Figure 9.1 IPRH Health and Safety Policy

International Power Hazelwood

Health and Safety Policy

International Power, Hazelwood is committed to mining coal and generating a reliable supply of low cost electricity in a Safe and Environmentally responsible manner.

International Power, Hazelwood will:

Consider Health and Safety requirements at all levels of the business decision-making process.

- Set and achieve Health and Safety objectives and targets to continuously improve Health and Safety performance.
- Ensure that all operations comply with Health and Safety legislation and regulations and meet voluntary agreements and community expectations.
- Regularly review and report Health and Safety performance.
- Ensure that all employees & contractors are fully aware of and meet their Health and Safety responsibilities.
- Establish and maintain a third-party certified Health and Safety Management System. (Certified to and compliant with OHSAS 18001 and AS4801).
- Recognise, communicate and respond to all interested parties concerns on Health and Safety matters.

The partnership representatives, through the Chief Executive Officer, are responsible for Health and Safety compliance and implementing system and performance improvements by:

- Ensuring the SMS is effectively resourced and maintained.
- Identifying compliance requirements through the Health and Safety audit program and actioning all areas of non-compliance.
- Review and implementation of the Safety Management Plan.
- Meeting all reporting requirements to statutory bodies and voluntary agreements.
- Informing all interested parties of International Power, Hazelwood's Health and Safety performance results.

Graeme York
Chief Executive Officer

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Responsible Person: Chief Executive Officer	**Page** 1 of 1	**Printed:** 27/02/2009

The initial list of hazards was then assessed using a qualitative risk assessment approach to identify those hazards that could be considered MMHs in accordance with the definition in the OH&S (Mines) Regulations. This step refined the list to 16 hazards, which were considered to constitute potential MMHs, with 14 identified as having a potential multiple fatality consequence, and two hazards being higher risk potential single fatality events.

These 16 hazards were then analysed to understand the relationships between the potential initiating causes and existing control measures. This information was used to build bow-tie diagrams to graphically represent each hazard scenario. The bow-tie diagrams were then used as a reference throughout the remaining steps in the assessment process.

In addition to the MMH's identified, there were 14 hazards assessed as having the potential to result in a single fatality consequence but considered a lower risk because they were deemed 'unlikely' to occur in the mine life.

Stage 2. Base Case Risk Assessment

The 16 potential MMHs identified were then further assessed using a semi-quantitative risk assessment ("SQRA") process. The SQRA approach was selected as it enables an annualised risk value to be generated, allowing the MMH's to be ranked and providing IPRH with an increased understanding of the MMH risk profile 1. The SQRA process also provides an effective method of selecting the critical and major controls for each MMH scenario.

Based on the current site controls and procedures, the risk assessment team estimated that the overall 'base case' risk for the MMHs was fatalities per year, equivalent to a single fatality every years (refer Table 8.3). This estimate is consistent with the results gained from applying the SQRA process at other mining operations.

The base case risk assessment identified that the overall risk from the MMHs is relatively concentrated, with 81% of the site attributable to the top five hazards assessed. Furthermore, that the three top hazards in the base case estimate relate to collisions involving mobile vehicles, placing the operation of mobile equipment as the dominant hazard in the risk profile.

The list of 16 hazards was then reviewed to determine which of these hazards would be considered MMHs, and therefore subject to further analysis through the safety assessment process. This was achieved through applying two criteria:

- Comparison of the estimated risk levels against an adopted site defined risk criteria of 1×10^{-3} (one in 1,000 years). This step resulted in an initial 10 hazards being identified as MMHs.
- A team-based review of the remaining six hazards to confirm their relevance for inclusion as MMHs. The objective of this review was to understand the relationships between each hazard, its existing level of control, and the estimated level of risk and /or potential consequences. From this review three additional hazards were identified as constituting MMHs, requiring further control analysis.

As such, 13 hazards were identified as MMHs and taken forward for control analysis. These hazards are shown in Table 9.3.

Table 9.3 Major Mining Hazards and Risk Values

Rank	MMH No.	Hazard Title	Potential Loss of Life Value ($x\ 10^{-2}$)	% Risk	Sum % Risk
1	NO1	Vehicle incident while accessing worksite.	1.15	24	24.3
2	IW32	Public vehicle incident during road alterations.	1.00	21	45.50
3	NO24	Heavy mobile equipment interactions on mine roads.	6.67	14	59.70
4	NO4	Dropped objects from major mining plant.	6.00	13	72.40
5	NO37	Failure whilst field jacking of major mining plant.	4.40	9	81.70
6	IW28	220 kV tower incident, including construction activities.	0.250	5	87.00
7	NO5	Uncontrolled movement of major mining plant.	0.165	4	90.50
8	NO38	Unplanned movement of equipment.	0.137	3	93.40
9	NO42	Fall from or tipping of extendable work platform.	0.110	2	95.80
10	NO26	Batter failure.	0.100	2	97.90
11	NO39	Confined spaces.	0.03	<1	98.50
12	NO8	Explosion of electrical components on major mining plant.	0.022	<1	99.00
13	NO43	Building fire.	0.022	<1	99.50
14	IW30	Cable incident on public road.	0.014	<1	99.80
15	NO7	Major mining plant fire.	0.010	<1	99.90
16	NO36	Inrush of water into mine.	0.0016	<1	100.00
Total Estimated Site Major Mining Hazard Potential Loss of Life			**4.72**		

Rank Items that are part of RRR project and not part of this WPV.

Identified hazards for critical control adequacy assessment (Stage 3).

It is important to note that three of the hazards in the risk profile solely relate to interim activities associated with the relocation of infrastructure for mining activities in the West Field lease area. It is estimated that following completion of the relocation activities, the risk from MMHs would reduce by approximately 40%, to a single fatality every years. Furthermore, these hazards relate principally to activities to be completed by contractors under IPRH management.

Stage 3. Critical Control Adequacy Assessment and Reduced Case Risk Assessment

The final stage of the safety assessment was to review the adequacy of the critical and major controls selected to confirm that they are "fit for purpose".

As discussed, a total of 13 MMHs were identified in Stage 2, for review through the control adequacy assessment process. Two of these hazards were not reviewed, as they related to infrastructure works associated with the relocation to the West Field lease area. As these activities are being completed outside of WPV approvals, it was considered more realistic to ignore these items.

A total of 45 controls were assessed through the adequacy assessment processes. This included 15 critical controls and 30 major controls. The controls were also categorised to identify the types of controls being relied upon (refer Table 9.4)

The results shown in Table 9.4, illustrate that there was a good spread between the procedural and engineering controls selected. It also shows that a vast majority of the controls selected were preventative in nature.

Table 9.4 Critical and Major Control Categories

Critical and Major Control Categories	Administrative	Procedural	Engineering
Mitigation	0	19	12
Reduction	1	0	4
Prevention	8	0	1
Totals	9	19	17

The adequacy assessment process generated improvement actions that targeted different aspects of the risk profile. These improvement actions were prioritised, according to their effect on improving the adequacy of the controls, and from the Safety Action Plan for major mining hazards. This plan represents the culmination of the safety assessment process and presents the context in which the reduced case risk assessment was completed. It therefore acts as a list of what needs to be done to reach the reduced risk level. The implementation of these actions was estimated to reduce the risk, form the hazards assessed, from one fatality every years to one fatality every years, constituting an 11.5% risk reduction.

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Appendix A

International Power Hazelwood Code of Practice Revegetation Guide

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INTERNATIONAL POWER HAZELWOOD

Code of Practice

Revegetation Guide

2004

Indigenous Design P/L

EXECUTIVE SUMMARY

This document has been prepared to assist the selection of plant species for revegetation programs undertaken by International Power Hazelwood. All species recommended for revegetation are indigenous to the area. Species listed within the document are found within International Power Hazelwood's boundary or its immediate surrounds, they are representative of the area, and are easy and reliable to propagate and establish.

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Map: EVC 1750
Map: LSYS 100

Front Cover: Revegetation at the Brodribb Road Wetland site.
A major component of this planting is the inclusion of *Eucalyptus yarraensis,* Yarra Gum.

INTRODUCTION

International Power Hazelwood's Environmental Policy states (in part):

> ***"We will improve natural resources and their ecological values to promote continued sustainable biodiversity".***

International Power Hazelwood's Rehabilitation Protocol states:

> ***"Restore all land disturbed by mining activities to a beneficial use as soon as practical, in line with community aspirations and the Minerals Resources Development Act".***

This Revegetation Guide provides a detailed list of indigenous plants that have been identified within the International Power Hazelwood site and adjacent landholdings (Appendix 1). This document also identifies species that are suitable for revegetation, rehabilitation and restoration by virtue of ease of supply and known good surviveability. These species are grouped in communities based on regional EVC lists, prior vegetation surveys and knowledge of plant requirements and associations (Appendix 2).

However, a distinction needs to be made between revegetation carried out on sites that resemble original site conditions and grossly disturbed landforms such as overburden dumps. On pastoral land where native vegetation has been removed but the landform remains unchanged, the modelled community composition (EVC) will be used to select plant species for planting programs. On grossly disturbed sites, plant species will be selected based on past performance success on similar sites.

Further plant species should be trialled to determine their suitability and to increase the diversity of species being planted on grossly disturbed landforms.

1.0 BACKGROUND

The International Power Hazelwood site and adjacent land has largely been cleared for agriculture last century and only small isolated pockets of the original (remnant) vegetation remain. Many vegetation studies have been conducted within the area and provide information that is helpful in the rehabilitation of land affected by mining.

Study Area

This Revegetation Guide covers the current International Power Hazelwood property and areas to the west of the IPRH Mine potentially affected by mine extensions.

Ecological Vegetation Classes (EVC's)

Ecological Vegetation Classes have been developed by the Victorian Government Department of Sustainability and Environment to aid our understanding of how native vegetation fits in a landscape. They are a basic mapping unit of vegetation types at a regional scale in Victoria.

An EVC consists of one or more vegetation communities that regularly occur together in similar environments. There are two major components of the State Mapping project:

- Pre- 1750 EVC mapping at 1:100,000
- Extant EVC mapping at 1:25,000

This Revegetation Guide is based on the pre European Settlement (1750) map data that is a hypothetical map of how vegetation may have looked before white settlement, based on what we know of native vegetation and its relationship to landform, hydrology, climate, etc. This is necessary because of the elimination of most of the native vegetation in agricultural areas such as the Latrobe Valley. There is some remnant native vegetation on International Power Hazelwood land that is represented on the extant (currently existing) map of the region. What little that does remain though is very valuable in many ways as it helps piece together bits of the jigsaw locally, confirming or refining the 'modelling' map data.

EVC boundaries at 1:100,000 are not expected to be accurate but they are based on environmental parameters that provide decisive information. Mapping units at this scale necessarily leave out some detail, vegetation community, sub- community and of course certain species.

Numerous native vegetation surveys have been conducted at Morwell and data is accurate enough to add to our understanding of local vegetation communities and how they fit within EVC's. Additional information is gathered frequently and there are many further research opportunities.

Mueck and Williams, *Biosis* (1999) reported: "The original (pre-1750) vegetation was a combination of several Ecological Vegetation Classes (EVC's). Today remnants of vegetation remaining within the study area include small areas of Swamp Scrub, Damp Forest and Riparian Scrub Complex".

The State Project (pre-1750) identifies 4 EVC's expected to occur within and surrounding the International Power Hazelwood site:

- **Swampy Riparian Woodland** EVC 83
- **Swamp Scrub** EVC 53
- **Plains Grassy Woodland** EVC 55 **(Plains Grassland** EVC 132**)**
- **Plains Grassy Forest** EVC 151

Further to this is Landsystem Data (LSYS 100, a separate State mapping project) that defines vegetation structure and includes typical dominant Eucalypt species of forest and woodland. This represents community compositions in more detail than the EVC alone. For example the ridge hilltops near and extending south from the mine are within larger areas of two EVC's, Grassy Woodland and Grassy Forest. The LSYS 100 suggests the vegetation of the hilltops specifically is of a similar composition that commonly includes *E. consideniana* (Shining Peppermint), which is not represented on either EVC list.

2.0 PLANNING

Planning for revegetation programs should start at least twelve months in advance. Planning should take into account site preparation and maintenance requirements. Maintenance is a costly component of revegetation and plantings should be planned with this ongoing cost adequately accounted for.

Species Selection

The foremost principle of this guide is to assist the selection of plant species that are appropriate to each planned revegetation site based on the EVC map, accompanying species lists and any further refinement that is currently available.

Species selection should include a mixture of upper and middle/lower storey species. Varying stratum is an integral component of any ecosystem and it is important that this is considered in revegetation programs. The upper storey should be planted first to allow for cost effective maintenance to be employed and to provide conditions more suitable for middle and lower storey species. When upper storey plantings have established (3-5 years) middle and understorey species should be added.

Seed Collection

Seed collection from locally sourced indigenous species is preferred, as the local provenance is adapted to the local conditions and reduces chances of gene-pool pollution. This is a primary principle of biodiversity protection. Appendix 2 indicates the period in which seed can be collected. This period varies depending on the season so plants must be monitored closely to make sure that collection opportunities are not missed.

Plant Supply

Nursery selection and ordering is important. Ordering should occur with guidance from the nursery as each work on different time lines.

Pest Plant and Animal Control

Weed control is the most important part of preparing and maintaining the site. Good access to the site for maintenance crews and equipment is important. Future management of pest plant and animals needs careful consideration. Losses from rabbits and hares can be considerable and seedlings may require protection. Staking and guarding of individual tree plots, or fencing will add significant costs to the program. If the area requires to be fenced off, allow plenty of space between the planting and the fence line for mowing.

Grazing Pressure

Successful revegetation requires the total exclusion of grazing animals such as sheep and cattle during establishment. It is preferable that grazing animals are excluded from the entire site prior to revegetation. However, where the intended purpose of the revegetation is for grazing, then individual tree clumps should be fenced-off, gates locked and the plantings arranged along 'Whole Farm' principles.

Note that wetland development and grazing animals are totally incompatible.

Maintenance

Maintenance will make or break a revegetation project, but there are numerous long and short-term considerations that can save time, money and herbicide.

3.0 PLANTING GUIDE

All species recommended for rehabilitation purposes within International Power Hazelwood sites are indigenous to the area. Appendix 1 lists a large number of species found within International Power Hazelwood's boundary or immediate surrounds. The species lists in Appendix 2 are only a selection of suitable species, those specifically known to be representative of the area and are easy and reliable to propagate and survive local conditions.

The lists are aimed as a guide. They contain sufficient information to enable informed decisions for rehabilitation of land affected by International Power Hazelwood's activities. The species have been selected to provide an appropriate combination of upper, middle and lower storey plants.

The species lists have been divided into the following groups:

- **Trees**
- **Small trees/large shrubs**
- **Shrubs**
- **Small shrubs/ground covers/ferns**
- **Grasses/sedges/rushes**
- **Emergent aquatics/aquatics**

Relatively Undisturbed Land

Where landform is generally unchanged, species selection should be made with reference to the EVC Map. Having identified the EVC(s) for the site, the species can then be selected from the corresponding species list (Appendix 2).

Grossly Disturbed Landforms

International Power Hazelwood and its predecessor the former SECV have been establishing indigenous trees, shrubs and grasses on overburden dumps and other grossly disturbed sites for more than a decade. Through trial and error, and more

recently, monitoring of these plantings, a broad range of indigenous plants that are reliable for planting on disturbed areas, including those without topsoil, have been identified.

However, each disturbed area requires detailed assessment prior to plant selection. The soils, aspect, elevation, slope, drainage and other conditions must be taken into account when compiling plant lists for revegetation. While plantings on grossly disturbed sites have produced successful results, there is still much to learn, and failures of recalcitrant species can and do occur. Long-term survivability is of utmost importance. It is suggested that each new disturbed landform is assessed and compared to other similar sites where plantings have proven successful.

Appendix 2 contains a species list that is comprised of indigenous species that have proven successful on grossly disturbed sites. A number of these species have been observed to colonise grossly disturbed areas, surviving the (unnaturally) harsh conditions and regenerating as primary colonising species do in natural succession.

Remnant Restoration (including Wetlands)

Areas with some existing remnant native vegetation may be enriched with supplementary plantings, though care should be taken to ensure species selection is accurate. There is value in planting more of the same plant species that already occur at the site, or are seen to be naturally regenerating, say following removal of grazing pressure. It is also important to investigate other plant species that were likely to have once occurred at the site but are now absent. These species should be assessed for there potential for reintroduction.

Wetland creation often produces a flush of native vegetation regeneration that can save managers from the costs of planting. Maintenance costs in the form of weed control are higher initially, but can quickly be reduced as the native vegetation begins to dominate the site. While the natural regeneration provides excellent cover, diversity can be increased with planting and plant translocation of plant species that do not readily regenerate naturally. This principle also applies for natural wetlands that have been degraded through grazing pressure or other degrading processes.

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Appendix 1:

Species of International Power Hazelwood and Surrounds

Scientific Name	Common Name
Native Species	
Acacia mearnsii	*Black Wattle*
Acacia melanoxylon	*Blackwood*
Acacia mucronata var. longifolia	*Narrow-leaf Wattle*
Acacia stricta	*Hop Wattle*
Acacia verniciflua	*Varnish Wattle*
Acacia verticillata	*Prickly Moses*
Acaena echinate	*Sheep's Burr*
Acaena novae-zelandiae	*Bidgee-widgee*
Acianthus exsertus s.l.	*Gnat orchid*
Acrotriche serrulata	*Honey-pots*
Adiantum aethiopicum	*Common Maidenhair*
*Alisma plantago-aquatica**	*Water Plantain*
Alternanthera denticulata s.s.	*Lesser Joyweed*
Amphibromus nervosus	*Common Swamp Wallaby-grass*
Amyema pendula	Drooping Mistletoe
Arthropodium strictum s.s.	Chocolate Lily
Asperula conferta	Common Woodruff
Austrodanthonia caespitosa	Common Wallaby-grass
Austrodanthonia laevis	Smooth Wallaby-grass
Austrodanthonia setacea var. setacea	Bristly Wallaby-grass
Austrostipa rudis ssp. Rudis	Veined Spear-grass
*Azolla filiculoides**	Pacific Azolla
Baumea tetragona	Square Twig-sedge
Blechnum minus	Soft Water-fern
Burchardia umbellate	Milkmaids
Busaria spinosa	Sweet Bursaria
Calystegia sepium	Large Bindweed
Cardamine paucijuga s.s.	Annual Bitter-cress
Carex appressa	Tall Sedge
Carex gaudichaudiana	Fen Sedge
Cassino aculeata	Common Cassino
Cassinia longifolia	Shiny Cassinia
Centella cordifolia	Centella
Chenopodium glaucum	Glaucous Goosefoot
Chiloglottis spp.	Bird Orchid
Chiloglottis valida	Common Bird-Orchid
Clematis aristate	Mountain Clematis
Coprosma quadrifida	Prickly Currant-bush
Corybas spp.	Helmet Orchid
Crassula helmsii	Swamp Crassula
Cynoglossum suaveolens	Sweet Hound's-tongue
Dianella amoena	Matted Flax Lily
Dianella longifolia	Pale Flax-lily
Dianella revolute s.s.	Black-anther Flax-lily
Dianella tasmanica	Tasman Flax-lily
Dichondra repens	Kidney-weed

Drosera peltate ssp. auriculata	Tall Sundew
*Eleocharis acuta**	Common Spike-sedge
*Eleocharis sphacelata**	Tall Spike-sedge
Elymus scaber	Common Wheat-grass
Epacris impressa	Common Heath
Epilobium billardierianum	Variable Willow-herb
Epilobium hirtigerum	Hairy Willow-herb
Eucalyptus angophoroides	Apple-top Box
Eucalyptus bridgesiana	But But
Eucalyptus consideniana	Yertchuk
Eucalyptus obliqua	Messmate Stringybark
Eucalyptus ovata	Swamp Gum
Eucalyptus pauciflora	Lowland Snow Gum
Eucalyptus radiata s.s.	Narrow-leaf Peppermint
Eucalyptus rubida	Candlebark
Eucalyptus strzeleckii	Strzelecki Gum
Eucalyptus viminalis sp.' ridge'	Manna Gum (high/dry sites)
Eucalyptus viminalis sp. 'riparian'	Manna Gum (2 distinct species)
Exocarpos cupressiformis	Cherry Ballart
Gahnia radula	Thatch Saw-sedge
Galium gaudichaudii	Rough Bedstraw
Galium propinquum	Maori Bedstraw
Geranium homeanum	Northern Cranesbill
Geranium potentilloides	Cinquefoil Cranesbill
Geranium sp. 2	Variable Cranesbill
Gleichenia microphylla	Scrambling Coral-fern
Glyceria australis	Australian Sweet-grass
Glycine clandestina	Twining Glycine
Gonocarpus tetragynus	Common Raspwort
Goodenia elongata	Lanky Goodenia
Goodenia humilis	Swamp Goodenia
Goodenia ovata	Hop Goodenia
Gratiola peruviana	Austral Brooklime
Gynatrix pulchella s.s.	Hemp Bush
Hardenbergia violacea	Purple Coral-pea
Helichrysum scorpioides	Button Everlasting
*Hymenanthera dentata s.*1.	Tree Violet
Hypericum gramineum	Small St John's Wort
Imperata cylindrica	Blady Grass
Isolepis cernua	Nodding Club-sedge
Isolepis inundata	Swamp Club-sedge
Juncus amabilis	Hollow Rush
Juncus australis	Austral Rush
Juncus bufonius	Toad Rush
Juncus gregiflorus	Green Rush
Juncus pallidus	Pale Rush
Juncus pauciflorus	Loose-flower Rush
Juncus planifolius	Broad-leaf Rush
Juncus procerus	Tall Rush
Juncus sarophorus	Broom Rush
Kunzea ericoides	Burgan
Lagenophera stipitata	Common Lagenophera
*Lemna disperma**	Common Duckweed
Lepidosperma elatius	Tall Sword-sedge
Leptospermum continentale	Prickly Tea-tree
Linum marginale	Native Flax

Lobelia alata	Angled Lobelia
Lomandra filiformis	Wattle Mat-rush
Lomandra longifolia	Spiny-headed Mat-rush
Lythrum hyssopifolia	Small Loosestrife
Melaleuca ericifolia	Swamp Paperbark
Melaleuca squarrosa	Scented Paperbark
Microlaena stipoides var. stipoides	Weeping Grass
Microtis arenaria	Notched Onion-orchid
Notodanthonia semiannularis	Wetland Wallaby-grass
Olearia lirata	Snow Daisy-bush
Oxalis perannans	Grassland Wood-sorrel
Oxalis thompsoniae	Fluffy-fruit Wood-sorrel
Persicaria decipiens	Slender Knotweed
Persicaria hydropiper	Water-pepper
Persicaria praetermissa	Spotted Knotweed
*Phragmites australis**	Common Reed
Pimelea humilis	Common Rice-flower
Poa labillardieri	Common Tussock-grass
Poa morrisii	Soft Tussock-grass
Poa sieberiana	Grey Tussock-grass
Poa tenera	Slender Tussock-grass
Polyscias sambucifolia	Elderberry Panax
Poranthera microphylla	Small Poranthera
*Potamogenton ochreatus**	Blunt Pondweed
Pteridium esculentum	Austral Bracken
Pterostylis falcate s.s.	Large Sickle Greenhood
Pterostylis longifolia s.s.	Tall Greenhood
Pterostylis nutans	Nodding Greenhood
Pterostylis spp.	Greenhood
Rapanea howittiana	Muttonwood
Rubus parvifolius	Small-leaf Bramble
Rumex bidens	Mud Dock
Schoenus apogon	Common Bog-sedge
Schoenus maschalinus	Leafy Bog-sedge
Senecio glomeratus	Annual Fireweed
Senecio hispidulus	Rough Fireweed
Senecio pinnatifolius	Variable Groundsel
Spergularia sp.1	Native Sea-spurrey
Thelymitra pauciflora s.s..	Slender Sun-orchid
Themeda triandra	Kangaroo Grass
Tricoryne elatior	Yellow Rush-lily
*Triglochin procerum s.s.**	Water-ribbons
Triglochin striatum	Streaked Arrow-grass
*Typha orientalis**	Cumbungi
Urtica incisa	Scrub Nettle

Appendix 2

EVC 83 Swampy Riparian Woodland

Landsystem

Traralgon (Tg)

- Landscape: Narrow poorly drained alluvial plains with small meandering streams
- Geology: Holocene fluviate, mostly clayey deposits
- Diagnostic: Drainage floors and minor alluvial terraces
- Soils: Parent material: mostly clay alluvium;
  Classification: Wiesenboden, some Alluvial soils, Brown Earths in occasional well drained sites
  Surface Texture: silty loam to clay loam
  Nutrient Status: moderate

Species List

Name	Common Name	Propagation	Seed collection
Trees and tall shrubs			
Acacia dealbata+	Silver Wattle	Seed	Dec-Jan
Acacia melanoxylon	Blackwood	Seed	Dec-Jan
Eucalyptus strzeleckii+	Strzelecki Gum	Seed	All year
Eucalyptus radiata	Narrow leafed Peppermint	Seed	All year
Eucalyptus viminalis ssp viminalis	Manna Gum	Seed	July-Apr
Pomaderris aspera	Hazel Pomaderris	Seed	Dec-Jan

Species List

Name	Common Name	Propagation	Seed collection
Shrubs & Herbs			
Acaena novae-zelandiae	Bidgee-widgee	Seed	Dec-Jan
Acacia verticillata	Prickly Moses	Seed	Dec-Jan
Bursaria spinosa+	Sweet Bursaria	Seed	Mar-Apr
Cassinia aculeata+	Common Cassinia	Seed	Jan-Feb
Clematis aristata	Mountain Clematis	Seed	Dec-Jan
Coprosma quadrifida	Prickly Currant-bush	Seed	Dec-Jan
Goodenia ovata	Hop Goodenia	Seed	Nov-Jan
Gratiola peruviana	Austral Brooklime	Cutting	
Gynatrix pulchella s.s.+	Hemp Bush	Seed	Dec-Jan
Hymenanthera dentata s.s.+	Tree Violet	Seed	Jan-Feb
Leptospermum continentale	Prickly Tea-tree	Seed	All year
Leptospermum lanigerum	Woolly Tea-tree	Seed	All year
Mentha australis+	River Mint	Cutting	
Ozothamnus ferrugineus	Tree Everlasting	Seed	Jan
Rapanea howittiana+	Muttonwood	Seed	Jan-Mar
Rubus parvifolius+	Small-leaf Bramble	Cutting	
Sedges, Grasses & Rushes			
Carex appressa	Tall Sedge	Seed	Dec-Jan
Dianella tasmanica	Tasman Flax-lily	Seed	Dec-Jan
Glyceria australis+	Australian Sweet-grass	Seed	Dec-Jan
Hemarthria uncinata var. uncinata+	Mat Grass	Seed	Dec-Jan
Juncus australis+	Austral Rush	Seed	Dec-Jan
Juncus gregiflorus+	Green Rush	Seed	Dec-Jan
Juncus pauciflorus	Loose-flower Rush	Seed	Dec-Jan
Lepidosperma elatius+	Tall Sword-sedge	Seed	Dec-Jan
Lomandra longifolia+	Spiny-headed Mat-rush	Seed	Dec-Jan
Microlaena stipoides var. stipoides	Weeping Grass	Seed	Dec-Jan
Phragmites australis+	Common Reed	Seed	Mar-May

\+ species added from local knowledge and prior surveys

EVC 55 Plains Grassy Woodland

(EVC 132 Plains Grassland)

Landsystem

Westbury 2 (W2)

- Landscape: Sloping to gently undulating plains and low hills
- Geology: Distal parts of Tertiary flood plain deposits and Lower Pleistocene terrace deposits, gravels, sands, silts and clays
- Diagnostic: Almost flat plateau remnants, gentle to moderate slopes rarely steep, drainage floors, mostly incised, in places permanently wet
- Soils: Parent material: mainly clays, silts and sands, with some intermixed quartz gravels, locally derived alluvium

  Classification: Mostly Yellow Podzolic soils with some Solodic soils, rarely Brown Podzolic soils; Humic Gleys

  Surface texture: Mostly sandy loam to sandy clay loam

  Nutrient status: Low

Anderson 2 (A2)

- Landscape: Dissected relict coalescing fans
- Geology: Tertiary fan and colluvial apron deposits; gravels, sands, silts and clays.Sloping to gently undulating plains and low hills
- Diagnostic: Uneven, gentle to moderate slopes, occasionally steep, crests and upper slopes, relicts of coarse sand tertiary outwash fans, narrow drainage floors with alluvium
- Soils: Parent material: Very variable, sands, silts, clays or gravels can be dominant, variable alluvial materials

  Classification:Yellow Podzolic soils, clays or gravels can be dominant, variable alluvial materials

  Surface texture: Mainly sandy loam to clay loam, sand

  Nutrient status: Low, very low

Species List

Name	Common name	Propagation	Seed Collection
Trees and tall shrubs			
Acacia mearnsii+	*Black Wattle*	Seed	Dec
Acacia melanoxylon	*Blackwood*	Seed	Dec
Allocasuarina littoralis+	*Black Sheoak*	Seed	Dec
Allocasuarina verticillata	Drooping Sheoke	Seed	Dec
Eucalyptus angophoroides+	Apple-topped Box	Seed	All year
Eucalyptus consideniana+	Yertchuk	Seed	All year
Eucalyptus ovata	Swamp Gum	Seed	All year
Eucalyptus pauciflora+	Lowland Snow Gum	Seed	All year
Eucalyptus radiata ssp. radiata	Narrow-leaf Peppermint	Seed	All year
Eucalyptus rubida+	Candlebark	Seed	Feb-May
Eucalyptus strzeleckii+	Strzelecki Gum	Seed	All year
Eucalyptus viminalis ssp. pryoriana	Coast Manna-gum	Seed	Jul-Apr
*Eucalyptus viminalis ssp viminalis**	Rough-barked Manna Gum	Seed	Jul-Apr
Eucalyptus yarraensis+	Yarra Gum	Seed	All year
Melaleuca ericifolia	Swamp Paperbark	Seed	All year
Shrubs / herbs			
Acaena novae-zelandiae	Bidgee-widgee	Seed	Dec-Jan
Daviesia latifolia+	Hop Bitter-pea	Seed	Dec-Jan
Dianella longifolia	Pale Flax-lily	Seed	Jan
Dianella revoluta s.l.	Black-anther Flax-lily	Seed	Dec-Jan
Leptospermum continentale	Prickly Tea-tree	Seed	All year
Ozothamnus ferrugineus	Tree Everlasting	Seed	Feb-Mar
Pultenaea gunnii	Golden Bush-pea	Seed	Nov-Dec
Sedge / grass / rush / tussock			
Austrostipa rudis	Veined Spear-grass	Seed	Dec-Jan
Hemarthria uncinata var. uncinata	Mat Grass	Seed	Jan
Juncus pallidus	Pale Rush	Seed	Dec-Jan
Lomandra longifolia	Spiny-headed Mat-rush	Seed	Dec-Jan
Microlaena stipoides var. stipoides	Weeping Grass	Seed	Dec-Jan
Poa morrisii+	Soft Tussock-grass	Seed	Dec-Jan
Poa labillardierei+	Common Tussock-grass	Seed	Dec-Jan
Themeda triandra	Kangaroo Grass	Seed	Dec-Jan

\+ species added from local knowledge and prior surveys * High/Dry 'Ridge' site

EVC 151 Plains Grassy Forest

Landsystem

Yinnar (Yr)

- Landscape: Almost flat alluvial plains
- Geology: Lower Pleistocene alluvium, sands, silts and clays
- Diagnostic: Broad alluvial plain, slightly depressed parts of plains with poorer drainage, minor drainage floors, narrow upstream valley terraces
- Soils: Parent material: Mainly fine textured alluvial materials, much of which is derived from surrounding Creaceous mudstoines, shales and sandstones

  Classification: Yellow Podzolic soils, Wiesenboden, Solodic soils; some Humic Gleyed Podzolic soils
  Surface texture: Variable sandy loam to light clay; sandy loam to loam; may be clay loam
  Nutrient status: Moderate

Species List

Name	Common name	Propagation	Seed collection
Trees and tall shrubs			
Acacia mearnsii	Black Wattle	Seed	Dec-Jan
Acacia melanoxylon	Blackwood	Seed	Dec-Jan
Eucalyptus angophoroides	Apple-top Box	Seed	All year
Eucalyptus obliqua	Messmate	Seed	All year
Eucalyptus ovata	Swamp Gum	Seed	All year
Eucalyptus radiata ssp. radiata	Narrow-leaf Peppermint	Seed	All year
Eucalyptus strzeleckii+	Strzelecki Gum	Seed	All year
Eucalyptus viminalis ssp. viminalis+	Manna-gum	Seed	Jul-Apr
Melaleuca ericifolia	Swamp Paperbark	Seed	All year
Shrubs			
Leptospermum continentale	Prickly Tea-tree	Seed	All year
Melaleuca ericifolia	Swamp Paperbark	Seed	All year
Olearia lirata	Showy Daisy-bush	Seed	Dec-Jan
Cassinia aculeata	Common Cassinia	Seed	Jan-Feb
Ozothamnus ferrugineus	Tree Everlasting	Seed	Dec-Jan
Acacia stricta	Hop Wattle	Seed	Dec-Jan
Acacia mucronata	Narrow-leaf Wattle	Seed	Dec-Jan
Cassinia longifolia	Shiny Cassinia	Seed	Jan-March
Acacia paradoxa	Hedge Wattle	Seed	Dec-Jan
Kunzea ericoides	Burgan	Seed	Jan-March
Herbs/grasses			
Acaena novae-zelandiae	Bidgee-widgee	Seed	Dec-Jan
Lomandra longifolia	Spiny headed Mat-rush	Seed	Dec-Jan
Poa labillardieri+	Common Tussock-grass	Seed	Dec-Jan
Microlaena stipoides var. stipoides	Weeping Grass	Seed	Dec-Jan
Austrostipa rudis	Veined Spear-grass	Seed	Dec-Jan
Austrodanthonia racemosa	Stiped Wallaby-grass	Seed	Dec-Jan
Themeda triandra	Kangaroo Grass	Seed	Dec-Jan

\+ species added from local knowledge and prior surveys

EVC 53 Swamp Scrub

Landsystem

Traralgon (Tg)

- Landscape: Narrow poorly drained alluvial plains with small meandering streams
- Geology: Holocene fluviate, mostly clayey deposits
- Diagnostic: Drainage floors and minor alluvial terraces
- Soils: Parent material: mostly clay alluvium;
  Classification: Wiesenboden, some Alluvial soils, Brown Earths in occasional well drained sites
  Surface Texture: silty loam to clay loam
  Nutrient Status: moderate

Westbury 2 (W2)

- Landscape: Sloping to gently undulating plains and low hills
- Geology: Distal parts of Tertiary flood plain deposits and Lower Pleistocene terrace deposits, gravels, sands, silts and clays
- Diagnostic: Almost flat plateau remnants, gentle to moderate slopes rarely steep, drainage floors, mostly incised, in places permanently wet
- Soils: Parent material: mainly clays, silts and sands, with some intermixed quartz gravels, locally derived alluvium
  Classification: Mostly Yellow Podzolic soils with some Solodic soils, rarely Brown Podzolic soils; Humic Gleys
  Surface texture: Mostly sandy loam to sandy clay loam
  Nutrient status: Low

Anderson 2 (A2)

- Landscape: Dissected relict coalescing fans
- Geology: Tertiary fan and colluvial apron deposits; gravels, sands, silts and clays.Sloping to gently undulating plains and low hills
- Diagnostic: Uneven, gentle to moderate slopes, occasionally steep, crests and upper slopes, relicts of coarse sand tertiary outwash fans, narrow drainage floors with alluvium
- Soils: Parent material: Very variable, sands, silts, clays or gravels can be dominant, variable alluvial materials
  Classification:Yellow Podzolic soils, clays or gravels can be dominant, variable alluvial materials
  Surface texture: Mainly sandy loam to clay loam, sand

Species List

Name	Common name	Propagation	Seed Collection
Trees & Tall Shrubs			
Eucalyptus strzeleckii+	Strzelecki Gum	Seed	All year
Eucalyptus viminalis ssp. viminalis	Manna Gum	Seed	Jul-Apr
Melaleuca ericifolia	Swamp Paperbark	Seed	All year
Shrubs & Herbs			
Alternanthera denticulata s.l.	Lesser Joyweed	Seed	Jan-Feb
Calystegia sepium	Large Bindweed	Seed	Jan-Feb
Crassula helmsii	Swamp Crassula	Cuttings	Nov-March
Lemna disperma+	Common Duckweed	Translocate	Nov-March
Persicaria decipiens	Slender Knotweed	Seed	Jan-Mar
Persicaria praetermissa	Spotted Knotweed	Seed	Jan-Mar
Rumex bidens	Mud Dock	Seed	Jan-Mar
Triglochin procerum s.l.	Water Ribbons	Seed	Jan-Apr
Urtica incisa	Scrub Nettle	Cuttings	Nov-March
Sedges, Grasses & Rushes			
Carex appressa	Tall Sedge	Seed	Dec-Jan
Carex fascicularis	Tassel Sedge	Seed	Dec-Jan
Carex gaudichaudiana	Fen Sedge	Translocate	Nov-March
Eleocharis acuta	Common Spike-sedge	Translocate	Nov-March
Isolepis inundata	Swamp Club-sedge	Seed	All year
Juncus amabilis+	Hollow Rush	Seed	Dec-Jan
Phragmites australis+	Common Reed	Seed	Mar-May

\+ species added from local knowledge and prior surveys

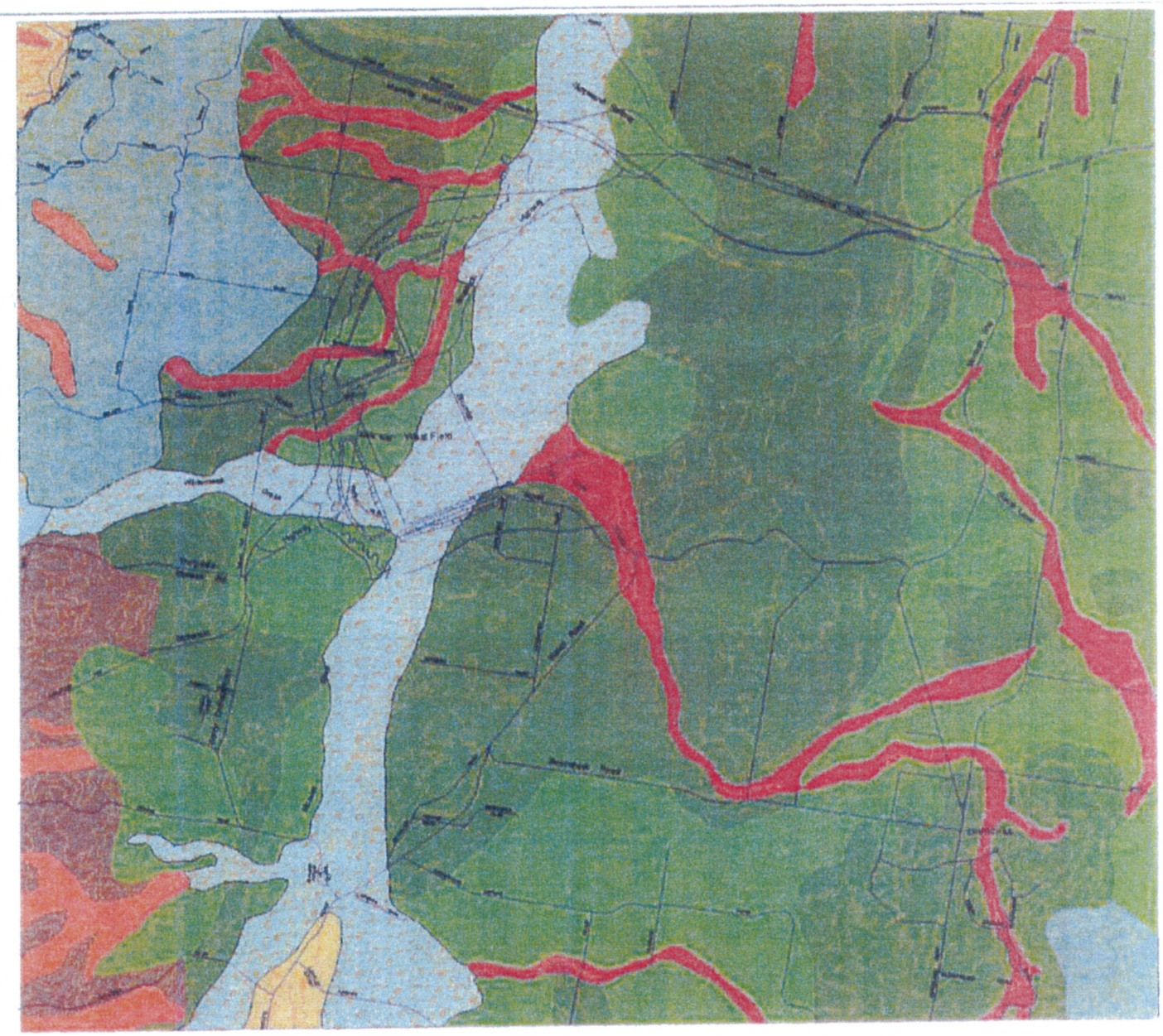
Species list for Disturbed Sites

Species List

Name	Common name	Proagation	Seed Collection
Trees & Tall Shrubs			
Acacia dealbata	Silver Wattle	Seed	Dec-Jan
Acacia mearnsii	Black Wattle	Seed	Dec-Jan
Acacia melanoxylon	Blackwood	Seed	Dec-Jan
Allocasuarina verticillata	Drooping Sheoke	Seed	Dec
Eucalyptus angophoroides	Apple-topped Box	Seed	All year
Eucalyptus consideniana	Yertchuk	Seed	All year
Eucalyptus ovata	Swamp Gum	Seed	All year
Eucalyptus pauciflora+	Lowland Snow Gum	Seed	All year
Eucalyptus radiata ssp. radiata	Narrow-leaf Peppermint	Seed	All year
*Eucalyptus viminalis ssp viminalis**	Rough-barked Manna Gum	Seed	Jul-Apr
Eucalyptus yarraensis	Yarra Gum	Seed	All year
Shrubs / herbs			
Acacia paradoxa	Hedge Wattle	Seed	Dec-Jan
Acacia stricta	Hop Wattle	Seed	Dec-Jan
Acacia verniciflua	Varnish Wattle	Seed	Dec-Jan
Acacia verticillata	Prickly Moses	Seed	Dec-Jan
Bursaria spinosa	Sweet Bursaria	Seed	Mar-Apr
Cassinia aculeata	Common Cassinia	Seed	Jan-March
Goodenia ovata	Hop Goodenia	Seed	Dec-Jan
Gynatrix pulchella s.s.	Hemp Bush	Seed	Jan-March
Hymenanthera dentata s.s.	Tree Violet	Seed	Dec-Jan
Kunzea ericoides	Burgan	Seed	Jan-Feb
Leptospermum continentale	Prickly Tea-tree	Seed	All year
Melaleuca ericifolia	Swamp Paperbark	Seed	All year
Ozothamnus ferrugineus	Tree Everlasting	Seed	Jan-Feb
Sedges, Grasses & Rushes			
Carex appressa	Tall Sedge	Seed	Dec-Jan
Juncus australis	Austral Rush	Seed	Dec-Jan
Juncus gregiflorus	Green Rush	Seed	Dec-Jan
Juncus pauciflorus	Loose-flower Rush	Seed	Dec-Jan
Lomandra longifolia	Spiny-headed Mat-rush	Seed	Dec-Jan
Microlaena stipoides var. stipoides	Weeping Grass	Seed	Dec-Jan

Environmental Data for Morwell Area

Data supplied by DSE Traralgon



EVC 1750

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- Herb-rich Foothill Forest
- Lowland Forest
- Plains Grassy Forest
- Plains Grassy Woodland
- Shrubby Foothill Forest
- Swamp Scrub
- Swampy Riparian Complex
- Swampy Riparian Woodland

Environmental Data for Morwell Area

Data supplied by DSE Traralgon

lsys 100

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Forest mostly with E.ovata E.viminalis E.radiata

Mixed forest: E.commonly E.bridgesiana E.consideriana E.obliqua E.radiata

Mixed forest: E.obliqua usually predominant

Mixed forest: commonly E.dives E.radiata E.bridgesiana E.obliqua

Mostly E.ovata forest also E.obliqua E.radiata E.viminalis

Appendix B

IPRH Mine Rehabilitation Progress Report 2008

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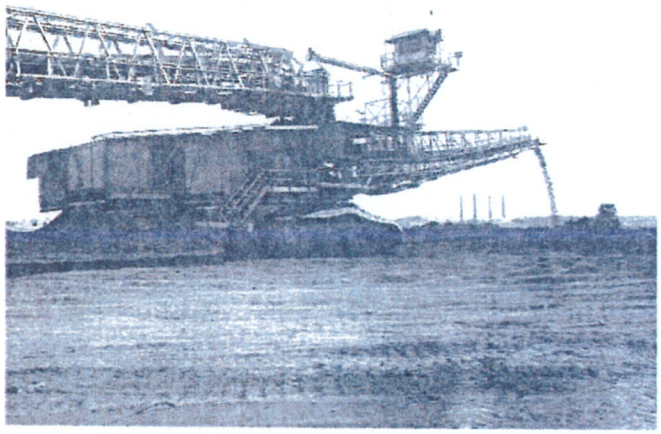
International Power
Hazelwood

IPRH MINE REHABILITATION

PROGRESS REPORT 2008



FROM THIS 'DUMP'

VIA THIS

TO THIS

IPRH MINE
PROGRESSIVE REHABILITATION PROGRAM
2008 UPDATE

INTRODUCTION

International Power Hazelwood is a privately owned business operating a 1600 megawatt (MW) power station fuelled by brown coal (lignite) from its nearby open cut mine. The business supplies approximately one fifth of the State of Victoria's electricity requirements and directly employs 500 people, including 200 at the mine itself. There are also a significant number of contractors on the site supporting the business. The mine is located immediately south of the township of Morwell in the Latrobe Valley, approximately 160 kilometres southeast of Melbourne.

SITE HISTORY

The Koori people were the first human immigrants in the Region and carbon dating evidence indicates a presence dating back at least 40,000 years. The Kooris had a sustainable fishing, hunting and gathering lifestyle. The Koori population of Victoria at the time of European settlement (1835) was estimated at 15,000, but was decimated over the next fifty years.

The Mine site and surrounds originally consisted of thickets of *Melaleuca sp.* (paperbark) in swamp scrub associated with the floodplain of the Morwell River and its tributary Eel Hole Creek, together with emergent swamp gums, *Eucalyptus strzeleckii, Eucalyptus ovata* and *Eucalyptus yarraensis*. Further afield there was open forest of *Eucalyptus pauciflora* (the very rare Lowland Snow Gum) and *Eucalyptus rubida* (Candlebark). Higher, drier sites supported a low open forest of *Eucalyptus viminalis* (Manna Gum), *Eucalyptus bridgesiana* (But But), *Eucalyptus radiata* (Narrow-leaf peppermint) and *Eucalyptus angophorides* (Apple-top Box).

The dominant native grasses in the area were Kangaroo Grass (*Themeda triandra*) and Wallaby Grass (*Danthonia sp.*) in the drier areas and Tussock Grass (*Poa sp.*) and Rushes (*Juncus sp.*) in wetter areas. There was also an established groundcover of wildflowers such as daisies, lilies and orchids.

Over the past 150 years the local area has been progressively drained and cleared of Upperstorey native trees such as eucalypts, wattles and paperbarks and opened up to agriculture which followed a

traditional European–style model. Subsequently, most of the native grass and groundcover species have been replaced with exotic pasture grasses to support the intense grazing requirements of dairy cattle, beef cattle, and sheep.

Remnant vegetation today predominantly consists of Upperstorey trees along roadsides, some sections of watercourses and isolated large trees in paddocks. Many of these trees are very old, provide significant hollows for habitat, and have been damaged by wind or fire. Much of the surrounding agricultural land has a serious noxious weed infestation.

REHABILITATION OF DISTURBED LAND

Electricity production, so essential to maintain our modern standard of living, is the dominant industry in the Latrobe Valley. The vast majority of electricity produced in the Latrobe Valley is generated by Brown Coal-fired Power Stations at Hazelwood, Morwell, Yallourn and Loy Yang. Each Power Station has its own dedicated open cut Brown Coal Mine.

Significant and long-term land disturbance is an unavoidable consequence of open cut mining operations. International Power Hazelwood has made a strong commitment to rehabilitate all land disturbed by mining operations as soon as practical, in accordance with community expectations and the requirements of the Victorian Governments' Mineral Resources (Sustainable Development) Act which is administered by the Department of Primary Industry.

Rehabilitation is divided into two phases:

(i) Final Rehabilitation (post closure – i.e. forever).

(ii) Progressive Rehabilitation (annual program).

Final Rehabilitation

The requirements for Final Rehabilitation are as follows:

- The post-mining landscape is safe and stable.
- The quality of surrounding water resources is protected.
- The post-mining land use is sustainable and agreeable to both the local community and Government.
- Success criteria are agreed to by stakeholders, monitored and reported.

A Rehabilitation Master Plan has been prepared by consultants, which envisages the worked out mine partly flooded as a lake, and the surrounding areas returned as community assets for varied activities including agriculture, recreation, and conservation.

Progressive Rehabilitation

Progressive Rehabilitation, as the name suggests, is undertaken on an annual basis as per the Department of Primary Industries (DPI) 'Work Plan' and involves the Rehabilitation of Mine Permanent Void Batters and Overburden Dumps as they are developed. This incremental program works towards achieving the long-term closure goal.

The Mining Licence requires the posting of a substantial 'Rehabilitation Bond' to ensure that Mine Closure and Final Rehabilitation never becomes a burden on the taxpayer.

Progressive Rehabilitation of disturbed land is a three-step process:

- First the area to be rehabilitated is shaped by earthmoving plant in a cut and fill operation to stabilise the slopes and make them safe for the long-term. Generally, the aim would be to blend the new landscape in with the surrounding countryside, as determined by landscape architects in consultation with the local community.

- Secondly the area is stabilised against erosion by revegetating with grass cover. Where adequate topsoil is available, the site is covered with reclaimed topsoil and sown with a pasture grass cover (ryecorn/rye/clover/sub clover).

  Drainage paths are established and lined at this stage. Where topsoil quality is poor or is not available at all, 'cover crops' such as ryecorn/fescue are sown directly into the clay face to stabilise it.

  The same technique is used to establish ground cover prior to hand-planting of native grass 'Viro Cells'. Wherever possible, conventional agricultural equipment and well-established agricultural techniques are used to fertilise and sow the various grasses, and proven commercial revegetation techniques are used to line drains.

- Finally the area is planted out with native trees of local provenance, mostly Upperstorey eucalypts and wattles, and in wetter areas, swamp paperbarks. Although the trees are planted in lines to assist maintenance, the lines are staggered, curvilinear and set out to resemble clumps of trees, consistent with the concept of 'Open Woodlands'. Several years after successful establishment of the Upperstorey trees, planting of suitable native Understorey shrubs and ground covers is undertaken.

  Based on previous experience over many years with establishing recalcitrant species on difficult sites, including those without topsoil, IPRH has developed a "Revegetation Code of Practice" in conjunction with DSE. The actual species chosen for planting on Overburden Dumps, while based on 'Pre 1750 Ecological Vegetation Classes' (EVC's), are determined according to known survivability. Generally, medium-stunted Eucalypts (e.g. *E. yarraensis, E. pauciflora, E.* radiata) and tall shrubby *Acacia species* do best.

The cover photos clearly show the successful transition from a 'Dump' to a Rehabilitated Landscape.

A total of approximately of disturbed land has been rehabilitated to date. This includes completed during 2008. Some 45,000 native trees, shrubs or groundcovers of local provenance have been planted in the Overburden Dumps and Mine area since Privatisation in 1996. Prior to this date non-indigenous native vegetation was planted and earlier still, exotic pines were planted as landscape screening.

During 2008 a total of 3,000 native trees, shrubs and groundcovers were planted on the Eastern (external) Overburden Dump as a 'Habitat Corridor'. To date a total of 2.3 million Native Grass "Viro Cells" have also been planted on the Eastern Overburden Dump.

Rehabilitation works are reported progressively to the Victorian Government Regulators and the public through the IPRH Environmental Review Committee (ERC) which meets quarterly. There is also a short annual (mid-year) report to DPI.

When the rehabilitation work for a given area is completed, an ongoing maintenance program is implemented, which includes inspections, erosion repairs, fertiliser re-application (if required), re-sowing of bare areas, grass mowing, and the control of pest plants and animals. The area coming under maintenance increases annually in proportion to new works completed. Specialist contractors undertake all of these works which are also reported to the ERC.

REHABILITATION AT IPRH MINE

Our Vision

Create a safe, sustainable mixed function rehabilitated landscape to meet DPI and Community expectations

1 Eastern Overburden Dump

The majority of rehabilitation work completed to date has been on the Eastern Overburden Dump beside Monash Way. This dump rises up to 30 m above the surrounding flat land to the east and has a significant visual impact on the surrounding areas.

Proposals for rehabilitation of the Eastern (external) Overburden Dump were developed for the former SECV by *Tract Consultants*, and the process included a public input phase via a four-page insert in *The LV Express* in July 1987. The local community's 'Preferred Final Land Use' for the Eastern Overburden Dump was a mixed-function area combining agriculture; open woodland and wetlands; flora & fauna conservation; and passive recreation. The 'Final Rehabilitation Concept (Master) Plan', developed by consultants *DPS P/L*, which was submitted to the then Department of Natural Resources and Environment (DNRE) as part of the "Work Plan" for a Mining Licence application, reflects this philosophy.

The south side of the dump near the Power Station (facing Brodribb Road) was originally constructed with steep batters and planted out with Pines (*Pinus radiata*). There is no ground cover to prevent erosion and as the pine trees have a limited life, they will have to be cleared within 10 years. The cleared site will then require considerable re-working to repair erosion scars and to stabilise the batters. The area will have to be topsoiled, sown to pasture grass and revegetated with native trees. Some native tree screening has recently been planted between the pines and Brodribb Road in anticipation of this work.

The north side of the dump has been landscaped using flatter batters, covered with topsoil and sown to pasture crop. Clumps of Upperstorey trees have been planted and fencing has been installed to create several paddocks. Following the installation of a pumped drinking water supply, cattle troughs and a cattle yard, the area was returned to limited cattle grazing. The landscaping concept used was 'Open Woodland'.

The west side of the dump facing the main Morwell-Hazelwood road has also been landscaped using flatter batters, covered with topsoil and sown to pasture crop. Clumps of Upperstorey trees were planted and fencing installed. However, the site was subsequently overdumped and most of the previously rehabilitated land features, including trees, were disturbed. The site has since been revegetated again and is recovering well.

The eastern side of the dump facing Monash Way was also originally developed as pasture and open woodland. However, the grazing lease has now been terminated permanently as part of the "Bennett's Creek Improvement Plan", as cattle grazing and wetlands development are incompatible activities.

Due to lack of suitable (or any) topsoil, the top of the dump and the upper eastern batters have been revegetated with native grasses, also as open woodland concept (refer to 2 below).

2 Other Overburden Dumps/Rehabilitation Projects

Other major project areas rehabilitated to date have been the Western Overburden Dump beside the Strzelecki Highway (approx.); the Brodribb Road 'Screening Embankment'/South West Corner Dump (approx.); the Mine 'permanent' Western Perimeter Batters; and parts of the Mine permanent Eastern and Southern Perimeter Batters. The Mine permanent Northern Perimeter Batters have not been rehabilitated due to the large amount of infrastructure remaining which is still required for many years to come.

3 Wetlands

Following community input, an impressive series of wetlands were re-created by the SECV on the former watercourses of the Morwell River and Eel Hole Creek, which were both diverted in the 1970's to allow mining to progress into the South West Coal Field.

These wetlands were located between the Mine western boundary and Strzelecki Highway and became a significant water bird habitat. They were awarded *Land for Wildlife* status in May 1996 by the former DNRE in recognition of this initiative.

These constructed wetlands have since been drained and some of the above areas are now being excavated as part of Hazelwood West Phase-1 works. Prior to draining, new wetlands were re-created offsite in a project known as the "Replacement Wetlands" and are the subject of a separate document.

4 Native Grasses

The lowland grasslands of South-eastern Australia are the most threatened natural ecosystems in the country. The destruction of indigenous grasslands has been a feature of European colonisation of temperate regions, including South America (Pampas), North America (Prairies) and New Zealand.

A Management Plan was developed by consultants to protect and enhance a remnant stand of native grasses on the 'Ridge' located within the IPRH site. This involves systematically clearing the area of competing weed species and planting some limited Upperstorey trees. A small plot of the rare and endangered Matted Flax Lily (*Dianella amoena*) has recently been discovered and that is also being protected. Seed collected from this area, mainly Wallaby Grass (*Danthonia sp.*), Kangaroo Grass (*Themeda*), Mat Rush (*Lomandra*) and Spear Grass (*Stipa*), is being used for a pioneering broadacre rehabilitation project on the top level and upper eastern face of the Eastern Overburden Dump.

Native grass seed is also sourced from other (progressively disappearing) remnants within the Works Area and then propagated as "Viro Cells" by a specialist contractor The native grass is progressively hand-planted directly into the clay on the overburden dump, an established technique that has proven far more successful than direct seeding. A low-maintenance ryecorn/fescue cover crop has previously been sown into the clay and fertilised using conventional agricultural equipment, to minimise erosion. This work is done by a local contractor

Despite the worst drought in living memory over the past ten years, the native grasses planted in the original trial plots on top of the dump in 1996, together with more recent plantings, have survived without watering to set seed and propagate downwind, thus increasing the local extent and biodiversity of native grasses in the region.

4.1 Native Grass Planting History

YEAR	Number of 'Viro Cells' Planted
1996-98 trials	105,000
1999	255,890
2000	415,800
2001	272,600
2002	306,320
2003	375,230
2004	269,225
2005	265,000
2006	24,500
2007	6,700
2008	172,000
Total	**2,468,265**

5 Native Tree/Shrub Planting

IPRH has made a commitment to plant and maintain at least 2,500 native trees or shrubs each year as part of its 'Progressive Rehabilitation' program. The majority of plantings to date, particularly on the Eastern Overburden Dump, have been Upperstorey trees such as Eucalypts and Wattles.

The extended drought conditions (this is year 11) and the harsh environment on the Eastern Overburden Dump have caused a postponement of follow-up Understory shrub plantings after one particularly unsuccessful attempt.

5.1 IPRH Mine Recent Native Tree/Shrub Planting History

YEAR	E. Overburden Dump	Wetlands	Other Sites	TOTAL
1997	1900	0	0	**1,900**
1998	2,770	0	0	**2,770**
1999	700	22,000	0	**22,700**
2000	5,000	29,000	0	**34,000**
2001	2,135	20,250	1,200	**23,585**
2002	17,500	230	0	**17,730**
2003	2,630	1,000	440	**4,070**
2004	2,950	15,529	50	**18,529**
2005	900	15,500	2,100	**18,500**
2006	3,000	15,000	176	**18,176**
2007	850	16,500	2,500	**19,850**
2008	3,000	200	0	**3,200**
Total	**43,335**	**135,209**	**6,466**	**185,010**

6. Bennett's Creek Improvement Plan (aka Monash Way Wetlands).

Plans were developed by consultants *DPS P/L* to enhance the visual amenity of the 'Morwell-Churchill Corridor' by building a series of wetlands and native tree clumps between the toe of the Eastern Overburden Dump and Monash Way.

Following the permanent removal of stock from the site, a series of shallow wetlands dams were constructed during 2001 along the existing 'inner' and 'outer' stormwater drains which are located between the toe of the Eastern Overburden Dump and Monash Way. Some 15,000 native trees and shrubs (salt tolerant wetlands species) were planted throughout the area during 2002.

Another feature of the project will be to minimise turbidity and salinity in discharges to Bennett's Creek from these open drains via the wetlands.

It was planned that after some 3-4 years of tree growth, through natural (passive) means, that the water quality would be improved, together with a reduced flow to Bennett's Creek. Unfortunately this performance has been affected by the prolonged drought. On the positive side, the aesthetics of the site from a viewer travelling on Monash Way have been vastly improved over this same period.

7. Overburden Runoff Pond Wetlands.

When overburden was being dumped on the northern side, there was a settling pond, polymer dosing station and sedimentation pond constructed to prevent turbid runoff entering Bennett's Creek. Now that the surrounding area has been fully rehabilitated, the dosing station has been decommissioned and the ponds turned into wetlands. Due to the saline nature of the water in these ponds, overflow water is pumped into the nearby Ash Pond No. 4 to protect Bennett's Creek.

8. Flora and Fauna Monitoring

Flora monitoring on the overburden dumps is limited to observing and noting which species do well in the harsh environment that exists on overburden dumps. From this developed the IPRH "Revegetation Code of Practice".

Fauna monitoring is undertaken on an informal basis during site inspections, tree planting works, etc. and documented.

Of significance is the permanent presence of several generations of Eastern Grey Kangaroos on the Eastern Overburden Dump (17 at latest count). Raptors such as Wedge-tailed Eagle, Swamp Harrier and Whistling Kite are frequent visitors.

Kevin Jones

Mine Environmental Officer, IPRH.

PHOTO APPENDIX

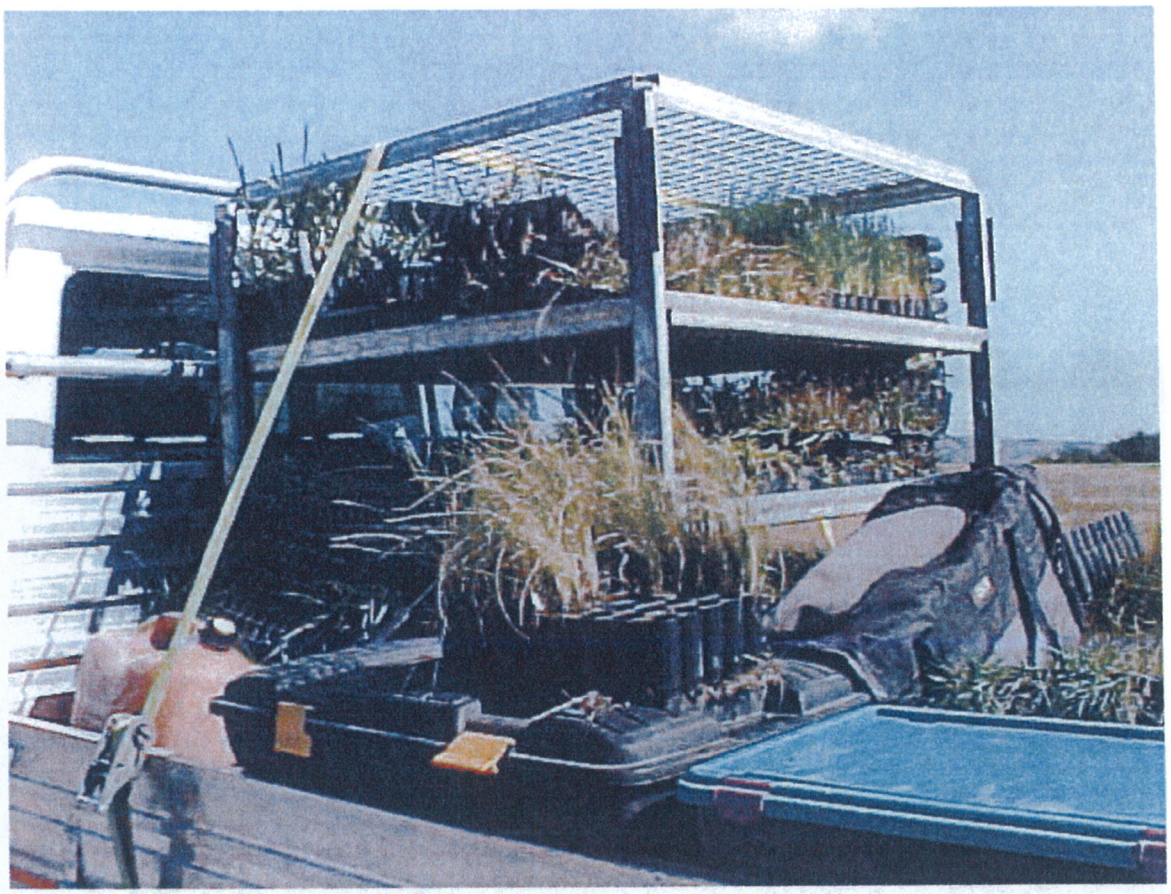
Eastern Overburden Dump north face (in background) looking south from Firmins Lane.

('Open Woodland' landscape concept)

Eastern Overburden Dump east face

looking from Monash Way (at Bond's lane).

Cattle grazing on the rehabilitated north face of the Eastern Overburden Dump.



Native Grass 'Viro Cells' in trays ready for planting.

*Native Grasses (*Danthonia sp.*) and native trees planted on the Eastern Overburden Dump. ('Open Woodland' landscape concept)*

Mechanical Harvesting of Kangaroo Grass (Themeda triandra) *seed from the 'Ridge Reserve' for revegetation works (Alliance Seeds P/L).*

Part of Mine Permanent Void Batters (TP8 Area) 'Progressive Rehabilitation' work.

Part of Bennett's Ck. Improvement Plan.