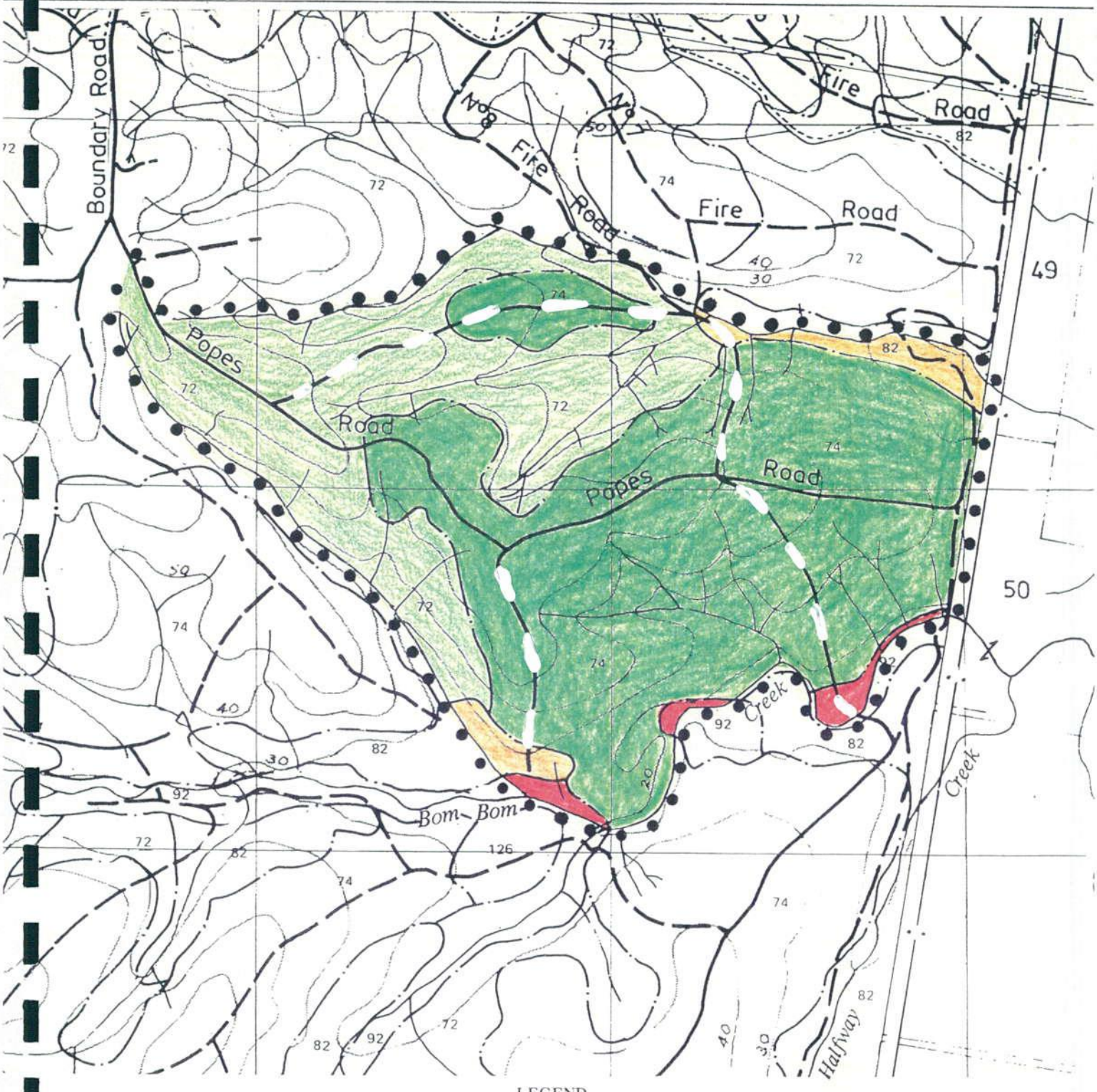
COMPARTMENT NUMBER...**80**

DIVINES STATE FOREST

SCALE 1 : 15000 CONTOUR INTERVAL 10 m

0 0.5 1 km

GN



LEGEND

BOUNDARIES

State Forest.....

Compartment.....

Forest Type.....

ROADS .....

Minor Roads.....

FOREST TYPES

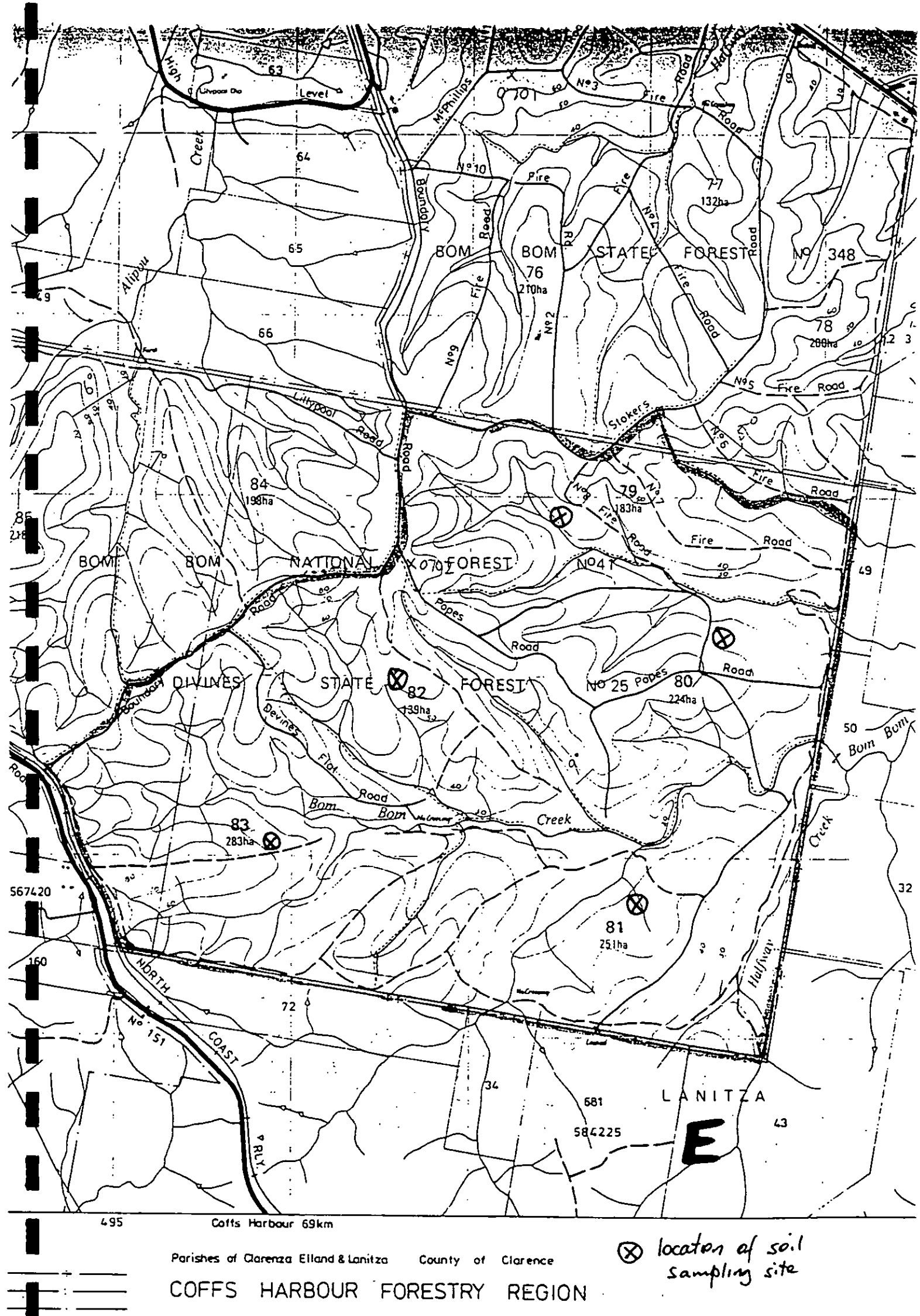
72.....

74.....

82.....

92.....

.....


Parishes of Clarenza Elland & Lanitza County of Clarence
COFFS HARBOUR FORESTRY REGION
⊗ location of soil sampling site
Coffs Harbour 69km
BOM BOM STATE FOREST No 348
BOM BOM NATIONAL FOREST No 41
DIVINES STATE FOREST
LANITZA
E
Lilypool Road
Stokers Road
Pipes Road
Devines Flat Road
Bom Bom Creek
Halfway Creek
NORTH COAST
No 151
PRLY.
Fire Road
Boundary Road
63
64
65
66
76 210ha
77 132ha
78 200ha
79 183ha
80 224ha
81 251ha
82 139ha
83 283ha
84 198ha
567420
584225

316 North 26/9/95

Harvesting Plan No GG 95/06/80

Contents

RECEIVED

Part 2 FOREST MANAGEMENT & ENVIRONMENTAL CONSIDERATIONS

2.1 PHYSICAL FEATURES

Description 1 Physical Description of the Area

STATE FOREST	**Divines No 25**	DISTRICT	**Grafton**
REGION	**Northern**	COMPARTMENT	**80**
MANAGEMENT AREA	**Grafton**		

Natural Features

General: The compartment contains near flat to undulating slopes. It is basically part of a long secondary ridge running east off a low main range system.

Catchment: Clarence River catchment. Bom Bom Creek, a tributary of the Clarence, runs along the eastern section of the compartment's southern boundary.

Altitude range: 20m - 75m A.S.L.

Aspect: Generally easterly.

Topography: The compartment consists of wide flat ridges with slopes generally less than 10°.

Artificial Features

Roads: Boundary Road gives access through the forest to Compartment 80. Popes Road runs off Boundary Road through the compartment west to east. Four other formed roads give access to side ridges in the compartment and to the eastern boundary.

Minor Roads: Three minor roads give access to dump sites in the compartment.

Description 2 Special Warning of Critical Boundaries or Non-harvest Areas

Private property joins the eastern boundary of the compartment. This boundary is fenced.

A Special Emphasis Flora and Fauna Protection Zone (PMP 1.1.7 Wildlife Corridor, 40m strip either side of the stream) exists along Bom Bom Creek on the eastern part of the southern boundary of the compartment, as indicated on the Operational Map.

Riparian Habitat Zones exist 20 metres either side of streams (watercourses, drainage lines and drainage depressions) with catchments greater than 40 hectares.

Reference Grafton Management Area Environmental Impact Statement

2.2 FOREST MANAGEMENT AND SILVICULTURE

Description 3 Compartment Subdivision, Forest Types

Areas:

Gross Area of Compartment	225 ha
Wildlife Corridor	8 ha
Riparian Habitat Zones	5 ha
Filter strips	15 ha
Proposed for logging	**197 ha**

Forest Types:

Forest Types		Area (ha)
72	Spotted Gum - Grey Box	77.2
74	Spotted Gum - Ironbark/Grey Gum	134.9
82	Grey Box	8.5
92	Forest Red Gum	4.3

Reference For Commission NSW (1989). Research Note 17. *Forest Types in New South Wales*

Description 4 Broad Description of Vegetation

(a) Forest Types

- Type 72 a dry type that occurs on the western and possibly less exposed sections of the compartment.
- Type 74 a dry type occurring over more than half of the compartment basically in the eastern section.
- Type 82 an open grassy type that occurs on the lower eastern sections of the compartment in bands along the drainage lines.
- Type 92 an open grassy type that occurs on the lower eastern section of the compartment replacing the Type 82 in places along the drainage lines.

It is difficult to distinguish between Types 72 and 74 in the field (there is no Grey Gum on the compartment) and with Grey Box occurring scattered over the whole of the Spotted Gum area it could all readily be typed as 72.

Overstory species

The overstory species are Spotted Gum, Grey Box, Grey, Narrow-leaf and Red Ironbarks, Grey Gum, White Mahogany, Red Bloodwood, Forest Red Gum, Roughbarked Apple and White Stringybark.

(b) Understory

The understory is typically dry and open (and often non-existent), being eucalypt regeneration and acacias with occasional forest oak and roughbarked apple. Mock olive, coffee bush and muttonwood are scattered through the area. Some swamp oak and melaleucas occur along the drainage lines towards the eastern boundary.

(c) Ground-cover

The ground-cover is mainly native grasses, mostly kangaroo and baldy, and litter. A creeper (*Hardenbergia violacea*) also occurs and there are herbaceous species along the moister creek areas.

(d) Rare or Endangered Species

No occurrences of rare or threatened flora are recorded on the compartment and none were encountered during field inspections.

(e) Rainforest

There are no areas of rainforest on the compartment.

(f) Exotic Weeds

Lantana is scattered through lower sections of the compartment. There are scattered plants of groundsel bush, noogoora burr, farmers friend and fire weed in the compartment.

(g) Regeneration and Serial Stages

The compartment carries a multi-age forest consisting of mature or maturing regrowth seemingly having resulted from harvesting and/or the impact of settlement during the later 1800s and early stand improvement treatment, and groups of younger regrowth of varying ages, the result of subsequent selective logging operations and stand treatments.

Description 5 Forest and Crop Condition

Compartment 80 has a long history of logging of varying intensities and it has been silviculturally treated on a number of occasions. The forest was basically logged out by the turn of the century. The early logging and intense treatment of 1911/15 (ringbarking, grubbing, stacking and burning - apparently removing the last of the remnants of the original stand) induced growth responses on retained stems and allowed regeneration to become established and grow. Much of the current stand would have resulted from that work. It is now mainly mature or maturing. Average growth rates would be low. There is a need to replace a large proportion of this stand over the next few cutting cycles to maintain stand vigour and increase growth rates. The whole of the compartment would now yield a range of log types.

The forest has been grazed more or less since European settlement in the 1840s, probably originally as part of *Bushy Park* station and since Forest Reserve notification in 1881 by way of lease or permit. The area has been regularly burnt to maintain grazing capacity. There were cattle on Compartment 80 at the time of recent inspections.

Description 6 Forest Management Activities

(a) Silviculture

The main silvicultural objectives are to:

- Maintain the natural forest in a healthy condition, with some areas in a relatively undisturbed state. This will include the provision of habitat trees and provide for their future replacement.
- Obtain adequate post-harvesting regeneration that is similar in species composition to that of the original forest.
- Provide for growth and development of regeneration.
- Produce multi-aged stands on a broader area basis.

The Wildlife Corridor, Riparian Habitat Zones and filter strips on the compartment will remain in a relatively undisturbed state. Protection strips will be thinned under specific prescriptions with up to 50% canopy removal.

Clusters of habitat trees will be retained to meet wildlife habitat requirements.

On the balance of the area, while taking groups of younger regeneration into consideration, harvesting will provide canopy gaps and ground disturbance to promote seedling regeneration leading to multi-age regrowth forest conditions. A minimum canopy gap size of 0.4 hectares is required in the forest types occurring on the compartment to achieve successful regeneration development. This corresponds to an area approximately 65 metres in diameter.

To sustain regrowth forest development on a cyclic basis, gap creation will aim at treating a maximum of 25% of the net harvesting area this cutting cycle. The balance of the area will be lightly selectively thinned, retaining stems that have the potential of putting on positive net increment to the next cutting cycle.

(b) Harvesting Method

The harvesting method proposed for the area is based on current accepted operational practices. It comprises:

- Chainsaw felling using directional felling techniques where required.
- Snigging of logs using a crawler tractor and/or a rubber tyred skidder.
- Debarking and loading of logs at the dump using an excavator or folklift.
- Transport of logs from the site using a jinker and prime mover.

A number of different log types will be produced by the harvesting. These will be segregated at the dumps and usually transported to different purchasers.

(c) Fire Management

Fire management is required to;

- limit damaged to stands caused by wildfires
- ensure the establishment and survival of regeneration
- maintain wildlife habitat
- maintain hydrological conditions
- meet State Forests' obligations under the Bush Fires Act.

Fire management entails the quick response to wild fire occurrence to limit fire spread, and the maintenance of fine fuels at low levels, usually by burning under mild conditions, to decrease wild fire intensities. Activities are co-ordinated with other fire control agencies through the Ulmarra District Fire Plan.

In Compartment 80, bark and logging debris will be progressively spread through the logged area and/or accumulated in small heaps on the dump during the harvesting operation, logging debris will be kept approximately 5 metres clear of identified habitat trees, bark and logging debris will be burnt, and in the longer term fine fuels will be managed as detailed in the **Grafton District Fuel Management Plan 1993** and the **Ulmarra District Fire Plan**.

2.3 FLORA PROTECTION

Description 7 Presence of Protected or Endangered Plant Species

No species listed as Rare or Threatened have been detected in this compartment and none are expected to occur.

Reference Briggs, J.H. and Leigh J. H., 1988. *Rare and Threatened Australian Plants*, Aus NPWS

Grafton Management Area Environmental Impact Statement

Description 8 Presence of Rainforest

There are no areas of rainforest in the compartment.

Description 9 Protection of Plant Species

Not applicable to this compartment.

2.4 FAUNA PROTECTION

Description 10 Endangered and Protected Fauna Occurrence

(a) General

Rufous Bettong is the only Schedule 12 species that has been detected in Compartment 80. Schedule 12 species expected to occur in, or in the vicinity of, the compartment are;

Glossy Black-Cockatoo	**Red Goshawk**	**Square-tailed Kite**
Swift Parrot	**Powerful Owl**	**Masked Owl**
Sooty Owl	**Stephen's Banded Snake**	**Beccari's Mastiff Bat**
Pale-headed Snake	**Brush-tailed Phascogale**	**Yellow-bellied Glider**
Rufous Bettong	**Common Planigale**	**Koala**
Hoary Bat	**Little Bent-wing Bat**	**Common Bent-wing Bat**
Yellow-bellied Sheath-tailed Bat		

References Grafton Management Area Environmental Impact Statement
SFNSW GIS Records

(b) Habitat Trees

Compartment 80 contains Dry Hardwood forest with xeromorphic understory. Sufficient potential habitat and recruitment habitat trees exist in the net harvest area to allow for the retention of enough trees to meet prescription requirements.

(c) Wildlife Corridor

A designated wildlife corridor exists along Bom Bom Creek as shown on the Operational Map. The corridor is 40 metres wide on either side of the creek.

(d) Riparian Habitat Zones

Riparian Habitat Zones exist 20 metres either side of streams (watercourses, drainage lines and drainage depressions) with catchments greater than 40 hectares.

(e) Refugia Areas

No areas of critical habitat for Schedule 12 species have been located in the net harvest area and no refugia areas have been set aside.

Description 11 Species and Habitats Descriptions

Brief habitat descriptions for Schedule 12 species that might be adversely impacted by forest management activities on Compartment 80 are stated below:

(a) Critical Weight Range Species

The only Critical Weight Range species likely to occur in Compartment 80 is the Rufous Bettong. Rufous Bettongs inhabit well-grassed open forests and are

commonly associated with Spotted Gum. Rufous Bettongs have been seen in the compartment.

(b) Glossy Black-Cockatoo

Glossy Black-Cockatoos require stands containing species of Casuarina for food and large tree-hollows for nesting in a range of hardwood forest types. Limited suitable Casuarina occur on the compartment and there are large hollow trees on it and nearby.

(c) Red Goshawk

Red Goshawks require large open woodland trees for nesting, often associated with riparian areas and swamps. Suitable habitat exists near to Divines SF.

(d) Square-tailed Kite

Square-tailed Kites prefer open forests and woodlands and may occasionally be seen over or near the compartment.

(e) Swift Parrot

This parrot prefers open dry forests and woodlands with winter-flowering eucalypts. It is nomadic, breeds in Tasmania and may occasionally be seen in or over the compartment.

(f) Powerful/Masked/Sooty Owls

These owls require large tree-hollows for nesting, roost sites in large trees and require a large home range. Suitable areas occur nearby but the compartment itself does not seem to have suitable habitat.

(g) Stephen's Banded Snake and Pale-Headed Snake

These snakes require tree hollows and old trunk scares. There is a scattering of suitable older trees through the compartment.

(h) Brush-tailed Phascogale

This species requires tree-hollows for nesting and prefers open forest areas, foraging generally in large rough-barked trees. The open, eastern drainage-line areas of the compartment might be suitable habitat.

(i) Yellow-bellied Glider

Yellow-bellied Gliders require tree hollows for nesting, feed on eucalypt sap by cutting V-notches into the bark of certain eucalyptus, eucalypt nectar and insects harvested beneath the loose bark of bark-shedding eucalypts. The lower, eastern section of the compartment might be suitable habitat.

(j) Common Planigale

This species occurs in a wide range of habitats generally close to water or wet areas and requires some surface cover. The eastern creek-line areas in the compartment may be suitable habitat.

(k) Koala

Koalas feed on eucalypt leaves from a range of species and prefer higher nutrient areas. The lower elevation, eastern section of the compartment is higher nutrient country.

(l) Yellow-bellied Sheath-tailed Bat

This bat roosts in tree hollows and occurs in a range of habitats, including lower elevation, dry forests. The compartment would seem to be suitable habitat, although tree hollows might be limited.

(m) Beccari's Mastiff Bat

This bat roosts in tree hollows and appears to prefer open forests and woodlands. Compartment 80 and nearby areas would seem to be suitable habitat, although tree hollows might be limited.

(n) Hoary Bat

This bat roosts in tree hollows and occurs in a range of habitats, including open forests and woodlands. The compartment would seem to be suitable habitat, although tree hollows might be limited.

(o) Little Bent-wing Bat/Common Bent-wing Bat

These bats roost in caves and similar structures and occur in most forest and woodland habitats.

References Grafton Management Area Environmental Impact Statement.
State Forests' Response to Submissions to the Grafton Environmental Impact Statement.

2.5 SOIL EROSION AND WATER POLLUTION CONTROL

Description 12 Site Soil and Water Data and Other Information

(a) Location

Compartment 80 is located on the eastern side of Divines SF which in turn is located some 10 kilometres south of Grafton. See location map attached.

(b) Climate

Generally the climate in the Grafton area is sub-tropical with hot summers, mild winters and a distinct winter/spring dry season.

Rainfall

The average annual rainfall for the area is about 1050 mm

The average rainfall erosivity - **R = 3300**

January to March is the wettest period while June to August is the driest period. Heavy rainfall events are common during summer and autumn. The monthly rainfall erosivity details are:

J	F	M	A	M	J	J	A	S	O	N	D
627	561	396	132	66	99	66	66	198	231	363	495

Reference — Rosewell C.J. & Turner J.B. (1992). *Rainfall Erosivity in New South Wales.* **Technical Handbook No 11 (1st Edition), Soil Conservation Service of New South Wales.**

Temperature

Mean maximum temperatures range from 30° in January/February down to about 20° in July/August. The mean minimum temperature range is from about 20° mid summer to around 5° July/August. These data give an indication that ground cover growth can be prolific during the warmer months but slows down considerably during the cooler drier winter periods and at times is basically nil.

(c) Geology

Compartment 80 is on the Grafton Formation, being lithic sandstone, siltstone, claystone clay-rich sedimentary deposits of Upper Jurassic-Cretaceous age.

Bedding planes

There are no obvious bedding or fracture planes in the area and no indications of mass movement.

References — Veness & Associates (1994). Soils Report Grafton Environmental Impact Statement.

(d) Soils

Soil sampling of the area and soil testing has been carried out by J Veness of Veness & Associates Pty Ltd. Soil sample sites are indicated on the map included with the Soils Report.

Soil types

The soil derived from the sediments is typed as structured plastic clays or yellow podsolic, gleyed podsolic soils.

Description and profile

The soil is described as brown, pedal, slightly stony light clay and reddish brown, pedal, light clay topsoil layers to reddish brown, strongly pedal, sometimes stony, light medium clay and bright yellow brown, pedal, usually stony, light medium clay subsoil layers.

The top-soil layers are up to about 30 cm in depth. The surface condition is described as either crusting, hard-setting or friable with a thin layer of decomposing plant litter and from 1% - 90% scattered stone fragments, which are usually ironstone.

References — Veness & Associates (1994). Soils Report Grafton Environmental Impact Statement.

Erodibility

K values A horizon = 0.023
K values B horizon = 0.031

Texture

A horizon - clay loam, normal plastic.
B horizon - light clay, normal plastic.

Dispersibility

% clay A horizon	18%(inclusive of gravels)
% clay B horizon	32%(inclusive of gravels)
D% A horizon	28%
D% B horizon	25%
% dispersible soil A horizon	18/100x28/100x100 = **5.04**
% dispersible soil B horizon	32/100x25/100x100 = **8.00**

The A horizon is not significantly dispersible.
The B horizon is not significantly dispersible.

Reference Vessess and Associates. Soils report Number VA1625A/02.

A copy of Report Number VA1625A/02 from J Veness is attached.

Inherent fertility

The soils are relatively fertile compared, generally, with soils in State forests in the Grafton area, as is evident by the occurrence of the Red Gum and grass cover on the low elevated areas. The nearby private property is typical Clarence valley open Red Gum/Apple woodland country. The original stand on the forest would have been very open.

Depth to subsoils and bedrock

Subsoils are from around 30 cm, bedrock is at about 100 cm or much deeper and was not always reached by the sampling. The compartment is relatively flat and the harvesting should not often disturb the subsoil.

Existing erosion

There is very little evidence of erosion within the compartment. All structures built during the most recent logging seem to be functioning. There is limited deposition of sand and fine gravel in some drainage lines. There is some hollowing-out on the main creek lines (probably not connected to any harvesting) and some more or less permanent water holes have been formed.

(e) Landform

Slope

Slopes are generally convex from the ridge-tops down to the drainage lines. The major portion of the compartment has slopes less than 10° with large areas nearly flat. Small sections, mostly near some drainage lines, are up to 15°. Areas of slope classes are given in Table 1 below.

Table 1 - Slope Class Areas
(hectares)

0° - ≤5°	>5° - ≤10°	>10° - ≤15°
174	48	3

Terrain

The compartment basically consists of a broad, relatively flat, secondary ridge with a number of short, wide, side ridges. The lower sections of the drainage lines are wide and nearly flat.

Drainage line condition

The drainage lines are incised in the higher sections of the compartment and then flatten out to become mostly broad and well grassed. There is limited deposition of sand and fine gravel. The channels tend to meander in the lower sections and there is evidence that the streams cut through the bends during heavy rainfall events.

The flow in the streams is intermittent (in fact they rarely run) and the drainage lines and watercourses were dry, with the only water being in a few scattered holes, at the time of recent inspections.

Aspect

The aspect is, generally, easterly (ranging from north to south-west).

Rockiness

There are no rock areas on the compartment and rockiness is not a consideration. The surface condition is described as either crusting, hard-setting or friable with a thin layer of decomposing plant litter and from 1% - 90% scattered stone fragments, which are usually ironstone.

(f) Hydrology

The compartment is in the Clarence River catchment. Bom Bom Creek runs north-east out of the forest and joins the Clarence River (as Deep Creek) at Ulmarra, about 10 km down river from Grafton. There are no prescribed streams, swamps or wetlands within the net harvest area.

No major water storages occur adjacent to or down stream from the compartment.

Representative water monitoring sites

The representative water monitoring site is Chaelundi (Sandstone, Rainfall 800 mm).

Reference Forest Planning Branch *Water quality monitoring program* **SFNSW** 1994

Previous harvesting

The forest was one of the original sources of hardwood timber in the Clarence area and was cut over and, apparently, had regenerated to some extent by the late 1800s. The compartment was intensively treated ("ringbarked and mattocked") in the period 1911-15. It was harvested, more or less, on an annual basis, mostly for poles, girders and sleeper material, from the 1920s to the 1960s and treated on a number of occasions. Compartment 80 was last logged during 1991 for poles and girders. Erosion mitigation structures were constructed on snig tracks and minor roads during the 1991 logging.

Upstream catchment water use

Production forestry - the upstream catchment is wholly within Divines SF.

Downstream catchment water use

Bom Bom Creek flows through grazing country before joining the Clarence River. There would be limited stock watering along its length before it becomes salty.

Domestic water use

There is no domestic water supply drawn from the Clarence below the Bom Bom Creek junction.

(g) Vegetation and Ground-cover

Effect on ground-cover during operations

The harvest operations are expected to remove less than 20% of the overall ground cover of the net harvest area.

Recovery time

Recovery will be relatively rapid with 100% live ground-cover being attained with 12 months. The tracks and minor roads utilised during the 1991 logging have revegetated.

(h) Proposed Operation System

Use of existing roads

Existing roads have been evaluated for their potential to cause water pollution.

Boundary Road and Popes Road, which are crowned, effectively drained by mitres and are permanently maintained, give access to and through the compartment. Additionally, six other minor roads give access to side ridges and the eastern boundary. Four of these roads have been established for a long time and are crowned, effectively drained by mitres and have been irregularly maintained open.

The pavements of these roads are consolidated by long time use and the verges are well grassed. Sections have recently been graded.

Two of the minor roads, constructed during the 1991 logging, will have to be reopened. This will simply require the lowering of some cross-fall banks, constructed at that time, and the removal of a few pieces of fallen timber. This will be done by the logging machinery and will cause minimal disturbance to the road pavements.

All roads are in a stable condition with batters and drainage outlets well grassed and none are likely to cause significant water pollution.

Log haulage will be up hill to Popes and Boundary Roads. The existing natural-surface, open crossings on the minor roads are not suitable for log haulage vehicles but there is no need to up-grade them for that purpose. They are well-grassed and stable.

Road construction

There is no road construction required for the harvesting. There will be no need to establish borrow pits or gravel pits.

Harvesting

The harvesting method proposed for the area is based on current accepted operational practices. It comprises:

- Chainsaw felling, using directional felling techniques where required.
- Snigging of logs using a crawler tractor and/or an articulated rubber tyred skidder.
- Debarking and loading of logs at the dump using an excavator or forklift.
- Transport of logs from the site using a jinker and prime mover.

The crawler tractor is used for construction work and for snigging from steeper slopes, including winching of logs. The rubber-tyred skidder is used on the flatter terrain, for snigging smaller logs and logs from steeper areas that have been bunched by the tractor. The tractor will not often be used in Compartment 80.

Cover factor

The harvesting operations described above result in a cover factor (in accordance with PCL Sch 3, Part A, Table 2) of **C = 0.108**.

Location of log dumps

Log dumps are located on ridge-tops to facilitate uphill snigging as indicated on the operational map. There will be limited downhill snigging to dumps 1 to 8 and 10 to 15 to reduce snigging distances and take advantage of previously constructed log dumps and snig tracks. Less than 10% of the snigging activity will be downhill.

Post-harvest burning

In Compartment 80, bark and logging debris will be progressively spread through the logged area during the harvesting operation and/or accumulated in small heaps on log dumps. Logging debris will be kept approximately 5 metres clear of identified habitat trees. Bark and logging debris will be burnt and, in the longer term, fine fuels will be managed as detailed in the Grafton District Fuel Management Plan (1993) and the Ulmarra District Fire Plan.

Post-harvest rehabilitation

Natural regeneration and natural re-seeding of overstory, understory and ground-cover plants will provide ground cover rehabilitation. Roads, log dumps, major snig tracks, associated batters and drainage structures normally stabilise within twelve months provided cross-fall and cross-bank drainage is properly installed. The extent of re-vegetation will be assessed during post-logging regeneration surveys.

Description 13 Evaluation of Soil and Water Data

(a) Soil Erosion and Water Pollution Hazard Categories

Soil Erosion and Water Pollution Ratings (SE/WPR) have been assessed using SOILOSS 5.1. The Ratings have then been used to assess Soil Erosion and Water Pollution Categories (SE/WPC) for the net harvest area. Details are in Table 2 below, the subsoil data having given lower slopes for the categories.

SE/WPR = R x K x LS x C (5.1) where:

R = 3300		
K = 0.023	**Topsoil (A horizon)**	Method B3
K = 0.031	**Subsoil (B horizon)**	Method B3
S = As factored in SOILOSS 5.1		
L = 20 metres		
C = 0.108	Native forest harvesting "B" Table 2	
P = 1.0		

Table 2: Water Pollution Hazard Categories

Slope Ranges (Degrees)	Water Pollution Category	Indicative % of Net Harvest Area
0 - ≤4	1	65
>4 - ≤19	2	35
>19 - ≤30	3	N/A
Roads	3	N/A

The following factors for rainfall erosivity and soil erodibility also apply to road construction:
R = 3300 **K = 0.031**

(b) Dispersibility

% dispersible soil A horizon = **5.04**
% dispersible soil B horizon = **8.00**
The A horizon is not significantly dispersible.
The B horizon is not significantly dispersible.

(c) Other Factors

There are no other soil erosion or water pollution factors which need to be considered in relation to the planned harvesting of Compartment 80.

References

Standard Erosion Mitigation Guidelines for Logging in New South Wales **Soil Conservation Service, CaLM, NSW 1993**

Rosewall C.J. *SOILOSS A program to assist in the selection of management practices to reduce erosion*

Soil Conservation Service Technical handbook No. 11 First Edition 1990, **2nd Edition** 1993.

2.6 FOREST ZONING AND SPECIAL ATTRIBUTES

Description 14 Forest Zoning and Special Attributes

(a) Research Plots

There are no research plots or long term inventory plots in the net harvest area.

(b) Special Attributes of the Area.

No special attributes occur in the net harvest area.

Part 3 AUTHORISATION CONDITIONS

3.1 COMPLIANCE

(a) Area Identification

GRAFTON DISTRICT

Divines State Forest No. 25

Compartment 80

Grafton Management Area

(b) Third Party/Lessee or Other Interest

The compartment is within the area of Occupation Permit No 11955 held by J.P. Lloyd for the purpose of grazing.

(c) Environmental Compliance Requirements

This Harvesting Plan is prepared by State Forests of New South Wales (State Forests) under the authority of the Forestry Act 1916. This Harvesting Plan is a condition of all Timber, Forest Products, Contractors and Operators Licences issued in connection with the timber harvesting operations described in the Plan.

All operations conducted under the authority of the Timber Licence and other Licences and Agreements issued for the area covered by this Harvesting Plan must comply with:

- Licence conditions issued by State Forests under the Forestry Act 1916.
- the **"Code of Logging Practice Native Forests - State Forests and Other Crown Timber Lands"** - State Forests (1993).
- the **"Standard Erosion Mitigation Guidelines for Logging in New South Wales" (SEMGL 1993)** issued by the Soil Conservation Service of Department of Conservation & Land Management (CaLM).
- the conditions of **Pollution Licence No 4017** issued by the Environment Protection Authority under the Pollution Control Act 1970. Those general conditions which affect licensees are set out in Schedule "A" attached to every Timber, Contractors and Operators Licence.
- conditions attached to licences issued by the National Parks and Wildlife Service under the Endangered Fauna (Interim Protection) Act 1992 and the National Parks and Wildlife Act 1967 (NPW Act).
- conditions resulting from the determination of the **Grafton Management Area Environmental Impact Statement**.
- the silvicultural specifications as stated in the **Grafton Management Area Environmental Impact Statement**.
- the schedule of specifications for the harvesting and utilisation of timber applicable to this operation, in this case:
    - **Grafton/Coffs Harbour Compulsory Sawlog Specification Hardwood Sawlog Flat Rate Royalty Utilisation Standards**
    - **Specification for Eucalypt Veneer Logs for Rotary Peeling**
    - **Australian Standard AS2209 - 1979 (poles)**
    - the Code of Procedure for the measurement of timber and other products applicable to this operation, in this case:

- **Code of Procedure for the Measurement of Hardwood Logs and other Timber Products - Northern Region.**

Variations, additions or amendments to the above documents may be made by the responsible authorities at any time, and must be implemented immediately by the State Forests Licensee.

(d) Environmental Planning & Assessment Act Requirements

In preparing this Harvesting Plan, the requirements of Part V of the EPA Act (as amended) and Section 92 of the NPW Act have been considered and Grafton Management Area Environmental Impact Statement (EIS) has been produced.

(e) Breaches and Infringements

Non-compliance with any condition or instruction set out in this Harvesting Plan will be dealt with in accordance with Section 4 of **the "Code of Logging Practice Native Forests - State Forests and Other Crown -Timber Lands"**. Serious breaches may lead to the issue of a penalty notice, licensee suspension or prosecution.

(f) Variations and Amendments to this Harvesting Plan

Conditions and requirements relating to the Pollution Control Licence cannot be varied in the field without the prior written approval of the EPA, other than those areas detailed in Condition 5.1 (c).

Variations and other specified approvals detailed in Condition 5.1(c), may be made by the Supervising Forest Officer, to this Harvesting Plan, subject to the District Forester's counter approval.

Other approvals may only be made by the Supervising Forester and are also subject to the District Forester's counter approval and, where relevant, to the Pollution Control Licence, with prior approval from the EPA.

All approvals must be recorded on a variation advice, attached as Part 6 to all operational copies of this Harvesting Plan.

This Plan must not be amended by a licensee or contractor.

(g) Harvesting Plan Availability

Copies of this Harvesting Plan must be held available by the contractor or bush supervisor at the site of timber-harvesting operations at all times that felling, snigging or environmental work is being undertaken within the area covered by this Harvesting Plan.

3.2 CERTIFICATION

(a) Plan Preparation

Prepared by: D.G. Ryan Signature: D G Ryan

Title: Consulting Forester Date: 6 Sept, 1995

(b) District Approval

I approve the issue of this Harvesting Plan subject to any amendments, endorsements or approvals that may be made following submission to the National Parks and Wildlife Service, the Environment Protection Authority and/or the Regulatory and Public Information Committee (constituted under the Timber Industry (Interim Protection) Act, 1993 as amended).

The date that operations will need to commence is: 7 October, 1995

Signature: ..... District Forester Date: 7 Sept, 1995

(c) Receipt of External Authority Approvals

(To be completed by the District Forester or a person nominated by the District Forester who must attach the relevant amendments to the Plan.)

Table 3: External Authority Approvals

Name of Authority	Date Received	Attached to Plan by
NPWS		
EPA		
RaPIC		
Other Authority		

I note approval of this Harvesting Plan from the above-mentioned authorities, together with the amendments they have required to be included in the Plan.

These amendments have been included in the final Plan. This Harvesting Plan comprises pages 1 - 36 attached and the Operational, Forest Types and Locality maps marked and referenced to this Harvesting Plan. This is Harvesting Plan No. GG 95/06/80

Date for commencement of operations: .....

Signature: ..... Date: .....
District Forester

3.3 DISTRIBUTION

Recipient	Parts	Minimum Copies
Timber Licensee	1,3,4	1
Contractors	1,3,4	1
Operator(s) (where required)	1,3,4	
Supervising Forest Officer(s) [SFO(s)]	1 ,3-5 , (2 optional)	1
Supervising Forester(s)	All	
District Forester	All	
District Office Register	All	
Compartment History File	All	1
Regional Office (optional)	All	
Community Groups		
Soil Conservationist (Forestry)	All	

Forest Planning Branch, Head Office, for distribution to:

Regulatory and Public Information Committee	All	3
National Parks And Wildlife Service	All	2
Environment Protection Authority	All	3
Department of Lands and Water Conservation (for harvesting in other Crown-timber lands)	All	1

3.4 INDUSTRY ENDORSEMENT

I endorse the harvesting plan on behalf of industry.

Signature: ..... Licence No.: ..... Date: .....

Position: ..... Company: .....

Signature: ..... Licence No.: ..... Date: .....

Position: ..... Company: .....

Signature: ..... Licence No.: ..... Date: .....

Position: ..... Company: .....

3.6 BUSH SUPERVISORS ACKNOWLEDGMENT

I acknowledge that I have received a copy of Harvesting Plan No GG 95/06/80 and that I understand the conditions of the Plan as explained to me by a State Forests officer.

Signature: ..... Licence No: ..... Date: .....

Position.....

Signature: ..... Licence No: ..... Date: .....

Position.....

Signature: ..... Licence No: ..... Date: .....

Position.....

Part 4 OPERATIONAL CONDITIONS

The Tree-marking Code shown in this Plan will be used to apply other Conditions of this Plan as required. All necessary tree-marking in the field will be carried out before and during the harvesting operation by the SFO. Product marking will generally be for extraction.

4.1 Harvesting Activity Description

The logging will be a selective harvesting operation in maturing and regrowth native hardwood forest.

4.2 Tree-marking Code and Harvest Regulation

Tree Marking Code

(a) Trees to be removed

Trees will be marked with a **dot**. Some trees may also be marked to produce a specific log type; **P** = pole, **G** = girder, **V** = veneer log.

(b) Trees to be retained

Trees will be marked with a **horizontal line**. Some trees may be marked for a specific purpose; **H** = habitat tree, **R** = recruitment habitat tree.

(c) Trees marked for information

Two horizontal lines indicates that machinery is not permitted past the point but there may be trees to be felled. Two horizontal lines also indicates a **protection strip**. **Three horizontal lines** indicates that machinery and that felling is not permitted past the point. **F** = wildlife corridor, **Z** = riparian zone, "**5**", "**10**", "**15**", "**20**", or "**25**" = buffer, protection or filter strip width as appropriate. **D** = dump site, **O** = compartment boundary.

Forest boundaries are marked by yellow painted **blazes** and/or **sawn stakes**.

A **vertical line** indicates the location of a minor road or snig track.

Reference: Northern Region Tree Marking Code (1995)

4.3 Order of Working

(a) Wet Weather, Dry Weather and Intermediate Areas.

Sixteen dump sites have been located and marked in the compartment, as indicated on the Operation Map. Dumps 5, 9, 11, 15 and 16 have been designated as suitable for working when conditions are wet. While allowing for wet conditions, harvesting will commence on dump 1 and work progressively through to dump 16.

(b) Wet Weather Controls - Roads

During wet weather, the wet-weather controls set out in Section 7 of the Code of Logging Practice will apply. In particular, where run-off occurs from a road surface, haulage may not occur unless the road is a gravel or sealed road.

[COLP 7.2, PCL Sch 4 C 82]

(c) Wet Weather Controls - Snigging

During wet weather, snig tracks must not be used where:

(i) there is run-off from the track surface, or

(ii) there is a likelihood of significant rutting leading to turbid run-off from the track surface. [COLP 7.2, PCL Sch 4 C 93]

4.4 Silviculture

(a) General

The aim of the harvest is to promote growth on retained trees and to create conditions that will allow the establishment and growth of regeneration.

(b) Canopy Gaps

Tree marking for removal shall be carried out by the SFO. Tree marking shall aim at creating **gaps** with a maximum diameter of 70 metres over about 25% of the net harvest area. The location of these gaps shall be determined by the SFO in the field.

- Gaps shall not be located on slopes greater than 25 degrees.
- Gaps shall not intrude into protection or buffer strips.
- Logging debris shall be moved away from edges of gaps, approximately 5 metres into the gap area.
- Some follow-up felling of unmerchantable trees within gaps, using chainsaws, may be required.

No additional disturbance to that achieved by the logging is required to stimulate regeneration and promote its development in the compartment's forest types. No additional soil erosion or water pollution control measures, other than those specified for the logging operations, are required in the gaps. Adequate wildlife habitat shall be retained in the **clusters** of undisturbed forest in the selectively logged forest surrounding the gaps.

(c) Tree Marking

Tree marking within the gaps and clusters shall aim at:

Gaps

Removing all merchantable products with the intention of maximising the practical yield of log products with the highest economic end use.

Interstitial Areas

Retaining trees capable of net merchantable timber value increment for cutting in future cutting cycles, except where:

a) the removal would result in more valuable increment on preferred retained trees (redistribution).

b) the tree has been or is likely to be significantly damaged during the course of harvesting operations.

Clusters

Retaining trees for wildlife habitat purposes.

In general, tree marking and supervision shall be directed towards:

1. Harvesting for the highest economic end use for which markets are available.
2. Ensuring maximum economic utilisation of all trees felled.
3. Minimising damage to the retained stand and minimising soil disturbance in excess of that required for successful regeneration establishment.

Reference Grafton Management Area Environmental Impact Statement

(d) Harvesting Debris

Harvesting debris within a gap shall be moved approximately 5 metres away from the edge of the gap.

Debris from the selective harvesting between canopy gaps shall be removed from within approximately 5 metres of the butts of retained habitat trees to minimise bark scorch during prescribed burning operations, or any wild fire.

Harvesting debris which is likely to impede the flow of water in road drainage structures must be removed from such structures every 2 days.

Bark and debris produced by the harvesting shall be returned to the logging area and dispersed as far as practicable around the net harvest area and/or stacked in small heaps on log dumps.

(e) Directional Felling

Directional felling techniques are to be employed to minimise damage to retained trees, to avoid hang ups and to maintain values of the Wildlife Corridor, Riparian Habitat Zones, filter strips, protection strips and buffer strips.

4.5 Flora Protection

(a) Rare or Endangered Species

No occurrences of rare or threatened flora are recorded on the compartment and none were encountered during field inspections.

(b) Rainforest Protection

There are no rainforest areas in the compartment.

4.6 Fauna Protection

(a) Sightings of Fauna

The Rufous Bettong is the only Schedule 12 species that has been detected in Compartment 80. Schedule 12 species expected to occur in or in the vicinity of the compartment are;

Glossy Black Cockatoo	**Red Goshawk**	**Square-tailed Kite**
Swift Parrot	**Powerful Owl**	**Masked Owl**
Sooty Owl	**Stephen's Banded Snake**	**Beccari's Bat**
Pale-Headed Snake	**Brush-tailed Phascogale**	**Yellow-bellied Glider**
Rufous Bettong	**Common Planigale**	**Koala**
Hoary Bat	**Little Bent-wing Bat**	**Common Bent-wing Bat**
Yellow-bellied Sheath-tailed Bat		

Contractors and supervisory staff shall report any sightings of Schedule 12 species to the District Marketing Forester. Such confirmed sightings or findings shall generate the application of the appropriate prescriptions to reduce the impact on the species.

(b) Habitat Trees

Compartment 80 includes Dry Hardwood forest with xeromorphic understory. Sufficient potential habitat and recruitment habitat trees exist in the net harvest area to allow for the retention of enough trees to meet prescription requirements.

Prescription 1:

Habitat Tree Retention

Habitat tree retention in Dry Hardwood and Moist Hardwood forests with a xeromorphic understory shall be four trees per hectare. For the purpose of this prescription, a xeromorphic understory is considered to be one composed predominantly of grasses, heath and/or shrubs with sclerophyllous leaves.

Habitat tree retention in Moist Hardwood forests with a mesic understory shall be six trees per hectare. For the purpose of this prescription a mesic understory is considered to be one composed predominantly of moist elements such as vines, shrubs with mesophyllous leaves and/or species often found in rainforest areas.

Habitat trees will be live, hollow-bearing trees. They are to be well spaced throughout the compartment being harvested, consistent with the size of canopy gaps required for adequate regeneration and growth for the species of the forest types. Where the specified density of habitat trees is not present, the existing density is to be retained. Sufficient recruitment habitat trees to sustain the retained density of habitat trees into perpetuity are also to be retained. Stags shall not be countered as habitat trees.

Habitat trees shall be marked by the SFO.

All practical precautions must be taken to avoid tree heads landing adjacent to identified habitat trees. Tree heads shall be removed from within approximately 5 metres of identified habitat trees. Tree heads shall be removed with minimum disturbance to understory vegetation and on-ground logs.

In gapping operations, logging debris shall be moved approximately 5 metres away from the edge of the gap.

(c) Non-harvest and Modified Harvest Areas

Wildlife Corridor

A designated wildlife corridor exists along Bom Bom Creek, as shown on the Operational Map. The corridor is 40 metres wide on either side of the creek.

- no harvesting machinery may enter the Wildlife Corridor.
- felling and snigging shall be excluded from the Wildlife Corridor.
- trees shall not be felled into the Wildlife Corridor.
- trees shall not be damaged in the Wildlife Corridor.

Riparian Habitat Zones

Riparian Habitat Zones exist 20 metres either side of streams (watercourses, drainage lines and drainage depressions) with catchments greater than 40 hectares.

- no harvesting machinery may enter Riparian Habitat Zones.

- felling and snigging shall be excluded from Riparian Habitat Zones.
- trees shall not be felled into Riparian Habitat Zones.
- trees shall not be damaged in Riparian Habitat Zones.

Refugia areas

No areas of critical habitat for Schedule 12 species have been located in the net harvest area and no refugia areas have been set aside.

(d) Species and Mitigation Prescriptions

Mitigation prescriptions to be applied in Grafton Management Area have been determined for Schedule 12 species that might be adversely impacted on by forest management activities. Those relevant to Compartment 80 are stated below. The appropriate mitigation prescription shall be immediately applied when any of the listed species is sighted or critical habitat is located.

Prescription 2:

Preservation of Critical Weight Range species

In applying the following prescription it should be noted that the *Bushfires Act* 1949 overrides Section 99(1) of the *National Parks and Wildlife Act* 1991. Given this, the prescription should only be seen as a guide for managing the habitat of CWR fauna.

The only Critical Weight Range species likely to occur in Compartment 80 is the Rufous Bettong.

SFNSW are to ensure, to the fullest extent practicable, that any post-logging burning is to be carried out in such a manner that encroachment into critical habitat for those species listed above is prevented. This can be achieved by carrying out post-logging burning under weather and fuel conditions which minimises the chance of encroachment into critical habitat and minimises the destruction of large fallen logs (ie. those logs with a diameter greater than 40 cm).

For the purpose of this prescription critical habitat for the Rufous Bettong is defined as well grassed open forest and woodland, and large fallen logs of greater than 40 cm diameter.

Prescription 3:

Glossy Black-Cockatoo

Harvesting operations shall avoid damage to Casuarina stands.

Prescription 4

Red Goshawk

200 metre radius buffer zone shall be established around each identified nest site. This prescription is to be reviewed when more than 10 confirmed locations of the species have been recorded in the management area.

Prescription 5

Square-tailed Kite

200 metre radius buffer zone shall be established around each identified nest site. This prescription is to be reviewed when more than 10 confirmed locations of the species have been recorded in the management area.

Prescription 6:

Powerful/Masked/Sooty Owl

200 metre radius buffer zone shall be established around each identified nest site and 100 metre radius buffer zone shall be established around each identified roost site. This prescription is to be reviewed when more than 10 confirmed locations of the species have been recorded in the management area.

Prescription 7:

Stephen's Banded Snake and Pale-headed Snake

100 metre radius buffer zone shall be established around each identified location site. This prescription is to be reviewed when more than 10 confirmed locations of the species have been recorded in the management area.

Prescription 8:

Brush-tailed Phascogale

200 metre radius buffer zone shall be established around each identified nest site. This prescription is to be reviewed when more than 10 confirmed locations of the species have been recorded in the management area.

Prescription 9:

Yellow-bellied Glider

Within 100 metres of identified V-notch scarred trees, the following trees will be retained: known scared trees, an additional 30 trees (>10 cm dbh) of the sap feed tree species and a minimum of 15 bark shedding trees. Additionally, within a 50 ha area surrounding a scarred tree or a sighting location of a Yellow-bellied Glider, an average of 10 trees (>10 cm dbh) of feed tree species and 5 mature bark shedding trees per hectare shall be retained. These trees may be located within unlogged remnants but retained sap feed trees may not count as retained bark shedding trees.

Prescription 10:

Koala

Trees with identifiable use by Koalas at the time of harvesting shall be retained. If no further Koala evidence is found within 100 metres of the use tree, a minimum of 5 Koala food trees shall be retained within the 100 metres. If regular activity is detected but less than 20% of the trees within 100 metres have faecal pellets underneath and no Koalas are observed, trees with evidence of regular Koala activity shall be retained; a minimum of 15 trees are to be retained within the 100 metres radius. If regular Koala activity is detected and more than one Koala is observed or more than 20% of trees within 100 metres radius have faecal pellets underneath, forestry operations, except low intensity prescribed burning, shall be excluded from the 100 metres radius and the Director General of the NPWS shall be informed.

Prescription 11:

Yellow-bellied Sheath-tailed Bat

100 metre radius buffer zone shall be established around each identified roost site. This prescription is to be reviewed when more than 10 confirmed locations of the species have been recorded in the management area.

Prescription 12:

Beccari's Mastiff Bat

100 metre radius buffer zone shall be established around each identified roost site. This prescription is to be reviewed when more than 10 confirmed locations of the species have been recorded in the management area.

Prescription 13:

Hoary Bat

100 metre radius buffer zone shall be established around each identified roost site. This prescription is to be reviewed when more than 10 confirmed locations of the species have been recorded in the management area.

Prescription 14

Little Bent-wing Bat/Common Bent-wing Bat

100 metre radius buffer zones shall be established around each identified roost site. This prescription is to be reviewed when more than 10 confirmed locations of the species have been recorded in the management area.

References Environmental Impact Statement Grafton Management Area.
State Forests' Response to Submissions to the Grafton Environmental Impact Statement.

4.7 Soil Erosion and Water Pollution Control Conditions

(a) Soil Erosion and Water Pollution Categories

The calculated Soil Erosion and Water Pollution Categories for Compartment 80, based on the subsoil data, are detailed in Table 4 below.

Table 4 - Water Pollution Hazard Categories

Slope Ranges (Degrees)	Water Pollution Category
0 - ≤4	1
>4 - ≤19	2
>19 - ≤30	3
Roads	3

(b) Approved Timber Harvesting and Extraction Method

- Chainsaw felling, using directional felling techniques where required.
- Snigging of logs using a crawler tractor and/or a rubber tyred skidder.
- Debarking and loading of logs at the dump using an excavator or forklift.
- Transport of logs from the site using a jinker and prime mover.

(c) Marking and Location of Roads, Log Dumps, Snig Tracks and Crossings

The marking of roads, log dumps, snig tracks and crossings in the field will be in accordance with condition 4.2. Locations of roads and dumps are indicated on the Operational Map.

(d) Wet Weather Controls

Harvesting operations may be conducted throughout the year, subject to the application of normal wet weather closure procedures, as per Section 7 of the Code of Logging Practice.

During wet weather, the wet weather controls for road usage and for snigging set out in section 7 of the Code of Logging Practice will apply. In particular, where:

i) run-off occurs from a road surface:

- haulage must cease on natural surface roads.

ii) there is run-off from a snig track surface:

- snig tracks must not be used.

(iii) there is a likelihood of significant rutting leading to turbid run-off from a snig track surface, snig tracks must not be used.

In any event, if:
rutting of a snig track is, or is likely to approach, a maximum of 200 mm below the natural surface, measured over any 20 metre length of track, snig tracks must not be used.

Dumps located along Popes Road, as marked on the Operational Map, are suitable to be worked during wet weather periods.

(e) Road Construction

No road construction is required for the harvesting.

Grade

Not applicable for this logging operation.

Survey

Not applicable for this logging operation.

Clearing

Not applicable for this logging operation.

Batters

Not applicable for this logging operation.

Road surface drainage

Construction of roll-over cross-banks may be required on some sections of the minor roads where outfall drainage has not been established. Where required, roll-over cross-banks will be spaced as stated in the Table below. The banks must have a minimum design unconsolidated vertical height from spillway to bank top of 35 cm. Such banks should readily cater for 1 in 5 year storm events.

Spacing of Roll-over Cross-bank Drainage
(grade of road - degrees)

0 - ≤5	>5 - ≤10	over 10
100m	60m	40m

Roll-over cross-banks must drain at natural surface level, or by way of installed plastic sheeting, onto undisturbed vegetation. Where undisturbed vegetation is not immediately accessible to the outfall, sediment trap fences must be installed across the outlet.

Effective road drainage shall be repaired/reinstated, by the contractor, at the completion of the operation.

Crossing of drainage features

Log haulage vehicles will not need to cross any drainage features.

Revegetation and rehabilitation

Popes and Boundary Roads will be maintained by regular grading, including a post-logging grading. The minor roads will be revegetated, following harvesting, through natural regeneration. Cross-fall (out-fall) drainage shall be reinstated and cross-bank drains shall be constructed to prohibit vehicular traffic.

Dispersible soils

The soils in Compartment 80 are not significantly dispersible.

(f) Slope Limits for the Area

(Note that the slopes in the compartment are mostly under 10 degrees and the limits listed below are not really relevant).

Maximum slope for harvesting ..... 30 degrees

Maximum slope for snig track construction ..... 30 degrees

Maximum side slope for snig track construction ..... 30 degrees

Maximum road grade permitted ..... 10 degrees

Maximum side slope for road construction ..... 30 degrees without design

(g) Drainage Feature Protection

A Wildlife Corridor exists 40 metres either side of Bom Bom Creek.

Riparian Habitat Zones exist 20 metres either side of watercourses, drainage lines and drainage depressions with catchments greater than 40 hectares. These zones have the same harvesting exclusion specifications as Wildlife Corridors.

Filter strips and protection strips shall be retained along all watercourses and drainage lines within the net harvest area of Compartment 80 at minimum widths as stated in Table 5 below (note that SE/WP Category 3 (High) comes in at 19° and probably does not occur in the compartment).

Table 5 - Filter Strip and Protection Strip Widths
(distance each side of stream)

Water Pollution Category	CATCHMENT /SLOPE	Riparian Zone	Filter Strip	Protection Strip
1	<40 ha		5M	
1	>40 ha	20m		
2	<40 ha <18° slope		10m	
2	<40 ha >18°slope		10m	10m
2	>40 ha	20m		
3	<40 ha <18° slope		10m	10m
3	<40 ha >18° slope		15m	10m
3	>40 ha <18° slope	20m		5m
3	>40 ha >18° slope	20m		10m

In addition, buffer strips 5 metres wide must be maintained on either side of drainage depressions.

(h) Tree Marking Rules for Fitter Strips, Protection Strips and Buffer Strips

The SFO shall mark the Wildlife Corridor, Riparian Habitat Zones and filter strips in the compartment progressively ahead of harvesting operations. The licensee or contractor shall be responsible for measuring off-sets to a protection strip from a filter strip, as indicated by the SFO, to determine the boundary of the protection strip adjacent to the filter strip. (See also 4.2, 5.2)

Contractors and operators shall be responsible for identifying drainage depressions encountered in the field and taking appropriate action whilst operating within the buffer strip or crossing the drainage depression. (See also 5.2)

(I) Felling and Extraction from Filter Strips and Protection Strips

There shall be no felling in filter strips. Directional felling must be used to avoid felling of trees into filter strips.

Trees located in protection strips may be felled provided a minimum of 50% canopy cover is retained within the strip.

Trees which are marked for removal inside protection strips must only be felled if they can be directed out of the strip. Crowns of trees may be felled into protection strips.

Machinery must not enter filter or protection strips except to construct or use crossings.

Where trees are felled out of a protection strip or felled into a protection strip, logs must be extracted in the line of the log so as to minimise damage to vegetation and ground-cover..

Any furrows resulting from log removal from protection strips must be diverted at the edge of the strip by harvesting debris or earth.

(j) Extraction from Drainage Depression Buffer Strips

Soil disturbance in drainage depression buffer strips must be minimised by use of the following techniques:

- no snigging along drainage depressions.
- minimal use of blade.
- logs shall be approached in reverse gear.
- minimal change in direction while snigging logs out of drainage depressions.

(k) Snig Tracks

It is preferable that, wherever practicable, walkover extraction techniques be used in preference to snig track construction. It is anticipated that all snigging in the compartment will be carried out by this method.

Wherever practicable, snig tracks shall be located slightly off ridge-top to ensure free cross-fall drainage. Side-cut tracks must have cross-fall drainage.

Snigging along roads must only occur in order to avoid snig track construction and only where approved by the SFO. Effective road drainage must be re-instated by the licensee/contractor immediately at the completion of the snigging operation.

Snig tracks must be drained to minimise the flow of water along them and directly into watercourses, drainage lines or onto roads and dumps. Drainage must be effected within 2 days of the completion of use or, where operations are to be temporally suspended, in accordance with Table 6.

Table 6 - Drainage of Snig Tracks at Temporary Cessation of Operations

Slope boundaries	WP Category	No. Days
0° - ≤4°	1	10
>4° - ≤19°	2	8
>19° - ≤30°	3	5

Where earth banks are required, they must be constructed to a minimum unconsolidated effective height of 35 cm, with spacing in accordance with Table 7.

Table 7 - Maximum Earth Bank Spacing

Track Grade (degrees)	WPH Category		
	1 (0° - ≤4°)	2 (>4° - ≤19°)	3 (>19° - ≤30°)
0 - ≤5	200m	150m	100m
>5 - ≤10		100m	60m
>10 - ≤15		60m	40m
>15 - ≤20		40m	25m
>20 - ≤25			20m
>25			15m

The above spacings are the maximums and should be varied to utilise the most suitable outlet point. Cross-banks must be discharged into undisturbed vegetation or logging debris.

(l) Downhill Snigging

Limited downhill snigging will be required to dumps 1 to 8 and 10 to 15.

The following techniques must be used where downhill snigging is used:

- Cross-fall drainage must be used where practicable.

- Where practicable, the snigging pattern shall be uphill from the stump with the logs being bunched for the downhill portion of the snig onto a centrally located extraction track(s).
- Tracks approaching a log dump shall be located so as to direct water away from the dump immediately before reaching the dump.

(m) Snig Track Drainage Line Crossings

The drainage lines in the compartment only flow intermittently and were dry at the time of recent inspections, the only water in the compartment being in a few scattered holes.

All snig track drainage line crossings shall be approved by the SFO before construction and shall be open causeways utilising the natural surface at the site. There should be little need to cross drainage lines and little need to modify the channel or banks of drainage lines that are crossed. Crossings must be rehabilitated after use, all loose material shall be removed from the channel, as far as practicable the crossing point shall be reshaped to its original condition and seeded with rye grass at the rate of 20 Kg/ha.

(n) Dispersible Soils

The soils in the compartment are not significantly dispersible.

(o) Log Dumps

Field location of log dumps must utilise the most level site available, consistent with the location indicated on the Operational Map.

Before use, topsoil must be stripped and stockpiled for subsequent respreading at the completion of operations.

Dumps shall be constructed with out-fall drainage.

At the completion of operations, any debris at or near the edge of a dump shall be moved away from standing vegetation into the dump area. The topsoil shall be spread uniformly over the dump area which shall be left in a neat and stable condition.

(p) Prescribed Burning

Pre-logging burning

There will be no pre-logging burning associated with the harvesting of Compartment 80.

Post-logging burning

Post-logging burning of Compartment 80 will be carried out in accordance with the provisions and specifications of the Ulmarra District Fire Plan and the Grafton District Fuel Management Plan.

Objectives

Post-logging burning objectives for the compartment are:

- to meet State Forests' obligations under the Bush Fires Act.
- to decrease fine fuel loads and logging debris under prescribed conditions to decrease the intensity of any wildfire that might occur in the compartment and hence decrease associated damage to regeneration and retained stems.
- to reduce the possibility of wildfire burning through the compartment and entering and damaging adjacent forests and private property areas.

- to simplify and increase the efficiency and the safety of any wildfire control activity.
- to promote good seedbed conditions for regeneration.

Ignition

Burning will be undertaken by the lighting of individual heaps of harvesting slash and debris under conditions that will enable the fires to be contained within the compartment.

The Grafton District Operations Foreman will be responsible for ignition, subject to the requirements of the Grafton District Fuel Management Plan.

Preferred season to burn

February to August.

4.8 Research and Inventory Plots

There are no research or inventory plots in Compartment 80.

4.9 Modified Harvest Conditions

(a) Special Emphasis Areas

Preferred Management Priority Classification; Special Emphasis Flora and Fauna Protection Zone 1.1.7 Wildlife Corridor, 40 metres either side of the stream, exists along Bom Bom Creek, as indicated on the Operational Map.

- no harvesting machinery may enter the Wildlife Corridor.
- felling and snigging shall be excluded from the Wildlife Corridor.
- trees shall not be felled into the Wildlife Corridor.
- trees shall not be damaged in the Wildlife Corridor.

(b) Riparian Habitat Zones

Riparian Habitat Zones, 20 metres either side of the stream, exist on all watercourses, drainage lines and drainage depressions with catchments greater than 40 hectares.

- no harvesting machinery may enter Riparian Habitat Zones.
- felling and snigging shall be excluded from Riparian Habitat Zones.
- trees shall not be felled into Riparian Habitat Zones.
- trees shall not be damaged in Riparian Habitat Zones.

(c) Boundary Fences

Private property joins the eastern boundary of the compartment, which is fenced.

- Damage to the fence is to be avoided. Any damage caused shall be immediately repaired.
- The gate at the entrance to the forest, on Boundary Road, shall be left closed when not in use.

4.10 Specification of Type of Products to be Removed.

Compulsory Sawlogs — See **Grafton/Coffs Harbour Compulsory Sawlog Specification Hardwood Sawlog Flat Rate Royalty Utilisation Standards**.

Salvage Sawlogs	See **Grafton/Coffs Harbour Compulsory Sawlog Specification Hardwood Sawlog Flat Rate Royalty Utilisation Standards.**
Poles	See **Australian Standard AS2209 - 1979 (poles)**
Veneer Logs	See **Specification for Eucalypt Veneer Logs for Rotary Peeling.**

Yield Information for Compartment 80

Estimated Yields are:

Compulsory Sawlogs 40 cm + ... 1400m³
Compulsory Sawlogs <40 cm 600m³
Salvage Sawlogs 100m³
Poles 300m³
Veneer Logs 50m³

Part 5 CONDITIONS FOR SUPERVISING FOREST OFFICERS (SFOs)

Condition 5.1 SFO' Authority to Supervise Harvesting Operations

(a) General

The Supervising Forest Officer responsible for the direct field supervision of this harvesting operation, including tree-marking, log measuring and/or log check measurement, safety, implementation of wet weather controls, and monitoring and reporting generally will be:

The appointed Hardwood Marketing Foreman, Grafton District.

(b) Relieving SFOs

Relieving SFOs , if required will be:

The Forest Assistant, Marketing, Grafton District.

The Marketing Forester, Grafton District.

(c) SFOs Authority

The SFO has the authority to approve:

- the blading-off of natural surface roads provided that damage will be minimal and the removed material is recoverable for respreading.
- downhill snigging routes where provided for in the Harvest Plan.
- use of natural surface roads for snig track crossings or as snig tracks to dumps provided restoration of the road for wheeled traffic is undertaken as necessary and use of the road significantly reduces soil disturbance.
- the exact location and type of drainage line crossing for snig tracks - for this plan area all crossings will be open causeways.

All approvals shall be noted on the harvesting plan.

Condition 5.2 Tree Marking and Other Harvesting Control Requirements

(a) Tree Marking for Forest Management and Silviculture

The Northern Region Tree Marking Code will apply to the harvesting operation. All trees to be removed shall be so marked. (Also see Part 4.2)

Canopy gaps for regeneration

Canopy gaps for regeneration will be approximately 65 metres in diameter. Gaps shall not intrude into protection or buffer strips. Tree marking should aim at creating sufficient gaps to occupy approximately 25% of the net harvest area. (Also see Part 4.4 (b)

Habitat trees and habitat recruitment trees for fauna protection

Habitat trees and habitat recruitment trees will be marked for retention by the SFO according to Prescription 1 in Part 4.6 (b).

Non-harvest areas and modified harvest areas

The boundaries of the Wildlife Corridor and Riparian Habitat Zones shall be marked ahead of harvesting operations.

(b) Soil Erosion and Water Pollution Control

Marking of filter strips and protection strips

Wildlife Corridor and Riparian Habitat Zone prescriptions are equivalent to or greater than filter/protection strips and drainage line buffer strip requirements. There is no need for filter/protection strips and drainage line buffer strips where they would be embedded in the Wildlife Corridor or Riparian Habitat Zones. Hence filter/protection strips shall only be marked in the field where they are not embedded in the Wildlife Corridor or Riparian Habitat Zones.

Filter strips, protection strips and drainage line buffer strips shall be retained along all drainage features at the minimum widths as specified in Table 5 in Part 4.7 (g).

The SFO is responsible for marking filter strips in the field progressively and prior to the commencement of operations in each section of the harvest area.

The SFO is responsible for ensuring that the licensee or contractor is correctly measuring off-sets to a protection strip (See also Part 4.7 (h)).

Drainage depression buffer strips

The SFO is responsible for ensuring that contractors and operators are detecting drainage depressions in the field and taking appropriate protective precautions within the buffer strip area whilst operating in the buffer strip or crossing the drainage depression. (See also Part 4.7 (h)).

Condition 6.3 Monitoring and Reporting

(a) Daily and Fortnightly Reporting

The standard District procedures for daily and fortnightly reporting on the conduct of operations shall be followed.

(b) Fauna Reporting and Mitigation Prescriptions

Reports of sightings of any Schedule 12 fauna as required in Part 4.6 (a) must be made to the District Marketing Forester within 24 hours of the sighting being made. For any of the animal species listed in Part 4.6 (d) the stated mitigation prescriptions shall be immediately applied.

(c) Soil Erosion and Water Pollution Control Conditions

The SFO must report the following matters and record their location if necessary on the SFO's copy of the Harvesting Plan Operational Map, or the recording map attached to the Plan for that purpose:

- any accidental felling into filter strips and remedial action taken.
- any approval to leave soil from road and track construction in drainage lines or watercourses where attempts at removal would have resulted in excessive damage.
- any approval to defer stabilisation works at a drainage feature crossing beyond five days.
- any approval to leave a snig track drainage feature crossing structure in place and the reason for it to be left in situ.
- any instances where effective cross-bank drainage of a snig track is not effected within two days of completion of snigging from the area served by the track.

(d) Sowing of Constructed Crossings

Not applicable to this operation.

(e) Dispersible Soils Exposed During Road/Snig Track Construction

The soils in the compartment are not significantly dispersible.

Condition 5.4 Pre- and Post-logging Burning

(a) Pre-logging Burning

The will be no pre-logging burning associated with the harvesting of Compartment 80.

(b) Post-logging Burning

Post-logging burning of Compartment 80 will be carried out in accordance with provisions and specifications of the Ulmarra District Fire Plan and the Grafton District Fuel Management Plan.

Ignition

The Grafton District Operations Foreman will be responsible for ignition, subject to the requirements of the Grafton District Fuel Management Plan.

Condition 5.5 Other Instructions

There are no other instructions concerning the supervision of harvesting Compartment 80.

Condition 5.6 Supervising Forest Officer's Acknowledgment

I acknowledge that I have received a copy of Harvesting Plan No GG 95/06/80 and that I have been briefed on the conditions of the Plan and understand the supervision and operational control requirements as explained to me by the District Marketing Forester.

Signature: ..... Date: .....

Position: .....
Supervising Forest Officer

Signature: ..... Date: .....

Position: .....
Relieving Supervising Forest Officer

CLEARANCE CERTIFICATE

HARVESTING PLAN No: ..... **Compartment:**.....

.....**STATE FOREST**.....**DISTRICT**

To M.....Supervising Forest Officer

I request approval for me to move my logging crew and all associated machinery from the above mentioned area to the next Compartment in accordance with Section 3.5 of the Code of Logging Practice.

I certify that:

(a) all permanent roads, trails and mitre drains have been cleared of harvesting debris;
(b) butt damage to retained trees has been kept to acceptable limits;
(c) all trees marked for removal have been felled;
(d) utilisation limits have been satisfactorily met;
(e) stump heights conform to requirements;
(f) all hanging trees have been felled and brought down;
(g) all log dump sites have been satisfactorily restored as required;
(h) harvesting debris is not accumulated around retained trees;
(I) all accumulated litter has been disposed of properly;
(j) all filter, protection and buffer strip requirements have been complied with;
(k) all snig track, extraction track and temporary logging road drainage has been installed satisfactorily and other required rehabilitation work has been completed;
(l) all necessary repairs to damaged roads, signs, fences and other structures have been carried out.

I believe that I have met all my obligations under the conditions of the Timber Licence, the Pollution Control Licence, and/or any licence issued under Section 120 of the National Parks and Wildlife Act, which apply to the Compartment just completed, as stated in this Harvesting Plan.

Signature.....Licence No.....Date .....
Contractor/licensee

As a result of inspections of the logging operations made in accordance with this Harvesting Plan, I am satisfied that, to the best of my knowledge, the licensee/contractor responsible for this harvesting operation has satisfactorily completed all work and approval is given for her/him to remove her/his machinery and equipment and leave the area/commence operations in another Compartment. (Compartment .....).

This clearance does not release the licensee/contractor from any obligation to undertake any remedial work if subsequent deficiencies are shown to result from inadequate practices during the harvesting operation, which are found during any inspections of the area made within 12 months of the date of this post-harvesting inspection.

Last inspection was made on .....(Date)

Signed) .....(Date).....
Supervising Forest Officer

NOTES

Appendix 1: Erosion Hazard Assessment - Soil Type "E" Grafton Formation

(a) Soil Erosion Hazard Classes

Soil Erosion Hazard Ratings (SEHR) have been assessed using SOILOSS High. The rating has then been used to assess Soil Erosion Hazard (SEH) classes for the net harvest area.

SEHR = R x K x LS x C x P where

R = 3300 Derived from $R = 89.31 \times {}^{2}I_{12}{}^{1.74}$

K = 0.031 Subsoil (B Horizon)

Derived from Laboratory Analysis of the B Horizon
B Horizon has been adopted as it gives lower slopes for the erosion classes.

S As factored in SOILOSS High
L = 10 metres
C = 0.45
Derived from 0.45 SEMGL standard

P = 1.0

Slope Rangers (Degrees)	Erosion Hazard Class	Where SEHR is	Indicative % of Net Harvest Area
<=6	Low	less than 40	80
>6 to <=24	Moderate	40 - 400	20
>24 to <=30	High	400 - 800	N/A
N/A	Extreme	greater than 800	N/A

(b) Special Conditions

No special conditions, other than the following, are required as the conditions for use with Harvesting Plans, Schedule 4, of the EPA Pollution Control Licence (PCL) for 1995/96, are adequate to address the erosion and pollution risk.

(a) In areas of high erosion hazard, the grades of snig tracks and extraction tracks must not exceed 25° (it is almost certain that high erosion hazard does not occur in the compartment).

(Conditions derived above are to be inserted into the Harvest Plan at Condition 4.7 Soil Erosion and Water Pollution Control, (d) Wet Weather Controls - Seasonal Operations and Safeguards and (k) Extraction Tracks and Snig Tracks, when necessary.)

Preparation (by Forester, Forest Assistant)

Prepared by D. G. RYAN Signature D G Ryan

Title Consulting Forester Date 6/9/95

District Approval (by District Forester)

Signature .....

Date 7/9/95

District Forester

POLLUTION CONTROL LICENCE CONDITIONS CHECKLIST
PLAN PREPARATION - PCL Sch 2, Div 3

Condition Number	Condition Title/Enquiry	Entry Needed?	Plan Ref.
C18	Representative water monitoring site	Yes	2.5 12 (f)
	Have the Water Pollution Categories and proportion of Dispersible Soil been calculated for the area?	Yes	2.5 13 (a) 2.5 12 (d)
	Method for soil sampling for K factor	yes	2.5 12 (d)
	Field sampling - sites?	yes	
	- lab analysis?	yes	
	- field analysis?	yes	
1b)	Site specific conditions	No	
4	Are areas >30° within the net harvest area	No	2.5 12 (e) Map
5	Are areas of WPC 4 within the net harvest area	No	2.5 13 (a)
6	Drainage feature protection, prescribe stream	Yes	4.7 (g) Map
7	Any major water storage?	No	2.5 12 (f)
8	Drainage depression buffer strips conditions	Yes	4.7 (g)
9.1 (c)	Filter strips on map?	Yes	Map
9.2	Protection strips on map?	Yes	Map
10	Prescriptions for marketing/identifying in the field		
	-filter strips	Yes	5.2 (b)
	-protection strips	Yes	5.2 (b)
	-buffer strips	Yes	5.2 (b)
13	Reporting accidental felling into filter strips	Yes	5.3 (c)
14, 20, 22	See 10		
24	Specify techniques in buffer strips	Yes	4.7 (j)
47	Stabilisation of roads within 12 months	Yes	2.5 12 (h)
48	Are roads shown on map	Yes	Map
49	Road traverses area over 30°	No	2.5 12 (h)
50 (a), (b)	Maximum road grade 10°	Yes	4.7 (e)
51	Marking of roads in field	Yes	4.7 (e)
52	Minimising road clearing widths	Yes	4.7 (e)

POLLUTION CONTROL LICENCE CONDITIONS CHECKLIST
PLAN PREPARATION - PCL Sch 2, Div 3

Condition Number	Condition Title/Enquiry	Entry Needed?	Plan Ref.
53	Road side clearing	No	2.5 12 (h)
57	Borrow or gravel pits	No	2.5 12 (h)
60	Batter stabilisation measures	Yes	4.7 (e)
63	Road drainage techniques	Yes	4.7 (e)
64	Road drainage spacing	Yes	4.7 (e)
65	Roadside windrows	No	
66	Removal of harvesting debris from structures	Yes	4.4 (c)
67	Blading-off of roads	Yes	5.1 (c)
71	Location of drainage feature crossings	Yes	4.7 (e)
74	Condition to cover non-removal of spoil from drainage features	Yes	5.3 (c)
76	Condition to cover non-completion of crossing stabilisation within 5 days - roads	Yes	5.3 (c)
77	Techniques to leave crossing sites stable	Yes	4.7 (e)
78	Techniques for stabilisation of roads that are no longer required	Yes	4.7 (e)
79	Evaluation of old roads	Yes	2.5 12 (h)
80	Road construction in dispersible soils	Yes	4.7 (e)
81	Protection techniques for roads traversing dispersible soils	Yes	4.7 (e)
82	Wet weather restrictions for roads	Yes	4.3 (b)
83	Condition to cover non-completion of crossing stabilisation within 5 days - snig tracks	Yes	5.3 (c)
84	Techniques to leave crossing sites stable	Yes	4.7 (e)
85	Condition to cover non-removal of temporary crossing structures	Yes	5.3 (c)
86	Crossing of drainage features other than drainage depressions by snig tracks	Yes	4.7 (m) 5.1 (c)
	Specification of snig track crossing locations, types and capacity	Yes	4.7 (m)
	Condition for SFO approvals for crossings	Yes	5.1 (c)
	Conditions for non-removal of soil from drainage features	Yes	5.3 (c)

POLLUTION CONTROL LICENCE CONDITIONS CHECKLIST
PLAN PREPARATION - PCL Sch 2, Div 3

Condition Number	Condition Title/Enquiry	Entry Needed?	Plan Ref.
89	Location and effective drainage of snig tracks	Yes	4.7 (k)
92	Condition for snigging along roads	Yes	4.7 (k)
93	Conditions for wet weather restrictions for use of snig tracks	Yes	4.3 (c)
99	Specifications for drainage of snig tracks include:		
	-capacity for peak flow in a 1:2 year storm event	Yes	4.7 (k)
	-diversion into stable surfaces	Yes	4.7 (k)
	-minimise unchecked flow into drainage features	Yes	4.7 (k)
	-divert water at minimum damage to structure	Yes	4.7 (k)
103	Minimum specification for bank height	Yes	4.7 (k)
105	Condition for non-drainage of snig tracks 2 days after use has ceased	Yes	5.3 (c)
107	Condition for drainage at temporary cessation of use	Yes	4.7 (k)
109	Specifications for preventing concentrated water flow where downhill snigging is specified	Yes	4.7 (l)
112	Protection techniques for snig tracks on dispersible soils	Yes	4.7 (n)
119	Specifications for log dump location and drainage	Yes	4.7 (o)
120	Use of traxcavators and wheeled loaders in relation to wet weather	No	
125	Post-logging burning conditions	Yes	4.7 (p)
	Other conditions listed in Sch 2 Div 3 that need to be included as alert conditions in this plan	None	
	Are any appendices required	Yes	???

District: Grafton (Devine's SF) **Compartment(s):** 79, 80, 81, 82, 83 **REPORT NUMBER:** VA1625A/02 **Page** 1 **of** 1

Sample Number	Sample Type	Soil Type	Depth (cm)	Particle Size Analysis (%) clay	silt	fine sand	coarse sand	gravel	D%	Texture+	Structure*	Permeability*	'K'#	per cent dispersible soil (D% x clay%)
79/A	Topsoil	E	0–10	15(16)	33(33)	42(44)	5 (5)	5	31	CL	1	2	0.029	4.65
79/B	Subsoil	E	15–30	42(46)	20(22)	27(29)	3 (3)	8	38	LMC	2	4	0.025	15.96
80/A	Topsoil	E	0–10	18(21)	30(35)	30(35)	7 (9)	15	28	CL	1	2	0.023	5.04
80/B	Subsoil	E	15–25	32(40)	26(33)	18(23)	3 (4)	22	25	LC	1	4	0.031	8.00
81/A	Topsoil	E	0– 5	12(16)	16(21)	39(52)	8(11)	25	25	FSCL	2	3	0.035	3.00
81/B	Subsoil	E	10–25	44(49)	14(16)	24(27)	7 (8)	11	25	LC	2	4	0.019	11.00
82/A	Topsoil	E	0–10	15(17)	25(29)	36(42)	10(12)	14	20	SiCL	1	2	0.024	3.00
82/B	Subsoil	E	15–30	45(49)	28(30)	17(18)	3 (3)	7	40	LMC	2	4	0.024	18.00
83/A	Topsoil	E	0–10	23(27)	25(30)	33(39)	3 (4)	16	23	CL	1	2	0.019	5.29
83/B	Subsoil	E	10–20	44(46)	26(27)	24(25)	2 (2)	4	30	LMC	2	4	0.026	13.20

NOTES: PSA values are calculated inclusive of gravels. The values in brackets have been recalculated after excluding gravels
+ textures determined after Northcote (1979);
* structure and permeability classes are those to be used in SOILOSS;
# 'K' value has been determined using SOILOSS version 5.1

These data have been determined on soil samples collected by Veness & Associates.

The laboratory methods used are those required by EPA in its documentation relating to Harvesting Plans.

The data presented on this page have been calculated and determined by me.

NOTE: This report differs from report number VA1625A/01 in that the value of "per cent dispersible soil (D% x clay%)" has been changed, due to an arithmetical error, from 7.75 to 8.00

Jim Veness
(Managing Director)
VENESS & ASSOCIATES Pty Limited
4th August, 1995

EPA

Environment
Protection
Authority
New South Wales

Civic Tower
Cnr of Jacobs Street
and Rickard Road
Locked Bag 1502
Bankstown
NSW 2200

Telephone .02. 795 5000
Facsimile .02. 795 5002

Dr H Drielsma
Managing Director
State Forests of NSW
Locked Bag 23
Pennant Hills NSW 2120

Our Reference: 600000D1

Your Reference: FPB 70846

6 October 1995

NOTICE UNDER SECTION 17D(3)
OF THE POLLUTION CONTROL ACT 1970

WHEREAS -

(a) FORESTRY COMMISSION OF NSW trading as STATE FORESTS OF NSW is the holder of licence number 004017 in respect of premises situated on LAND IN THE NORTHERN REGION - which expires on 7 August 1996

TAKE NOTICE THAT -

in accordance with the powers vested in the Environment Protection Authority (EPA) under Section 17D(3) of the Pollution Control Act 1970, the EPA with respect to licence number 004017 from the date of this Notice varies the licence as set out below.

1. Insert the following compartment description, corresponding water pollution hazard categories, special conditions, representative water quality monitoring site, and date of licence variation into Schedule 1:

Compartment Description

Compartment 80
Divines State Forest No. 25

Water Pollution Hazard Categories

Water Pollution Hazard Category	Slope Ranges (degrees)
1	Less than or equal to 5.
2	Greater than 5 and less than or equal to 19.
3	Not applicable.
4	Not applicable.

Proportion of dispersible soils: 5.04% (A Horizon) and 8.0% (B Horizon)

Special Conditions

Special conditions are those conditions contained in the harvesting plan for Compartment 80, Divines State Forest No. 25, prepared by State Forests of NSW, and received by the EPA on 26 September 1995.

Water quality monitoring site

Chaelundi State Forest

Date of licence variation

6 October 1995."

2. Insert the following compartment description, corresponding water pollution hazard categories, special conditions, representative water quality monitoring site, and date of licence variation into Schedule 1:

"Compartment Description

Compartment 86
Never Never State Forest No. 613

Water Pollution Hazard Categories

1. Native Forest Operation

Water Pollution Hazard Category	Slope Ranges (degrees)
1	Less than or equal to 3.
2	Greater than 3 and less than or equal to 13.
3	Greater than 13 and less than or equal to 30.
4	Not applicable.

2. Plantation Forest Operation

Water Pollution Hazard Category	Slope Ranges (degrees)
1	Less than or equal to 17.
2	Greater than 17 and less than or equal to 25.
3	Not applicable.
4	Not applicable.

Proportion of dispersible soils: 1.3% (A Horizon) and 7.8% (B Horizon)

Special Conditions

Special conditions are those conditions contained in the harvesting plan for Compartment 86, Never Never State Forest No. 613, prepared by State Forests of NSW, and recieved by the EPA on 31 July 1995, as amended by addendums 1, 2, 3, 4, 5 and 6 recieved by the EPA on the following dates:

1. 8 August 1995;
2. 9 August 1995;
3. 10 August 1995;
4. 25 August 1995;
5. 4 September 1995; and
6. 7 September 1995

Water quality monitoring site

Orara East State Forest

Date of licence variation

6 October 1995."

NEIL SHEPHERD
Director-General

Per.....
GEOFF NOONAN
Manager, Waters and Catchments Policy
(by Authorisation)

FOR ACTION OR NOTING BY		
ORIGINATOR	SB	6/10/95
1. A/HWCP/P		
2. MWCP		6/10/95
3.		
4.		

SUBMM41-7868-KG

FACSIMILE TRANSMISSION

To	Dr. Neil Shepherd, Environment Protection Authority P O Box 1135 CHATSWOOD NSW 2057		
Attention	Mr Geoff Noonan Catchments Branch	**Date**	6 October 1995
Your Fax		**Our Fax**	(02) 980 7042
From	Kris Gounder Forest Planning Branch	**Phone**	(02) 980 4217 (015) 271 625
No of Pages	1 (including this cover page)		

STATE FORESTS

State Forests of New South Wales

Building 2
423 Pennant Hills Road
Pennant Hills NSW
2120
Phone (02) 980 4100

RE: NOTICE UNDER SECTION 17D(3) OF THE POLLUTION CONTROL ACT 1970

In terms of Clause 13(b) of the Pollution Control Regulations, State Forests of New South Wales hereby notifies you that no appeal will be made against EPA's decision to vary Licence No. 4017 on 6 October 1995 to include the following areas:

Compartment No.	State Forest	Management Area
80	Divines	Grafton
86	Never Never	Urunga

for A. HOWE
Manager
Forest Planning Branch

For State Forests Use Only (Page 1 of 5)

District Forester Grafton & Urunga.

As required under the above legislation we advised EPA about our intention not to appeal against this Licence amendment **on 6 October 1995**. Accordingly you may start logging these compartments **on 8 October 1995**.

Manager, Forest Planning Branch

HARVEST PLAN DESK AUDIT CHECK LIST

Register No. 316 Date Received 26/9/95

State Forest Dwines Compartment/~~Age~~ Class 80
District Grafton Region Northern
Native Forest/~~Native~~ Plantation/~~Softwood~~ Plantation* Harvest/~~Thin~~* Harvest
* Delete inappropriate

WATER POLLUTION HAZARD CATEGORY (WPHC) AND PROPORTION DISPERSIBLE SOIL (PDS)

Factor	Provided		Relevant Method used		Comments
	Yes	No	Yes	No	
R	✓		✓		R = 3300
K	✓		✓		K = 0.031
S	✓		✓		as factored
L	✓		✓		L = 20
C	✓		✓		C = 0.108
PDS	✓		✓		A_H = 5.04 ; B_H = 8.00

Sampling personnel named and approved Yes/~~No~~ J. Veness

CALCULATION OF WATER POLLUTION HAZARD CATEGORIES

1. Calculations provided Yes/~~No~~
2. Verified against Soiloss Yes/~~No~~
3. Appropriate WPHCs assigned ~~Yes~~/No
4. Slopes associated with WPHC provided Yes/~~No~~
5. % Cpt per WPHC provided Yes/~~No~~

Fill in the table below

Category	Y/N	% Cpt	Slopes	Catchment Size
WPHC 1	✓	65	0 - 5	
WPHC 2	✓	35	5 - 19	
WPHC 3			Roads	
WPHC 4				

1120 Sle : Chaelund SF1

DRAFT

HARVEST PLAN DESK AUDIT CHECKLIST

Cond No.	Condition	Comply Yes/No	Comments
1 b	**Site specific conditions** Attach site specific conditions to HP	Yes	
6	**Minimum protection widths for drainage in native forests** Any prescribed streams, swamps and wetlands present detailed	Yes	
7	Any major water storage present detailed	Yes	
9 1c	**Minimum protection widths** Show filter(P)strips on HP	Yes	
9 2	Show protection(P) strips on HP	Yes	
10	Prescriptions for marking P,P & B strips in field	Yes	
20	Operation within Native Forest protection strips Person responsible for identifying P strip in the field	Yes	
22	Operation in Native Forest buffer strips Person responsible for identifying B strips in the field	Yes	
24	Specification of techniques for minimising soil exposure and that any disturbance will no cause channelised flow in buffer strips	Yes	
25	**Minimum protection widths for drainge features in native plantations** as per 6 and 7	n/a	–
32	**Operations within Native Plantation Protection strips** as per 20	n/a	–
1	**Operations within Native Plantation buffer strips** as per 22 and 24	n/a	–

34	**Minimum protection widths for drainage features in softwood plantations** as per 6 and 7	n/a	–
40	**Operation in Softwwod Plantation Filter Strips** Person responsible for determining 5 metre machinery exclusion zone in plantation F strip	n/a	–
46	**Operations within Softwood Plantation buffer strips** as per 22 and 24	n/a	–
47	**Road, design, construction and maintenance** Specify techniques for the road design, construction and maintenance that ensures that road surfaces, batters and drainage structures are stable in 12 months of construction for 1:10 year storm event.	Yes	
48	Proposed road locations are shown on HP	Yes	
49	**Maximum slopes for road construction** Specify techniques for road stabilisation within 6 months of construction for roads built on slopes > 30°	n/a	–
53	**Road Clearing** Specify techniques for clearing areas adjacent to roads with minimal disturbance to groundcover and topsoil and with 70 % groundcover attained in 12 months.	Yes	
57	**Borrow pits and Gravel pits** Specify techniques for 1.construction of stable batters for gravel and borrow pits 2.stabilising gravel and borrow pits at the completion of operations	Yes	
60	**Road Batters** Specify road batter stabilisation tecniques	Yes	

63	**Road drainage** Specify road drainage structures to be used and techiques for 1. conveying peak flow in 1:5 year event 2. diverting water onto stable surface 3. minimising unchecked flow of water from table drains directly to watercourses and drainage lines, snig tracks, extraction tracks and log dumps 4. discharging onto surfaces or structures which provide efficient sediment trapping	Yes	
71	**Crossing of drainage features** Specify location and type of crossings at drainage features	Yes	
78	**Roads no longer required** Specify techniques to be used to stabilise roads that are no longer required	Yes	
81	**Dispersible Soil** Specify techniques used to protect roads and dispose of spoil that is dispersible	n/a	
89	**Snig Track construction** Specify criteria for ensuring that snig tracks are located and constructed where they can be drained effectively	Yes	
99	**Drainage of extraction tracks and snig tracks** Specify techniques to 1. convey peak flow in a 1:2 year storm event 2. divert water onto stable surfaces 3. minimise unchecked flow directly into watercourses, drainage lines, roads and log dumps 4.divert water at a velocity which minimises damage to the structure	Yes	
109	Specify measures to prevent concentrated water flow where down hillsnigging occurs	Yes	
112	**Extraction tracks and snig tracks and dispersible Soils** Specify measures to protect dispersible soils if present	n/a	

115	**Log dumps** Specify location of log dumps	Yes	
119	Specify techniques for 1.drainage of log dumps during and at completion of operations so that runoff is dispersed onto stable surfaces and not discharged directly into water courses etc 2. log dump being left in a stable condition at the completion of operations	Yes	
125	**Burning** Specify key and strategic and operational details including 1. objective of burn 2. method of ignition 3. preferred season of burn	Yes	

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SOIL LOSS ESTIMATION

The computer program, SOILOSS, uses the procedures of the Universal Soil Loss Equation (USLE) to predict the average annual soil loss due to sheet and rill erosion. It is based on extensive research in the United States and by the Soil Conservation Service in New South Wales.

The following report was prepared by SOILOSS:

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Estimation prepared for : **DIVINES 80**
Date : 05-10-1995 Time : 08:50 Report Number : 1

$$A = R \times K \times L \times S \times P \times C$$

Rainfall Erosivity:	Rainfall Zone: 1	R = 3300
Soil Erodibility : User supplied		K = 0.031
Topography :Slope: **4.0ø**	Slope Length: 20 m	LxS = 0.747
Support Practice : No cultivation (P = 1)		P = 1.000
Management :		
Rotation :		
Cultivations :		
Stubble Mgmt :	- User Supplied	C = 0.1080

Long-term average annual soil loss: **A = 8.3 t/ha**

Soil Loss Targets :

There is very little information to indicate target levels of soil loss for Australian soils. The following are suggested as a guide:

Very deep and fertile soils	<10 t/ha.a
Moderately deep and fertile soils	<5 t/ha.a
Shallow or infertile soils	<1 t/ha.a

Management Options :

To reduce soil loss from 8.3 to 5 t/ha.a the options are : Reduce C to 0.0654

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SOIL LOSS ESTIMATION

The computer program, SOILOSS, uses the procedures of the Universal Soil Loss Equation (USLE) to predict the average annual soil loss due to sheet and rill erosion. It is based on extensive research in the United States and by the Soil Conservation Service in New South Wales.

The following report was prepared by SOILOSS:

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Estimation prepared for : **DIVINES 80**
Date : 05-10-1995 Time : 08:50 Report Number : 2

$$A = R \times K \times L \times S \times P \times C$$

Rainfall Erosivity:	Rainfall Zone: 1	R = 3300
Soil Erodibility : User supplied		K = 0.031
Topography :Slope: **5.0ø**	Slope Length: 20 m	LxS = 0.922
Support Practice : No cultivation (P = 1)		P = 1.000
Management :		
Rotation :		
Cultivations :		
Stubble Mgmt :	- User Supplied	C = 0.1080

Long-term average annual soil loss: **A = 10 t/ha**

Soil Loss Targets :

There is very little information to indicate target levels of soil loss for Australian soils. The following are suggested as a guide:

Very deep and fertile soils	<10 t/ha.a
Moderately deep and fertile soils	<5 t/ha.a
Shallow or infertile soils	<1 t/ha.a

Management Options :

To reduce soil loss from 10 to 5 t/ha.a the options are : Reduce C to 0.0530

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SOIL LOSS ESTIMATION

The computer program, SOILOSS, uses the procedures of the Universal Soil Loss Equation (USLE) to predict the average annual soil loss due to sheet and rill erosion. It is based on extensive research in the United States and by the Soil Conservation Service in New South Wales.

The following report was prepared by SOILOSS:

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Estimation prepared for : **DIVINES 80**
Date : 05-10-1995 Time : 08:50 Report Number : 3

$$A = R \times K \times L \times S \times P \times C$$

Rainfall Erosivity:	Rainfall Zone: 1	R = 3300
Soil Erodibility : User supplied		K = 0.031
Topography :**Slope: 19.0ø**	Slope Length: 20 m	LxS = 4.472
Support Practice : No cultivation (P = 1)		P = 1.000
Management :		
Rotation :		
Cultivations :		
Stubble Mgmt :	- User Supplied	C = 0.1080

Long-term average annual soil loss: **A = 49 t/ha**

Soil Loss Targets :

There is very little information to indicate target levels of soil loss for Australian soils. The following are suggested as a guide:

Very deep and fertile soils	<10 t/ha.a
Moderately deep and fertile soils	<5 t/ha.a
Shallow or infertile soils	<1 t/ha.a

Management Options :

To reduce soil loss from 49 to 10 t/ha.a the options are : Reduce C to 0.0219

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