REHABILITATION

Includes Statements on General Rehabilitation, Mining Rehabilitation, Basic Raw Materials Rehabilitation and Public Utilities Rehabilitation

MISSION AND OBJECTIVES – 1999-1996

CALM Annual Report 1998/1999. 1999
CALM Annual Report 1997/1998. 1998
CALM Annual Report 1996/1997. 1997
CALM Annual Report 1995/1996. 1996

NOTE: REFER TO ENTRY UNDER ANNUAL REPORT 1992/1993 – SIMILAR WORDING

TIMBER HARVESTING … 1996 ED. – 1996

Timber Harvesting in Western Australia … 1996 Ed. 1996

PART ONE : CODE OF HARVESTING PRACTICE

Section 4 : Extraction
NOTE: REFER TO ENTRY 4.7 AND 4.8 UNDER 1987 EDITION (SIMILAR WORDING)

PART TWO : MANUAL OF HARVESTING SPECIFICATIONS

Section 1 : Planning and Monitoring
Specification 1.1 : Harvesting and Regeneration Plans
1. Responsibilities
NOTE: REFER TO ENTRY UNDER 1990 EDITION (SIMILAR WORDING)

2.3 Short Term Integrated Harvesting and Regeneration Plan
"*This is the tertiary level integrated harvesting plan which shows in detail proposed harvesting ares over a one or two year period. The short term plan takes into account the principles contained in 'Guidelines for Integrated Forest Harvest Planning and Design.'*" (p. 16)

8. Records
"*SFRBU or District staff must maintain up-to-date field records of areas cut over and silviculturally treated. Forms for inputs into the computer system 'SILREC' will be collated every six months with assistance from Forest Management Branch.*" (p. 17)

Section 2 : Roading
Specification 2.5 : Gravel Pit Management
NOTE: REFER TO ENTRY UNDER 1993 EDITION (SIMILAR WORDING)

3. Rehabilitation of Damaged Soil
3.1 Landings and Snig Tracks (Hardwood)
"*Landings will be categorised by the FOIC into one of the following types prior to the feller's block being opened:*

(a) Concreted or dissected laterite close to the surface with a skeletal gravelly or sandy soil.
(b) Duplex soil with a gravelly or sandy soil over a clay that is operated on under dry conditions.

(c) Duplex soil with a gravelly or sandy soil over a clay operated on in wet conditions OR deep loam, including gravelly or sandy loam, with no impeding layer, that is operated on in any season.

Each of these landing types will be rehabilitated using the appropriate prescription detailed below. All landings must be rehabilitated by the harvesting contractor to the specifications in the appropriate prescription. The contractor will make available suitable machinery to undertake this work.

All rehabilitation must be carried out in strict accordance with standard dieback hygiene practices.

Any burning of debris considered necessary will be carried out by the relevant CALM District.

Any seeding or fertilising will be carried out by the contractor(s). Seeds and fertiliser will be supplied by CALM.
[…]

3.1.1 Landings with Concreted or Dissected Laterite Close to Surface

- *At the completion of loading out, ensure all landing debris, and all unmerchantable log material and bark generated during the harvesting operation, is neatly stacked at the sides and/or rear of the landing, no closer than 5 metres from any retained crop trees. Some of this material must be used to block access from the landing to snig tracks.*

- *At any time following the completion of debris stacking, but before application of seed and fertilizer in April, lightly scarify the surface of the landing to disturb any surface crusting that may have occurred, using any suitable machine or implement. The scarifying depth will be governed by the amount of rock or laterite present on the landing, but is not expected to be greater than 100 mm. The aim of the scarifying is to facilitate germination of seed.*

- *In April, apply CALM-supplied indigenous tree and scrub seed mix to the landing at 1.5 kg/ha, and CALM-supplied superphosphate at 250 kg/ha.*" (p. 68)

3.1.2 Landings and Major Snig-Tracks with Duplex Soils Operated on Under Dry Conditions

- "*At the completion of loading out, ensure all landing debris, and all unmerchantable log material and bark generated during the harvesting operation, is neatly stacked at the sides and/or rear of the landing, no closer than 5 metres from any retained crop trees. Some of this material must be used to block access from the landing to the snig tracks.*

- *At any time following the completion of debris stacking, but before application of seed and fertilizer in April, scarify the landing, and major snig tracks, to a depth of 200 mm, using any suitable machine or implement, in a manner which will facilitate germination of seed.*

- *In April, apply CALM-supplied indigenous tree and scrub seed mix to the landing at 1.5 kg/ha, and CALM-supplied superphosphate at 250 kg/ha.*

3.1.3 Landings and Major Snip, Tracks with Duplex Soils Operated on in Wet Conditions, and Deep Loams

"*(Note requirement for winning and stockpiling of topsoil - Specification 4.3.)*

- *At the completion of loading out, ensure all landing debris, and all unmerchantable log material and bark generated during the harvesting operation, is neatly stacked at the sides and/or rear of the landing, no closer than 5 metres from any retained crop trees. Some of this material must be used to block access from the landing to the snig tracks.*

- *When soils are sufficiently dry - generally between November and April - respread any overburden (not topsoil) back onto the landing and blade flat any irregularities. At the same time blade level all major snig tracks.*

- *Return and spread topsoil evenly over surface of landing.*

- *At any time following the completion of topsoil return, but before application of seed and fertilizer in April, rip the landing and the major snig tracks to a depth of 500 mm at one metre spacing, using a winged ripper. Ripping will be considered adequate when an 8 mm rod can be pushed by hand to a depth of 500 min in the rip lines and to a depth of 200 mm over 60% of the remainder of the landing.*

- *In April, apply CALM-supplied indigenous tree and scrub seed mix to the landing at 1.5 kg/ha, and CALM-supplied superphosphate at 250 kg/ha.*" (p. 69)

3.2 Rehabilitation of Outrows and Firebreaks (Softwood)

"*3.2.1 Soil damage exceeding limits in 1.3.1 must be repaired during the ensuing summer period, as part of the overall firebreak maintenance programme. Particular attention needs to be paid to landing points.*

3.2.2 Where firebreaks are disturbed through harvesting operations, interceptor banks will be installed as per Section 2 - Erosion Control.

3.2.3 Any erosion control interceptor banks damaged during the course of a harvesting operation will be re-installed to the standard listed in Section 2 - Erosion Control." (p. 69)

MISSION AND OBJECTIVES – 1995

CALM Annual Report 1994/95. 1995

NOTE: REFER TO ENTRY UNDER ANNUAL REPORT 1992/93 – SIMILAR WORDING

GUIDELINE - 1995

Guidelines For Forest Landing & Snig Track Design & Management. 1995

Introduction

"*The following set of guidelines provides instructions for all phases of landing, snig track and in-coupe shunt operations from planning through to rehabilitation.* […]" (p. 1)

Replanting Of Landings

NOTE: REFER TO ACTUAL DOCUMENT FOR ACCOMPANYING ILLUSTRATION

"*Replant landings at irregular intervals in the rip lines, and in areas partially beyond the landing boundaries.*" (p. 2)

Construction

- *With the exception of sheet laterite areas, top soil will be stripped from the entire landing clearing (to a minimum depth of 100 mm where soil depth allows) and stockpiled in screened areas, clear of site operations. No heavy woody debris will be mixed with or strewn over stockpiled top soil.* […]" (p. 2)

Landing Rehabilitation

- "*Landings will be rehabilitated with the aim of restoring natural landforms and drainage patterns and vegetation species.*

- *The following sequence of rehabilitation measures will be fully implemented as soon as possible, preferably at the same time, following the harvest operations and as soil conditions allow (see Appendix*

3). Partial rehabilitation measures will be implemented if the overall coupe operations extend over long time periods. If the coupe is to be inactive for more than 14 days then drainage structure will be established." (p. 3)

Rehabilitation Sequence

- "*All unmerchantable debris heaps resulting from landing and in-coupe road clearing, including ramp logs will be removed from the screened area and pushed into a tight heap in the middle of the landing, avoiding the boundaries or edges of the landing.* […]

[…]

- *The landing area will be regarded to original land contours.* […]
- *Original top soil will be returned & evenly spread over the areas disturbed.*
- *Using a winged ripper, the landing, and where possible-areas immediately adjacent to the landing, will be deep ripped to 0.5 metre (max.) at 1.0 metre intervals, along the contour, avoiding geometrical like patterns or shapes.*
- *Drainage from snig tracks will be diverted to ensure that water does not run onto the landing site. Refer to MHLS Specification Section 5.2, Part 2.*
- *Trees of suitable indigenous species will be planted at irregular intervals (+/-3 x 2 metres) in the rip lines and in areas partially beyond the landing boundaries.* […]" (p. 3)

MISSION AND OBJECTIVES – 1994

CALM Annual Report 1993/94. 1994

NOTE: REFER TO ENTRY UNDER ANNUAL REPORT 1992/93 – SIMILAR WORDING

MANAGEMENT PLANS - 1994

Forest Management Plan 1994-2003. 1994

2. The Strategies for the Sustainable Management of Native Forests
Jarrah Forest Structural Strategies
"*The forest can be stratified into four broad classes and structural goals related to the goals of management and the degree of acceptable disturbance. The four classes are:*
[…]
4. High disturbance

Where forest values are subordinated to other uses, such as surface mining, there is a complete loss of native forest and limited sensitivity to biological values. In these cases the immediate structural goal is of lesser importance than the value sought by disturbing activity.

> *Structural goal: wherever possible maximise the retention of late development stages and seek early and rapid regeneration of as much of the pre-existing ecosystem as possible.*

The structural goals for the minimal, low, moderate and high disturbance classes will be adopted and implemented as described above. […]" (p. 10-11)

3. Managed Forest Values
Ecological Processes
"*This Forest Management Plan will ensure that the ecological processes continue to be maintained by.*
[…]

- *ensuring that all areas of forest which are harvested or disturbed by other activities are regenerated with the same mix of forest species which was present prior to the disturbance.*" (p. 42-43)

Mineral Production
"*CALM'S role is to ensure that the rehabilitation of mined areas is planned and effected in such a way that the structure and composition of the new forest complements the structural goal for the whole forest.* […]" (p. 49)

Gravel, Sand and Stone Supplies
"*All areas will be rehabilitated and the royalty obtained will be directed to purchase forest of sufficient area to replace that lost by extraction.*" (p. 50)

STRATEGIC PLAN - 1994

Strategic Plan : Southern Forest Region. 1994

4.0 Vision
"*The Southern Forest Region is a place of EXTENSIVE VALUES where our PEOPLE ARE MOTIVATED, our UNIQUE ENVIRONMENT SUSTAINED, our RESOURCES are WELL MANAGED and our CUSTOMERS NEEDS are MET.*" (p. 2)

7.1 Objectives
"*Commencing immediately we plan to have achieved the following by the year 2000. (See 7.2 Action Plans for a description of how we intend achieving each of these objectives).*" (p. 4)

Customer/Client Area
"*OBJECTIVE 2 – HARVEST CONTRACTOR PERFORMANCE IN UTILISATION AND REHABILITATION:*

We have achieved effective harvesting contractor performance according to specified and agreed environmental, utilisation and rehabilitation standards." (p. 4)

Customer/Client Area
"*OBJECTIVE 2 – FOREST MANAGEMENT STRATEGY:*
We have successfully implemented the 1994 Forest Management Plan and 1987 Regional Management Plan." (p. 5)

"*OBJECTIVE 4 – IMPLEMENTATION OF MANAGEMENT PLANS:*
We have effectively implemented the priority works defined in the:

- *Shannon D'Entrecausteaux Management Plan*
- *Walpole/Nornalup Management Plan*
- *Various Interim Management Guidelines*" (p.5)

LEGISLATION – 1993

Forest Management Regulations 1993

Part 14. Marking out of Mining Tenements in State Forests and Timber Reserves
Conditions upon entering State forest or timber reserve
"*95. A person who is within any State forest or timber reserve in the South West Division for the purpose of, or in connection with, marking out, shall ensure that-*

(a) all reasonable precautions are taken to avoid unnecessary damage to any trees in the State forest or timber reserve;

(b) no trees in the State forest or timber reserve are felled, cut or removed except with the approval of a forest officer and in accordance with the terms of that approval;

(c) no excavation or other movement of earth, soil, or rock in the State forest or timber reserve is carried out, whether by hand tools or machinery except with the approval of a forest officer and in accordance with the terms of that approval; […]." (p. 1160)

Person not to make camp, fuel depot etc. in State forest or timber reserve
"*96. A person shall not, for the purpose of, or in connection with, marking out, establish any camp, fuel depot or parking area within any State forest or timber reserve in the South West Divi*sion." (p. 1160)

MISSION AND OBJECTIVES – 1993

CALM Annual Report 1992/93. 1993

"***CALM's mission :***

We conserve and manage Western Australia's wildlife and the lands, waters and resources entrusted to the Department for the benefit of present and future generations*.*" (p. i)

"*In keeping with our mission, the Department of Conservation and Land Management has the following objectives.*

Conservation: *To conserve indigenous plants, animals and ecological processes in natural habitats throughout the State.*

Value and Use of Resources: *To optimise the value and economic return to the community of wildlife, lands, waters and resources entrusted to the Department without compromising conservation and other management objectives.*
[…]
Knowledge: *To seek and provide an up-to-date and sound scientific and information basis for the Department's conservation and land management activities.*
[…]" (p. i)

POLICY STATEMENT - 1993

Policy Statement No. 2. Local Government Authority Access to Basic Raw Materials from State Forest and Timber Reserves. 1993

Objective
"*To regulate the supply of basic raw materials (BRMs) to local government authorities (LGAs) from State forest and timber reserves while ensuring minimal environmental damage, the replacement of values foregone and the rehabilitation of excavations.*" (p. 1)

4. Strategies
"*To accomplish the objectives within the framework of the polices CALM will;* […]
... 4.2 Be responsible for the siting and area demarcation of leases on State forests and timber reserves in consultation with LGAs. Ensure that material extraction occurs at locations and in a manner that maintains both local and regional natural biophysical values; […]
... 4.10 Require rehabilitation subject to DOME's 'Environmental Management of Quarries' (1991) and CALM's 'Guidelines for Gravel Pit Rehabilitation' (1992). […]" (p. 2)

5. Procedures
"*Procedures to implement the strategies are attached to the Policy Statement Summary.*" (p. 2)

NOTE: REFER TO ACTUAL DOCUMENT FOR TABLE – POLICY STATEMENT SUMMARY

Local Government Authority Access to Basic Raw Materials from State Forest and Timber Reserves Procedures
[…]
"*3. CALM officer and LGA jointly:*
(a) select the site. Pits not to be located within environmentally sensitive locations or have significant impact on status of regional and local natural biophysical values; […]" (p. 4)

"*7. Land Branch issues lease to LGA. In lease document CALM guidelines for gravel pit rehabilitation (1992) is made a condition and attached to the lease document sent to the LGA.*" (p. 4)

TIMBER HARVESTING … 1993 ED. – 1993

Timber Harvesting in Western Australia … 1993 Ed. 1993

PART 1 : CODE OF LOGGING PRACTICE

Section 4 : Extraction

NOTE: REFER TO ENTRIES 4.7 AND 4.8 UNDER 1987 EDITION, *CODE OF HARDWOOD* … (SIMILAR WORDING)

PART 2 : MANUAL OF LOGGING SPECIFICATIONS

Section 1 : Planning and Monitoring
Specification 1.1 Harvesting and Monitoring and Regeneration Plans
Part A : Hardwood
"Complete details are contained in the Department's 'Provisional Manual of Hardwood Logging Planning'. The following is a summary." (p. 20)

1. Responsibilities
NOTE: REFER TO ENTRY UNDER 1990 EDITION (SIMILAR WORDING)

8. Monitoring and Records
NOTE: REFER TO ENTRY UNDER 1992 EDITION (SIMILAR WORDING)

Section 2 : Roading
Specification 2.5 : Gravel Pit Management

"*1. For the purposes of this specification, the term 'gravel' also applies to other road-making materials such as sand, quartz, limestone, marl and rock. These materials are sometimes referred to as 'basic raw materials' or 'BRMS'.*

2. Contractors involved in gravel extraction, including CALM logging contractors, are required to work to the guidelines set out in the CALM booklet: 'Guidelines for Management and Rehabilitation of Gravel Pits – South West Forest Areas'. This booklet is undated but was released in 1992." (p. 54)

Section 5 : Environmental Protection

Specification 5.2 : Protection of Soil (Including Rehabilitation Measures)
NOTE: REFER TO ENTRY UNDER 1992 EDITION (SIMILAR WORDING)
***EXCEPT* FOR –**

Rehabilitation of Landings

"*3.1 All landings must be rehabilitated by the logging contractor to the satisfaction of the FOIC. All landings requiring ripping must be rehabilitated within 18 months of certification of the sub-coupe or feller's block. All other landings must be rehabilitated in conjunction with the completion of loading out.*" (p. 96)

"*3.4 Rehabilitation of landings will involve:*
[…]

c) the ripping of any damaged soil (such as on landings on karri clearfell areas, and on other landings where the soil horizons have been mixed) to a depth of 500mm and a general spacing of 1 metre, parallel to the natural contour of the land. Ripping will be considered adequate when an 8mm rod can be driven [a] to 500mm into the landing in rip lines and [b] to 200mm/ over 60% of the remainder of the landing.

d) elsewhere, the levelling and raking of any disturbed soil again parallel to the natural contour of the land." (p. 97)

MISSION AND OBJECTIVES – 1992

<u>CALM Annual Report 1991/92. 1992</u>

NOTE: REFER TO ANNUAL REPORT 1990/1991 – SIMILAR WORDING FOR MISSION AND OBJECTIVES

GUIDELINES - 1992

<u>Guidelines for the Management and Rehabilitation of Gravel Pits : South West Forest Areas. 1992</u>

"*Quarrying in Conservation and Land Management (CALM) lands results in the loss of conservation and production values. It also impacts on aesthetics, recreational and water production values.*

The aim of this document is to establish a consistent standard for management and rehabilitation to minimise these impacts.

This document is to be used for all CALM operations, leases and it is to be included as contract conditions for CALM contractors." (p. 1)

Site Selection
Sensitive Management
"*Checklist A and any other relevant checklist must be completed and approvals obtained.*" (p. 2)

Maximising Resourcese [sic]
"*Avoid shallow resources.*" (p. 3)

Other Planning Requirements
"***No more than 2ha** is to be cleared at any one time without the approval of the Regional Manager.*

A pit management plan showing sequence of mining (Figures 2 and 3), access routes and topsoil management strategies is to be produced and attached to Checklist 'A'." (p. 4)

Operational and Rehabilitation Procedures
Commissioning
Clearing
"*Debris, free of topsoil, must be cleared into heaps or windrows at a distance of no closer than 5m from standing trees and burnt, or if required retained for later scattering over the rehabilitated pit after topsoil has been spread over the pit surface.*" (p. 5)

Stripping Topsoil
"*Topsoil Management is of critical importance. This is the only effective means of re-establishing a diverse vegetation.*" (p. 6)

"***A nominal 100 to 150mm of topsoil is to be stockpiled***.[…**]** *Subsoil below 150mm depth must be stored separately.*" (p. 6)

Rehabilitation
Landscaping
"*Batters must be no greater than **1 vertical to 4 Horizontal*** (14 degrees).[…]" (p. 7)

"*Laterite floaters must be cracked, removed, or buried in the batters. Rockpiles only with approval of DM.*" (p. 7)

Ripping
"*The pit floor **must** be ripped at 1m intervals across the contour to a depth of 0.8m prior to return of overburden and then topsoil. **After the return of topsoil the pit must be cross ripped on the contour at 1 meter intervals to a depth of 0.8 metres.***" (p. 7)

Topsoil Return
"*Topsoil return is not permitted until the site has been inspected and approved (Checklist 'B').*" (p. 10)

"[…]*Vegetation and debris are to be returned to the pit floor and minimum of 1 den log and mound per ha to be provided as per Chuditch Management Program.*" (p. 10)

Seeding
"[…]***Indigenous tree and shrub species only** are to be used.(See lists appended).Rate : Min 1.5 kg mixed seed/ha. (Major overstorey tree species must be included in the seed mix as well as in the planting stock).*" (p. 10)

"*Seed bearing brush is useful seed source.*" (p. 10)

Planting
"*Planting of overstorey species is required in the first year at a rate of 600 trees/ha. Second year planting of trees and shrubs is required if a success criterion of less than 30 shrubs and 5 trees per 100m2 (10mx10m) over 90% of the area is not achieved by year 2.*" (p. 10)

Fertilizer
"*Min 250kg/ha superphosphate is to be applied prior to seeding.*[…]" (p. 11)

NOTE: REFER TO ORIGINAL DOCUMENT FOR – *Checklist A 'Approval for Clearing of Gravel Extractions'* AND *Checklist B : Rehabilitation Preparation*

TIMBER HARVESTING … 1992 ED. – 1992

Timber Harvesting in Western Australia … 1992 Ed. 1992

PART 1 : CODE OF LOGGING PRACTICE

Section 4 : Extraction

NOTE: REFER TO ENTRIES 4.7 AND 4.8 UNDER 1987 EDITION, *CODE OF HARDWOOD* … (SIMILAR WORDING)

PART 2 : MANUAL OF LOGGING SPECIFICATIONS

Section 1 : Planning and Monitoring

Specification 1.1 : Harvesting and Regeneration Plans

Part A : Hardwood

"*Complete details are contained in the Department's 'Manual of Hardwood Harvesting and Regeneration Planning'. The following is a summary.*" (p. 23)

1.1 Responsibilities

NOTE: REFER TO ENTRIES UNDER 1990 EDITION (SIMILAR WORDING)

8. Monitoring and Records

"*District staff must maintain up-to-date field records of areas cut over and silviculturally treated. For each coupe, a Coupe Silvicultural Report (CLM 160) must be completed as quickly as possible following the completion of harvesting. (Refer Attachment 1.1.2)*

A Post Operation Checklist (CLM 813) must be completed between 12 and 24 months following the completion of harvesting. (Refer Attachment 1.1.3)" (p. 27)

LEGISLATION - 1991

Conservation and Land Management Amendment Act No. 20 of 1991

"*AN ACT to amend the Conservation and Land Management Act 1984, and to consequently amend certain other Acts.*

[Assented to 25 June 1991.]" (p. 1)

Section 33 Amended

"*21. Section 33 of the principal Act is amended –*

(a) in subsection (1) –

[…]

(dc) to promote the conservation of water, as to both quantity and quality, on land referred to in paragraph (a);

(ii) in paragraph (e) by deleting subparagraphs (i) and (ii) and substituting the following subparagraphs -

' (i) the management of land to which this Act applies;" (p. 12)

"*(ii) the conservation and protection of flora and fauna; and*
(iii) the taxonomy of flora and introduced plants,';
and
(iii) in paragraph (f) by inserting after 'other person' the following -
' , whether in the State or elsewhere';

(b) in subsection (3), by deleting paragraph (b) and substituting the following paragraph –

(i) in the case of nature reserves and marine nature reserves, in such a manner that only necessary operations, within the meaning in section 33A (1) are undertaken;

(ii) in the case of national parks, conservation parks and marine parks, in such a manner that only compatible operations, within the meaning in section 33A(2), are undertaken; or

(iii) in any other case, in accordance with the provisions of section 56 applicable to the land.'.
and

(c) by deleting subsection (4)." (p. 13)

Section 33A Inserted
"*22. After section 33 of the principal Act the following section is inserted-*

Definition of 'necessary operations' etc.
' 33A. (1) In section 33 (3) (b) 'necessary operations' means those that are necessary for the preservation or protection of persons, property, land, flora or fauna, or for the preparation of a management plan." (p. 13)

Section 55 Amended
"*27. Section 55 of the principal Act is amended by inserting after subsection (1) the following subsection (1) the following subsection-*

' (1a) A management plan for an indigenous State forest or timber reserve shall specify the purpose, or combination of purposes, for which it is reserved being one or more of the following purposes-

(a) conservation;
(b) recreation;
(c) timber production on a sustained yield basis;
(d) water catchment protection; or
(e) other purpose being a purpose prescribed by the regulations.'." (p. 17)

Section 56 Amended
"*28. Section 56 of the principal Act is amended-*

(a) in subsection (1)-

(i) by repealing paragraph (a) and substituting the following paragraph-

‘ (a) in the case of indigenous State forests or timber reserves, to achieve the purpose, or combination of purposes, provided for in the proposed management plan under section 55 (1a);’;

(ii) in paragraph (c) by inserting after ‘national parks’ the following-

‘ and conservation parks’;

and

(iii) in paragraph (d) by inserting after ‘and fauna’ the following-

‘ , and to preserve any feature of archaeological historic or scientific interest’;

and

(b) by repealing subsection (2).” (p. 17)

POLICY STATEMENT - 1991

Policy Statement No. 18 : Recreation, Tourism and Visitor Services. 1991

2.9.2 Fossicking
“*…Fossicking for gold or other minerals is considered to be prospecting. A prospector must operate in accordance with the Mining Act.*

The search for and indiscriminate removal of artefacts and relics can result in localised disturbance of the environment as well as the loss of cultural and historical records. For these reasons, fossicking needs to be carefully controlled and managed.

Many fossicking clubs have a code of ethics which involves minimal disturbance of the environment and replacement of soil removed during their activities. Where such activities are permitted fossickers will be required to replace soil, rocks and debris.[…]”(p.69)

Policy
“*2.9.2.1 Nature Reserves, National, Conservation and Marine Parks*
Fossicking is not permitted in Nature Reserves, National Parks, Conservation Parks or Marine Parks without the written approval of the Executive Director.” (p. 69)

“*2.9.2.2 Hand tools only may be used for fossicking.*[…]” (p. 70)

STRATEGIC PLAN – 1991

CALM Annual Report 1 July 1990 to 30 June 1991. 1991

NOTE: THE STRATEGIC PLAN 1989-1993 IS REPRINTED WITH AN ADDITIONAL CLAUSE (THE FINAL ONE IN THE FOLLOWING SECTION) –

“*To achieve the primary objectives the Department will:*” (p. 11)

“***Prepare and implement management plans for lands and waters entrusted to the Department.***

This will involve:

- *Establishing priorities for management plan preparation according to set criteria.*

- *Preparing and implementing management plans according to agreed priorities.*

- *Developing and implementing 'Interim Guidelines for Operations', according to an approved procedure and format, where there is a need for protection of people, property, land, flora and where there is no approved management plan.*" (p. 14)

MANAGEMENT PLAN – 1990

Lane Poole Reserve Management Plan 1990-2000. 1990

Resources and Land Use
B.13.1.2 Current Situation
"[…] *It is, however, important to outline guidelines for mining under existing agreements. Mining adjacent to conservation zones must also be considered.*" (p. 59)

B13.1.3 Exploration and Mining Regulations
Bauxite Mining
"[…] *Drilling plans are submitted annually by Alcoa; from these, CALM specifies environmental protection controls including dieback hygiene strategies.*" (p. 59)

"*Under the provisions of the Wagerup Agreement Act (1978), Alcoa is required to submit annually updated, 5 year mine plans to the Mining and Management Planning (MMP) Liaison Group. This group is co-ordinated by the Department of Resources Development and has representative from CALM, the WA Water Authority, the Environmental Protection Authority and the Department of Mines. The MMP group considers the environmental impacts of various mining options and interactions with other land users, then makes recommendations to the Minister for Minerals and Energy.*

Rehabilitation is carried out under the guidelines outlined in 'Rehab 86', a prescription jointly developed by CALM and Alcoa. A Mining Operations Group, comprising government department representative, supervises mining and rehabilitation operations to ensure that environmental control and rehabilitation guidelines are adhered to. This group assesses clearing applications for all mine sites and makes recommendations to the Minister for Conservation and Land Management and the Environment." (p. 59-61)

C7.4 Declared and Exotic Plants
Background
"*The use of local native species is preferred in all rehabilitation and site design programs. Local jarrah forest eucalypt species will be used to replace pine plantations in rehabilitation projects. These are to be dieback tolerant and to blend visually with the surrounding forest.* […]" (p. 94)

C13 Resource Management
Prescriptions
Mining
"*The objective is to ensure that in the event of any mineral exploration or mining activity, the values of the Reserve suffer minimal degradation.*" (p. 117)

Background
"*It is essential that the values for which the Reserve was established and safeguarded from damage by mineral exploration or mining. The conditions under which the Reserve was established preclude the possibility of exploration or mining for bauxite by companies other than Alcoa. Alcoa has the right to explore or mine only in specific areas of the Reserve (Re B13.1). If future legislative changes alter this situation, mineral exploration*

and mining will only be permitted if no significant environmental damage to conservation values in the Conservation Zone, and recreation values in the Recreation Zone is to occur. Extremely stringent guidelines must exist to guarantee this.

As outlined in CALM's Basic Raw Materials Policy, mining (for purposes other than those required for Reserve management) does not allow the extraction of construction materials, such as gravel, soil, sand and rock. These can be obtained elsewhere and do not constitute a significant economic resource in the Reserve." (p. 117)

Bauxite Mining and Exploration

"*Exploration, under strict environmental safeguards, in the Recreation Zone will be necessary to delineate individual bauxite deposits.* […]

Any mining operations conducted within the Reserve will accord with the following guidelines. […] *Stringent environmental procedures must be undertaken to minimise dieback spread and protect water quality.*

Rehabilitation will be designed to restore or enhance values which existed prior to mining. In the Recreation Zone, these values are recreation and protection of water catchments. In areas adjoining the Conservation Zone, important values to be protected include conservation, water catchment and forest values. […]" (p. 117)

Mining for Minerals Other than Bauxite

"*Government decisions arising from the recommendations of the Bailey Committee enquiry into mining and mineral exploration will require the approval of both Houses of Parliament before exploration may take place. Guidelines which exist for bauxite exploration or mining are the most appropriate for any mining activity within or adjacent to the Reserve.*" (p. 118)

Prescriptions

"*2. Further bauxite mining plans for the Recreation Zone and areas adjoining the Conservation Zone will be reviewed by the Mining and Management Planning Liaison Group. This Group will make the final recommendation on mining, to ensure conformity with mining elsewhere in State forest.*

Areas which require careful planning and environmental control include those clearly visible from the valley floor, other prime recreation or historic areas, and those adjoining the conservation area.

3.Alcoa must first consult the NPNCA if future bauxite mining proposals require access through the Conservation Zone.

[…]

5. Rehabilitation programs in the Recreation Zone will aim to replace or enhance the forest based recreation values. Trees indigenous to the northern jarrah forest will be used preferentially in rehabilitation, planting will be as random as possible, and understorey species will preferably be those which occur naturally in the Reserve. […]

6. Rehabilitation of mine sites adjoining the Conservation Zone will be compatible with conservation values and will consider other forest land use values. Techniques used for maximising conservation values in mined areas will be the best available at that time." (p. 118)

"*7. Applications for mining or mineral exploration in any part of the Reserve will involve CALM and the EPA. As the Reserve has 'A' class status, all applications need approval of both Houses of Parliament.*

[…]

9. Any existing or future gravel pits that are used for reserve management will be rehabilitated as soon as possible according to the CALM policy on rehabilitation and using the best techniques at the time." (p. 119)

MANAGEMENT PLAN – 1990

Waroona Reservoir and Catchment Area Management Plan 1990-2000. 1990

8.4.5 Gravel Extraction
Objective
"*To minimise the effect of the extraction of gravel on conservation values, landscape values, water quality and rehabilitation potential.*" (p. 40)

Rationale
"*Extraction of gravel from the banks of the reservoir is sometimes conducted but is considered to be incompatible with a number of other uses, principally in regard to visual acceptability and bank stability.*" (p. 40)

Prescription
"*The extraction of gravel will not be allowed within the viewshed from the foreshore or the reservoir surface when the dam is full. Gravel extraction will only be considered from the banks between low water and full water levels in special circumstances under strict conditions approved by the Consultative Committee and by CALM. Strict attention must be paid to timing of the operation, rehabilitation and the prevention of spread of dieback disease.*" (p. 41)

MANUAL OF LOGGING … 1990 ED. – 1990

Manual of Logging … 1990 Ed. 1990

Section 1 : Planning
Specification 1.1 : Logging Plans
1. Responsibilities
"*In all cases, planners must produce fully integrated plans and consult with Regional staff, District staff, Specialist Branch staff and where relevant Timber Industry Representatives during plan preparation.*" (p. 1)

4. Monitoring and Records
"*Logging cannot commence until an approved logging plan has been issued and CLM 109 has been signed by the Regional Manager (ref Part 6 of this Specification).*

District staff must maintain up-to-date field records of area cut over and silviculturally treated. This information must be ready when inventory officers visit Districts within one month of the close of the logging season (refer to revamped HOCS – issued from SOHQ on 14/8/90 and CLM 160 – Coupe silviculture report – Jarrah – refer Attachment 1.1.2." (p. 3)

Section 2 : Road Construction and Maintenance
Specification 2.4 : Gravel Pit Selection Working and Rehabilitation
Note: The term 'gravel' also applies to other basic raw materials such as sand, limestone and quartz.

1. *The use of existing or new gravel pits for logging road construction and/ maintenance must be approved by the Forest officer in Charge, and must conform with Policy Statement Number 2 (revised October 1989) a summary of which attached (Attachment 2.4.1) and Guidelines for the Management and Rehabilitation of Gravel Pits - South West Forest Areas (1990) (Reproduced below).*

Guidelines for the Management and Rehabilitation of Gravel Pits : South West Forest Areas

1. Background

"*Quarrying on Conservation and Land Management (CALM) lands results in the loss, conservation and production values. It also impacts on aesthetics, recreation and water production values.*

The aim of this document is to establish a consistent standard of management rehabilitation to minimise these impacts.

This document is to be used for all CALM gravel leases and be included as contract conditions for CALM contractors.

[…]

This document is presented in two parts:

*(i) The Guidelines which outline the principles of pit management. (Minimum criteria is in **Bold Type**).*

(ii) The Checklists which are a mandatory agreement and are summary of the guidelines for approval to commence new and pits (Checklist A) and rehabilitation (Checklist B).

2. Site Selection

2.2 Dieback Status

"- *The dieback status of the pit must be ascertained before any work commences and a 7 Way Test completed.*

- *Dieback-free forest is a valuable resource.*

Gravel	*Gravel Destination*
Dieback-free gravel	*Dieback-free*
	Uninterpretable
	Suspect
	NEQ
Dieback gravel	*Dieback*
	Immediately below dieback
	in high potential risk
	(where appropriate)" (p. 37)

2.4 Resource Arrangement

"- *Avoid shallow resources. Try to maximise the resource available for every hectare cleared. A suggested minimum depth of gravel is one metre.*" (p. 37)

2.5 Water Conservation

Pits proposed in harnessed catchments must be discussed with Water Authority of WA. […] *Pits are not to be located within stream reserves.*

As a minimum standard all second and third order (or higher) water courses within 3km of a catchment reservoir are to have a buffer of 100m from the drainage point of the pit.

For water courses in non harnessed catchments or outside the 3km zone the minimum buffer width is 50m." (p. 37)

2.6 Floristic Values

"*All sites are to be checked for DEF and priority listed species before any operation proceeds.* […]

2.7 Visual Impact
This must be minimised by adequate screening (buffer) from public roads (150 metres is a suggested minimum), by dog legging the access roads into the pit and by avoiding sites in view of prominent observation points." (p. 37)

3. Other Planning Requirements
***No more than 2ha** is to be cleared at any one time without the approval Regional Manager.*

A pit management plan showing sequence of mining, access routes and topsoil management strategies is to be produced and attached to Checklist "A".

4. Operational and Rehabilitation Procedures
4.1 Commissioning
4. 1. 1 Clearing:
"[…]*Debris, free of topsoil, must be cleared into heaps or windrows at distance of no closer than 5m from standing trees and burnt.*

4.1.2 Dieback Management:
"*- All earthmoving machinery must be clean of all dirt and root material to the satisfaction of the District Manager before entering or leaving the pit.*

- Access to the pit must be properly formed and free draining Drainage from access roads should not enter the pit.

- Dieback-free pits must be closed to unauthorised access whilst not in use. […]

- All vehicles entering the pit must be clean of soil material. […]

4.1.3 Stripping Topsoil:
"*Topsoil Management is of critical importance. This is the only effective means of re-establishing a diverse vegetation.*

*- **A nominal 100 to 150om of topsoil is to be stockpiled**.* […]. *Subsoil below 15Omm depth must be stored separately.*

Topsoil stockpiles will be on elevated, dry locations. The heap will be kept low and not compacted. This will avoid heat build up and an aerobic conditions detrimental to seed survival." (p. 38)

4.2 Pollutants
" - *No oil changes in the pit.*
- *Remove soil contaminated by spilt oil and fuel.*
- *Remove all rubbish.*
[…]" (p. 39)

4.3 Rehabilitation
Landscaping:
"*<u>Batters</u> must be no greater than **1 vertical to 4 horizontal** (14 degrees).* […]

Laterite floaters must be cracked, removed, or buried in the batters.

Ripping:
[…]
*- The pit **must be cross ripped.***

- Firstly the pit floor ***must*** ***be cross ripped at lm intervals to a depth of 0.8m prior*** *to return of overburden and then topsoil.* […]

- ***If ripping to depth is not possible the operator will be required to drill and blast the caprock****. This will have a bearing on site selection and depth of excavation.* […]

- Winged tyne rippers must be used to increase the shatter zone." (p. 39)

Topsoil Return
"*- Topsoil return is not permitted until the site has been inspected and approved (Checklist B).*

- […]*. Vegetation and debris are to be returned to the pit floor.* […]

Seeding
" - […]*Indigenous species only are to be used. (See lists appended). Rate : In 1.5kg mixed seed/ha.*
[…]
- Min 250kg/ha superphosphate is to be applied prior to seeding. if topsoil is insufficient or of low fertility. 400kg.ha should be applied.
[…]" (p. 40)

SEE ALSO: SPECIFICATION 5.2 : PROTECTION OF SOIL (INCLUDING REHABILATION MEASURES) IN 'SOILS'

CODE OF LOGGING - 1990

Code of Logging Practice. 1990

Section 4 : Extraction

NOTE: REFER TO ENTRIES 4.7 AND 4.8 UNDER 1987 EDITION, ***CODE OF HARDWOOD*** **… (SIMILAR WORDING)**

POLICY STATEMENT - 1989

Policy Statement No. 2 : Basic Raw Materials. 1989

"*The CALM Policy and conditions on rehabilitation, compensation and royalties is presented in the table (attached).*" (p. 1)

NOTE: REFER TO ORIGINAL DOCUMENT FOR TABLE OUTLINING POLICY

STRATEGIC PLAN – 1989-1993

Strategic Plan For the Period 1989-1993. 1988

General Principles/Philosophy
"*The Department is committed to the principle that it is managing public land and natural resources, and conserving indigenous wildlife on behalf of the public of Western Australia. Consequently, particular importance is placed on informing the public of the Department's activities and wherever possible involving the public.*

The regional system of management as adopted by the Department ensures that its officers develop a detailed knowledge of the area of their operations, are available to interact with local communities and resolve problems associated with local conservation and land management operations. […]" (p. 10)

5. Mission
"*Western Australia has a beautiful and diverse natural environment which provides material, aesthetic and spiritual benefits. The natural environment is an essential component of the quality of life for West Australians. The statement of mission for the Department of Conservation and Land Management is therefore:-*

> *TO CONSERVE WESTERN AUSTRALIA'S WILDLIFE AND MANAGE LANDS AND WATERS ENTRUSTED TO THE DEPARTMENT FOR THE BENEFIT OF PRESENT AND FUTURE GENERATIONS.*" (p. 11)

6. Primary Objectives
"*Five primary objectives have been established:-*

- *MANAGEMENT*
  To protect, restore and enhance the value of resources entrusted to the Department so as to meet, as far as possible, the diverse expectations of the community.

- *CONSERVATION*
  To conserve the indigenous plant and animal species and environmental processes in natural habitats throughout the State.

- *PRODUCTION*
  To provide and regulate the supply of those renewable resources that Government decides should be used, on a sustained yield basis for the satisfaction of long term social and economic needs, and in a manner that minimises impact on other values." (p. 12)

7. Broad and Sub Strategies
"*To achieve the Primary Objectives the Department will:-*

"***7.2 Establish and maintenance a system of secure reserves which protect viable representative samples of all the State's natural ecosystems and species, both terrestrial and aquatic, as well as areas suitable for recreation and the production of renewable natural resources.***

This will involve:

[…]

7.2.4 Protecting ecosystems, landscape and the cultural heritage on lands and waters entrusted to the Department from damage by fire, disease, chemicals, grazing, feral animals and people.

7.2.5 Developing prescriptions for control of disturbance and for rehabilitation of damaged forests, parks and reserves." (p. 14)

10. The Organisation
10.3 Planning
"*Detailed planning of conservation and land management activities is a key function in the Department.*

Under the Conservation and Land Management Act, there is a responsibility to prepare management plans for all land and water vested in either the Lands and Forest Commission or the National Parks and Nature Conservation Authority. Such plans must be available to the public for comment for a period of at least two months. They apply for a maximum period of ten years.

Two levels of this planning are undertaken. These are regional and area management plans.

Regional management plans are to be prepared for each CALM administrative region. They will cover all categories of land and water entrusted to the Department. Each plan will described the management objectives to be achieved over the life of the plan and the strategies for implementation which are to be adopted.

Area management plans will apply to specific areas such as a national park, marine park, nature reserve, marine nature reserve. State forest, or other reserve. These are more detailed than regional management plans. Area management plans will be prepared only where there are requirements that cannot be adequately considered by a regional management plan. Each area management plan will also describe management objectives and strategies for implementation." (p. 31)

"*Other major plans prepared by the Department are issue plans that are either a follow up to an approved management plan, or consist of interim guidelines for necessary operations where there is not yet an approved management plan. Issue plans cover all relevant topics, such as site plans, fire plans, dieback plans, recreation plans, resource allocation plans and wildlife management programs. Issue plans are generally prepared by district or regional staff in conjunction with research and other specialist branches within the Department.* […]" (p. 32)

10.5 Specialist and Support Services
"*Functions of the Branches within each of these Division are as follows:*
[…]

- *Environmental Protection Branch – prepares guidelines and procedures for protection from dieback, weeds and vermin, evaluates mining proposals, and advises on implementation of guidelines and rehabilitation of CALM land.*" (p. 35)

STRATEGIC PLAN (SOUTHERN REGION) – 1989

Strategic Plan : Southern Forest Region. 1989

Key Result Objectives
Site Rehabilitation
"*Objective*
1. Ensure all sites disturbed as a result of logging, roading recreation and other works are rehabilitated promptly with endemic species wherever possible. […]

Measure of Performance
'Priority'
1. All snig tracks, landings, and borrow pits to be rehabilitated (at least to earthworks stage) within one year of operation completion.
2. Liaise with Timber Production Branch to ensure
   a) rehabilitation requirements
   b) road building specifications are incorporated into I.C.M. by June annually." (p. 46)

Basic Raw Materials
"*Objective*
1. To implement the CALM policy in regard to the mining of Basic Raw Materials.

Measure of Performance
'Priority'
1. *To ensure B.R.M. activity is directed onto private property wherever possible.*
2. *To ensure all B.R.M. leases granted contain adequate provisions for rehabilitation, access and disease hygiene.*

Objective
2. To maintain an ongoing and effective liaison with our clients, particularly Local Government. To ensure B.R.M. pits are established with minimal visual impact on landscape. To rehabilitate finished pits promptly.

[…]" (p. 49)

Environmental Awareness and Visual Resource Management
"*Objective*
3. Promote greater recovery, stockpile and re-use of topsoil during earthworks and in the rehabilitation programmes." (p. 73)

MANUAL OF HARDWOOD … 2ND ED - 1989

Manual of Hardwood Logging Specifications … 2nd Ed. 1989

Section 1 : Planning
Specification 1.1 Logging Plans
1. Responsibilities
"*The preparation and distribution of logging plans is the responsibility of the Regional Inventory Branch Offices. These plans are prepared for each Supply Area and include:*
i) a one or two year logging plan (short-term)
ii) a four or five year logging plan (medium term)
and
iii) a long term (eg. 15 years) logging plan (long term).

These plans are produced after consultation with District staff, Regional staff and specialist branch staff, and timber industry representatives where necessary. The plans must be integrated with all other operational plans including plans for roading, silviculture, mining, fire control and visual resource management." (p. 1)

6. Monitoring and Records
"*Logging must not commence until plans are issued. If during a year additional areas of forest are to be cut, additional or amended plans must be issued by the relevant Inventory Office. Districts supervising logging must keep accurate records of areas cutover and quantities of log products removed and forward such information to the relevant Inventory office as required.* […]" (p. 2)

2. Road Construction and Maintenance
Specification 2.4 : Gravel Pit Selection Working and Rehabilitation

NOTE: REFER TO ENTRIES FOR THE ABOVE IN 1987 EDITION (SIMILAR WORDING)

SEE ALSO: SPECIFICATION 5.2 : PROTECTION OF SOIL (INCLUDING REHABILATION MEASURES) IN 'SOILS'

MINING GUIDELINES – 1989

Mining on C.A.L.M. Lands Guidelines. 1989

Exploration Approvals
"*Applications for Exploration licences are generally referred to District offices to ensure any sensitive areas/issues are identified and that adequate conditions are prepared. The conditions in Section 8, recently agreed to with the Department of Mines, have adopted a 'staged approval' concept. Each phase of a*

programme has to be submitted to and discussed with the local CALM manager and agreement reached as to procedures and techniques. […]" (p. 2)

Mining Management
"*It is essential mining plans and some form of working arrangements for any ongoing mining project (including gravel) so as to clearly spell out procedures and obligations. Mining plans for new operations can be prepared as part of a Notice of Intent (NOI) subsequent to the grant of the tenement. The plan must be approved before operations are allowed to proceed. This stage is generally managed by CALM's Environmental Protection Branch in consultation with Regions and the Environmental and Rehabilitation Branch of the Department of Mines.*" (p. 2)

Guidelines for Approval : Costeans, Trenches, Pits, Drill Holes
"*1. Topsoil to be stockpiled.*

2. Where possible pits to be progressively refilled to original contour as sampling proceeds.

3. All drill holes to be capped or filled in (water bore holes to be capped)." (p. 21)

"*4. All exploration sites (drill pads, camps etc) to be left clean and rehabilitated.*

5. Any bulk sampling programme requires special approval." (p. 3)

Rehabilitation Techniques
"*1. <u>Roads and Tracks</u> – Roads and tracks to be ripped (if compacted) and windrows graded back.*

2. <u>Drills Pads</u> – Topsoil to be pushed back, site ripped and debris returned.

3. *<u>Costeans</u> – Topsoil returned and lightly ripped or tyned.*" (p. 22)

Schedule 'B' Department of Conservation and Land Management : The Mining Act 1978 : Conditions for Prospecting and Exploration Licences on State Forest and Timber Reserves (South West)

Planning and Approvals
"*1. Prior to any disturbance to vegetation the licencee preparing a detailed programme for each phase of proposed exploration for written approval of the Regional Mining Engineer in agreement with the Regional Manager, Department of Conservation and Land Management (CALM). This programme to include:*

(i) Maps and/or aerial photographs showing the proposed routes, construction and upgrading tracks, camps, drill sites and any other disturbances;

(ii) Proposals which may disturb any declared rare or geographically restricted flora and fauna; and

(iii) Techniques, prescriptions and target dates for the rehabilitation of all proposed disturbances." (p. 1)

Rehabilitation
"*2. The licencee at his expense, rehabilitating all areas cleared, explored or otherwise disturbed to the satisfaction of the District Mining Engineer in agreement with the District Manager Engineer in agreement with the District Manager, CALM.* […]

3. Prior to the cessation of exploration/prospecting activity the licensee notifying the District Mining Engineer and the Regional/District Manager CALM and arranging an inspection as required." (p. 1)

Compliance With Acts

"*5. The licencee complying with and ensuring that all persons under its control operating in the licence area are aware of and comply with the provisions of:*

(i) the Conservation and Land Management Act, 1984 and the Regulations thereunder;

(ii) the Bush Fires Act, 1954-77 and the Regulations thereunder;

(iii) the Wildlife Conservation Act, 1950, as amended and the Regulations thereunder, and

(iv) *the Country Areas Water Supply Act, 1947 and the Regulations thereunder.*" (p. 2)

General

"*10. The grant of this licence not inferring automatic approval to mine or the subsequent grant of a mining lease in accordance with Section 75 of the Mining Act.*

[…]

12. *The licencee keeping the licence area free from all waste materials, rubbish and litter, and prior to or at the termination of operations removing all equipment and temporary buildings from the licence area.*

[…]

15 The licencee not establishing any camp, base works or area, fuelling depot or similar establishment on the licence area unless the site and access has received prior approval of the District Manager, CALM." (p. 3)

POLICY STATEMENT– 1988

Administrative Instruction No. 39 : Fire break Construction. 1988

"*Admin Instruction 39 currently requires the approval of the Divisional Manager Operations for necessary operations involving new fire break construction.*

For the purposes of this instruction the activity – Fire Break Construction can be considered in two parts.

1. Perimeter Fire Break construction.

2. Internal Fire Break construction.

The Level of approval for Part 1, perimeter fire break construction, is hereby devolved to the Regional Manager.

The level for approval for Part 2, internal fire break construction, remains with the Divisional Manager Operations." (p. 1)

Levels For Approval For Necessary Operations In National Parks, Nature Reserves and Conservation Parks : November 1988

[…]

"*Control of Soil Erosion/Rehabilitation:* *RM*

Mining and Exploration: *Hon Minister*

[…]" (p. 3)

CORPORATE MISSION AND OBJECTIVES - 1988

CALM Annual Report 1st July 1987 to 30th June 1988. 1988

NOTE: REFER TO ENTRY UNDER ANNUAL REPORT FOR 1986/87 AND 1985/86. ENTRY IS SIMILAR EXCEPTING THAT THE MISSION STATEMENT HAS CHANGED (THE SCOPE HAS BECOME THE STATEMENT OF MISSION)

"*TO CONSERVE WESTERN AUSTRALIA'S WILDLIFE AND MANAGE LANDS AND WATERS ENTRUSTED TO THE DEPARTMENT FOR THE BENEFIT OF PRESENT AND FUTURE GENERATIONS*." (p. 6)

STRATEGIC PLAN – 1988?

Central Forest Region Strategic Plan. 1988?

Industry Control – (Mining) (Function)
Objective
"*1. Ensure all exploration and mining is carried out in an environmentally sound manner.*"(p. 43)

Strategy
"*ii) Ensure that exploration on CALM land is conducted in strict adherence to conditions stipulated by the relevant departments.*

iii) Seek to direct mining operations into areas where there will be least conflict with other land uses.
[…]" (p. 43)

Measure of Performance
"*1. Rehabilitation targets are achieved.*

2. Quality of rehabilitation is to standard prescribed.
[…]
4. Exploration meets Departmental guidelines.

5. 5 Yearly and yearly rehabilitation plans are implemented by the companies." (p. 43)

Strategy
"*v) Where exploration and mining occur on CALM land prepare (in conjunction with the companies), agreed working arrangements for planning, clearing, mining, rehabilitation, monitoring, maintenance and fire protection.*

vi) Consolidate mining operations with agreed long-term strategies, aiming to reduce the range of ages of rehabilitation, thus allowing more efficient protection and future management.

[…]

viii) Evaluate rehabilitation after mining. Where acceptable standards are not met, prepare a program of management." (p. 44)

"*xiii) Ensure, via Collie Coal Mines Rehabilitation Committee, that detailed plans for future coal mining and rehabilitation are provided and implemented satisfactorily by both companies.*" (p. 45)

"*xiv) Obtain from tin and mineral sand mining companies operating on CALM land a long-term conceptual plan, and five-year plans to cover mining and rehabilitation proposals.*" (p. 46)

Industry Control – (Mining) (Function)
Collie
"*3. Prepare and continually update a rehabilitation prescription to cover all areas mined for coal in the Collie District and ensure it is adhered to.*" (p. 47)

Performance Indicator
[…]
All areas disturbed by coal mining to be rehabilitated to the satisfaction of the D/M." (p. 47)

Kirup : Tin Mining
Performance Indicator
"*2. Rehabilitation according to approved plan.*" (p. 48)

Greenbushes Tin
Performance Indicator
"*2. Operations are implemented according to approved plan.*" (p. 49)

Basic Raw Materials (Function)
Objective
"*To minimise the impact of basic raw material (gravel, sand, stone) on designated land use values on CALM land.*" (p. 50)

Measure of Performance
"*3. All borrow pits are rehabilitated to the prescribed standard by the responsible organisation as soon as possible.*" (p. 50)

Strategy
"*vii) Ensure borrow pits are rehabilitated by the responsible organisation to the designated land use.*

viii) One and five year plans for major users are updated annually.

ix) For all CALM basic raw materials leases develop agreed working arrangements, in particular, ensure all lessees use efficient and cost effective methods that allow for maximum rehabilitation conditions, e.g. the removal of topsoil before mining for subsequent use as a planting and natural seed germination medium." (p. 51)

Industry Control – Timber (Function)
Hardwood
Objective
"*3. Minimise environmental impact of logging operation.*" (p. 54)

Strategy
"*i) Carry out all hardwood logging operations in accordance with the Code of Hardwood Logging Practice and the Manual of Specifications for the Control of Hardwood Logging Operations.*

ii) […]" (p. 54)

Measure of Performance
"[…]
2. Areas damaged by logging are rehabilitated.
[…]." (p. 54)

Environmental Protection
Objective
"*Minimise the impact of public utilities on CALM lands.*" (p. 116)

Strategy
"[…]
v) Develop procedures for rehabilitation of redundant sites in conjunction with and, where appropriate, at the expense of, the agency responsible.
[…]" (p. 116)

"*vii) Meet with Regional officers in charge of key public utilities once a year to obtain information on any proposals likely to affect CALM land and negotiate relocation, timing of operations, etc., to minimise impact on CALM land.*
[…]
ix) Maintain an inventory of existing damage on areas of public utilities and implement rehabilitation programs.

Ensure that where new damage occurs the utility involved is aware of its obligation to fund and undertake rehabilitation." (p. 117)

Measure of Performance
"*1. Clearing of CALM land is minimised.*

2. New public utilities on CALM land are kept to a minimum.
[…]
4. All redundant sites are rehabilitated to a satisfactory standard.
[…]" (p. 116)

CODE OF LOGGING PRACTICE – 1988

Code of Logging Practice. 1988

Section 3 : Felling, Trimming and Crosscutting
NOTE: REFER TO ENTRIES UNDER 1987 EDITION, *CODE OF HARDWOOD* EXCEPTING FOR 3.8 WHICH WAS NOT INCLUDED IN THIS EDITION

Section 4 : Extraction
NOTE: REFER TO ENTRIES 4.7 AND 4.8 UNDER 1987 EDITION, *CODE OF HARDWOOD* … (SIMILAR WORDING)

CONSERVATION POLICY - 1987

Strategies for Conservation and Recreation on CALM Lands in Western Australia. 1987

The Objectives and Principles in the State Conservation Strategy (SCS)
"*The SCS for W.A. sets out five key objectives for conservation. These are:*

to maintain essential ecological processes and life-support systems;
[...]
to ensure the sustainable utilisation of species and ecosystems;
to maintain and enhance environmental qualities;
[…]" (p. 4)

"*CALM is committed to the objectives and principles listed in the SCS and uses them as the basis for all conservation planning and operations.*" (p. 4)

The Legislative Base
"*CALM operates under two legislative acts: the CALM Act and the Wildlife Conservation Act.*

These Acts place a number of statutory requirements on the way in which CALM manages land and wildlife. The major requirements are:

(1) Management must be in accord with a published management plan and all management plans must be made available for public review and comment in the draft phase.

(2) All lands are vested in two controlling bodies (not the Department). The controlling bodies (National Parks and Nature Conservation Authority and Lands and Forest Commission) are comprised mainly of members of the public representative of conservation and land management interests.

(3) The Department must perform the following functions:

> *manage land vested in the NPNCA and LFC;*
> *provide the NPNCA and LFC with assistance;*
> […]" (p. 4)

The Corporate Plan : The CALM Mission and Key Objectives
General Principles and Philosophy
"*CALM is committed to the principle that it manages public land and natural resources and conserves native wildlife on behalf of the public of W.A. Emphasis is placed, then, on informing the public of the Department's activities and, wherever possible, involving the public in planning and management.*" (p. 5)

Statement of Mission
"*In recognising that Western Australia has a beautiful and diverse natural environment which provides material, aesthetic and spiritual benefits and that the natural environment is an essential component of the quality of life for Western Australians, a statement of mission adopted for the Department of CALM is:*

> *TO PROVIDE FOR THE USE OF THE NATURAL ENVIRONMENT WITHOUT DETRACTING FROM POSSIBLE FUTURE USE.*" (p. 5)

Charter
"*The scope of the Department's responsibilities is represented by its charter which is:*

> *TO CONSERVE WESTERN AUSTRALIA'S WILDLIFE AND MANAGE PUBLIC LANDS AND WATERS ENTRUSTED TO THE DEPARTMENT FOR THE BENEFIT OF PRESENT AND FUTURE GENERATIONS.*

Primary Objectives
Five primary objectives have been established:

> ***Management***
>
> *To protect, restore and enhance the value of resources entrusted to the Department so as to meet, as far as possible, the diverse expectations of the community.*

Conservation

To conserve the indigenous plant and animal species and environmental processes in natural habitats throughout the State.

Production
To provide and regulate the supply of renewable resources on a sustained yield basis for the satisfaction of long-term social and economic needs, and in a manner that minimises impact on other values.
[…]"(p. 5)

"*Subsequent sections of the Department's corporate plan elaborate on these objectives, particularly those relating to conservation. The strategies used to meet these objectives are:*

ESTABLISH AND MAINTAIN A SYSTEM OF SECURE RESERVES WHICH PROTECT VIABLE REPRESENTATIVE SAMPLES OF ALL THE STATE'S NATURAL ECOSYSTEMS AND SPECIES BOTH TERRESTRIAL AND AQUATIC, AS WELL AS AREAS SUITABLE FOR RECREATION AND THE PRODUCTION OF RENEWABLE NATURAL RESOURCES.

This will involve:
[…]

Protecting ecosystems, landscape and the cultural heritage on lands and waters entrusted to the Department from damage by fire, disease, grazing, feral animals and people.

Developing prescriptions for control of disturbance and for rehabilitation of damaged forests, parks and reserves.

[…]" (p. 6)

"*PREPARE AND IMPLEMENT MANAGEMENT PLANS FOR LANDS AND WATERS ENTRUSTED TO THE DEPARTMENT.*

This will involve:

The establishment of priorities for management plan preparation according to set criteria.

Restricting procedures to necessary operations to maintain public safety and the status quo of area management where no management plan exists." (p. 7)

CORPORATE MISSION AND OBJECTIVES - 1987

CALM Annual Report 1st July 1986 to 30th June 1987. 1987

NOTE: REFER TO ENTRY UNDER ANNUAL REPORT FOR 1985/1986. ENTRY IS SIMILAR

MANAGEMENT PLANS - 1987

Northern Forest Region Regional Management Plan 1987-1997. 1987

Part 3. Land Use Classification and Management
Rehabilitation
"*Rehabilitation processes return disturbed land to a predetermined surface, land use or productivity.*" (p. 37)

"*The need for rehabilitation of disturbed sites depends upon the capacity of the site to restore itself and/or the degree of acceptable departure from natural processes.*" (p. 37)

"[…]*Integration with the aesthetics and the operation of surrounding lands is also necessary.*

Most of the rehabilitation site works on CALM land is undertaken by the agency responsible for the site disturbance eg. gravel pit rehabilitation by Main Roads Department, timber industry and shires. Special Agreement Acts for mining on State forest require rehabilitation of mined areas." (p. 37)

Rehabilitation work in this region on CALM land is of the following order:

> *rehabilitation of bauxite mining areas 300 ha/year;*
> *Forest Improvement and Rehabilitation Scheme (FIRS)*
> *1500 ha/year;*
> *rehabilitation (planting) of gravel and other pits 20ha/year;*
> *rehabilitation of dieback areas 10 ha/year.*" (p. 37)

"*Many areas of CALM land disturbed long ago remain unrehabilitated e.g. limestone quarries, gravel pits and areas degraded by dieback disease. These areas will remain in a degraded condition until resources can be provided for their rehabilitation.*" (p. 38)

Regional Strategies
"*In addition to implementing Departmental policies and guidelines … during the period of this plan CALM staff in the region will:*

(i) *prepare rehabilitation prescriptions for all disturbances on CALM lands. Important factors are the need to conform to land use priority and to provide an acceptable level of resources and values;*

(ii) *continue to maintain an inventory of CALM lands within the region and quantify the areas and location of disturbance that require rehabilitation;*

(ii) *provide guidelines and standards for rehabilitation practices and monitor their implementation;*

(iv) *establish schedules of agreed working arrangements between CALM and the relevant organisations, to cover all phases of the operation, e.g. objectives, success criteria, methods of evaluation, responsibilities and funding;*

(v) *liaise with Research Division on current findings. Use this knowledge to improve objectives and prescriptions*." (p. 38)

Mining
Regional Strategies
"*In addition to implementing Departmental policies and guidelines … during the period of this plan CALM staff in the region will:*

(i) where exploration and mining occur on CALM land, and in conjunction with the companies involved, prepare agreed working arrangements to provide for planning, clearing, mining, rehabilitation, monitoring, maintenance, and fire protection;

(ii) consolidate operations to reduce the range of ages of mine pit rehabilitation; allow for the more orderly return of both mined and unmined forests and landscapes to the land use priority; minimise forest and conservation values lost for ore gained;

(iii) evaluate rehabilitation after mining and where acceptable standards are not met, prepare a program of the post-rehabilitation management;

(iv) review rehabilitation research requirements and consolidate research activities to a small percentage of operational plantings;

(v) maintain effective liaison with mining companies ..." (p. 50)

Basic Raw Materials (Gravel, Sand and Stone)
Regional Strategies
"*In addition to implementing Departmental policies and guidelines … during the period of this plan CALM staff in the region will:*

(i) develop basic raw material plans for CALM lands, taking into account the resources on private and other Crown lands;

(ii) regulate raw materials supply using CALM leases. Where the provision of material is required for a specific job, Excavation Licences may be used;

(ii) for all CALM basic raw materials leases/licences, develop agreed working arrangements. In particular, leases must use efficient and cost effective methods that optimise rehabilitation conditions e.g. the removal of topsoil before mining for subsequent use as a planting and natural seed germination medium." (p. 50-51)

Public Utilities
Regional Strategies
"*In addition to implementing Departmental policies and guidelines … during the period of this plan CALM staff in the region will:*

(i) form advisory committees, comprising CALM and representation from other Government agencies. These committees will report to the Regional Manager on the benefits and costs of proposed pubic utilities, alternatives, public opinion and compensation to CALM;

(ii) determine environmental damage from public utilities, prepare agreed working arrangements, implement and monitor rehabilitation programs;

(ii) aim to minimise environmental impacts wherever possible;
[...]" (p. 53)

<u>Central Forest Region Regional Management Plan 1987-1997. 1987</u>

Rehabilitation
"*Plants and/or seed are often supplied and planted by the Department. In recent years rehabilitation work on CALM land has been of the following order, in this region:*

rehabilitation of mining areas 210 ha/year (bauxite 80 ha, coal 50 ha, mineral sands 50 ha, tin 30 ha);
Forest Improvement and Rehabilitation Scheme (FIRS) 150 ha/year;
rehabilitation of gravel and other pits 40 ha/year;
rehabilitation (planting) of dieback areas 15 ha/year." (p. 38)

Regional Strategies
"*In addition to implementing Departmental policies and guidelines … during the period of this plan CALM staff in the region will:*

(i) *prepare rehabilitation prescriptions for all disturbances of CALM lands;*

(ii) *continue to inventory CALM lands to quantify the areas and locations of disturbance that require rehabilitation;*

(iii) *direct new disturbance and rehabilitation to previously disturbed and unrehabilitated sites wherever possible;*

(iv) *establish schedules of Agreed Working Arrangements between CALM and mining companies;*

(v) *aim to rehabilitate and restore natural ecosystems;*

(vi) *update rehabilitation prescriptions on the basis of research.*" (p. 38-39)

Mining
Regional Strategies
"*In addition to implementing Departmental policies and guidelines … during the period of this plan CALM staff in the region will:*

(i) *where exploitation and mining occur on CALM land prepare (in conjunction with the companies), agreed working arrangements for planning, clearing, mining, rehabilitation, monitoring, maintenance and fire protection;*

(ii) *consolidate mining operations with agreed long-term strategies, aiming to reduce the range of ages of rehabilitation, thus allowing more efficient protection and future management;*

(ii) *prescribe and implement hygiene mining operations to protect adjacent unmined ecosystems from dieback;*

(iv) *evaluate rehabilitation after mining. Where acceptable standards are not met, prepare a program of post-rehabilitation management;*

(v) *maintain effective liaison with mining companies ...;*

(vi) *ensure working arrangements with Alcoa and Worsley Alumina are updated frequently and liaise with Northern Forest Region to maintain a consistent approach;*

(vii) *upgrade prescriptions as research develops;*

(viii) *ensure, via the Collie Coal Mines Rehabilitation Committee, that detailed plans for future coal mining and rehabilitation are provided and implemented satisfactorily by both companies;*

(ix) *obtain from tin and mineral sand mining companies operating on CALM land a long-term conceptual plan, and five-year plans to cover mining and rehabilitation proposals.*" (p. 51)

Basic Raw Materials (Gravel, Sand and Stone)
Regional Strategies
"*In addition to implementing Departmental policies and guidelines … during the period of this plan CALM staff in the region will:*

(i) develop basic raw material plans for CALM lands, to meet long-term needs;

(ii) for all CALM basic raw materials leases develop agreed working arrangements, in particular, ensure all lessees use efficient and cost effective methods that allow for maximum rehabilitation conditions e.g. the removal of topsoil before mining for subsequent use as a planning and natural seed germination medium." (p. 52)

Public Utilities
Regional Strategies
"*In addition to implementing Departmental policies and guidelines … during the period of this plan CALM staff in the region will:*

(i) meet with Regional officers in charge of key pubic utilities once a year to obtain information on any proposals likely to affect CALM land and negotiate relocation, timing of operations etc. to minimise impact on CALM land;

(ii) seek involvement in public utility maintenance programs affecting CALM land to ensure that harmful effects are minimised;

(iii) maintain an inventory of existing damage on areas of public utilities and implement rehabilitation programs. Ensure that where new damage occurs the utility involved is aware of its obligation to fund and undertake rehabilitation." (p. 54)

Southern Forest Region Regional Management Plan 1987-1997. 1987

Rehabilitation
"*Plants and/or seed are often supplied and planted by the Department.*

In recent years, rehabilitation work on CALM land in this region has been of the following order:

rehabilitation of gravel pits, 30 ha/year;
rehabilitation of landings and snig tracks after logging, 170 ha/year;
rehabilitation of degraded forest (e.g. former farmland, millsites), 80 ha/year." (p. 37)

Regional Strategies
"*In addition to implementing Departmental policies and guidelines …, during the period of this plan CALM staff in the region will:*

(i) survey CALM lands and quantify the areas and locations of disturbance that require rehabilitation;

(ii) prepare rehabilitation prescriptions for all disturbances;

(iii) where rehabilitation is the responsibility of the user, establish a schedule of conditions between the user and CALM." (p. 37)

Mining
Regional Strategies
"*In addition to implementing Departmental policies and guidelines … during the period of this plan CALM staff in the region will:*

(i) where exploration and mining occur on CALM land, prepare (in conjunction with companies) agreed working arrangements for planning, clearing, mining, rehabilitation, monitoring, maintenance and fire protection." (p. 48)

Basic Raw Materials (Gravel, Sand and Stone)
Regional Strategies
"*In addition to implementing Departmental policies and guidelines … during the period of this plan CALM staff in the region will:*

(i) develop basic raw material plans for CALM lands;
(ii) develop working arrangements with agencies extracting basic raw materials from CALM lands." (p. 48)

Public Utilities
Regional Strategies
"*In addition to implementing Departmental policies and guidelines … during the period of this plan CALM staff in the region will:*

(i) liaise with Officers in Charge of key public utilities to obtain information on any proposals likely to affect CALM land;

(ii) negotiate to obtain relocation or rescheduling of operations to minimise impact on CALM land." (p. 51)

MANAGEMENT PLAN – 1987

Shannon Park and D'Entrecasteaux National Park Management Plan 1987-1999. 1987

1.0 Management Objectives For National Parks
"*The following management objectives for national parks are derived from the Conservation and Land Management Act (1984) and departmental polices for management. The objectives are to:*
[…]
4.Regulate use to be consistent with the maintenance and protection of natural resource values and to minimise conflict between uses.
[…]" (p. 47)

2.0 Management Objectives For the Shannon Park and D'Entrecasteaux National Park
"*Management objectives specific to the two Parks were derived from: the above general objectives; the dual purpose of 'national park and water'; and the information provided in B. Description of the Parks. The following background information is most relevant to the determination of specific objectives –*
[…]

- *Several areas contain important biological and physical features.*

- *Some areas have been disturbed by human activities and this disturbance is likely to spread unless the areas are actively managed and rehabilitated.*

- *Many areas in the Park are capable of sustaining very little public use without irreparable environmental damage.*

[…]" (p. 48)

The specific management objectives for the Parks are to:

[…]

3.Rehabilitate the natural environment as necessary.
[…]" (p. 48)

3.0 Land and Water Management
3.4 Rehabilitation
Objectives
"*1. To realign or close, and subsequently rehabilitate, poorly located roads and tracks, based on a recognition of access and recreational demands.*
2. To close and rehabilitate degraded sites or to relocate sites where the facilities are still required and rehabilitate the disused site.
3. To rehabilitate areas formerly used for logging.
4. To remove existing rubbish and minimise future rubbish dumping within the Parks." (p. 69)

Background
"*There are many areas in both Parks where the biological or physical environment has been modified or degraded as a result of human activities.*

Some roads and tracks in the Parks have been placed on alignments which may cause soil erosion or exacerbate the spread of dieback. Other roads have been built on straight alignments which has significantly reduced their scenic value.

Gravel, limestone and other road-building materials have been removed from pits in many places in the Parks. The location of some pits decreases the scenic quality of the Parks." (p. 69)

"*Recreational use of the Parks has resulted in damage to the environment through the inappropriate use of vehicles or intensive recreational use of sites in sensitive environments. In some places buildings have deteriorated, and rubbish has been left around campsites and huts.*" (p. 70)

Prescriptions
"*1. All roads and tracks that are poorly located, resulting in soil erosion, degradation of wetlands or impairment of scenic values will be rehabilitated, relocated or closed.*

2. Designated public access routes that have been constructed at an inappropriate scale or following alignments with low scenic amenity will be systematically realigned to more appropriate routes, subject to the development of approved design plans (eg. Deeside Coast Road, Chesapeake Road).

3. Gravel and other road-building-material pits will be systematically rehabilitated. Rehabilitation will be an integral part of the road maintenance program for the Parks.

4. Existing recreation sites that are poorly located will be relocated and the areas rehabilitated." (p. 70)

7.4 Log Road Access
Prescriptions – Preston Road
"*2. The continued use of the above road will be subject to the following conditions:*
[…]
e) gravel pits will be located outside the Park and existing pits within the Park rehabilitated." (p. 96)

11.0 Resource Management
11.1 Mining
Objectives
"*2. To ensure that in the event of exploration or mining activity being approved that they are carried out in such a way that it will minimise or restore any damage to the biological, physical and landscape values of the Parks.*" (p. 119)

Prescriptions
"*1. In its management of the Parks the Authority will pursue a policy of not favouring proposed mining activity. By giving advice and by other appropriate means the Authority will seek to ensure that if mining does occur it is strictly conditioned so as to minimise and require restoration or damage to the physical environment of the Parks.*
[…]" (p. 120)

11.2 Basic Raw Materials (Gravel, Sand, etc)
Objectives
"*1. To minimise extraction of basic raw materials from the Parks.*" (p. 120)

Prescriptions
"*1. Basic raw materials for Park maintenance should be sought within the Parks, while ensuring that pit area and numbers are minimised. All pits will be rehabilitated after use.*
[…]
4. Basic raw material requirements by other agencies (eg. Main Roads Department, local government, contractors) will not be met within the Parks. Existing pits will be closed and rehabilitated." (p. 121)

GUIDELINES - 1987

Northern Forest Region Regional Management Plan 1987-1997. 1987
Central Forest Region Regional Management Plan 1987-1997. 1987
Southern Forest Region Regional Management Plan 1987-1997. 1987
Strategies for Conservation and Recreation on CALM Lands in Western Australia. 1987

Departmental Management Guidelines
Rehabilitation
Objective
"*To regenerate degraded land with self-regulating ecosystems consistent with the purpose of the land and, where possible, to restore indigenous biological communities.*

Specifically, the aim is to:

> *rehabilitate land managed by the Department which has been degraded by disturbance so that it will best meet the needs of the designated land use for the areas;*
>
> *apply restoration techniques which favour natural values, wherever possible;*
>
> *ensure that the cost of rehabilitation is borne by the agency responsible for site degradation, wherever possible;*
>
> *ensure that rehabilitation provides for as many secondary land uses as possible;*
>
> *monitor regeneration programs and encourage research to ensure that the aims are being achieved and that techniques are continually being improved;*
> [...]" (p. 84 in *Northern Forest Region Regional Management Plan 1987-1997*)

Strategies

"*(i) Ensure that agreements and planning for disturbances on CALM land make provision for rehabilitation.*

(ii) Employ species and genotypes native to the original site in restoration, whenever possible.

(iii) Encourage natural regeneration of indigenous vegetation.

(iv) In the absence of natural regeneration, planting or seeding procedures should be planned to simulate the original vegetation with respect to species diversity, composition and spacing.

For areas where nature conservation is not the priority use, if naturalness cannot be achieved, rehabilitation should enhance priority uses or maintain them at an acceptable level as determined by landscape architects." (p. 84 in *Northern Forest Region Regional Management Plan 1987-1997*)

Departmental Management Guidelines
Mining
Objective

"To ensure that approved exploration and mining operations proceed according to conditions specified to minimise environmental damage and to rehabilitate in conformance with the purpose of vesting.

Specifically, the aim is to :

abide by the Mining Act which allows for proposals to be rejected or approved subject to conditions by the Hon Minister for Conservation and Land Management on national parks, State forest and A class reserves;

ensure that when any proposal for exploration or mining is submitted involving land and waters under CALM management that the land values affected by the proposal are fully considered;

where conditions applying to exploration and mining are being considered by Government, ensure the development of the most appropriate conditions to preserve the values for which the land was reserved;

liaise with Mines Department, the Department of Resources Development and the Environmental Protection Authority to ensure that the most appropriate conditions for exploration and/or mining on parks, reserves and forests, are developed;

ensure that conditions applied to exploration and mining are complied with;

[...]

rehabilitate areas affected by mining to suit the designated land use, and in accordance with conditions imposed by State Government under the various special agreement Acts and Mining Act." (p. 89 in *Northern Forest Region Regional Management Plan 1987-1997*)

Strategies

"*ii) Ensure that exploration on CALM land is conducted in strict adherence to conditions stipulated by the relevant departments.*

[…]

(iv)Where possible obtain realistic compensation from companies mining on CALM land to cover loss of conservation values, land purchase and the continuing cost of rehabilitation and management of areas affected by mining." (p. 89 in *Northern Forest Region Regional Management Plan 1987-1997*)

Departmental Management Guidelines
Basic Raw Materials
Objective
"*To minimise the effect of the extraction of gravel, stone and sand on conservation values on Departmental land.*

Specifically, the aim is to:
[…]
ensure appropriate environmental measures are taken with all operations." (p. 90 of *Northern Forest Region Regional Management Plan 1987-1997*)

Strategies
"*(ii) Rehabilitate borrow pits according to the designated land use.*

(iv) Minimise pits in national parks, conservation parks and nature reserves.

[…]" (p. 90 of *Northern Forest Region Regional Management Plan 1987-1997*)

Public Utilities
Objective
"*To limit development of public utilities that result in loss of reserve area and conservation values on CALM land to those considered essential by Government and for which there is no reasonable alternative location.*

The aim is to:

retain as much as possible of the land managed by the Departmental free of public utilities.

guide the location of public utilities on CALM land into areas where land use conflict and environmental damage are minimised;

rehabilitate redundant sites to suit the designated land use;

liaise with, and advise, service authorities to ensure their operations are in sympathy with the environment and other land uses." (p. 92 *Northern Forest Region Regional Management Plan 1987-1997*)

Strategies
"*(i) Liaise with shires to avoid the use of CALM land for access to new subdivisions.*" (p. 92 *Northern Forest Region Regional Management Plan 1987-1997*)

"*(iv) Encourage the use of the same sites for more than one utility.*

(v) Ensure management practices do not endanger public utilities.

(vi) Develop procedures for rehabilitation of redundant sites in conjunction with and, where appropriate, at the expense of, the agency responsible.

(vii) Ensure that proposals for public utilities are provided for in management plans for CALM lands." (p. 93 *Northern Forest Region Regional Management Plan 1987-1997*)

MANUAL OF HARDWOOD LOGGING - 1987

Manual of Hardwood Logging Specifications … 1987

Section 2 : Roading
Specification 2.4 : Gravel Pit Selection Working and Rehabilitation
Note: The term 'gravel' also applies to other basic raw materials such as sand, limestone and quartz.

1.The use of existing or new gravel pits for logging road construction and/or maintenance must be approved by the Forest Officer in Charge, and must confirm with Policy Statement Number 2 (January, 1986) a summary of which is attached (Attachment 2.4.1).

2.The pit selection must be carried out in conjunction with the planning of log haul routes. This implies a two year lead time. Selection of pits must take into account the following:

* *Location of pits must be rationalised to avoid numerous small, scattered pits.*
* *No pit shall be located within road, amenity or stream reserves.*
* *Pits must be located out of sight of features such as public roads, scenic lookouts and recreation areas.*
* *Pits must not be located in areas likely to create severe drainage and/or erosion problems particularly if rehabilitation is likely to be delayed.*
* *Access tracks into pits must be located to avoid direct line of sight into the pits.*

3. The dieback status of pits must be decided by C.A.L.M., with sampling and laboratory testing if necessary." (p. 23)

4. Operation of pits
* *Boundary of clearing must be marked by a Forest officer with white paint crosses.*
*[…]** *Debris, free of topsoil, must be cleared into heaps or windrows at a distance of not less than 5m from standing trees.*
* *Top soil to a depth of at least 30cm must be stripped and stockpiled in conveniently situated heaps on the perimeter of the cleared area, at distances of not less than 5m from standing trees or heaps of debris.*
* *If the pit is classed as dieback-free, then removal of gravel resource must be strictly in accordance with split phase standards …* […]
* *Pits developed specifically for logging roads must be physically closed when logging is complete*." (p. 24)

5. Rehabilitation of pits

"*An exhausted pit, or exhausted parts of a large pit, must be rehabilitated by the user when, and as directed by, the Forest Officer in Charge, using the following guidelines*:

* *Clearing debris must be burnt and the ashes spread over the floor of the pit.*
* *Stockpiled top soil must be spread evenly on of the pit.*
* *Banks of the pit must be battered to an angle no greater than 10 degrees.*
* *The floor of the pit must be ripped, along the contour, to a depth of 500mm at 1m intervals.* […] *In most instances it is best to rip after spreading of topsoil.*
* *The pit must be drained where necessary to prevent ponding of ground water.*
* *Erosion control drains or barriers must be constructed as required.*
* *If the pit is completely exhausted, the pit access road must be ripped to a depth of 50Omm at lm intervals, parallel to its length.*

* *Indigenous, dieback resistant tree species, and nitrogenous understorey species must be planted on the rehabilitated pit and access road during the first winter period following preparation for rehabilitation.*

Earth works are to be carried out and funded by the pit user. Tree planting is to be carried out and funded by CALM." (p. 25)

SEE ALSO: SPECIFICATION 5.2 : PROTECTION OF SOIL (INCLUDING REHABILATION MEASURES) IN 'SOILS'

CODE OF HARDWOOD LOGGING – 1987

Code of Hardwood Logging Practice. 1987

Section 3 : Felling, Trimming and Crosscutting

"*3.8 Extraction, erosion control and cleaning up must work progressively through fallers blocks and allocated coupes.*" (p. 9)

Section 4 : Extraction

"*4.7 An Operator shall not carry on extraction at such times or places, or by methods or equipment which a Forest Officer has prohibited until such prohibition has been revoked by the Forest Officer.*

4.8 At the completion of snigging or during temporary cessation of snigging, erosion control work must be completed. All extraction tracks and temporary roads subject to erosion will have cross drains installed as prescribed by the Forest Officer." (p. 13)

Soil

"*7.25 At the completion of snigging or during temporary cessation of snigging, erosion control work must be completed. Extraction tracks and temporary roads subject to erosion will have cross drains installed, as prescribed by the Forest Officer.*" (p. 24)

Section 7 : Environmental Protection

"*7.26 An Operator shall at his expense carry out any measures specified by a Forest Officer to prepare denuded areas for revegetation. These areas shall include landings, gravel pits and temporary roads used during the logging operation.*" (p. 25)

OPERATIONS MANUAL (SOUTHERN REGION) - 1987

Southern Forest Region Operations Manual. 1987

Gravel Pit Rehabilitation Preparation

1.Scope

"*Rehabilitation of pits mined for gravel, shale or sand etc.*" (p. 128)

2.Objective

"*2.1 To return site to a condition which will enable growth of new forest.*
2.2 The site to be aesthetically acceptable." (p. 128)

3. Prescription

"*3.1 Refer to Item 10 Industry Control Manual – Gravel Pit Working Prescription.*
[…]

3.3 Schedule rehabilitation when soil is reasonably dry so that maximum 'shatter' of pit base is achieved by ripping.

3.4 Debris from clearing shall be stacked in tight heaps in pit area and burnt.

3.5 The pit shall be drained if necessary to prevent ponding.

3.6 Banks shall be battered to an angle which is not greater than the 'Natural angle of repose' of the material removed.

3.7 Top soil to be spread evenly on the floor of pit.

3.8 The floor of pit shall be ripped to a minimum depth of 0.6 metres at 1.0 metre intervals. All ripping shall be on the contour.

[…]." (p. 128)

Landing and Snig Track Rehabilitation for Planting
Scope
"*This preparation covers landings and snig tracks in completed cutting coupes in the Southern Forest Region.*" (p. 129)

Objective
"*To prepare (level, clear, rip, drain) landings and snig tracks for regenerating (planting, seeding with selected tree spp plus scrub spp if required).*" (p. 129)

Technique
"*3.1 <u>Preplanning</u>*
[…]
3.1.4 Rehabilitation will commence in late spring (November) in the drier lateritic soil types (Jarrah forest), in the northern end of the region, and proceed south into the loams and clays (Karri forest) during the summer and autumn." (p. 129)

Operation
"*5.3 Landings shall be cleared of logging debris which will be stacked to the rear or sides of landing ready to burn at a later stage. This debris will not be stacked within 20m of the road edge so as to avoid future mop up problems.*

5.4 The landing surface will then be leveled, with top soil if possible and drained if necessary. Ripping will then be done on the contour at 1m intervals and at 1m depth.

5.5 Snig tracks are to be ripped as indicated on the coupe sheet only. […]

[…]" (p. 130)

Direct Seeding of Shrub Species on Rehabilitated Areas
Scope
"*The rehabilitation of borrow pits, log landings, snig tracks and other disturbed areas is of vital importance in the land management process.* […] *this section is designed simply to describe the scrub species seeding techniques which are an important adjunct to most rehabilitation processes.*" (p. 163)

2. Objectives
"*To establish native creepers and shrub species for revegetation of severely disturbed landings, snig tracks and other rehabilitated sites for the purpose of stabilising surface soils, improving soil nutrient status and growing*

conditions, and establish a diverse and therefore more stable understorey. At present, shrub seeding does not replace the need to plant the disturbed sites with containerised tree seedlings." (p. 163)

4. Species Selection
"*Current knowledge indicates that the species that best meet the above objectives are native legumes common to the karri forest, and particularly Kennedya coccinea, which is a pioneer ground creeper that is effective in stabilising the soil surface. The species mix currently preferred are shown in Table 1.*" (p. 163)

5. Seed Selection
"*Seed is gathered by hand from naturally occurring concentrations of desired species. (eg: K. coccinea seed are most abundant in areas burnt by high intensity fire two years previously).*" (p. 163)

6. Seed Preparation
"*Species of the Leguminosea require special pre-treatment to ensure, even germination.* […]" (p. 164)

7. Site Preparation
"*Direct seeding is only successful on sites which have been prepared within 12 months of seeding. The seed bed must be well raked to provide good germination sites, and deep ripped (to 0.8 metres deep) to permit root development of tree species.*" (p. 164)

8. Time of Sowing
"*The seed must be sown in April/May following the first heavy winter rains. The early sowing ensures adequate germination while weather conditions are relatively mild, and provides sufficient time for root systems to develop before onset of dry conditions.*" (p. 164)

9. Sowing Method
"*Seed must be applied evenly, with special considerations given to erosion barriers and ripped lines.*" (p. 164)

POLICY STATEMENT - 1986

Administrative Instruction No. 23 : Interim Guidelines For Operations. 1986

Introduction
"*For substantial areas of land under the control of the Department of Conservation and Land Management it will be many years before approved Management Plans will be developed. In the meantime the CALM Act provides in Section 33 (3) (b) that certain operations can be carried out when there is no management plan*." (p. 1)

"*For indigenous State forest the operations are defined as those actions that ensure the multiple use and sustained yield of that resource for the satisfaction of long term social and economic needs.*

In accordance with the Departmental Planning Policy (Policy 1, January 1986) the necessary operations must be carried out in a planned manner through the development and implementation of INTERIM GUIDELINES FOR OPERATIONS.

The Interim Guidelines will consist of:

(1) a brief description and brief guidelines for major potential activities;

(2) a map showing the locality and area of proposed management activities;

(3) an indication of who must give approval before particular operations can be carried out.

This paper shows how the Interim Guidelines are intended to work." (p. 1)

Aim
"*The aims of the Interim Guidelines are:*

(i) to provide an adequate safeguard against natural and operational calamities on lands administered by CALM in the absence of an approved Management Plan;

(ii) to ensure that critical 'necessary operations' are identified and properly prescribed;

(iii) to ensure that the impacts of necessary operations are fully considered and effectively incorporated within existing management and control systems;

(iv*) to provide a simple, efficient and attainable means of gaining approval for necessary operations*." (p. 2)

Identification
"*The first step is to identify all the necessary operations within each of the areas concerned. Use can be made of a checklist showing all the possible necessary activities – see Appendix 1. Only those operations that are essential for safeguarding the area in question should be considered. These must be consistent with the objectives for the area concerned as described in the CALM Act.*" (p. 2)

"*The development of suitable strategies and prescriptions* ***wil****l necessitate consultation and collaboration between CALM Operations, Planning and Specialist groups*. […]" (p. 3)

Duration of Interim Guidelines
"*Most Interim Guidelines should have an approval duration of at least 3 years with a maximum of 5 years. […] However, the works programme that emanates from these Interim Guidelines must be reviewed and updated annually*." (p. 4)

Approval
"*A system of approval for the Interim Guidelines and the methods of implementing these is to be adopted which recognises and utilises the established hierarchy of authority and control, i.e. District Manager to Regional Manager to Divisional Manager (or Branch Manager) to Directorate (Director National Parks or Director Nature Reserves or both, or entire Policy Directorate depending on the range of necessary activities). It is expected that once the pattern of the development of these Interim Guidelines have been universally accepted, that the final approval will be delegated to Divisional or Regional Managers.*" (p. 4)

CORPORATE PLAN OBJECTIVES - 1986

CALM Annual Report 1st July 1985 to 30th June 1986. 1986

Corporate Objectives
"*Under a corporate plan formulated in 1985/86 the statement of mission for the Department of Conservation and Land Management is:*

> *TO PROVIDE FOR THE USE OF THE NATURAL ENVIRONMENT WITHOUT DETRACTING FROM POSSIBLE FUTURE USE.*

The scope of the Department's responsibilities is represented by its charter which is:

TO CONSERVE WESTERN AUSTRALIA'S WILDLIFE AND MANAGE PUBLIC LANDS AND WATERS ENTRUSTED TO THE DEPARTMENT FOR THE BENEFIT OF PRESENT AND FUTURE GENERATIONS.

Primary objectives are:

Management

To protect, restore and enhance the value of resources entrusted to the Department so as to meet, as far as possible, the diverse expectations of the community.

Conservation

To conserve the indigenous plant and animal species and environmental processes in natural habitats throughout the State." (p. 8)

"*Production*

To provide and regulate the supply of renewable resources on a sustained yield basis in a manner that minimises impact on other values.

[…]

Knowledge

To seek a better understanding of the natural environment and to promote awareness and appreciation of its values.

To achieve the primary objectives the Department will:

Provide an effective administrative framework for the conservation of wildlife throughout the State and the management of lands, waters and natural resources entrusted to the Department.

This will involve:

- *The maintenance of a Policy Directorate to establish, review and refine Departmental aims, policies and priorities; to monitor the implementation of management plans; and to see that goals are achieved.*
- *The maintenance of an operations wing to implement policies and management plans and to set up efficient financial, administrative and management systems.*" (p. 9)

"*Establish and maintain a system of secure reserves which protect viable representative samples of all the State's natural ecosystems and species, both terrestrial and aquatic, as well as areas suitable for recreation and the production of renewable natural resources.*

This will involve:

- *The development and maintenance, in conjunction with other government instrumentalities and the public, of a comprehensive data base on the occurrence and conservation status of the State's ecosystems and species.*

[…]

- *Categorising lands and waters entrusted to the Department into priority use zones and applying the principle of multiple use consistent with the needs of (in order of priority) nature conservation, recreation and production.*" (p. 10)

- "*Protecting ecosystems, landscape and the cultural heritage on lands and waters entrusted to the Department from damage by fire, disease, grazing, feral animals and people.*

- *Developing prescriptions for control of disturbance and for rehabilitation of damaged forests, parks and reserves.*

- *Opposing the incompatible use of lands and waters entrusted to the Department and opposing the release of such lands and waters for other purposes.*" (p. 11)

"*Prepare and implement management plans for lands and waters entrusted to the Department.*

This will involve:

- *The establishment of priorities for management plan preparation according to set criteria.*

- *Restricting procedures to necessary operations to maintain public safety and the status quo of area management where no management plan exists.*" (p. 13)

"*Manage exploitation of renewable natural resources according to the following principles:*

- *resources are managed to ensure their long term conservation;*
[…]" (p. 13)

STRATEGIC PLAN - 1986

Strategic Plan : Southern Forest Region. 1986

Key Area : Site Rehabilitation
Objective
"*1. Ensure all sites disturbed as a result of logging, roading recreation and other works are rehabilitated promptly with endemic species wherever possible. To develop an awareness of the need to avoid excessive site disturbance during earthmoving operations on CALM land, and to prescribe amelioration works where necessary.*
Measure of Performance
1. All snig tracks, landings, and borrow pits to be rehabilitated (at least to earthworks stage) within one year of operation completion.
2. Development of a light scarifying system to facilitate seed regeneration on suitable logging sites." (p. 14?)
Objective
"*2. To undertake some discussion (and field trials) with the timber industry to define the benefits of stockpiling topsoil from log handling sites before they are used, to aid in the rehabilitation process.*
Measure of Performance
"*1. Complete at least 80ha of degraded land rehabilitation in each year.*" (p. 15?)

Key Area
Basic Raw Materials
Objective
"*1. To implement the CALM policy in regard to the mining of Basic Raw Materials.*" (p. 17?)
Measure of Performance
"*2.* […]*To ensure all B.R.M. leases granted contain adequate provisions for rehabilitation, access and disease hygiene.*" (p. 17?)

Objective
"*To maintain an ongoing and effective liaison with our clients, particularly Local Government. To ensure B.R.M. pits are established with minimal visual impact on landscape. To rehabilitate finished pits promptly.*" (p. 17?)

Key Area : Environmental Awareness and Visual Resource Management
Objective
"*1. Provide guidelines for road planning design, construction and maintenance.*
Measure of Performance
"*... 3. Develop specific guidelines for:*
** bank and batter stabilisation*
** rehabilitation and revegetation*
** debris removal and final presentation*
** drainage and culverts*
** bridges*
4. Regional Manager, District Managers and Parks and Reserves Officer to assess new roads at practical completion. Report to outline remedial action.
Objective
2. Provide guidelines for planning designing, implementing and evaluating rehabilitation of disturbed lands.
Measure of Performance
1. Develop guidelines and procedure for determining post disturbance land use by June, 1987
2. Develop guidelines and criteria for plant species selection by July, 1987." (p. 31)
"*3. Ensure seed used is collected from appropriate vegetation association and geographic location.*
... 5. Environmental Protection Branch, Regional Manager and Parks & Reserves Officer to review rehabilitation works annually. Report to provide action steps." (p. 32)

Objective
3. Ensure logging coupes are demarcated to minimise environmental degradation and visual impact.
Measure of Performance
"*1. Participate in demarcation task groups to set guidelines for boundary selection and optimal use of the 20% reserve allocation. Develop guidelines by April, 1987.*
... 4. Assess and evaluate level of environmental degradation through inspection by Environmental Protection and Research personnel with Regional Manager and Parks and Reserves Officer annually. Report to provide action steps." (p. 32?)

Objective
"*6. Ensure planning and construction of fire breaks minimises visual their impact and environmental degradation.*" (p. 33?)

Objective
"*7. Ensure that fire-breaks do not create other management problems such as providing 4WD access to restricted area.*" (p. 33?)

Key Area : Land Rehabilitation
Objective
"*1. To rehabilitate areas disturbed by logging, roading or BRM extraction*" (p. 59?)
Measure of Performance
"*1. Rip all landings and snig tracks by the summer following regeneration*
2. All excavation pits are to be ripped battered and overburden respread, within 12 months of removals finishing.
3. Prepare current season rehabilitation programme by November each year." (p. 59?)

Key Area : Land Rehabilitation
Objective
"*1. To rehabilitate areas which have been disturbed by logging, roading or BR.M. extraction*" (p. 75?)
Measure of Performance
"*1. Landings and snig tracks are to be rehabilitated in the summer following regeneration (at the latest).*" (p. 75?)

"*2. Gravel pits etc. are to be rehabilitated within 12 months of removals finishing.*
3. Rehabilitate and replant at least 50 ha of degraded land each year.
... 5. Ensure topsoil is stockpiled and re-spread on disturbed areas. Alternatively scatter scrub seed to establish understorey." (p. 76?)

Key Result Objectives - Walpole District
Key Area : Degraded Land
Objective
"*1. Systematically rehabilitate degraded land to its natural values.*" (p. 89?)
Measure of Performance
"*1. Plan to rehabilitate all gravel and sand pits on CALM lands (approx 6ha/yr).*
2. Ensure Shires and other Government bodies undertake borrow pit rehabilitation programmes (letters to Denmark, Albany, Manjimup Shires).
3. Rehabilitation requirements to be specifies in leases." (p. 89?)

Key Result Objectives - Walpole District
Key Area : Basic Raw Materials
Objective
"*1. To implement the CALM policy in regard to the mining of Basic Raw Materials.*
... To rehabilitate finished pits promptly." (p. 90?)
Measure of Performance
"*2. To ensure all B.R.M. leases granted contain adequate provisions for rehabilitation, access, and disease hygiene.*" (p. 90?)

POLICY STATEMENT – 1986

Policy Statement No. 10 : Rehabilitation of Disturbed Land. 1986

Operational Objective
"*To regenerate, on disturbed land, self-regulating ecosystems, consistent with the purpose for which the land is to be managed.*" (p. 1)

Background
"*Disturbance is defined here as any activity or process producing, or likely to produce, long-term degradation of habitats and ecosystems.*[…]" (p. 1)

"*… It is expressed in various ways including changes to natural assemblages of plants and animals (especially the loss of species), soil compaction and/or erosion, salination and reduction in water quality, safety problems or threats to private land or other habitats.*" (p. 1)

"*The type, and extent, or rehabilitation required will vary depending upon the type and extent of the disturbance.*[…]" (p. 1)

Policy
"*The Department will:*
1. Prevent disturbance causing activities on CALM land wherever possible, particularly on Nature Reserves, National Parks, and Conservation MPAs, and in cases where the activity will lead to irreversible degradation of ecosystems or habitats; (this clause does not prevent duly authorised necessary operations, or the implementation of an approved management plan).

2. In the event of planned activities on CALM land which will cause disturbance, establish conditions for such activities which minimise the area and degree of disturbance, and define the type of rehabilitation required.

3. Ensure that all CALM land which has suffered disturbance, as defined, is rehabilitated as far as practicable, so that it will best meet the needs of the designated land use.

4. Prevent or suppress the invasion by weeds of disturbed or rehabilitated areas.

5. Ensure that, whenever possible, the cost of rehabilitation is borne by the agency responsible for the disturbance.

6. Ensure that rehabilitation provides for as many secondary land uses as possible, consistent with 3 above.

7. Apply one of the following four procedures wherever nature conservation is the priority use, as in Nature Reserves, National Parks and Flora, Fauna and Landscape MPAs.
(i) Natural regeneration of indigenous vegetation is the preferred method of rehabilitation, and where necessary, steps should be taken to encourage it." (p. 2)
(ii) Where (i) is not possible, or needs supplementing, local species, grown from seed or cuttings obtained locally, should be planted, with restoration as far as possible of the original species diversity, composition and spacing.
(iii) Where conditions have been changed to such an extent that local species cannot grow (eg. on areas affected by salinity, dieback disease, or the removal of topsoil), or where a desired purpose such as providing shade, cannot be met by local species, species suitable to the conditions should be planted. However, where more than one species are suitable, then that which occurs naturally closest to the rehabilitation-site should be used, with seeds and cuttings collected from the nearest possible source.
(iv) The necessity, and feasibility, of reintroducing species, or aggregations of species, of the original fauna will be considered." (p. 3)

"*10. Maintain detailed operational guidelines based on the best current techniques, and ensure that disturbance causing activities and subsequent rehabilitation are fully integrated into land use planning and management.*

11. Establish criteria by which to judge the success of rehabilitation on land for different purposes.

12. Monitor regeneration programmes to ensure that the aims are being achieved, and to contribute to the continuing improvement in methods." (p. 3)

MANUAL – 1986

Manual of Specifications for Control of Hardwood Logging Operations in the Northern … 1986

Specification 2.4 Gravel Pit Selection Working and Rehabilitation
"*1. The use of existing or new gravel pits for logging road construction and/or maintenance must be approved by the Forest Officer in Charge, and must confirm with Policy Statement Number 2 (January, 1986) a summary of which is attached (Attachment 2.4.1).*

4. The Pit selection must be carried out in conjunction with the planning of log haul routes. This implies a two year lead time. Selection of pits must take into account the following:
* *Location of pits must be rationalised to avoid numerous small, scattered pits.*
[…]
* *Pits must not be located in areas likely to create severe drainage and/or erosion problems particularly if rehabilitation is likely to be delayed.*
[…]
* *Access tracks into pits must be constructed to allow vehicular use under all weather conditions.*

3. The dieback status of pits must be decided by C.A.L.M., with sampling and laboratory testing if

necessary." (p. 29)

"*4. Operation of pits:*

[…] * *Debris, free of topsoil, must be cleared into heaps or windows at a distance of not less than 5m from standing trees.*

* *Top soil to a depth of at least 30 cm must be stripped and stockpiled in conveniently situated heaps on the perimeter of the cleared area, at distances of not less than 5m from standing trees or heaps of debris.*

* *If the pit is classed as dieback-free, then removal of gravel resource must be strictly in accordance with split phase standards; that is:-*
  - *(a) a log barrier must be strategically positioned on the perimeter of the pit entrance to prevent entry of gravel trucks onto the pit floor occupied by the loader,*
  - *(b) loading facilities will be designed to prevent ground contact between the loader and gravel trucks, and*
  - *(c) loaders entering or re-entering the pit must be thoroughly cleaned down.*
  - *(d) The flow of water into the pit, from dieback-infected forest or roads, must be prevented.*

* *Pits developed specifically for logging roads must be physically closed when logging is complete.*

5. Rehabilitation of pits:

An exhausted pit, or exhausted parts of a large pit, must be rehabilitated by the user when, and as directed by, the Forest Officer in Charge, using the following guidelines:" (p. 30)

"* *Clearing debris must be burnt and the ashes spread over the floor of the pit.*

* *Stockpiled top soil must be spread evenly on the floor of the pit.*

* *Banks of the pit must be battered to an angle no greater than 10 degrees.*

* *The floor of the pit must be ripped, along the contour, to a depth of 70 cm at 1m intervals. Ripping may take place before or after spreading of topsoil, depending on the depth of topsoil. In most instances it is best to rip after spreading of topsoil.*

* *The pit must be drained where necessary to prevent ponding of ground water.*

* *Erosion control drains or barriers must be constructed as required.*

* *If the pit is completely exhausted, the pit access road must be ripped to a depth of 70cm at 1m intervals, parallel to its length.*

* *Indigenous, dieback resistant tree species, and nitrogenous understorey species must be planted on the rehabilitated pit and access road during the first winter period following preparation for rehabilitation.*" (p. 31)

Specification 5.2 Protection of Soil (Including Rehabilitation Measures)

"*3.1 All landings in fully integrated logging operations must be rehabilitated by the logging operator to the satisfaction of the FOIC. Rehabilitation must be completed by the first day of May following the completion of logging. Logging is deemed to be complete when the cutting section, including landings, has been certified complete by an authorised certifying officer.*" (p. 67)

"*3.4 Rehabilitation of landings will involve:*

(a) the ripping of any damaged soil to a depth of 500mm at a spacing of 1 metre, parallel to the natural contour of the land, and

(b) the heaping or windrowing of clearing and logging debris along the sides and rear of landings, such heaps or windrows to be no closer than 5m from crop trees.

3.5 All rehabilitation must be carried out in strict accordance with dieback hygiene principles, as directed by the FOIC.

3.6 Any burning or debris, seeding or planting considered necessary will be carried out by the relevant CALM District during the winter following rehabilitation." (p. 68)

POLICY - 1985

Forests Department Annual Report 1 July 1984 to 21 March 1985. 1985

NOTE: REFER TO ENTRY UNDER 1982 EDITION, SIMILAR WORDING FOR ANNUAL REPORTS FOR 1983, 1984, 1985

MANAGEMENT PLAN – 1985

Northern Forest Region : Working Arrangements and Management Program. 1985

Bauxite Mining
Objectives

- "*Department G.W.P. 87. Guide mining operations into areas of lease* [sic] *conflict with other land uses including economic considerations, competing land uses, environmental damage and rehabilitation requirements.*

[…]

- *Region.* […] *Ensure high standard of rehabilitation consistent with long term forest management requirements e.g. fire control.* […]" (p. 34)

Strategy
"[…]

- *Improve planning and provide better prescriptions for long term forest management of rehabilitated areas, particularly fire control.*

[…]" (p. 35)

Mining for Gravel Stone and Sand
Objective

- "*Department G.W.P. 87. Minimize adverse effects on forest by supplying these resources exclusively to Government, and semi-Government authorities and then when there is no alternative supply and when the supply will not damage conservation policies.*

- *Region.* […] *Locate mining in areas of least adverse environmental impact where possible and rehabilitate after mining.*" (p. 35)

Strategy
"[…]

- *Arrange rehabilitation.*

[…]" (p. 35)

LEGISLATION - 1984

Conservation and Land Management. No. 126 of 1984

"AN ACT to make better provision for the use, protection and management of certain public lands and waters and the flora and fauna thereof, to establish authorities to be responsible therefor, and for incidental or connected purposes

[Assented to 8 January 1985]" (p. 1881)

Part IV. - Department of Conservation and Land Management
Division 1. - Establishment of Department
"*33.(1) The functions of the Department are, subject to the direction and control of the Minister-*

(a) to manage land-

(i) to which this Act applies; or

(ii) which becomes subject to the management of the Department under subsection (2), and the associated forest produce, fauna and flora;

(b) to provide the Commission, the Authority and the Council with such assistance as they may reasonably require to perform their functions;" (p. 1905)

"*(d) to be responsible for the conservation and protection of flora and fauna throughout the State, and in particular to be the instrument by which the administration of the Wildlife Conservation Act 1950 is carried out by the Executive Director pursuant to section 7 of that Act;*

(e) to carry out or cause to be carried out such study or research of or into-

(i) the management of land to which this Act applies; and

(ii) the conservation and protection of flora and fauna, as the Minister may approve;

(f) to provide advice to, or undertake work for or jointly with, and to supply services or facilities to, any department, public or private body or other person if that Minister is of the opinion that the provision of that advice or the undertaking of that work is in the public interest;
(g) upon request by the Minister to whom the administration of the Land Act 1933 is committed, to advise him on the reservation, alienation, and disposal of Crown land in rural areas under that Act." (p. 1906)

"*33(3) The management of land referred to in subsection (1) (a) (i) and the associated forest produce, flora and fauna shall be carried out-*

(a) where there is a management plan for the land, in accordance with that plan; or" (p. 1906)
"*(b) where there is for the time being no such plan-*
(i) in the case of national parks and nature reserves, in such a manner that only necessary operations are undertaken; or
(ii) in any other case, in accordance with the provisions of section 56 applicable to the land.
(4) In subsection (3) (b), 'necessary operations' means those that are necessary for the preservation or protection of persons, property, land, flora or fauna, or for the preparation of a management plan.

(5) Nothing in subsection (1) shall be read as limiting the functions of the Commission and the Authority under sections 19 and 22 respectively.

34. Subject to this Act and the Public Service Act 1978, the Executive Director has power to do all things that are necessary or convenient to be done for, or in connection with, the performance of the functions of the Department." (p. 1907)

Part V. – Management of Land
Division 1. – Management Plans
"*54. (1) A controlling body shall be responsible-*

(a) for the preparation of proposed management plans; and

(b) the review of expiring plans and preparation of further management plans,

for all land which is vested in it whether solely or jointly with an associated body.

(2) This Part applies to the preparation of a plan under subsection (1) (b) in the same way as it applies to the preparation of an initial management plan." (p. 1914)

"*(3) Proposed management plans for any land shall be prepared-*

(a) by the controlling body for that land through the agency of the Department; and

(b) within such period after the commencement of this Act as is reasonably practicable having regard to the resources of the Department available for the purposes." (p. 1915)

"*55. (1) A management plan for any land shall contain –*

(a) a statement of the policies or guidelines proposed to be followed; and

(b) a summary of the operations proposed to be undertaken,

in respect of that land during a specified period which shall not exceed 10 years.

(2) A management plan shall state the date on which it will expire, unless it is sooner revoked, but notwithstanding anything in this section or in the plan, a plan which would otherwise expire shall, unless it is revoked, remain in force until a new plan is approved." (p. 1915)

"*56. (1) A controlling body shall, in the preparation of proposed management plans for any land, have the objective of achieving or promoting the purpose for which the land is vested in it, and in particular management plans shall be designed –*

(a) in the case of indigenous State forest or timber reserves, to ensure the multiple use and sustained yield of that resource for the satisfaction of long-term social and economic needs;
[…]" (p. 1916)

"*(2) In subsection (1) (a) 'multiple use' means as many different uses as are possible and compatible among themselves.*" (p. 1916)

POLICY - 1984

Forests Department Annual Report 1984. 1984

NOTE: REFER TO ENTRY UNDER 1982 EDITION, SIMILAR WORDING FOR ANNUAL REPORTS FOR 1983, 1984, 1985

RECREATION PLAN – [1984]

Forest Recreation Framework Plan. [1984]

9.2.9 Roadway Management Unit
"*Management Strategy: This unit encompasses the viewshed on all major forest roads, as determined by the confining boundaries of the surrounding topography. This may vary from 30m to 2km depending upon the*

inherent features of the particular area. Within this zone attention will be given to the planning and implementation of all forest land use activities which impinge upon the roadscape.

The Specific Management Strategies are:

- *to ensure that all activities involving the removal of forest produce including gravel, and the rehabilitation of degraded areas are carried out according to landscape design and management guidelines provided by Extension Branch.*" (p. 47)

POLICY - 1983

Forests Department Annual Report 1983. 1983

NOTE: REFER TO ENTRY UNDER 1982 EDITION, SIMILAR WORDING FOR ANNUAL REPORTS FOR 1983, 1984, 1985

HANDBOOK – 1983

Bauxite Mining : Northern Jarrah Forest : Mining Operations Handbook 1. Ed. 2. 1983

NOTE: REFER TO ENTRY UNDER EDITION 1981 AS IT CONTAINS SIMILAR DETAILS EXCEPT FOR A NEW SECTION AND AMENDMENTS TO THE FOLLOWING PRESCRIPTONS-

5 : Inventory and Control
5.1 Bauxite Rehabilitation Monitoring Project
"*The aim of this project is to monitor the survival and growth of bauxite minesite rehabilitation plantings.* […]" (p. 5.1)

6. The Forest Improvement and Rehabilitation Scheme Prescription : F.I.R.S. 82
"*1.1 In the Wagerup ERMP Alcoa gave a commitment to finance the rehabilitation of dieback affected State forests adjoining bauxite mines. This led to the initiation of the Forest Improvement and Rehabilitation Scheme (FIRS) in 1978.*" (p. 6.1)

"*1.3 FIRS work is breaking new ground in the integration of site, land use and disease variables. Each annual prescription is therefore regarded as interim.*

1.4 This prescription sets out objectives and guidelines for FIRS based on the best information available in October 1982." (p. 6.1)

Objective
"*The objective of FIRS is:-*

> *'To improve the capacity of the forest for longterm production of water, timber, recreation, conservation and/or other forest values.'*

This objective implies two broad categories of treatment

(i) The rehabilitation of areas of advanced dieback forest, so as to regenerate its productive capacities, and
(ii) The improvement of the health and vigour of other stands so as to render them less susceptible to dieback disease impact." (p. 6.1)

The Prescription

"*4.1 FIRS 1 –* **Water Production MPA*
**Advanced Dieback*
**Pipehead or pumpback catchments only*

For all sites except stream zone.

(i) Define according to field inspection and demarcation of areas where the jarrah overstorey is largely dead or dying.

(ii) Determine and specify hygiene requirements, as detailed in 'Jarrah 81'.

(iii) Mark for retention and ensure full protection of sound, healthy dieback tolerant species such as marri, wandoo or blackbutt. Retain advanced regrowth and saplings of dieback tolerant species. Retain sound healthy sheoak, particularly on sites which will not be planted.

[…]
(v) Bulldoze or fell those trees not marketable or marked for retention, and stack into heaps at regular intervals to create ashbeds. […]

Carry out erosion control on all unwanted roads, tracks, landings and pits. Drainage must not empty into DBF forest.

(vi)Scarify harsher compacted sites (to improve seed germination) prior to sowing.

(vii) Burn the heaps at the most convenient time.

(viii) Sow leguminous understorey species in late May at rate of 0.5 kg per hectare bulked with 450 kg/ha of superphosphate." (p. 6.3)

"*(ix) Cultivate, and plant with tree species suitable for the site. Plant to achieve an initial stocking of 625 stems per hectare. Approximate a 4.0m x 4.0m spacing with preference for planting on ashbeds.*

Tree species to choose from:

(a) On upland sites plant Euc. resinfera, Euc. maculata or Euc. wandoo.
(b) On other sites plant Euc. wandoo, Euc. patens and E. maculata.
[…]
The following autumn, carry out a survival count in planted areas. Success criteria for planting is 80% survival (counting natural regeneration) based on a 10% systematic sample of rows for tree seedlings. […]" (p. 6.4)

"*4.2 FIRS 2 -* ** Water Production MPA*
** Advanced Dieback*
** All other catchments*

(i) As for (i), (ii), (iii), (iv), (v), (vi), (vii) and (viii) in the FIRS 1 prescription.

(ii) Select promising sites (i.e. <u>not</u> massive ironstone or caprock) and plant small groves or clumps of E. wandoo, E. resinfera or E. patens. […]" (p. 6.4)

"*4.3 FIRS 3 -* **Water Production MPA*
** Other forest (i.e. <u>not</u> advanced dieback).*

These are stands where the overstorey has not suffered extensive mortality. […]" (p. 6.5)

"*General*
The optimum means of treating jarrah forest so as to improve resistance to infection or disease intensification, is still to be proven. A number of variables are involved (e.g. thinning, banksia de-stocking, legume regeneration, special fire and water management) and the aim is to combine these in a treatment regime which will maximally disfavour the fungus while at the same time improving the natural health and vigour of the forest.

A wide range of treatments is currently being investigated. The 'base' prescriptions, about which variations will be designed, is:

(i) Define according to field inspection and demarcate dieback categories. Demarcation is required in order to implement hygiene.

(ii) Determine and specify hygiene requirement as detailed in Jarrah 81." (p. 6.5)

"*(iii) If it is an even-aged 'pole' stand:*

- Mark crop trees for retention at a stocking of 150-250 sph depending on site and age.

(Thinning guides based on height and basal area are to be used where available). The definition of a crop tree is as used in 'Jarrah 81'.

- Jarrah is the preferred species, but if absent or deficient, retain marri, blackbutt, wandoo or bullich.

- Harvest all marketable poles, logs and minor produce from trees not marked for retention. Crop trees must be protected from falling and snigging damage. Ensure erosion control, crop tree protection and landing rehabilitation measures are carried out.

(NOTE: Thinning of DBF stands only to be done if the silvicultural advantage is considered to be worthwhile and hygiene measures are of the highest order. […]" (p. 6.5)

"*(iv) If it is not a 'pole stand':*
- Carry out standard selection mark as per J81.
[…]
- Harvest for poles, sawlogs or minor forest produce all trees not marked for retention as crop trees. Crop trees to be protected from falling and snigging damage.

Erosion control and crop tree protection to be carried out.

[…]
(vii)Erosion control works to be completed prior to autumn rains. It is essential to ensure that water from roads, pits, conveyors, etc. does not drain into the treated stand.

(viii) Conduct Autumn burn under dry soil conditions aimed at minimum scorch and maximum heat in soil. Timing of burn important in order to maximise banksia suppression. Burn only after banksia cones are dry or seed has germinated following pushdown. Burn Autumn after Spring pushdown. Allow one winter with Summer pushdown if sufficient drying time has not elapsed.

(ix) Legume seeding in these areas will not be done for the time being as this technique is under review.

(x) Close all unwanted roads. Upgrade drainage on existing roads to ensure no water flows into forest unaffected or only lightly affected by dieback." (p. 6.6)

"*4.4 FIRS 4* - **Recreation MPA*
- **Advanced Dieback*

Apply as for FIRS 1 except for the influence zone which will be areas surrounding or adjacent to a depth of about 100 metres, any major or tourist facility. These areas will be worked according to a landscape and rehabilitation plan which prescribes:

* *planting pattern*
* *stocking*
* *species*
* *seed mix for understorey species.*" (p. 6.6)

"*Factors to be considered are: Plant trees in clumps, not lines; choose species which fit the natural landscape (e.g. E. patens okay in lowlands but not uplands; E. resinifera blends with jarrah); feather edges; do not create thickets of prickle bush.*

Each DFO will compile an appropriate prescription for these areas, seeking specialist advice from the Departmental Landscape architects." (p. 6.7)

"*4.5 <u>FIRS 5</u>* - **Recreation MPA*
- ** Stand is Not Advanced Dieback*

(i) Apply as for FIRS 3 except for the thinning. No thinning to waste will take place in a Recreation MPA.

(ii) Areas surrounding or adjacent to a depth of about 100m, any major or tourist road or existing tourist facility will be worked according to a landscape and recreation plan which prescribes:

* *stocking*
* *species*
* *seed mix of understorey species*

Each DFO will be responsible for definition of these special areas and for compiling an appropriate prescription. Specialist advice must be sought from the landscape architects during the preparation of plans, and final plans endorsed by R/L Operations." (p. 6.7)

Forest Management After Bauxite Mine Rehabilitation in the Western Jarrah : Prescription 82
Responsibilities
"*1.1 Current techniques for the regeneration of forests destroyed by mining are dealt with in the Forests Department prescription 'Rehab 83'.*

This new prescription deals with the subsequent management of these areas, comprising the regenerated stands on pits, roads, crusher sites and other sites disturbed by mining.

1.2 Pursuant to Para 7 page 15 of the Wagerup ERMP, the responsibilities for various facets of initial revegetation are shared, but <u>subsequent forest management is solely the responsibility of the Forests Department</u>. Mining Companies may not prescribe or undertake silvicultural or engineering work in the rehabilitated forest beyond agreed establishment programmes, unless directed to do so or otherwise approved by the Forests Department." (p. 7.1)

2. This Prescription
"*2.1 Because there is no past experience to draw upon in the management of forests regenerated after mining, and because of uncertainty as to how these stands will develop, this prescription is regarded as interim, and will* [*be*] *subject to regular review.*

Nevertheless, it is the best 'State of the Art' and must be strictly adhered to.

2.2 The next review of the prescription will be in October 1983." (p. 7.1)

3. Objective
"*The objective of management after rehabilitation in the forests of the mining envelopes is: To sustain a site-adapted forest capable of resisting fire, disease and parasites, able to regenerate naturally and produce valued products.*

In other words, the aim is to manage a healthy and productive forest ecosystem in accordance with designated management priorities." (p. 7.1)

4. Strategies
"*The means to be adopted in order to achieve the objective are:-*

4.1 *Identify the areas to which this prescription will apply.*

4.2 *Specify treatment regime for each area, taking into account previous treatment history, protection requirements, costs and the land use priorities.*

4.3 *Establish criteria of success/failure against which the 'present status' of any stand can be assessed.*

4.4 *Implement the prescriptions and monitor forest condition and development.*

4.5 *Develop and implement remedial treatments where assessment indicates that success criteria are not being met.*" (p. 7.2)

5. Areas for Application
"*5.1 This prescription will apply to those areas of forest in and around which mining and rehabilitation has taken place.*

The D.F.O. will mark these areas on a map, using existing and most convenient boundaries, in accordance with the sub-divisions of the H.O.C. system." (p. 7.2)

6. Basis for Treatments
"*6.1 Treatments must be based on goals and needs. Goals are derived from the land use plans and needs from detailed field assessment, HOCS records and comparisons between actual and expected forest development.*

6.2 Land Use: existing mining envelopes occur in areas designated as either Water Production or Recreation Management Priority and should do so for some years.

Management goals for these areas are:

(i) *Water Production MPA – To establish a stable forest ecosystem with a high yield of water of an acceptable quality, which may also be manipulated for secondary land use priorities.*

(ii) *Recreation MPA - to establish a stable forest ecosystem capable of satisfying the diverse recreation and landscape needs as indicated in the Divisional Recreation Plan.*" (p. 7.2)

"*6.3 <u>Silvicultural History</u>: HOCS records indicate for each stand the year of rehabilitation, method of site preparation, species used and any subsequent treatment.*

The 'as-constructed' Rehabilitation Plans for pits show location of engineered structures.

Additional detailed stand information is available from the Bauxite Rehabilitation Monitoring Programme.

These records must be consulted before treatment is prescribed.

6.4 Field Inspection: Each stand for which treatment is proposed must be inspected on the ground. The following attributes will be checked and/or measured:-

(i) Roads, tracks and drainage: Inspect and prescribe for upgrading, closure or maintenance of each road or track. The ultimate road network must conform with a regional plan which minimises the number of roads while providing adequate access for management.

(ii) Trees: Record mean top height by species, review tree health, condition, and nutritional status, and prescribe for tending, stand improvement or replacement as required.

(iii) Understorey: Record stocking, density, condition, unwanted species, weeds, and prescribe treatment.

(iv) Soil: Inspect and prescribe remedial treatment where possible for soils which are compacted, bare of topsoil or otherwise unsatisfactory for successful forest growth.

(v) Access: Determine need for removal or amelioration of impediments to access such as sumps, banks, rip-lines.

(vi) Fire Hazard: Check in relation to regional protection plan.

(vii) Water Management: Prescribe according to land use and water supply requirements.

(viii) Recreation and Tourist Facilities: Check need for upgrading, installation, closure or maintenance, in accordance with regional plans." (p. 7.3)

6.5 Success Criteria
"*In the long term, the desired forest ecosystem will have the following characteristics:-*

Capacity to withstand summer drought, windstorm, periodic fire and the presence of P.c. or parasites." (p. 7.3)

"*Capacity to produce water, timber and landscape values in the long term without heavy demands for inorganic fertilizer, or the necessity for constant engineering maintenance.*

Research has not yet proceeded to the point to enable values to be placed on all these criteria, or in some cases to define how they are to be measured.

In the meantime the following will apply:

(i) Stocking
Failed Stands: Further rehabilitation to be considered in terms of the land use needs.

Eucalypts: thin to approximately 300 s.p.h. at about age 10 or earlier if subject to undue competition. An exact regime is not prescribed at this stage, pending further research trials." (p. 7.4)

"*(ii) Hazard*
All stands to be fully protected from fire at least until codominant heights exceed 10m. Thereafter fuels to be managed in accordance with soil building requirements and local fire protection plans." (p. 7.4)

(iii) P.c.
All stands to be banksia free, and periodically regenerated with predominantly leguminous understorey. […]" (p. 7.4)

"*Growth Rates*
Compare tree height growth with height/age graphs for each species. […]

Where the regeneration has patently failed, the site must be analysed to determine:-

(a) Reason for failure (chemical, physical or biological or combination).
(b) Significance or failure in terms of the land use.

If this analysis indicates the need, the rehabilitation process must be recommenced." (p. 7.4-7.5)

"*(v) Water*
It is undesirable for permanent water to lie in the pits or the forest; water leaving pits or roads is to be non-turbid and discharging into streams; no possibility/opportunity for flash floods; water is to be chemically and biologically unpolluted.

(vi) Timber
Boles are to be straight and limb-free, but this is to be achieved by control of stocking in preference to pruning (other than pines). […] *Other pruning of Eucalypts is undesirable as it leads to stem cankers and rot.*

(vii) Landscape
Forest to be attractive (i.e., green and leafy, with a leguminous shrub understorey) and easily accessible for walking, and fire control.

(viii) Soil Conservation
Minimum erosion gullies or transport of topsoil from hillsides to drains. No compacted soils or bare subsoil exposures.

(ix) Fauna
Experience has shown that site-matched fauna will colonise rehabilitated areas as the vegetation develops. No specific treatments are therefore recommended at this stage." (p. 7.5)

8. Implementation
8.1 The Forests Department will be responsible for assessment, inventory and for prescribing all treatments, and will generally carry out the work with its own personnel or contractors.

8.2 Each years work will be in accordance with a 5 year plan which is updated annually." (p. 7.5)

"*9.Control*
9.1 All treatments will be prescribed and controlled according to the HOC system." (p. 7.6)

'Rehab 83' : Prescription for Rehabilitation of Bauxite Mines in the Western Jarrah Forest
"*Rehab 83 now represents the best current 'State of the Art' describing techniques to be used in bauxite mine rehabilitation in the western jarrah forest.*" (p. 1)

Objective
"*An objective is a broad statement of what it is expected to achieve within known constraints.*

The overall objective for rehabilitation of bauxite mines in the western jarrah forest is:-

'To regenerate a stable forest ecosystem, planned to enhance or maintain water, timber, recreation, conservation and/or other nominated forest values'.

Specific goals (not listed in order of importance since priorities may vary with designated land use) are:-

2.1 Water Values: to ensure that mined areas provide acceptable water quality and quantity.
[…]
2.4 Protection: to conserve the residual soils; to control dieback spread, and to ensure that unacceptable fire hazards do not accumulate." (p. 2)

"*2.5 Landscape: to create a rehabilitated landscape visually compatible with the adjoining remnants of indigenous forest.*

2.6 Conservation: to recreate, in the long term, flora and faunal characteristics compatible with the jarrah forest.

In seeking to meet goals for the rehabilitation of mined areas, it is important to remember that the desired end-result is a multiple-use forest in which rehabilitated and remnant stands are fully integrated." (p. 3)

3. Rehabilitation Strategies
"*Strategies are the measures to be adopted in order to achieve the objective. These are:*

3.1 The development of prescriptions for rehabilitation procedures for each mined area, in accordance with the designated land use priority and land use management plans.

[…]
3.2 The monitoring of the regenerated areas for their capacity to sustain long-term production of the forest values listed in the objective, and

3.3 The development of remedial treatments should monitoring reveal that rehabilitation objectives are not being achieved." (p. 3)

4. Rehabilitation Planning
"*Rehabilitation planning occurs at two levels:*

The first is broadscale regional minesite planning on a 5-year time-scale. The second is the detailed operational annual planning on a pit-by-pit basis." (p.3)

4.1 Broadscale Regional Planning
"*The mining company is required to produce each year an updated 5-year Mining and Management Plan for approval by Government. In the preparation of these plans, the following aspects of rehabilitation are to be considered:-*

- *The sequence of mining and rehabilitation.*
- *Access for mining and future management.*
- *Location of mine facilities.*
- *Dieback Hygiene*
- *Landscape considerations*
- *Water management systems and water course protection.*
- *Land use priorities.*
- *Buffer zones for fire protection.*

This prescription deals with Mining Operations only within Water Production M.P.A.s and Recreation M.P.A.s.

At this stage no mining is proposed for other M.P.A.s." (p. 4)

4.2 Responsibility of the Company
"*(ii) Record vegetation types which will be cleared as a result of mining and identify any special elements worthy of special protection. Information on vegetation will be used in selecting species mixes for scrub re-seeding following mining.*" (p. 5)

4.3 Annual Operational Planning
"*Detailed proposals for each minepit are prepared roughly 12 months in advance of rehabilitation.* […]" (p. 6)

"*Each detailed proposal is prepared jointly by Forests Department and mine company staff, and is to deal with the following factors:-*

- *Pit identity – nominated by F.D.*
- *Dieback hygiene, drainage, erosion control and water management – specific measures to be adopted from initial drilling through to completed rehabilitation.*
- *Management of 'islands' of unmined forests'*
- *Species to be used;*
- *Any special features to be incorporated or retained (e.g. pit walls) as part of the rehabilitated landscape;*
- *Access, and location of mining facilities/structures.*
- *Scheduling in sensitive areas.*

A conceptual rehabilitation proposal will be prepared for each area, and must be initialled as 'Agreed To' by the local Forests Department officer in charge." (p. 6)

6. Preparation of Pits for Planning
"*6.1 When mining is completed, pit walls will be battered and smoothed.* […]

6.2 Overburden and topsoil will then be evenly respread over all areas to be regenerated. The distribution of this material from pit to pit will be in accordance with the following dieback hygiene requirements:" (p. 8)

"*6.3 Islands or inliers of low grade ore often occur within a pit. It is desirable that these areas remain undisturbed. However, there will be occasions when they are both cleared and stripped.*

When this occurs the unmined caprock will be 'popped' with explosives to provide planting sites and ameliorate run-off. Blasted craters will be graded level prior to respreading overburden and topsoil." (p. 8)

6.5 Ripping
"*Ripping is required to fracture the compacted pit floor so as to facilitate root penetration and drainage, and to provide an 'anchor' for the returned topsoil.*

<u>In general</u>: All compacted pit floors will be ripped along the contour." (p. 8)

"*Battered banks and pit edges need not be deep ripped, but must be scarified to control erosion and prepare a seed bed.*

The distance between parallel riplines is to be determined by the need to ensure a continuous fracture of the compacted subsoil." (p. 9)

8. Planting
"*8.1.1 As a general rule, tree species will be established as mixtures.* […]

In every mixture, favour species indigenous to the Darling Range and with roughly similar growth rates. Species mixes will be determined in advance and specified in the rehabilitation plan by the Forests Department.

8.1.2 Plant spacing will be varied according to the detailed site rehabilitation objectives. […]

8.1.3 Aim to achieve a stocking of about 600 planted trees/ha.

8.1.4 Do not plant trees on overflow channels.

8.1.5 Commence planting when the soil is wet to depth after about 10 June. Cease planting by 1 August." (p. 12)

"*8.2 Before planting commences, all pits will be inspected by the Forests Department. Pits which are deemed by the Forests Department to be inadequately prepared, will not be planted, but carried over for improved preparation and planting the following year.*" (p. 13)

8.5 Selection of Tree Species for Planting
"*Criteria for selection of tree species to be used are:-*

(i) *Tolerance to dieback.*
(ii) *Fire resistance.*
(iii) *Capacity for roots to penetrate the compacted kaolin layer.*
(iv) *Useful timber.*
(v) *Proven longevity, and growth to maturity in the mine pit environment.*
(vi) *Visual compatibility with indigenous forest.*
(vii) *Useful nectar source.*

There are currently no tree species with proven capacity to satisfy <u>all</u> these criteria. Pending continuing studies into a wide variety of species in pits and arboreta (and new arboreta establishment), the following species will be planted:

High in the original landscape (ie. the original jarrah forest uplands, or relatively free-draining sites):-

E. wandoo
E. laeliae
E. accedens
E. resinifera
E. maculata" (p. 13)

"*Low in the original landscape (ie. water-gaining sites):-*

E. patens
E. saligna
E. calophylla

Swamps and pit sumps:-

E. patens
E. megacarpa
E. rudis

[…]
Jarrah (E. marginata) will be sown onto the upland sites at a rate of 0.25kg pure seed per ha. […]" (p. 14)

8.6 Seed Sources
"*E. marginata and E. patens seed to come from specifically designated stands and trees. Seed provenances for other tree species to be laid down by Forests Department.*" (p. 15)

9. Understorey Establishment
"*9.1 The aim of understorey establishment is to assist with erosion control and general site rehabilitation. Species to be used will be reviewed for each site each year. Criteria for species selection will be dieback tolerance, appearance and nutritional value.*

9.2 Base species to be used will be selected from: Acacia pulchella, A. lateriticola, A. drummondii, Kennedya coccinea and K. prostrata. Where other species are included in the seed mix, Forests Department approval must be obtained." (P. 16)

"*9.5 Scrub seed mixes will be determined in advance and specified in the rehabilitation plan for each pit and for specific sites within pits.*" (p. 16)

POLICY - 1982

Forests Department Annual Report 1982. 1982

NOTE: SIMILAR WORDING FOR ANNUAL REPORTS FOR 1983, 1984, 1985

3. Objectives
"*The Government forest policy involves the following management objectives.*

Mining: To rehabilitate and stabilize those forest areas upon which the original vegetation has been destroyed in the course of mining operations.

[…]" (p. 7)

MANAGEMENT PLAN – 1982

Hardwood Management Plan (Central Region). 1982

5.4 Dieback Rehabilitation
(1) F.I.R.S. Operation
"*(1) This scheme is jointly planned with and funded by Alcoa and implemented by the Forests Department. Its design is to improve and rehabilitate dieback affected forest adjoining bauxite mines.*

(2) The areas for current treatment in the Northern Region fall into Water Production and or Recreation Management Priority areas." (p. 21)

(2) Rehabilitation of Graveyard Dieback in Production Forest Areas
"*(1) Sites adequately stocked with marri regeneration, tops disposal burning will be carried out under mild conditions.*

(2) Sites inadequately stocked with marri regeneration will have a tops disposal burn that is intense enough to create ash beds.
[…]" (p. 21)

WORKING PLAN - 1982

Working Plan No. 87 1982 Part I, General Working Plan for State Forests in Western Australia. 1982.

Management Objective
"*To regenerate stable forest ecosystems capable of maintaining or enhancing, where possible, recognized forest values including water, timber, recreation, flora and fauna.*" (p. 44)

Policy
"*(1) Rehabilitate areas affected by mining, a dieback disease or clearing for farming in accordance with the designated land use priority.*
(2) Develop optimum techniques for rehabilitation.
(3)Liaise with mining companies, and other Government Departments to ensure they are aware of the latest rehabilitation techniques and standards." (p. 44)

Strategy
"*In Mined or Dieback Disease Affected Areas:*
(1) Ensure that prescriptions for rehabilitation procedures are developed for each affected area.
(2) Monitor the rehabilitated areas for their capacity to sustain long term production of recognized forest values.
(3) Develop remedial treatments should monitoring reveal that the objective is not being met.
In Cleared Forest Areas in High Salinity Risk Zones:
(4) Plant species that can be grown successfully on these sites and that have the ability to transpire large amounts of water from deep in the soil.
(5) Develop and prescribe remedial action if monitoring reveals deficiencies in the establishment or growth phases of the stand." (p. 44-45)

Inventory and Planning
"*In this planning period, emphasis will be placed on the following projects in addition to the standard work listed above:*
[…]
(13) Monitor bauxite rehabilitation by the Mining Rehabilitation Operations Control System.
[…]" (p. 65)

Mapping
"*Major tasks of the branch during the current planning period will be to:*
[…]
(5) Prepare maps for the introduction of the Mining Rehabilitation Operations Control System.
[…]
(7) Define annually areas mined for bauxite.
[…]" (p. 66)

WORKING PLAN – 1982

General Working Plan No. 87 of 1982 : Part II. 1982

"*The detailed prescriptions for the operations in each Division which appear in this document are designed to implement the policy contained in Part 1 of General Working Plan No. 87. These prescriptions are intended to remain in operation until 31st December, 1986, unless an earlier revision of the plan becomes necessary in the light of new factors which might arise in the meantime.*" (p. 1)

General Prescriptions For The <u>Whole Northern Region</u>
7. Regulation of the Harvest
7.5 Mining
"*7.5.1 The objective is to guide mining operations on to areas where there will be least conflict with other land uses, to minimise environmental damage and to rehabilitate areas affected by mining to best suit future land use.* […]" (p. 9)

7.5.2 Gravel, Stone and Sand
"*Gravel, stone and sand will be provided for government and semi-government authorities where there is no reasonable alternative supply and where the supply will not result in the spread of dieback or prejudice amenity values. Supplies will not generally be made available to private contractors who will be expected to use private sources.*" (p. 10)

"[…] *Pits will be located where they will not be in view from public roads and rehabilitated when worked out, relevant earthworks to be carried out by or at the expense of the licence or lease holder.*" (p. 9)

General Prescriptions For <u>The Whole Central Region</u>
7.5.1 Mining
"*The objective is to guide mining operations on to areas where there will be least conflict with other land uses, to minimise environmental damage and to rehabilitate areas affected by mining to best suit future land use.* […]" (p. 10)

7.5.2 Gravel, Stone and Sand
"*Gravel, stone and sand will be provided for government and semi-government authorities where there is no reasonable alternative supply and where the supply will not result in the spread of dieback or prejudice amenity values. Supplies will not generally be made available to private contractors who will be expected to use private sources.*

Removals will be controlled by the existing system of licences and leases.

Pits will be located where they will not be in view from public roads and rehabilitated when worked out, relevant earthworks to be carried out by or at the expense of the licence or lease holder." (p. 11)

General Prescriptions For <u>The Whole Southern Region</u>
"*7.5.1 The objective is to guide mining operations on to areas where there will be least conflict with other <u>land</u> uses, to minimise environmental damage and to rehabilitate areas affected by mining to best suit future land use.* […]" (p. 8)

7.5.2 Gravel, Stone and Sand
"*Gravel, stone and sand will be provided for government and semi-government authorities where there is no reasonable alternative supply and where the supply will not result in the spread of dieback or prejudice amenity values. Supplies will not generally be made available to private contractors who will be expected to use private sources.*

Removals will be controlled by the existing system of licences and leases.

Pits will be located where they will not be in view from public roads and rehabilitated when worked out, relevant earthworks to be carried out by or at the expense of the licence or lease holder." (p. 8)

NORTHERN REGION OBJECTIVES AND GOALS- 1982

Northern Region : Objectives and Goals 1982/83. 1982

1.1 Departmental Objective : Conservation
"*Our overall aim is to achieve the Departmental objective, which is*
'the conservation, though planned use and management, of forest land and resources for the greatest long term social and economic benefit'." (p. 1)

1.2 Regional Objective
"*The role of the Regional Group is to determine management strategies for each activity in the region, so as to provide co-ordinated direction for the achievement of Departmental objectives by divisions.*

Where necessary, management strategies will be presented in the form of Regional Plans. These will take account of: -

- *Departmental objectives, policies and strategies*
- *Land use objectives*
- *Site capability and potential*
- *Protection requirements*

[…]" (p. 1)

1.3 Resources
"*The forest resources of the northern region are water, timber, flora and fauna, minerals, recreational and scientific/educational values and the physical environment of soil and air.*

Factors which threaten the long-term conservation of these resources are fire, disease, alienation of land, and uses which permanently destroy the productive capacity of the forest.

The specific land, resource and protection objectives are:" (p. 1)

"*1.5.6 Minerals*
Objectives
[…]
(2) Other (e.g. gravel): to supply gravel etc. on S.F. only where reasonable alternative supplies are not available and only if dieback spread does not result.
(3) For all mined areas: to rehabilitate mined areas to best suit designated land use priorities.

1982 Goals
(i) Prepare a manual for Gravel Pit Management and Rehabilitation in the forest.

Responsibility: R/L Hardwood forest.

(ii) Survey all old pits in each division and prescribe rehabilitation.

Responsibility : Divisions.
Priority : 2." (p. 5)

GUIDELINES - 1981

Jarrah 81 : Guidelines for Planning and Control of Logging and Silvicultural Operations in the Northern Jarrah Forest, West of Quarantine. 1981

3.3 Logging
3.3.5.6 Erosion Control
" *The need for erosion control must be checked in all coupes, irrespective of dieback status. Where required, it must be undertaken before snigging machines leave the sub-coupe. This work includes cutting the snig tracks diagonally with the blade at intervals as follows:* […].

Erosion control measures are required on all snig tracks where the mineral earth is exposed and slope exceeds 2 degrees." (p. 16-17)

3.4.2 Environmental Standards
"[…] *(ii) Check for soil compaction in coupe and landing and see that erosion control is correctly completed.*" (p. 18)

4. Silvicultural Practice
4.4 Prescriptions
4.5.1 Stand A
"* *Water Production MPA*
* *Jarrah overstorey still largely unaffected by dieback*
* *Pole stand*
[…]
(iii) Ensure erosion control and landing rehabilitation measures are carried out.
[…]
(vii) Close roads not wanted for future management, and rehabilitate where necessary." (p. 23-24)

4.5.2 Stand B
"* *Water Production MPA*
* *Jarrah overstorey still largely unaffected by dieback*
* *Not an even aged pole stand.*
[…]
(iii) Erosion control measures to be carried out.
[…]
(vii) Rehabilitate landings and close unwanted roads." (p. 24)

4.5.3 Stand C
"* *Water Production MPA*
* *Extensive mortality in jarrah overstorey*
[…]
(vi) Rehabilitate landings." (p. 24-25)

4.5.5 Stand E
"* *Recreation MPA*
* *Not an even aged pole stand*
* *Jarrah overstorey largely unaffected by dieback*
[…]

(v) Tidy up and rehabilitate landings and snig tracks." (p. 25)

4.5.6 Stand F

"* *Recreation MPA*
* *Extensive mortality in jarrah overstorey*
* *Average to good site quality*
(i) Apply as for Stand C (i) to (vi)
(ii) In the winter after burning, plant dieback tolerant timber producing trees.
Use: E. wandoo, E. patens, E. resinfera.
Plant on ashbeds at approximately 625 stems per hectare. Fertilise with 100 gms MAP per tree at time of planting.
(iii) Protect from fire until fire-resistance achieved." (p. 26)

4.5.7 Stand G

"* *Recreation MPA*
* *Extensive mortality in jarrah overstorey*
* *Poor site quality*" (p. 26)
" *(i) Apply as for Stand C (i) to (vi).*
(iii) In the winter after burning, plant E. wandoo on selected sites (eg. ashbeds, stump holes, etc.) where a future tree might grow. An establishment of 50-100 trees per hectare will be acceptable.
[…]" (p. 26)

FORESTERS' MANUAL – 1981

<u>Foresters' Manual : Part 12 : Mining in Forest Areas. 1981</u> [in *Foresters' Manual*. 1979]

Policy

"*12.010 The main policy directions were first put into printed form in the Department's General Working Plan No. 86 of 1977. They are as follows.*

Advise Government of the effects of mining lease approval on forest values.
Continue research into techniques aimed at minimising environmental damage and land-use conflict.

Liaise directly with mining companies to ensure that they are aware of the effects of mining on the environment and other land uses and of rehabilitation techniques.

Liaise with other authorities responsible for administering mining agreements and with other organisations authorised to study mining effects and rehabilitation techniques.

Rehabilitate areas affected by mining to suit the anticipated land use, in accordance with conditions imposed by State Government under the various mining agreements.

Investigate rehabilitation techniques." (p. 5)
Issued 05/81

Strategy for implementing policy directions

"*12.011 The strategy adopted to implement this policy requires minimisation of the area cleared for mining, realistic compensation payments, rehabilitation in accordance with land management objectives and the direction of open-cut operations into areas where the least land-use conflict will occur and where salinity problems are unlikely.*" (p. 5-6) Issued 05/81

Standard Objection Procedures
"*12.026 The standard procedures for objection, defined by the Mining Act, have been modified in the following respects as a result of representations by the Conservator to the Under Secretary for Mines:*

The Mines Department sends written advice and plans of each new application for a mineral tenement on forest land to the Forests Department." (p. 10)
Issued 05/81

Conditions for Mining
"*12.032 When Forests Department objections have been unsuccessful the Department is still usually in a position to nominate conditions under which the prospecting or mining can proceed. In the case of open-cut mining in particular, the Department has been able to have very stringent conditions accepted by both Warden and claimant. (Appendix III shows a typical set of conditions. However, these are varied to meet specified needs.)*" (p. 13)

Mining Agreement Acts Vary in Details
"*12.034 As mentioned earlier (paragraph 12.008), there are a number of mining agreement acts between the Government and Alcoa. The agreements are generally similar, but their details vary, particularly with respect to the procedure for mine clearing, rates of compensation for forest destroyed and the assignment of responsibility for rehabilitation.*" (p. 14)

Mining Agreement Acts Administration
"*12.035 The mining agreement acts are officially administered by the Department of Industrial Development. There are also several groups of committees concerned with both the practical and environmental aspects of open-cut bauxite mining operations:*

Bauxite Policy Committee
Mining Management Programme Committee
Purity of Water Committee
Research Coordination Committee
Mining Operations Control Group (MOG)." (p. 14)

Erosion Control and Rehabilitation Working Group
"*12.036 The Mining Operations Group is an inter-disciplinary group representing Government interests, including the Public Works Department, the Metropolitan Water Board and the Department of Agriculture (Soil Conservation Service). It is chaired by the Forests Department's Superintendent (Northern Region). All applications for access to forest areas for mining activity are submitted to the Conservator at least six months in advance (up to 2 years in advance for roadworks), and are referred to this committee before approval is given for the removal of timber and subsequent operations.*" (p. 15)

Group Monitors Forest Values as Risk and Rehabilitation Operations
"*The committee assesses the likely impact of mining activities on forest and some social values, including risk of erosion, stream turbidity, and conservation of flora and fauna. The Committee then reports to the Conservator on whether they consider there are grounds for objection, deferal, or modification to the areas applied for, and for any conditions to be met to meet mining and rehabilitation standards. The group works in close liaison with research and operational bodies associated with the mining sphere. Any abnormal situations are referred for comment and resolution to an interdepartmental working committee consisting of the Chief Engineer (M.W.B.), the Commissioner for Soil Conservation and the Deputy Conservator of Forests.*" (p. 15)

Interdepartmental Working Committee
"*12.037 Any abnormal situations are referred for comment and resolution to an interdepartmental working committee consisting of the Chief Engineer (M.W.B.), the Commissioner for Soil Conservation and the Deputy Conservator of Forests.*" (p. 15)
Issued 05/81

Written Approval
"*12.038 Head Office provides written approval for access to State Forest for mining activities, specifies the conditions, and forwards an invoice for compensation.*

Bauxite Mine Rehabilitation
"*12.040 After Alcoa has advised of areas ready for rehabilitation, preliminary proposals are prepared by the Divisional O.I.C. and Regional Leader (Operations), and are submitted to the Superintendent (Northern Region), who is also required to consider proposals from the Department's Research Branch, and other involved organisations including the CSIRO.*

12.041 The Mining operations Group, accompanied by Alcoa environmental personnel, the local O.I.C. and the Regional Leader (Operations), inspects areas in November each year." (p. 16)

Details to be included in proposals
"*12.042 Proposals for rehabilitation include recommendations for soil erosion control, water disposal, contouring, species of trees, ground cover, and planting patterns and technique to be used. They are submitted to Head Office for approval.*

12.043 [...] *The site seeded and fertilised in May to July by the Forests Department at Jarrahdale and by Alcoa at Dwellingup.*

12.44 Subsequent tending operations are prescribed by the Forests Department. Consideration is given to recommendations put forward by the mining company, the Metropolitan Water Board, the Public Works Department and research personnel." (p. 17)

Appendix II : Application for Coal Mining Leases
"*2.Mining will be restricted to exploration operations until:*
[…]

2.2 An environmental review and management programme of the development and rehabilitation of the 'mining area' has been submitted to and approved jointly by the minister for Mines and the Minister for Forests.

2.3The holder has satisfied the Minister for Works that mining will not adversely affect the water quality and quantity of any reservoir, stream, river or watershed, and approval to proceed has been given by that Minister.

2.4 The holder has agreed that no mining operations or associated activities be undertaken in areas designated as Conservation Management Priority Areas." (p. 19)

3. Exploration Conditions*:*

"*3.1 All proposals for forest clearing for mining exploration on the 'mining area' must be submitted in writing by the holder to the Conservator of Forests at least six months in advance of the intended commencement date. Clearing must not commence until the Conservator's approval in writing has been given.*

The holder must obtain a license for any clearing on any declared catchment (Part II, Country Areas Water Supply Act 1947/80 as amended). […]" (p. [19])

"*3.7The provision of the Forest Act, 1918 and the Regulations thereunder.*
[…]
3.9 The right of the Conservator of Forests, his servants, agents or nominees to enter upon the 'mining area' and inspect any work being carried out on the 'mining area'." (p. [20])

"*3.10 The holder must inform the Divisional Forest Officer each week of the operation's location on the 'mining area' (unless otherwise advised by the Divisional Forest Officer or his nominee).*
[…]
3.11 The holder must keep the 'mining area' free from litter and rubbish, and leave the area in a clean and tidy condition to the satisfaction of the Conservator of Forests.

3.13 The holder must take all reasonable precautions not to unnecessarily destroy or damage any tree or woody shrub on the 'mining area'.

3.14 The holder must refrain from allowing any firearms to be taken onto or used on the 'mining area'.

3.15 The holder must refrain from establishing any camp, base works or area, fuelling depot or similar establishment on the 'mining area' unless the site is agreed to by the Divisional Forest Officer." (p. [21])

HANDBOOK – 1981

<u>Bauxite Mining Northern Jarrah Forest Mining Operations Handbook 1. Edition 1. 1981</u>

Part 1.Introduction
"*Underlying all these developments, the Forests Department remains the authority basically responsible for the management of State Forest. It is our task to see that designated forest values are preserved in the long term.*[…]" (p. 3)

1.2 Objectives, Policy & Strategy
"*The objective, policies and strategies adopted for forest management in areas affected by bauxite mining operations are set out in Section 5.7 of General Working Plan No. 86 of 1977. They are :*" (p. 4)

2. Policy for Mining on State Forest
"*2.1 Advise Government of the effects of mining lease approvals on forest values.*
[…]
2.5 Rehabilitate areas affected by mining to suit the anticipated land use, in accordance with conditions imposed by State Government under the various mining agreements.
[…]" (p. 4)

3. Management Strategy
"*3.1 Minimise the area of State forests cleared for mining operations.*
[…]
3.3 Establish a full canopy cover of deep-rooted perennials on areas affected by mining in the salt-sensitive areas of catchments which are harnessed, or proposed to be utilised for water supply.
[…]" (p. 4)

Part 3: Planning
3.4 Other Plans
"*Annual rehabilitation plans and detailed plans for each pit are prepared each year in liaison between the Company and the Forests Department.*" (p. 15)

Part 8 : Management of Rehabilitated Stands
"*Little detailed attention has yet been given to the problems of managing stands regenerated within pits and FIRS areas.*

The following section must therefore be regarded as INTERIM. More detailed prescription will be developed during 1981." (p. 56)

8.2 Fire Protection

"*(1) The aim is to provide special protection for regenerated stands during their fire sensitive stage, i.e. from about age 4 to about age 15.*

(2) Current regeneration is a hodge-podge of pits comprising mixtures of tree species of varying fire sensitivity and a range of understorey mixtures. Stands range from very hazard/high risk (e.g. thinned pinaster in Langford Park) to very low risk/low hazard (e.g. 10 year old eucalypts with no scrub or litter fuel).

(3) All Protection Plans must be based upon a <u>regional plan</u> which prescribes the prevention, pre-suppression and suppression measures to be adopted.

Regenerated stands around minesites must fit into these plans.

Basic steps are :-

(i) Define stands requiring no fire and determine how these can be protected.

(ii) Incorporate other stands into the Master Burning Plan.

(4) <u>Burning Regenerated Stands</u>

For pines, follow the Foresters Manual. For other species, prescribe according to fuel weight and inflammability; […]
[…]" (p. 56)

8.3 Disease Management

"*The aim is to prevent the regenerated stands from becoming infected with <u>Phytophthora cinnamomi</u>. This will be attempted by maintaining an in-pit environment which is hostile to the fungus.*

Factors hostile to PC are :-

(i) Use of 'resistant' trees
(ii) Establishment of legume understorey
(iii) Maintain pits banksia-free
(iv) Prevent free water ponding and impede drainage
(v) Maintain stand vigour by thinning and fertilizing" (p. 57)

8.4 Tending Operations

"*The aim is to improve the form, health and vigour of regenerated stands.*

8.4.1 Nutrition

"[…]
Until research work proves otherwise, the treatments proposed are :-

(i) Maintain a leguminous understorey as long as possible to improve nitrogen status and assist with formation of organic matter.

(ii) Apply 100 gms/tree of Agras 12:52 following first thinning – delay one year after thinning treatment
<u>OR</u>
Apply 475 kg/ha by air of Superphosphate with Cu, Zn and Mo in the first autumn after first thinning.

Aerial fertilizing programmes must be approved by the MWB in harnessed catchment areas." (p. 57)

8.4.2 Thinning
"*Thin at age 7 or when average dominant height exceeds 6m for all Eucalypt species, except Euc. microcorys which is planned for age 5. Thin to 50% of standing stem numbers. This results in stem numbers being reduced from 625 SPH to 300 SPH.*

Priority is to remove malformed or suppressed trees or drought affected species.
[…]
The timing of subsequent thinnings have not been devised and will be influenced by the priority land use objectives.

e.g. Water Production MPA – wide spacing increases water yield and wood production

Catchment MPA – Relatively dense stocking required.
[…]" (p. 58)

'Rehab 80' : Prescription for Rehabilitation of Bauxite Mines in Western Jarrah Forest
Responsibilities for Rehabilitation
"*1.1 Under the terms of the Forests Act, the Forests Department has exclusive control and management for all matters of forest policy, for all State Forests and Timber Reserves and for the planting, thinning and maintaining of State Forests.*

1.2 Although the Conservator of Forests has the responsibility for overall direction and control of the bauxite mine rehabilitation programme in S.F., the actual work is shared with the mining companies at the various minesites.

1.3 Current roles are :-

(i) *Forests Dept : prescriptions; quality control; revegetation at Jarrahdale.*

(ii) *Mining Companies : earthworks; erosion control measures; revegetation at minesites other than Jarrahdale.*" (p. 37)

2. This Prescription
"*2.2 However, this prescription represents the best present 'state of the art' and must be strictly adhered to.*" (p. 37)

3. Rehabilitation Objective
"*The overall objective for rehabilitation of bauxite mines in the western jarrah forest is :-*

'To regenerate a stable forest ecosystem, capable of maintaining or enhancing water, timber, recreation, conservation and/or other nominated forest values'.

Specific goals (not listed in order of importance since priorities may vary with designated land use) are :-

3.1 *Water values : to prevent any adverse effect of mining on water quality.*
[…]
3.4 *Protection : To conserve the residual soils; to control dieback spread; and to control fire hazard.*

3.5 *Landscape : To create a rehabilitated landscape visually compatible with the adjoining remnants of indigenous forest.*

3.6 *Conservation : To recreate, in the long-term, floral and faunal characteristics compatible with the jarrah forest.*" (p. 38)

4. Rehabilitation Strategies
"*The measures which will be taken in order to achieve the objectives are : -*

4.1 The development of prescriptions for Rehabilitation procedures for each mined area, in accordance with the designated land use priority.
[…]
4.3 The monitoring of the regenerated areas for their capacity to sustain long-term production of the forest values listed in the objective; and

4.4 The development of remedial treatments if monitoring reveals that the objective is not being met." (p. 38)
[…]" (p. 38)

5. Planning Approval
"*5.1 Overall rehabilitation planning must precede, not follow, the mining operation. Accordingly, the following aspects must be taken into account in the preparation and approval of the 5 year Mining and Management Plans for each mine site :-*

- *landscaping requirements and visual effects*
- *buffer zones for screening and fire protection*
- *priorities for rehabilitation*
- *dieback hygiene, in particular topsoil allocation and protection of dieback forest.*
- *future access and management.*

5.2 Specific minepite planning will commence in August each year when Forests Department in association with Mining Company staff determine the rehabilitation programme and schedule for the coming 12 months (see Appendix for yearly Rehabilitation Schedule).

5.3 A detailed rehabilitation plan will be prepared for each pit. This will indicate :-

- *areas to be regenerated*
- *erosion control and water management measures to be adopted*
- *species to be used*
- *any special features to be incorporated*
- *access*

[…]
Departures from approved rehabilitation plans may only take place after detailed field consultation between Forests Department and Mining company staff." (p. 39)

6. Preparation of Pits For Planting
"*6.1 When mining is completed, pit walls will be battered and smoothed by a bulldozer.*" (p. 39)

"*6.2 Overburden and topsoil will then be evenly respread over all areas to be regenerated.*

The distribution of overburden and topsoil from pit to pit will be in accordance with dieback hygiene requirements – i.e., avoid transfer of infected material to diebackfree sites.

6.3 Islands or inliers of cleared but unmined caprock will be 'popped' with explosives to provide planting sites and aemliorate run-off. Blasted craters to be graded level before planting commences.

6.4 Pit floors and banks will be ripped with a 2M ripper in lines along the contour and approximately 2M apart.

Contours are to be indicated by surveyed peg lines.

All ripping is to be done when the soil is dry (i.e. late summer to early autumn) to maximise clay breakup and minimise topsoil compaction.

6.5 Pits will be designed to minimise topsoil erosion and to retain rainfall and water inflow by :

(i) infiltration and silt trapping in the contoured rip lines and

(ii) collection of overland flow in banks and sumps.

Each pit must have the capacity to store the run-off from a 15 year storm event, as calculated from hydrological records and catchment area.

This requires the installation of an adequate grade or contour bank along each 6M vertical contour within each pit.

6.6 Suitably constructed waterways will be installed at the overflow of each bank or sump.

6.7 Success criterion for pit preparation : no turbid water originating on mine pits or associated roadworks to enter a stream or watercourse." (p. 40)

7. Planting

"*7.1 Criteria for selection of tree species to be used are :-*

(i) Tolerance to dieback
(ii) Fire resistance
(iii) Capacity for roots to penetrate the compacted kaolin layer." (p. 40)

" *(v) Proven longevity, and growth to maturity in the mine pit environment.*
(vii) Visual compatibility with indigenous forest
(vii) Useful nectar source.

There are currently no tree species with proven capacity to satisfy all these criteria. The following will therefore be used as an interim measure :-

7.2High in the original landscape (i.e. the original jarrah forest uplands) :

E. wandoo
E. laelii
E. accedens
E. resinifera
E. maculata
E. calophylla

7.3 Low in the original landscape :

E. patens
E. saligna
E. calophylla

7.4 Swamps and pit sumps :

E. patens
E. megacarpa
E. rudis

7.5 E. marginata will be sown onto all sites other than swamps and sumps at a rate of 0.25 kg. pure seed per ha.

7.6 Seed Sources : E. marginata seed to come from specifically designated stands and trees. Seed provenances for other tree species to be laid down by Forests Dept.

7.7 Planting Layout & Design
7.7.1 Species will be established as random mixtures, not pure stands. In every mixture a minimum of 50% of trees must be W.A. indigenous species. Species mixes will be determined in advance and specified in the rehabilitation plan.

7.7.2 Plant espacement approximately 4m x 4m (i.e. 625 trees/ha, not counting the sown jarrah)." (p. 41)

"*7.7.3Plant in the rip lines.*

7.7.4 Do not plant trees on overflow channels.

7.7.5 Commence planting when the soil is wet to depth after about June 10th. Cease planting by August 1st.

7.7.6 Seedling specification : Plants in jiffy pots or paper pots, 6 to 15cm in height with a minimum of 2-4 pairs or leaves. Pots and soil mix sterile." (p. 42)

9. Success Criterion for Planting/Fertilizer Operation
"*Is 80% survival of planted species at 9 months after planting, as determined by a 10% systematic sample of rows.*

Areas of 0.5 ha. and above which fail to meet this criterion, to be rescheduled for replanting the next winter." (p. 42)

10. Scrub Seeding
"*10.1 The aim of scrub seeding is to assist with erosion control and general site rehabilitation. Species to be used will be reviewed for each site each year. Criteria for species selection will be dieback tolerance, habit and nutritional value.*

10.2 Base species to be used will be selected from : Acacia pulchella, A. strigosa, A. drommondii, A. saligna, Kennedya cocinea and K. prostrata.
[…]
10.4 Species not to be used are non-indigenous species Proteacaea or large woody and inflamable species such as Albizzia.

10.5 Scrub seed mixes will be determined in advance and specified in the rehabilitation plan for each pit and for specific sites within pits." (p. 42)

Part 5 : Inventory & Control
Interim Prescription : FIRS 80
"*1.1 In their Wagerup ERMP Alcoa gave a commitment to finance the improvement and rehabilitation of dieback affected State forests adjoining bauxite mines. This lead to the initiation of the Forest Improvement and Rehabilitation Scheme in 1978.*

1.2 By agreement the scheme is jointly planned with and funded by Alcoa, and implemented by the Forests department.

1.3 Initial treatments have been reviewed after a two year trial period. This prescription sets out the objectives and guidelines for future FIRS work." (p. 45)

Objective
"*The objective of the F.I.R.S. operation is :*

> *'To improve the capacity of the forest for long-term production of water, timber, recreation, conservation and/or other forest values'.*" (p. 45)

3. Strategy
"*The strategies to be followed in order to achieve the objective are :-*

3.1 *To develop and prescribe forest improvement and rehabilitation procedures in accordance with designated land use priorities and land capabilities based on Havel's ecotypes.*

3.2 *To monitor forest treatments and develop remedial treatment where the objective is not being met.*" (p. 45)

4. Planning
"*Areas to be treated will be defined on 5 year plans drawn up by Forests Department and Alcoa.*

Five year plans will form the basis of annual works programmes.

The 1980/81 plan involves areas at Jarrahdale, Del Park, Huntly and Willowdale." (p. 45)

5. Land Use Classification
"*Areas for current treatment fall into Water Production and/or Recreation Management Priority Areas. In these areas the following land uses are designated :-*

5.1 *<u>Recreation Priority Area</u>*
Primary Use : recreation
Secondary Use : catchment protection and conservation
Tertiary Use : timber and honey production

5.2 *<u>Water Production Priority Area</u>*
Primary Use : water production
Secondary Use : catchment protection and timber production
Tertiary Use : honey production and conservation

5.3 *<u>Influence zones</u>*
Natural and artificial features which exert an influence on the management of the surrounding forest, e.g. stream zone, certain roads, certain recreation sites, townsites or railway lines." (p. 46)

7. Site Description
"*Within each management priority area and dieback status the following will be identified as possibly requiring different treatments.*" (p. 46)

"*7.4 Bauxite Mines and associated clearing – pits, crusher sites, haul and conveyor routes etc. These operations are covered in a separate prescription 'Rehab 80'.*" (p. 47)

8. Graveyard Dieback – Water Production MPA
"*For all sites except stream zone.*

8.1 *Define according to field inspection and demarcation of areas where the jarrah overstorey is largely dead or dying.*

8.2 *Mark for retention and ensure full protection of sound, healthy dieback tolerant species such as marri, wandoo or blackbutt (include jarrah in the case of individuals which have long survived in old dieback areas). Include advanced regrowth and saplings of dieback tolerant species.*

[…]

8.4 […] *On sites with low timber production potential leave culls not competing with crop trees.*

8.5 *Burn in the autumn, and broadcast sow leguminous understorey species in late May at rate of 0.5kg per hectare bulked with 450kg/ha of superphosphate. Consider scarifying harsher compacted sites to improve seed germination prior to sowing. Further treatment differs according to suitability for timber production and influence zones.*" (p. 47)

"*8.6* *Carry out erosion control methods on all unwanted roads, tracks, landings and pits.*

8.7 *Acceptable timber production sites – visible or not visible*

8.7.1 *Cultivate and plant site with timber producing species suitable for the site. Plant to achieve 625 stems per hectare. Average 4.0m x 4.0m spacing with preference for ashbeds.*

8.7.2 *Timber producing species for planting :*

(i) *For areas where jarrah/marri occurred plant Euc. resinifera, Euc.maculata and Euc. wandoo.*

(ii) *For areas where jarrah/wandoo or jarrah/blackbutt occurred plant Euc. wandoo and Euc patens.*

[…]

8.7.5 *Protect from fire for 8-10 years after planting.*

[…]

8.8 *Low Potential for Timber Production – Not visible*
No further treatment after 8.6. Do not plant trees.

8.9 *Low Potential for Timber Production – Visible*
Select leguminous understorey species for specific aesthetic purposes. Do not plant trees." (p. 48)

"*8.10* *Stream Zones in Water Production MPA*

8.10.1 *Define according to vegetation – e.g. adjacent to stream and carrying bullich, blackbutt with ti-tree understorey.*

[…]

8.10.3 *If specific fire treatment necessary, install temporary fireline.*

8.10.4 Inspect for man-made features (such as gravel pits, roads, earth dumps) which may contribute to stream turbidity. If located, prescribe erosion control measures – e.g. cross drains, sumps, seed bed preparation and apply seed.

8.10.5 Protect from fire for 2 years before mining adjacent areas and at least 5 years subsequent." (p. 49)

9. Graveyard Dieback in Recreation MPAs

"*9.1 Apply as for 8.1 to 8.9 except for the influence zone which will be areas surrounding or adjacent to a depth of about 100 metres, any major or tourist road or existing tourist facility. These areas will be worked according to a landscape and rehabilitation plan which prescribes :*

- *planting pattern*
- *stocking*
- *species*
- *seed mix for understorey species.*

Each DFO [Dieback Forest Officer] *will compile a prescription for these areas.*

(ii) *Stream Zones in Recreation MPA*

Apply all measures listed under 8.10. In addition the following will be undertaken.

- *Survey recreation facilities within the stream zone (e.g. picnic site, walk trail) and ensure :*
  - *Dead or dangerous overhanging trees are felled*
  - *Special attention is given to erosion control away from car parks, access tracks etc.*
  - *Limited hazard reduction burning is programmed to prevent dangerous hazard adjoining picnic areas.*" (p. 49)

10. Forest Other than Graveyard Dieback in Water Production MPA

"*10.1 Define according to field inspection and demarcate dieback-free forest, dieback understorey infected and suspect dieback areas. Demarcation is required in order to implement hygiene.*

10.2 Mark for retention healthy well formed jarrah aiming at 250 sph or a 6m spacing. Exceptions to this are permissible where two or three stems of exceptional form and vigour occur within 6m of each other. Selected crop trees to be dominant or co-dominant with 4m defect free bole and healthy crown.

10.3 Areas of 1ha or more which carry a stocking of less than 500 sph of advanced growth require seed trees to be retained.

10.4 Jarrah is preferred species. Where jarrah is absent or is insufficient numbers ensure retention of sound marri, wandoo, blackbutt or bullich.

[…]

10.9 Ensure full protection of crop trees and groups of advance growth from logging and push down activities.

10.10 Carry out tops disposal around crop trees.

10.11 Erosion control works to be completed prior to autumn rains.

10.12 Conduct Autumn burn aimed at minimum scorch and maximum heat in soil. Timing of burn important in order to maximise banksia suppression. Burn only after banksia seed has germinated following push down. Burn autumn after spring pushdown. Allow one winter with summer pushdown.

10.13 Seed with selected legume species at rate of ½ kg/ha following autumn burn." (p. 50)

MANAGEMENT PLAN – N.D. - 1980?

Land Management Plan for State Forest in the Mount William Area. N.D. 1980?

"*The object of this conceptual plan is to define the Forests Department's ultimate land use aims for the areas likely to be affected by mining, as the basis for consideration of mining and rehabilitation proposals.*

The provisions herein will be fine tuned as detailed five year mining plans are provided annually." (iii)

1. Land Use in the Mt. William Area
"*Three Management Priority Areas (MPAs) are affected by Alcoa's 25 year mining proposals, namely Water Production, Recreation and an area where Conservation of Flora and Fauna and Catchment Protection are given equal priority.* […]" (p. 1)

2. Impact of Mining Proposals on Current Management
2.6 Recreation Development
"*Preparation of landscape plans will ensure rehabilitation conforms with any recreation proposals for the area.*" (p. 10)

3.4 Recreation Development
3.4.3.1 Western Boundary Road
"*(d) Gravel pits not to be mined within ten years are to be landscaped and planted with dieback resistant species as in (c) above.*" (p. 28)

3.6 Environmental Control over Bauxite Mining and Rehabilitation of Mined Areas
3.6.1 Objective Management
"*To ensure that bauxite mining is carried out on State Forest in areas approved by the Conservator of Forests, and that the ore extraction and rehabilitation phases of mining are undertaken in accordance with land use objectives.*" (p. 35)

3.6.2 The general prescription
3.6.2.1 Application for Clearing Phase
"*(a) Maintain plans showing Alcoa's 10 year mining proposals and ensure these are annually updated.*

(b) Investigate areas requested for clearing in March each year and report to the Regional Operations Leader detailing the impact on local land use and means of resolving conflicts." (p. 35)

"*Items to be incorporated include impact on logging operations, apiarists, access, tourists and recreationists, forest lease holders, farmers, gravel supplies, noise levels, water reservoirs and structures.*

(c) Attend annual inspection of areas subject to clearing applications in conjunction with Erosion Control and Rehabilitation Working Group and Alcoa's Mine Superintendent. The group recommend to the Conservator:

- *adjustments to boundaries to facilitate optimum landscaping and erosion control requirements;*

- *treatment for sensitive areas. A plan of operations will be required which will avoid deleterious effects on mining and on land use (e.g. mining adjacent to a dam will require ore extraction to commence from the bottom of the slope, and the provision of sumps and contour banks for erosion control progressively in the wake of extraction);*

  the deletion or deferment of mining in areas where it is considered there is good and sufficient reason (e.g. in high quality protectable forest, essential research areas, Conservation MPAs, potential to damage public utilities, etc.).

[…]" (p. 36)

3.6.2.4 Rehabilitation Phase

"*(a) In conjunction with the Regional Operations Leader, set out preliminary proposals in September each year for rehabilitation based on advice from Alcoa on the availability of areas.* […]

(b) Accompany the Erosion Control and Rehabilitation Working Group and Alcoa environmental personnel on an inspection of areas available for rehabilitation in order to:

- *draw up plans to meet the objectives of pit rehabilitation as outlined in General Working Plan 86, land use management plans, and other submissions such as those made by the Water Purity Committee to System 6 for the northern jarrah forest;*

- *lay down specifications for soil erosion control, water disposal, bank height, ground cover, tree species, spacing and ripping intensity. Redundant haul roads not required for the mining process or by the Forests Department are to be included in the rehabilitation plans.*

(c) Rehabilitation proposals are submitted to the Conservator for approval (usually in November)." (p. 39)

"*(d) Alcoa are to carry out earthworks to prepare the landscape for tree planting according to the rehabilitation specification. This involves the following:*

- *pits are landscaped by blasting, battering the walls and grading the floor;*

- *topsoil is replaced evenly over the pit floor. Where possible, top soil is immediately transferred from areas in advance of mining into pits being rehabilitated and largely overcomes biological degrade caused by stockpiling.*

- *pit floors are deep ripped at 2 metre intervals along contours. Sump provided at the base of pits and contour banks at intervals of 5-15 metres are constructed to retain water within pits.*

- *haul roads not required for further mining or for future forest management are ripped for planting;*

- *earthworks associated with approved research projects are undertaken as per specific working plans.*" (p. 40)

"*(e) Between May and August, Alcoa will plant dieback resistant tree species over the prepared sites to the specifications of the Forests Department. Tree selection is usually based on the potential to produce commercial timber but in areas where recreation is desirable, trees with amenity values are planted. Wide tree spacing is used to allow for high yields of both water and wood. Tree species will be determined for each mined area by the Forests Department and will generally include:*

Eucalyptus wandoo
Eucalyptus accedens
Eucalyptus calophylla
Eucalyptus patens
Eucalyptus saligna
Eucalyptus maculata
Eucalyptus resinifera

Where timber production is an objective, the stocking will be 625 trees/ha (spacing of 4 metres x 4 metres).

(f) Fertilise tree seedlings at 3 and 9 weeks after planting with Agras 12/52 using a rate of 100 grams/tree. Apply legume seed at the rate of 1 kgm/ha and fertilise (in conjunction with sowing) using 300 kgm/ha of superphosphate with copper and zinc additives.

(g) Continually appraise performance of erosion control measures and the performance of established native vegetation." (p. 41)

3.6.4 Effect of Influence Zones on General Prescription
3.6.4.1 Recreation Features and Facilities
"*Where the mining operation impinges on existing or planned recreation developments (see Figure 3) the general prescription will be varied as follows:*

Within recreation influence zones, rehabilitation plans are to be prepared to facilitate or enhance areas of recreational value (e.g. Wagerup, Willowdale Road, Mt. William Tower access, Western Boundary Road, picnic sites, etc.). Parts of pits alongside recreation routes will be rehabilitated using a mixture of tree and understorey species to provide an array of forest structure and floral composition. […]" (p. 42)

PLANNING POLICY - 1977

A Perspective For Multiple Use Planning in the Northern Jarrah Forest. 1977

"*The perspective is drawn primarily from the viewpoint of multiple use management in the northern jarrah region. Nonetheless, it establishes principles that can be applied to State Forests as a whole. It also establishes a framework for more broadly based regional land use plans.*" (p. 2)

Introduction
"*The Forests Department is required to provide a multiplicity of benefits from the northern jarrah forest according to the inherent capabilities of the environment, the existing statutory constraints and the recognised public demand. This objective is attainable because sufficient data are now available for a comprehensive and environmentally responsible regional plan.*" (p. 4)

"*This document sets the overall perspective for the development and subsequent implementation of detailed proposals. In doing this the region has been divided into six management zones based on geomorphology and climate. However, for detailed local planning it is envisaged that site vegetation zoning will be more appropriate and precise.*

The management strategies proposed supplement the Forests Department policy on multiple land use." (p. 4)

2. Economic and Legal Constraints
2.3 Mining Leases
"*The entire northern jarrah forest is covered by three leases for the mining of bauxite under special mining agreements (Figure 6).*

The leases confer upon the holders the right to mine bauxite on all Crown land within the lease, including State Forest and Timber Reserves. Rehabilitation of the mined areas to the satisfaction of the Conservator of Forests is a condition of the lease.

Coal mining has been carried out to the south-east of Collie for some 80 years and leases are granted under the Mining Act, 1904-1973. Rehabilitation of mined areas is a condition in some of these leases." (p. 13)

3.2 Mining
"*All of the State's production of coal is mined at Collie at both open cut and underground methods. Production has exceeded two million tonnes per annum. In the 80-odd years since mining commenced, some 500 ha of forest have been cleared. Site restoration of open cut areas and on spoil dumps is continuing.*" (p. 16)

"*All of the current State's production of bauxite is mined at Jarrahdale and at Del Park, by ALCOA. ALWEST propose to mine at Mt. Saddleback. The current level of operations by ALCOA exceeds 100 ha per annum. The area of forest destroyed by mining is estimated as 800 ha at Jarrahdale (1963 to 1974) and 200 ha at Del Park (1972 to 1974). There is close liaison between the Forests Department, ALCOA and other government agencies with respect to site restoration*." (p. 16-17)

4. Proposed Management Strategies
4.2 Lateritic Uplands, High Rainfall Zone (more than 1 150 mm/annum)
Current Land Use

"*a)* *Hardwood silviculture, based on high stocking rates, a high proportion of merchantable species and high growth rates.*
b) *Bauxite mining, based on the large and deep deposits, whose value is enhanced by their proximity to ports.*
c) *Catchment protection, important because of the high rainfall and low accumulation of salt.*
d) *Recreation, based on proximity to centres of population, and ready access.*
e) *Conservation of indigenous flora and fauna. At risk because of widespread dieback disease.*" (p. 26)

Management Strategies

"*(b)* *Mining is acceptable here (particularly in the western parts of this zone, where a considerable area is already infected by dieback), because:*

[…]

(iv) *the vegetation is already disturbed by dieback, can no longer be considered natural and will need to be rehabilitated. Within existing catchments a minimum cover to increase water yield, restore aesthetic appeal and provide for erosion control is proposed.*" (p. 27)

"*d)* *Stands affected by dieback will be salvage logged and rehabilitated with native or exotic eucalypts is proposed.* […]" (p. 28)

"*f)* *Rehabilitation of dieback areas and of mine pits offer considerable flexibility in options (particularly when not on existing water supply catchments). Timber production, water production, recreation and aesthetics can be favoured, depending on the best use for each area. Restoration activities are being planned on a composite basis, catchment by catchment.*" (p. 28)

WORKING PLAN - 1977

General Working Plan No. 86 of 1977. Part I. 1977

4.2 The Concept of Multiple Use of Land Management
"*(c) The selection of a priority or dominant use for an area with the practice of secondary uses which in some circumstances may not significantly interfere with the primary aim, but in others may impose a restriction on output from each competing use. This necessitates a social ranking of use priorities which can usually be done satisfactorily with limited data and experienced value judgement. The Forests Department has adopted this approach for the future management of State Forests and timber reserves.*

Multiple use has temporal as well as spatial over-tones. In the long term the structure of use priorities may alter with socio-economic, technological and successional changes. Such changes could be brought about by a number of influences such as dieback spread, mining, increased water supply requirements or altered demand for wood." (p. 31)

5.9.5 Conservation of the Physical Environment
5.9.5.1 Objective of management
"*To minimise the deleterious effects of land use and management on the soil, air and water components of the forest environment.*' (p. 129)

5.9.5.2 Policy
"*1. Provide for conservation of the physical environment in all management plans.*

2. Monitor the effect of human activity on the physical environment of the forest.

3. Investigate means by which impairment of the physical environment may be avoided or repaired." (p. 129)

5.9.5.3 Management strategy
"*1. Prepare environmental reviews with respect to proposals for any major land use of management changes.*

2. Liaise with other forest-using authorities and organisations to ensure their awareness of environmental effect from their activities.

3. Ensure environmental safeguards form part of all management prescriptions.

4. Continue liaison with the Department of Conservation and Environment, other Government departments and interested bodies." (p. 130)

5.7 Mining
5.7.1.6 Policy for mining on State forest
"*1. Advise Government of the effects of mining lease approvals on forest values.*

2. Continue research on techniques aimed to minimise environmental damage and land use conflict.

3. Directly liaise with mining companies to ensure they are aware of the effects of mining on the environment and other land uses and of rehabilitation techniques." (p. 107)

"*4. Liaise with authorities responsible for administering mining agreements, and with other organisations authorised to study mining effects and rehabilitation techniques.*

5. Rehabilitate areas affected by mining to suit the anticipated land use, in accordance with conditions imposed by State Government under the various mining agreements.

6. Investigate rehabilitation techniques." (p. 108)

5.7.1.7 Management strategy
"*1. Minimise the area of State forests cleared for mining operations.*

2. Continue to obtain realistic compensation from companies mining on State forests to cover loss of forest values, and costs of rehabilitation and the ongoing cost of management of areas affected by mining.

3. Establish a full canopy cover of deep-rooted perennials on areas affected by mining in the salt-sensitive areas of catchments which are harnessed, or proposed to be utilised for water supply.

4. Guide bauxite mining operations into areas where the salinity problem is minimised. Seek to direct other mining operations into areas where there will be least conflict with other land uses." (p. 108)

5.7.2.5 Gravel, Stone and Sand Policy
"*3. Rehabilitate borrow pits according to the anticipated land use*.
[…]" (p. 110)
5.7.2.6 Management strategy
"*4. Minimise the area of State forests cleared for borrow pit sites.*
[…]" (p. 110)

5.8 Public Utilities
5.8.4 Objective of Management
"*The objective is to limit further development of public utilities which result in loss of forest values to those considered essential by Government, and for which there is no reasonable alternative location. Where this is so, any such development will be planned to ensure that it results in least environmental damage and minimum land use conflict.*" (p. 113)

5.8.6 Policy
" *1 Ensure that the forest estate and <u>associated</u> forest values are not unnecessarily eroded.*

2. Guide the location of public utilities on State forests into areas where land use conflict and environmental damage are minimised.

3. Rehabilitate redundant sites to suit the future land use.
[…]" (p. 113)

5.8.7 Management Strategy
"*1. Minimise the area of State forests cleared for public utilities.*
[…]
4. Guide public utilities into areas where the salinity risk and aesthetic impact are minimised. […]

5.Encourage the use of the same sites for more than one utility.[…]" (p. 113-114)

FOREST POLICY - 1976

<u>Forests Department 1976 'Focus on Forest Policy', *Forest Focus*, No. 17, pp. 1-15.</u>

"*Multiple-use planning recognises that priority may be given at particular times to one land use on a short-term basis, providing that the land use does not permanently interfere with other forest values.*

Given this understanding, and allowing for the provisions of relevant Acts, the department's policy on mining is to guide it into areas where there will be least immediate conflict with other land uses and away from areas where it will be permanently damaging to them.

The rehabilitation of mined areas will always be a foremost consideration in forest management decisions.[…]" (p. 13)

Forest Policy
"*The Forests Department will manage the state-owned forests and timber reserves in Western Australia according to a policy that will ensure provision for the optimum social and material needs of the people. At the same time the policy will provide for the environmental well-being of the forests themselves.*
The policy involves the following objectives:

[...]

Mining
To rehabilitate and stabilise those forest areas upon which the original vegetation has been destroyed in the course of mining operations." (p. 15)

FOREST POLICY – 1975?

Forest Policy : Western Australia. [1975?]

Introduction
"*It has therefore become necessary to restate forest policies to take into account the major changes that have taken place since rigid control of the timber industries was first introduced in 1918.*

The objectives of forest management at that time were to protect the forest estate through control of the industry and to protect the forest itself from fire and other destructive agencies.

In more recent times there has been a greater emphasis placed on multiple-use of the forest but with a strong tendency still to produce timber for industry. However, multiple-use demands have imposed limits on the timber resources of the native forests. Emphasis has therefore been given to pine planting to provide a source of timber to supplement and in some instances replace those native forests that will be required for purposes other than timber production.

This statement will outline the current situation regarding those permanently dedicated State Forests and Timber Reserves which come within the stewardship of the Forests Department and formally establish management objectives according to the requirements that now exist. It will take into account a multiple-use concept of those forests managed by the Forests Department." (p. 2)

2.8 Mining
"*Co-operation between the mining companies and the Forests Department to rehabilitate mined areas is currently most satisfactory but the long-term loss of forest areas must always be foremost in future management objectives.* […]" (p. 10)

3. Future Management Objectives
3.1 Policy
"*The future policy will emphasise the multiple-use management of State Forests and Timber Reserves. It will continue to provide for the renewable resources of publicly-owned forests to be utilised in the combination that will best meet the needs of the West Australian people. The aim will be to make the most judicious use of the land for some or all of the resources or related service over areas sufficiently large to provide latitude for periodic adjustments in use to conform with changing public needs and the development of the forest itself.*" (p. 12)

3.1.1 Multiple-Use Priorities
"*Multiple-use management implies the realisation of the best combination of forest benefits according to the particular attributes of each area considered. Compatible benefits may be derived simultaneously from the same area, but separate areas must be used where there is conflict in management for non-compatible benefits.*

In order to overcome the problems imposed by limited forest area, it is proposed to establish a system of management priorities so that the greatest possible number of compatible uses can be practised throughout most of the forest, whilst carefully selected representative areas of native forest will be managed specifically to retain them in an undisturbed condition for scientific reference purposes." (p. 12)

"*The major forest values currently recognised for multiple-use management are:*

Timber Production
Water Supplies
Amenity and Recreation
Flora and Fauna
Special Scientific Values" (p. 13)

3.1.2 Multiple-Use Requirements
"*Future requirements to meet the need for multiple-use forest management posed by increasing public demand are:*

> *Classification and designation of State Forest into areas to be managed according to a scale of multiple-use priorities, together with increased security for these management objectives.*
>
> *Increased research into recreational use and intensified environmental monitoring and inter-departmental co-ordination and liaison with respect to land use planning in the forest areas of the South West including engagement of professional staff with appropriate qualifications where necessary.*" (p. 13)

3.2.6 Forest Rehabilitation
"*Rehabilitation of forests within water catchments where necessary, is considered to be a most important management objective.*

The Forests Department will continue to manage State Forests for water catchment purposes and may also be called on to rehabilitate some areas adjoining State Forests." (p. 17)

WORKING PLAN – 1971

General Hardwood Working Plan No. 85. 1971

7.2 Forest Conservation and Multiple Use Management
"*In all operations proper attention will be paid to:*
[…]
6. The issue of licences or leases to excavate shale, gravel or other road surfacing material on State Forest will be restricted to the minimum for essential public works only.

7. Close liaison will be maintained with mining companies operating on permanent forest, to ensure that their activities are carried out in such a way and in such localities as to minimise loss to the forest asset, and that rehabilitation is carried out in the most effective and economic manner out in the most effective and economic manner consistent with predetermined objectives." (p. 36-37)