EMOS: Environmental Management Overview Strategy

New Oakleigh Mine

ML 4568, 4584, 4675, 4683, 4698, 4699 and MLA 50175

Prepared for: **New Oakleigh Coal Pty Ltd**

Prepared by: **New Hope Coal Australia**

April 2002

Table of Contents

Tables

Figures

Document Information

Authorship Change and Acknowledgement

Based on extensive changes made to the content of EMOS3.4 by New Hope Coal Australia as a result of Advisory Body consultation (i.e. three meetings held on 15 March, 28 March & 11 April 2002) and significant editing changes made by New Hope Coal Australia in the original development of EMOS3.4, this document, EMOS3.5, is released as a New Hope Coal Australia document for development of the draft Environmental Authority for Mining Lease Application 50175.

The original environmental and scientific information and professional comment and time provided by Ison Environmental Planners in the development all previous drafts, EMOS3.1 to EMOS3.4, is acknowledged by New Hope Coal Australia as a valuable contribution to the development and content of sections of this document.

Document Control

The following table records the issue and revisions of the document. For convenience, the nature of the revision is briefly noted.

Version	*Date*	*Comments*	*Origin*	*Check*
EMOS3.1	15/03/01	Internal draft - limited distribution	RI	DG
EMOS3.2	18/06/01	Internal draft - limited distribution	RI	PA / DG
EMOS3.3	30/10/01	Revised Internal draft - changed format	RI	DG
EMOS3.4	24/01/02	Submission to EPA and for public consultation	RI/DG	DG
EMOS3.5	15/04/02	Revised based on Advisory Body consultation	NHCA	

File Location: c:\my documents\oakleigh\emos\emos3.5 170402.doc

Abbreviations

ACARP	Australian Coal Association Research Program
EA	Environmental Authority
EAS	Environmental Audit Statement
EMOS	Environmental Management Overview Strategy
EMS	Environmental Management System
EPA	Environmental Protection Agency
EPC	Exploration Permit for Coal
EPP	Environmental Protection Policy
FRR	Final Rehabilitation Report
ML	Mining Lease
MLA	Mining Lease Application
Mt	Million Tonnes
Mtpa	Million Tonnes per annum
NATA	National Association of Testing Authorities
NHCA	New Hope Coal Australia
NPI	National Pollutant Inventory
NRM	Department of Natural Resources and Mining
POOP	Plan of Operations
PP	Prospecting Permits
ROM	Run of Mine

Definitions

"**Administering Authority**" means the Environmental Protection Agency or its successor.

"**Australian Standard 1940**" means "Australian Standard 1940-1993: The Storage and Handling of Flammable and Combustible Liquids" or any replacement Australian Standard.

"**ARI**" means average recurrence interval.

"**Contaminant**" means the definition stated in section 11 of the Environmental Protection Act 1994.

"**Contamination**" has the meaning in section 10 of the Environmental Protection Act 1994, which defines contamination of the environment as the release (whether by act or omission) of a contaminant into the environment.

"**Contaminated land**" has the meaning provided in schedule 3 of the Environmental Protection Act 1994.

"**Environment**" Section 8 of the Environmental Protection Act 1994 defines the environment as:

(a) ecosystems and their constituent parts, including people and communities; and

(b) all natural and physical resources; and

(c) the qualities and characteristics of locations, places and areas, however large or small, that contribute to their biological diversity and integrity, intrinsic or attributed scientific value or interest, amenity, harmony and sense of community; and

(d) the social, economic, aesthetic and cultural conditions that affect, or are affected by, things mentioned in paragraphs (a) to (c).

"**Environmental Authority**" means a licence or approval issued by the Administering Authority under the Environmental Protection Act 1994.

"**Environmental compatibility**" means that operations at the Mine are conducted with due care for the environment, but at a level commensurate with the impacts of the operations (i.e. in terms of safety, the environment and economic efficiency).

"**Existing surface area**" means the area of the mining lease where 'surface mining rights' are held under the Mineral Resources Act 1989. On mining leases where the existing surface is less than the total surface area, the difference in area represents the area where only 'underground mining rights' are held under the Mineral Resources Act 1989. (see also "Lease area")

"**Final Rehabilitation Report**" means a final rehabilitation report prepared under chapter 5, part 10, division 2, subdivision 2 of the Environmental Protection Act 1994. The report assesses the extent to which the standard environmental conditions and any additional conditions of the environmental authority have been met.

"**Financial Assurance**" means a security required under the Environmental Protection Act 1994 by the Administering Authority to cover the cost of rehabilitation or remediation of disturbed land or to secure compliance with the environmental authority.

"**IAMR**" means Internal Annual Monitoring Report prepared by or on behalf of the environmental authority holder.

"**Lease area**" means the total area of the mining lease. (see also "Existing surface area")

"**Mine**" has the meaning defined in the Mineral Resources Act 1989.

"**POOP (Plan of operations)**" means a planning document required under the Environmental Protection Act 1994 for a mining project. The plan will be submitted to the Administering Authority prior to carrying out activities on the mining lease. The plan will contain an Action Program that will demonstrate how the holder of the environmental authority will meet the conditions of the environmental authority and EMOS.

"**Product coal**" means coal that has been mined and washed by the Coal Handling and Preparation Plant (or Washplant) and is ready for sale.

"**Project EMOS**" means the Environmental Management Overview Strategy prepared for the project.

"**Regulated waste**" Schedule 9 of the Environmental Protection Regulation 1998 defines regulated waste as non-domestic waste mentioned in schedule 7 (whether or not it has been treated or immobilised), and includes:

for an element - any chemical compound containing the element; and

anything that has contained the waste (e.g. regulated waste commonly generated from mining projects include tyres, oils, cyanide, mercury and batteries).

"**ROM coal**" or "**Run-of-Mine coal**" means coal that has been mined and not washed by the Coal Handling and Preparation Plant (or Washplant).

"**Washplant**" or "**Washery**" means the Coal Handling and Preparation Plant or the facility used at the Mine to wash the coal ready for sale.

1. INTRODUCTION

An EMOS (Environmental Management Overview Strategy) is an integral part of the application and processing of a non-standard mining lease by the NRM (Department of Natural Resources and Mining) and the EPA (Environmental Protection Agency).

Section 202 of the *Environmental Protection Act 1994* states "The purpose of an EMOS is to propose environmental protection commitments to help the Administering Authority prepare the draft environmental authority for the application."

As required by Section 203 (1) of the *Environmental Protection Act 1994*, this EMOS is intended to:

(a) be in the approved form; and

(b) describe the following—
  (i) each relevant mining lease;
  (ii) all relevant mining activities;
  (iii) the land on which the mining activities are to be carried out;
  (iv) the environmental values likely to be affected by the mining activities;
  (v) the potential adverse and beneficial impacts of the mining activities on the environmental values; and

(c) state the environmental protection commitments the applicant proposes for the mining activities to protect and enhance the environmental values under best practice environmental management; and

(d) contain enough other information to allow the Administering Authority to decide the application and conditions to be imposed on the environmental authority; and

(e) another matter prescribed under an environmental protection policy or a regulation.

As required by Section 203 (2) of the *Environmental Protection Act 1994*, the environmental protection commitments of this EMOS are intended to:

(a) be stated in a way that allows them to be measured and to be audited under part 11; and

(b) state the environmental protection objectives and the standards and measurable indicators, including, for example, objectives for progressive and final rehabilitation and management of contaminated land; and

(c) include control strategies to ensure the objectives are achieved, including for example, strategies in relation to the mining activities—
  continuous improvement
  environmental auditing
  monitoring
  reporting
  staff training.

There may be a need to submit future applications for variations of the EMOS should market opportunities arise which allow potential for expansion of production above the 0.5 Mtpa (Million Tonnes per annum) clean coal proposed in this EMOS. Dependent on the scope of any such expansion opportunity there would obviously be some impact on the Mine's plans, equipment and infrastructure.

There may also be a need for submission of further applications for variation depending upon the outcome of research and experience locally and overseas. These possible variations are discussed where appropriate.

In operating the New Oakleigh Mine, the Company has set a high standard in achieving a safe working environment with sensible environmental compatibility while maintaining a profitable, efficient and sustainable coal mining operation.

Various reports and documents prepared previously and containing environmental data and management strategies used in developing environmental planning for the project have been extensively referred to in preparation of this EMOS.

This EMOS complies with the standard criteria as defined in the Environmental Protection Act 1994.

2. PROJECT DESCRIPTION

2.1 LOCATION

New Oakleigh Coal Pty Ltd operates the New Oakleigh Mine near the town of Rosewood, 65 km west of the city of Brisbane, and 92 km from Queensland's major Port of Brisbane where the Fisherman Islands Export Coal Terminal is situated (Figure 1).

New Oakleigh Coal Pty Ltd currently holds a number of Mining Leases (ML) in the New Oakleigh Mine area totalling about 994 ha (Figures 2 and 7 and Table 1).

Table 1 Details of granted Mining Leases, New Oakleigh Mine.

ML	Lease area (ha)	Existing Surface area (ha)
4568	192.00	54.959
4584	161.60	115.470
4675	62.00	Nil
4683	173.46	37.479
4698	189.30	116.960
4699	129.75	Nil
50175	* 85.41	* 85.410
TOTAL	993.52	410.278

* Current application.

New Oakleigh Mine is strategically located to provide steaming coal for export as well as a variety of domestic coal users in southeast Queensland and the northern district of New South Wales. Traditional markets that have for many years been supplied with coal from New Oakleigh Mine include power stations, hospitals, brickworks, food processing plants, abattoirs, sugar refineries, breweries, paper manufacturers and other small industrial users. New Oakleigh, Swanbank, Ebenezer and Jeebropilly Mines in the West Moreton region and Wilkie Creek Mine on the Darling Downs currently produce Walloon series coals.

The mine area is wholly within the Ipswich City Council and West Moreton region. Telfer et. al. (1998) in a study of the Bremer River and its major tributaries defines the major land uses in the catchment as agriculture and cattle grazing. Other important land uses noted by the study in the catchment were mining, quarrying, rural residential and urban developments, State forest and recreation and nature reserves.

There are a number of residences in the vicinity of the Mine. Currently, the nearest legal human habitation not owned by the company is 0.9 km from the open cut and approximately 0.5 km from the wash plant. The distance from the open cut will

change as operations progress across the site. The location of residences with respect to the mine, washplant and haul roads is shown in Figure 3.

2.2 CLIMATE

New Oakleigh Mine generally experiences a subtropical climate of warm-hot wet summers and cool dry winters. The hottest months are November to March with average maximum and minimum temperatures of around 30°C and 15-19°C, respectively. The coolest months are June to August with average maximum and minimum temperatures of around 21-22°C and 5-7°C, respectively. The average annual maximum and minimum temperatures are 26.6°C and 13.2°C (BOM 2002).

The wettest months of the year are December to February with an average of 116-126 mm falling on an average 11-12 days per month. The driest months of the year are August and September with an average of 30-32 mm falling on an average 6 days per month (BOM 2002). Typical of the Australian climatic environment, irregular periods of drought and higher than average rainfall are not uncommon occurrences.

In general, the wind for all hours tend to be mostly light to moderate (85% of all winds are less than 5 m/sec) with a significant portion of winds from the east-north easterly to easterly sector as well as from the southerly sector (Katestone Environment/Scientific 2002).

The general climatic information for New Oakleigh Mine was sourced from the Bureau of Meteorology Australia (Amberley Station: 27.65° South, 152.71° East) and summary data from Katestone Environment/Scientific (2002) air quality report.

2.3 HISTORY

Oakleigh is the oldest continuously operated coal mine in Queensland and is one of three remaining coal mines still operating in the Rosewood area of the West Moreton District. It commenced operation underground in approximately 1920 as Perry's Knob Colliery and changed its name to Oakleigh Colliery around 1929. Oakleigh was continuously worked by underground means until November 1997 when the underground mine was sealed as the remaining underground coal reserves could no longer be worked economically.

Oakleigh Colliery first commenced open cut operations in 1973 at the southeast corner of ML 4584 and progressed in a generally northern direction. This pit was developed to supplement underground operations and was known as the North Pit. The North Pit remained in operation until 1998.

Normanton Collieries also started an open cut, the Normanton Pit, on the eastern side of Blake's Road in 1973. It was developed to supply coal to the now defunct power stations of Bulimba and Tennyson. Operations in the Normanton Pit moved westwards across Blake's Road and then northwards. The operation in this area ceased in about 1981.

In June 1997, mining recommenced at the Normanton Pit and continued until December 1999 when coal reserves could no longer be worked economically. The area is currently under rehabilitation. This operation was within 1 km of the town of Rosewood.

New Oakleigh Coal Pty Ltd, a subsidiary of New Hope Coal Australia (NHCA), acquired the Mine in December 1999. In March 2000, New Oakleigh Coal Pty Ltd resumed mining in the North Pit. Coal mining in the North Pit ceased at the end of September 2000 when the remaining available coal reserves were mined out. This pit is now being used as an emplacement area for tailings and coarse reject disposal and will be progressively back filled over the life of the mine.

The initial box cut operations for the West Pit on ML 4698 commenced in May 2000 and coal mining commenced in September 2000. ROM (Run of Mine) coal is hauled from the West Pit by trucks via an approved road crossing over the Rosewood – Marburg Road to the existing washery located on ML 4584 for processing.

In September 2001, in-pit dumping of overburden commenced allowing initial rehabilitation works (profiling and top soiling) to commence on the out-of-pit dump. Advanced rehabilitation works (revegetation with grass and tree species) commenced in late 2001.

2.4 LAND TENURE

Figure 2 shows cadastral details and land ownership for the various project ML's (MLs 4568, 4584, 4675, 4683, 4698 and 4699 and MLA 50175) and surrounding areas. NHCA owns all the freehold land affected by surface mining (Figures 2 and 3).

Within the surface area of the mining leases there is the gazetted road reserve of the 'Rosewood-Marburg Road' that may be affected by future mining operations. New Oakleigh is proposing in the future to possibly re-align the Rosewood-Marburg Road to allow improved recovery of the economic coal reserve within ML 4698. Discussions have commenced with the Department of Main Roads in relation to the proposal. The local Rosewood community will be consulted in relation to the proposed road re-alignment as details become available (i.e. as part of the Mine's Community Consultation and Awareness Program - see 3.9.3.4 Control Strategies for Social Conditions).

If approved, re-alignment of the Rosewood-Marburg Road will offer the added benefit of upgrading current road conditions, including safety aspects, and allow haulage of coal from the West Pit to the washplant under the re-aligned road.

2.5 GEOLOGY

Currently, New Oakleigh Mine produces coal from the lower series of the Walloon coal measures, which were deposited 150 million years ago in the Jurassic Period. The Walloon Coal Measures are characterised by thin coal seams with multiple splits interspersed with layers of clay, shale, siltstone and sandstone. The overburden

comprises light grey sandstone (usually clayey, sometimes calcareous) and siltstone with some ironstone beds. These rocks weather to a brown colour to a depth of up to 20 m. Mining conditions are often difficult due to dilution of the raw product by these contaminants.

Coal quality characteristics are high volatile matter, low sulphur, low nitrogen and good electrostatic precipitability. Sulphur, both organic and inorganic, occurs in the Walloon coals, inferior coal and carbonaceous shales. Total sulphur is highest in the marketable coal - about 0.6 %. Inorganic sulphur is visible at times in all carboniferous lithologies in the form of pyrite nodules. Calcite is more common, usually occurring as in-fillings in coal and inferior coal cleats. To-date, no occurrences of acid mine drainage have been identified on site. Monthly monitoring information collated in Annual Audit Reports has demonstrated that the pH of the water from overburden runoff is neutral to alkaline.

2.6 SOIL TYPES

A soil survey detailed in Ison Environmental Planners (2001) identifies three principal soil types within the boundaries of ML 4698 (current mining area) and MLA 50175 (Western Extension). A summary of the three principal soil types is provided in Table 2. The areas of ML 4698 and MLA 50175 are the focus of current and proposed mining operations at New Oakleigh Mine.

2.7 MINING OPERATION

The main elements of the Mine are:

- presence of a high grade coal resource;
- clearing of vegetation in advance of mining;
- selective stripping of available topsoil to be immediately reused or stockpiled for further use in the rehabilitation program;
- operation of a conventional open cut truck and shovel mine;
- overburden used to form environmental bunds, haul roads and hardstands with most spoil used to backfill mined out areas although excess spoil is dumped outside the pit limits clear of the coal resource;
- mining of a high energy, low ash, low sulphur coal;
- reshaping of spoil dumps, replacement of topsoil and revegetation of the mined out and backfilled area;
- processing of coal through an existing washplant located on ML 4584;
- transport of product coal by road to domestic markets and export via the Ebenezer Rail Loop out of the Port of Brisbane;
- utilisation of existing and new support infrastructure facilities including offices, power and water; and

Table 2 A summary soil types within ML 4698 and MLA 50175, New Oakleigh Mine (Ison Environmental Planners 2001).

Soil Type	General Description	Average Depth	General Location
Grey-brown Dermosol	Uniform textured profile (Uf 6.31, Uf 6.32, Uf 6.33). Very dark grey to dark brown, fine sandy light clay to light clay surface texture. Land capability is Class III, being suitable cultivation with moderate restrictions.	140-250 mm	Located on the hill slopes (moderate slopes).
Grey Vertisol	Uniform textured profile and a cracking surface (Ug 5.24). Very dark greyish brown, light medium to medium clay surface with angular blocky structure grading gradually to a dark greyish brown medium clay, strong medium to coarse lenticular structure with occasional faint orange mottling. Land capability is Class III (being suitable cultivation with moderate restrictions) although areas of Class II (being suitable cultivation with slight restrictions) exist close to the road.	100 mm	Located on the terrace area, adjacent to the drainage lines (moderate to gentle slopes).
Alluvial	Coarse sandy surface horizon underlain by layers of alluvial material deposited by water movement. Subject to water logging for extended periods. Land capability is Class VII (being not suitable for cultivation but pastoral use possible with careful management).	The depth varies depending on depositional and erosional forces.	Located within the drainage line area, draining the surrounding hills (gentle slopes).

- continued direct employment of operating workers and support personnel with the flow on employment through the provision of associated goods and services.

A general arrangement plan showing the location of the existing and proposed activities is presented (Figure 3).

Mine planning studies indicate that the West Pit has 3 Mt of coal available at the current strip ratio and economic circumstances (e.g. coal prices, market demand, etc.).

New Oakleigh Coal Pty Ltd employs its own staff and equipment as well as utilising earthmoving and other contractors when required. The Mine currently operates from 6:00 am to 2:00 am Monday to Friday and 6:00 am to 6:00 pm Saturday. The Mine may progress to 3 shifts per day. Therefore, potential impacts have been determined on a 24 hour/day, 7 days/week operation.

It is an open cut multi-seam operation using selective mining methods. Mining involves the use of dozers, excavators, front end loaders and rear dump trucks. Overburden is ripped and pushed by dozers and removed using front end loaders or excavators and rear dump trucks. Coal is selectively mined. Coal bands are removed separate to the stone bands allowing a better quality product to be presented to the coal treatment plant (washplant).

An important New Oakleigh Mine's open cut mining methodology is to clean each coal ply during mining, extract any bentonite laminations and provide coal to the washery as clean as possible for washing. New Oakleigh Mine currently regard -100 mm of coal ply band and –50 mm of bentonite clay or parting as the cut off limit for recovery.

Mining currently employs approximately 24 personnel operating haul trucks, front end loaders, graders, dozers, a water truck, and a fuel and service truck. Light vehicles also perform a range of functions on site.

2.8 COAL WASHING

The current washery is the combination of a McNally Baum Jig installed in 1959 and Visman Water Washing Cyclones installed in the 1970's. This has been progressively improved to meet current operational and safety requirements.

ROM coal from the Mine is washed to produce a variety of washed clean products (product coal). The washery operates on a 2 or 3 shifts per day basis depending on production rates and washability, normally from 10:00 pm Sunday to 10:00 pm Friday each week. Currently, 8 personnel are employed at the washery on a 3 shifts per day basis.

Washery feed rates vary according to the quality of the ROM feed, including the amount of contamination from the interburden between the coal plies being mined.

High quality ROM coal can be washed at feed rates up to 150 t/hour while lesser quality ROM feed may require much lower feed rates.

The present plant with minor upgrades will be capable of producing 0.5 Mt (Million Tonnes) of washed coal per year.

Coal produced from the washing plant is stockpiled on the clean coal stockpile pad. From here the coal is loaded into road trucks for delivery to various local customers or transported to the Ebenezer Rail Loop. Currently all coal is transported by road from the site.

Coarse washery reject (coalstone) is removed from the washery using small tip trucks for emplacement in the former worked areas. Fine tailings are pumped to the existing mining voids. All water from these operations is recovered and used in the washery system. Coarse rejects and fine tailings are currently disposed in the North Pit. When the North Pit is completely filled, the reject and fine tailings will be deposited in the Normanton Pit. The Mine possesses sufficient void space to cover the current production rate or any future increase in production rate. This method of waste disposal is an efficient and beneficial use of mine void space.

No hazardous chemicals are used in the preparation process. The process relies entirely upon water for the separation of coal and reject. This water is utilised from a closed water system whereby any water recovered from the process is reused. Nothing is added to the tailings to assist in settling.

2.9 WESTERN EXTENSION

MLA 50175 is approximately 2 km to the north west of the town of Rosewood, in relatively flat to slightly hilly terrain.

The area of interest is located within Exploration Permit Coal 642 and Prospecting Permits 50596 and 50601. Geographically, the area of interest is bounded to the east by ML 4698, the west by Keates Road, the north by the Australian Railway Historical Society railway line, and the south by Urry Road (Figures 2, 3 and 7). The total area of the mining lease application is 85.41 ha and the proposed mining area is approximately 43 ha.

The Western Extension contains 1.7 Mt of saleable coal and is proposed as a continuation of existing operations in the West Pit. The extension will lengthen the operation of the open cut mine by approximately 5 years. The mining works will be undertaken using the following operations and equipment:

Clearing – Dozer, front end loader and dump truck;

Overburden extraction – Excavator, dump truck, dozers and scrapers; and

Coal extraction – Excavator, dump truck, dozers and front end loaders.

Mining will continue to progress as a series of strips generally south to Urry Road. Initially, overburden from mining was placed in an out-of-pit spoil dump. Overburden

is now largely used to back fill previously worked areas and will continue under this method for the majority of mine life.

In moving to the Western Extension, New Oakleigh Coal Pty Ltd will increase the current level of mining production to 0.5 Mtpa of clean coal. Existing infrastructure including haul roads and coal washery will continue to be used.

The development of the new Western Extension mine will coordinate with the existing West Pit to facilitate the continuous production of coal (Figures 3 and 7).

The backfill areas will be undulating with the appropriate profile and contour to fit the surrounding landscape as per the commitments in the current EMOS and Plan of Operations (POOP).

3. ENVIRONMENTAL IMPACTS AND CONTROL

3.1 GENERAL

New Oakleigh is committed to adopting good management practices and to mine in accordance with all statutory requirements or amendments at any given time unless written agreement has been sought and received to do otherwise. A number of general Environmental Authority (EA) conditions applicable to all elements have been established.

Draft EA Conditions

General - EA Conditions

EA Condition 1. The conditions of this environmental authority are in force until the Administering Authority pursuant to the Environmental Protection Act 1994 accepts the surrender of the authority or approves an amendment to the authority.

EA Condition 2. A financial assurance will be lodged for this environmental authority with the Department of Natural Resources and Mines in the amount and form and at a time required by the Administering Authority.

EA Condition 3. The financial assurance for this environmental authority will remain in place until the Administering Authority accepts the surrender of the environmental authority or approves an adjustment to the financial assurance.

EA Condition 4. Notwithstanding any other requirements of this environmental authority, all reasonable and practicable measures will be taken to prevent and/or to minimise the likelihood of environmental harm being caused when carrying out the environmentally relevant activity authorised by this environmental authority.

EA Condition 5. The Administering Authority will be notified within one business day of an event which causes or may cause environmental harm (i.e. not in accordance with the conditions of this environmental authority).

EA Condition 6. The Environmental Authority Holder undertakes to commit the necessary management, technical, personnel, mechanical and financial resources to ensure compliance with the conditions of this environmental authority.

EA Condition 7. The current complaints register will continue to be maintained and all legitimate complaints will be addressed, thoroughly investigated and remedial action will be undertaken as necessary to prevent further occurrences of the identified problem/nuisance (i.e. in accordance with New Hope Coal Australia's Complaints Handling Procedure).

Note: If this application proceeds, the EPA will develop streamline licence conditions based on the information provided in the EMOS, statutory requirements and EPA policies and guidelines.

3.2 AIR QUALITY

3.2.1 ENVIRONMENTAL VALUE

Local airshed is of high quality, compromised only infrequently by diffuse particulates and dust haze produced by agricultural and pastoral operations on surrounding lands, especially during periods of drought.

3.2.2 IMPACTS ON AIR QUALITY

There are a number of residences in the vicinity of the Mine. The edge of the town of Rosewood, the nearest commercial centre, is within 2 km (Figure 3).

Katestone Scientific Pty Ltd (2002) conducted an assessment of potential air pollution in the vicinity of the mine site based on current and predicted future operational parameters. The assessment identified the main emissions from the proposed west pit extension as dust emissions from soil, overburden and coal handling activities, in particular:

- land clearing and top-soil removal and overburden loading and dumping (using trucks and loaders);
- coal excavation, loading and unloading (using trucks and loaders);
- transport of coal to the wash plant stockpiles and overburden to the dump site; and
- wind erosion of stockpiles and exposed areas.

Burning of cleared vegetation may also be an intermittent source of dust, ash and smoke nuisance. However, this practice is uncommon and the last resort in a hierarchy of strategies for dealing with cleared vegetation (see Section 3.4.3.4.5 Topsoil Recovery).

Dust emissions will vary according to the following factors:

- coal seam and overburden properties;
- prevailing meteorological conditions;
- mining activities currently occurring (such as clearing, overburden removal or coal extraction);
- location, condition and extent of stockpiles; and
- length of time that cleared areas remain unvegetated.

In conclusion, the assessment by Katestone Scientific Pty Ltd (2002) made the following statements about potential air pollution based on current and future operations at New Oakleigh Mine.

- The main source of emissions from the proposed west pit extension will be haul road emissions and the loading and unloading of overburden.

- Predicted 24-hour average ground-level concentrations of fine particulates (PM_{10}) are predicted to be well below the guidelines within the township of Rosewood.
- Predicted annual average nuisance TSP concentrations and dustfall levels are predicted to be well below the guidelines in the township of Rosewood.
- Predicted maximum 24-hour average ground-level concentrations of fine particulates (PM_{10}) due to the mine are predicted to be below the 24-hour guideline at residences not owned by the mine.
- Predicted TSP and dustfall levels are below the annual guidelines at residences nearest the mine, with maximum values to the north east of the mine at sites 8 and 9. During later years the impact will be lower as mining activities move to the south.
- Dustfall monitoring undertaken at the existing New Oakleigh Mine indicates that dust nuisance is unlikely to occur at distances greater than 500 m from the centroid of mining operations.

The use of vegetated mounds and additional mitigation measures (such as stockpile watering, reduction of vehicle speed, relocation of haul roads, minimisation of cleared areas) if and where required on the basis of future dustfall monitoring should reduce dust impacts at all nearby receptors to below the relevant health and nuisance related guidelines.

3.2.3 COMMITMENTS FOR AIR QUALITY

3.2.3.1 Objective for Air Quality

New Oakleigh Coal Pty Ltd will minimise the impacts on ambient air quality levels from operations at New Oakleigh Mine and ensure that emissions are within acceptable measured values and do not affect sensitive receptors.

3.2.3.2 Indicators for Air Quality

- Levels of fugitive dust.
- Levels of fugitive particulates (PM_{10}).
- Monitoring results of dust deposition levels and particulates.
- The number of legitimate complaints received from surrounding sensitive receptors in relation to air quality (e.g. dust complaints).
- Installation of control strategies and verification that these achieve the design operating parameters.

3.2.3.3 Standards for Air Quality

- Airborne dust deposition rate will not exceed an average annual 130 mg/m^2/day at nearby sensitive receptors.
- Particulates (PM_{10}) will not exceed 150 $\mu g/m^3$ (24 hour average) at nearby sensitive receptors.

- All monitoring and sampling techniques conducted by New Oakleigh Coal Pty Ltd will be consistent with the Air Quality Sampling Manual, EPA, and applicable Australian Standards.
- Compliance with the Offensive Odour and Air Pollution Section of Ipswich City Council's Rural Development Code (ICC 2001c).
- Monitoring results will be interpreted on a monthly basis and reported on an annual basis.

3.2.3.4 Control Strategies for Air Quality

The management of dust at New Oakleigh Mine seeks to:

- create a satisfactory working environment for the mine workers;
- improve visibility and safety;
- prevent excessive contamination of equipment, nearby residences and the surrounding countryside; and
- meet the air quality goals of the EPP (Air) 1997.

As required, the following control strategies are employed at New Oakleigh Mine to help meet the air quality standards set out in this EMOS.

- Haul roads are watered on a continuous basis by water trucks whenever mining or haulage operations are being undertaken.
- Land clearing operations are scheduled in a manner to avoid burning vegetation or topsoil stripping when winds are blowing towards sensitive locations or wind speeds are excessive (e.g. > 5 m/s) – (see also 3.4.3.4.5 Topsoil Recovery).
- Land clearance is kept to an operational minimum (i.e. to what is required for safe and efficient operations).
- Loose stockpiles are orientated or bunded with reference to the prevailing wind direction to reduce exposed surfaces.
- Mining operations and haul roads are bunded with reference to the prevailing wind direction to reduce wind exposure.
- Sections of the washplant are enclosed to minimise excessive dust release.
- Rehabilitation is conducted as soon as operationally possible on disturbed areas to allow establishment of a protective vegetative cover.
- Where operationally possible, buffer areas are established between operations and sensitive locations.
- Where operationally possible, overburden dumping heights are reduced.
- Where operationally possible, blasting operations are not conducted when winds are blowing towards sensitive locations.
- On site vehicular speeds are limited to 60 km/hour.

- Roads at the Mine are constructed and maintained in a manner that promotes surface cohesion and strength.
- All complaints about the Mine's operations are handled in a prompt manner using NHCA's complaints handling procedure. As required, new monitoring sites are established to investigate legitimate concerns.
- NHCA has purchased a number of sensitive sites (private residences) close to the current operations to remove the potential for adverse impacts to sensitive receptors. This procedure will continue on an as required basis as operations progress.
- NHCA continues to investigate new products and research into dust suppression for potential use on site.

Many of the above dust control practices are based on 'best practice' environmental management for dust control and are conducted as described by Environment Australia (1998c) and Cliff (1996).

In relation to bunding, two forms of bunding exist on site, short and medium-long term. Short term bunds are temporary structures, and therefore, do not receive any specialist treatment, except where necessary to stabilise against erosion (e.g. using grass species). Short term bunds may be constructed using topsoil. Medium-long term bunds are normally put in place for periods of two years or longer, and therefore, may receive specialist treatment to improve visual amenity (e.g. using tree plantings). To-date, due to operational factors, bunding has been of a short term nature. A review of future bunding requirements based on projected mine planning will be conducted to identify where long term bunds or tree screens may be established to assist in attenuation of air, noise and/or visual impacts. Medium-long term bunds will not be constructed using topsoil.

The company has a well establish consultation strategy with nearby residences to ensure response to perceived problems. New Oakleigh Coal Pty Ltd has established a complaint register and complaint handling system. If a complaint is received, New Oakleigh Coal Pty Ltd undertakes to thoroughly investigate the complaint, establish the legitimacy of the complaint and undertake remedial action as necessary. Dust monitoring using static dust deposition gauges will be undertaken as required.

If required, control strategies can be implemented to promptly address any legitimate complaints and to ensure compliance with the EMOS. All statutory requirements will continue to be addressed.

Spontaneous Combustion

At New Oakleigh Mine, the virgin coal seam is not expected to provide any problem during operations. Spontaneous combustion has not been an issue during active mining operations. At the end of the mine life any coal seam likely to be a fire risk in the final voids will be sealed off by backfilling the bottom of the void above the coal seam.

All coal rejects and tailings will be buried back in the pit and covered with a minimum of 1 m of spoil.

Coal that is to be stockpiled for any length of time (raw or product) will be compacted to reduce air/water ingress. Prevailing wind directions will be considered in layout of stockpiles and provision of wind protection. The operational height of stockpiles is also minimised to reduce air ingress.

Should any hot spots develop, they will be dug out and dealt with immediately they are noticed. After combustion has been extinguished, the material will be either put through the wash plant (if otherwise good coal) or compacted and buried under impermeable overburden layers.

Draft EA Conditions

Air Quality - EA Conditions

EA Condition 8. The release of dust and/or particulates (PM_{10}) from mining activities at New Oakleigh Mine will not cause a nuisance at any dust sensitive place.

EA Condition 9. Airborne dust deposition rate will not exceed an average annual 130 mg/m^2/day or particulates (PM_{10}) will not exceed 150 µg/m^3 (24 hour average) at nearby sensitive receptors.

EA Condition 10. All dust monitoring will be conducted in accordance with the appropriate Australian Standard (e.g. dust deposition - AS 3580.10 or PM10 – AS 3580.9.6) or any alternative method of monitoring permitted by the "Air Quality Sampling Manual" as published from time to time by the Administering Authority.

Note: If this application proceeds, the EPA will develop streamline licence conditions based on the information provided in the EMOS, statutory requirements and EPA policies and guidelines.

3.3 WATER MANAGEMENT

3.3.1 ENVIRONMENTAL VALUE OF WATER

Surface Water

The lease area is on a hillside traversed by ephemeral gullies. During periods of flow, the ephemeral gullies eventually empty via farm dams into Western Creek, just to the southwest of Rosewood (Figure 4). Western Creek joins with the Bremer River, about 1.5 km south of Rosewood. The catchment of the lease area is part of the Western Creek/Franklin Vale Creek Subcatchment of the Bremer River (Telfer et. al. 1998).

The occurrence of water leaving the lease area is infrequent, as the ephemeral gullies only carry water for short periods following major rainfall events due to the Mine's location at the top of the catchment and the short steep catchment areas on site.

No permanent water bodies are present within the project area, except for farm dams and dams and pits created as part of the Mine's water management system (Figures 4 and 6). Surface water from the site is used for stock watering.

Groundwater

The project is not within a Proclaimed Area under the Water Resources Act 1989/Water Act 2000. Water levels in the mine area are consistent showing a gradient north to south reflecting the surface topography.

Groundwater yield from exploration holes and active mining pits has been very low or nil and no significant groundwater has been encountered by any surface or underground mining operations. Extensive drilling completed within the current mining area to establish the extent of old underground workings has identified that only the old underground workings exist as a discreet underground water source. Available data indicates no sizeable, useable groundwater resource within a 2.0 km radius of proposed operations. Currently, the nearest known groundwater resource is the Bremer River alluvials to the south of Rosewood.

Analyses of groundwater samples from the site were nonsaline with a salinity of < 550 µS/cm. Results of current monitoring of groundwater from underground workings are generally saline with a salinity of 5,000 to 7,000 µS/cm.

Current Water Management

Current operations recycle water on site for dust suppression and use in the coal washery circuit. The recycled water is managed from the various surface water structures on site and is supplemented with groundwater from old underground workings (Figure 6). Water is also managed to minimise the potential for discharge off site. The periodic addition of groundwater from old underground workings occurs during dry times to make up for operational water losses (evaporation, product removal, etc.). All water management structures on site are monitored and evaluated on a monthly and annual basis.

The key environmental value for water are:

- the physical, chemical and biological integrity of the Bremer River and its amenity as a water source for stock and small-scale irrigation; and
- the preservation of local groundwater as a water source for agricultural or other suitable uses.

3.3.2 IMPACTS ON WATER

The areas or issues where the Mine is likely to have impact have been identified as:

- mine water supply;
- security of supply for downstream users;
- groundwater; and
- water quality (surface and underground).

The large areal disturbances on the lease and the coal processing requirements have resulted in contaminant mobilisation on the lease. Water monitoring including the current program has identified potential water management issues. They are

principally sediment mobilisation from mined areas as well as chemical elements from dissolved solutes in runoff, groundwater and process waters.

Potential sources of water contamination at the New Oakleigh Mine are:

Mine dewatering	Pit water from groundwater, direct rainfall and runoff from spoil.
Process water	Sediment and dissolved salts from overflow of drains and pipe failure.
Coal	Runoff containing sediment and dissolved salts from stockpiles.
Cleared areas	Runoff containing sediment.
Spoil	Runoff containing sediment and dissolved salts.
Infrastructure	Runoff from roads etc. containing oils, sediment, etc..

3.3.3 COMMITMENTS FOR WATER MANAGEMENT

3.3.3.1 Objective for Water Management

New Oakleigh Coal Pty Ltd will ensure that water quality, water access, and the physical, chemical and biological characteristics of the water in the Bremer River and nearby groundwater sources are not degraded by operations at New Oakleigh Mine.

3.3.3.2 Indicators for Water Management

- Concentrations at key monitoring points of conductivity/salinity, suspended solids and pH (as an indicator of acidity).
- Upstream / downstream water quality variances in relation to the mine site.
- Discharge levels or flows off site.
- The number of legitimate complaints received from surrounding sensitive receptors in relation to water quality.
- Installation of control strategies and verification that these achieve the design operating parameters.

3.3.3.3 Standards for Water Management

The Mine's discharge water quality criteria shall be in accordance with Table 3.

Table 3 Maximum and target discharge water quality criteria, New Oakleigh Mine.

Parameter	Units	Maximum Level*	Target Level
pH		6.5 - 9.5	6.5 – 8.0
Conductivity	µS/cm	7,500	1,500
Total Suspended Solids	mg/L	100	30

* Discharge for storm events exceeding design criteria.

Water quality at monitoring stations downstream of the Mine will not exceed the maximum level specified in Table 3 of the EMOS or 10% higher than the background levels upstream of any disturbance, whichever is higher.

Water sampling will follow the EPA Water Quality Sampling Manual and water samples will be taken to a laboratory NATA (National Association of Testing Authorities) accredited for each analyte for analysis.

Routine monitoring of water leaving the mining lease will be undertaken to determine if adjacent water users are not adversely affected by the Mine's operation. Monitoring results will be interpreted on receipt and action taken to address any adverse results. Legitimate complaints in relation to water issues will be dealt with promptly using NHCA's complaint handling procedure.

A detailed description of the water management system and current monitoring locations will be described in the POOP. An annual evaluation of water analysis results will be undertaken to check the effectiveness of the Mine's water management plan.

3.3.3.4 Control Strategies for Water Management

The Mine's water management system consists of a raw water dam, sediment ponds, stream diversion banks and water diversion bunds. The aim of the Mine's water management system is to:

- maintain water quality leaving the lease area to agreed standards for downstream use;
- protect groundwater resources;
- minimise interruption to mining operations, including flooding of the pit;
- ensure water is available for coal processing and dust suppression;
- preferentially use water that can not be discharged for mining and processing;
- accommodate staged development of the mine; and
- comply with statutory requirements.

Dams, waterways, diversion banks, sediment control structures and a water recycling scheme have been installed to provide catchment separation and control of clean and dirty water. Dirty water runoff from current mine and recently rehabilitated areas is diverted to sediment ponds, treated by overland flow or other sediment control devices prior to discharge to protect water quality. To minimise the possibility of discharges off lease, dirty water runoff is used extensively in the water recycling scheme for process water and dust suppression. Water on the leases is managed to ensure control of water quality and quantity.

The following hydrological design criteria are normally applied in relation to water management on site:

- the catchment area is defined, the discharge flow rate is determined for the

catchment based on the selected storm event (frequency and duration) and the water management structure is constructed appropriately based on the discharge flow rate;

- detention/sediment ponds are designed for 1 in 10 year storm events with allowance for siltation;
- channels/waterways and dams spillways are designed for 1 in 20 year storm events;
- no runoff from areas under rehabilitation is allowed to pass off site without being routed through a detention/sediment pond; and
- runoff velocities for 1 in 5 year storm events in main channels are to be kept to < 2.0 m/s as an absolute maximum and < 1.5 m/s as a desirable maximum.

New Oakleigh Coal Pty Ltd will develop a 'Standard Operating Procedure' outling the inspection regime and cleaning method for detention/sediment ponds at New Oakleigh Mine and the correct disposal method for sediment removed from detention/sediment ponds. The 'Standard Operating Procedure' will be designed to ensure that:

- sediment control structures operate efficiently at New Oakleigh Mine, particularly during the wet season or periods of high inundation; and
- sediment removed from sediment control structures is disposed of in a manner that will not cause environmental harm (eg. using in-pit burial of the sediment).

The project area is divided into three main water management areas:

1. West Pit area (current mine area);
2. Washplant and North Pit areas (current processing and tailings disposal areas); and
3. Normanton Pit area (former mine area).

West Pit Area

In the West Pit area, there are two main catchment areas, one that drains from the east/southeast (rehabilitation, area ROM pad, haul road and bunds) and another that drains from the south/southwest (current mine path). The south/southwestern drainage involves two well-grassed gully systems and a series of ex-farm dams, which now act as sediment traps. OW10 is the point confluence of the two gully systems and is monitored as a major discharge point. The east/southeast drainage travels initially along a reconstructed channel/waterway containing a series of sediment traps to a dam below the ROM pad. From the dam below the ROM pad, water spills and flows via a well-grassed gully to OW9, which is the other major discharge point monitored by the Mine. Another drainage gully from the eastern side of the Rosewood-Marburg Road also joins at OW9.

Washplant and North Pit Areas

The drainage arrangement in the Washplant and North Pit areas is complicated and

influenced by historical factors, such as the location of the Washplant, a former council landfill and the Ipswich City Council's current transfer station for the Rosewood district. The void at the North Pit (OW1) captures surrounding runoff (ML 4683) and is a non-discharge system. Water from this site is recycled back to the Washplant Holding Dam (OW4). The Washplant Dam is the main supply dam for the Washplant and receives runoff from the surrounding area (ML 4584 rehabilitation, roads and the Washplant area) and groundwater from old underground workings.

The Washplant Dam, which overflows only during extreme events, spills into a gully that eventually drains to OW9. Water spilling from the Washplant Dam is caught by another dam (OW6), which further spills via a well-grassed gully to OW9. As required, OW6 is pumped dry to reduce the potential for off site discharges. OW5 is a dam above the Washplant, which receives runoff from the surrounding area (ML 4584 rehabilitation and a nearby road) and groundwater pumped from old underground workings.

Normanton Pit Area

In the Normanton Pit area, runoff from disturbed areas flows to the former pit and is a non-discharge system. Runoff from established rehabilitation to the south of the Normanton Pit flows overland via well-grassed areas and a series of dams to the Rosewood Detention Basin or Blakes Road.

An overview of the Mine's current dirty water management described above is provided in Figure 6. The overview concentrates on dirty water management and does not include water losses from evaporation, product removal and seepage.

Monitoring of all major water management structures and discharge points is conducted on a monthly basis to ensure water quality is maintained below the water discharge criteria. This is important during dry times when groundwater is used to supplement the water supply. To-date, results from the on-going water monitoring program has confirmed that current water management practices are satisfactory and that the water quality is suitable for stock watering (the main water use downstream of the Mine).

In addition, the following 'continuous improvements' will be added to the current surface water monitoring regime:

1. rising stage samplers will be installed at each of the main discharge points to monitor compliance with the water discharge criteria during major flow events;
2. the monitoring of water quality in the rainwater tanks of the Mine's nearest neighbours (i.e. based on agreement by the owner's of the rainwater tanks to the monitoring) for a reasonable period to establish if the water quality of the rainwater tanks is being adversely affected by the Mine's operations;
3. the monitoring of water quality of the Bremer River up and downstream of the Mine will be added to assess the impact of the Mine upon the river;
4. additional monitoring points will be established on site to incorporate the ex-farm dams recently incorporated into the water management regime; and

5. reporting of surface water monitoring results will be included in the Mine's commitment to public reporting as part of the Mine's Community Consultation and Awareness Program (see 3.9.3.4 Control Strategies for Social Conditions).

In relation to groundwater, New Oakleigh Coal Pty Ltd will establish a groundwater monitoring regime in the vicinity of the Mine based on previous fieldwork, further reseach and additional information (owner's contact details, locations, etc.) provided by the local community (e.g. by local community groups with concerns, such as the Rosewood District Protection Organisation). The monitoring will be designed to help identify if the Mine is impacting on the local groundwater users. Reporting of groundwater monitoring results will be included in the Mine's commitment to public reporting as part of the Mine's Community Consultation and Awareness Program (see 3.9.3.4 Control Strategies for Social Conditions).

Fuels and oils will be stored in bunded areas in accordance with Australian Standard AS 1940. Bunded areas will have compacted floors or liners to minimise and prevent seepage losses.

Contaminated water containing oil or other hydrocarbons products will be contained, collected and used on site or treated to reduce hydrocarbon to acceptable levels before release. Waste oil and other hydrocarbons products are collected and recycled off site by a licensed operator.

To reduce the potential impacts to water from accidental spills, NHCA employs a policy of buying 'environmentally-friendly' chemical products. This is a progressive system, which seeks to continually improve the chemicals used on site.

Many aspects of the water management control strategies detailed above are consistent with 'best practice' environmental management for water management on mine sites (i.e. as defined by McQuade & Riley (1996), MCA (1997) and Environment Australia (1999)). As stated earlier, the site's water management plan will also be fully detailed in each POOP.

Draft EA Conditions

Water Management - EA Conditions

EA Condition 11. All on site surface water management structures are designed to a hydraulic standard commensurate with the risk associated with failure of that structure in terms of environmental harm and safety factors.

EA Condition 12. The Environmental Authority Holder will ensure water quality at monitoring stations downstream of the Mine do not exceed the maximum receiving water quality specified in Table 3 of the EMOS or 10% higher than the background levels upstream of any disturbance, whichever is higher.

EA Condition 13. Monitoring of water leaving the mining leases will be undertaken to ensure adjacent water users are not adversely affected by the Mine's operation.

EA Condition 14. Water sampling undertaken by the Environmental Authority Holder will follow the EPA Water Quality Sampling Manual and analysis will be undertaken by laboratories NATA accredited for each analyte.

EA Condition 15. The Environmental Authority Holder will interpret water analysis results on a monthly basis and complete an annual evaluation of water analysis results to check the effectiveness of New Oakleigh Mine's water management plan.

Note: If this application proceeds, the EPA will develop streamline licence conditions based on the information provided in the EMOS, statutory requirements and EPA policies and guidelines.

3.4 LAND MANAGEMENT

3.4.1 ENVIRONMENTAL VALUE OF LAND

The project area is wholly within the Ipswich City Council boundary and West Moreton Region and is located approximately 1-2 kilometres from the township of Rosewood. Rosewood is the largest township outside the urban core of Ipswich and is an important centre for the surrounding rural community (ICC 2001b).

Telfer et. al. (1998) in a study of the Bremer River and its major tributaries defines the major land uses in the catchment as agriculture and cattle grazing. Other important land uses noted by the study in the catchment were mining, quarrying, rural residential and urban developments, State forest and recreation and nature reserves.

The project area rises from low lying areas with flat to gentle slopes in the south to slopes of 10 to 18 % with short isolated sections up to 50 % in the north and east. The mining lease application area has been extensively cleared by past land use practices and now supports rural residential development, small scale grazing, small patches of native regrowth and a remnant stand of native vegetation ('Rosewood Scrub').

The environmental value of the area is defined in terms of a rural environment and the land use practices it may support (i.e. both currently and in the future).

3.4.2 IMPACTS ON LAND

Land Capability Changes

The pre-mining capability was determined by a competent soil surveyor based on standard NRM parameters and Rosser et al (1974) (Ison Environmental Planners 2001).

The existing land use capability classes on site is VII and III with smaller areas of VIII and VI. From an agricultural perspective, the land is being land primarily suitable for pastoral activity (Table 4).

The target post mining land capability is primarily based on the slopes of the final conceptual landform outlined in Figure 5 and the anticipated soil profile characteristics. It is important to note that the final conceptual landform may change

in the future depending on a range of factors, such as community input, economics including coal prices and market demand, and the development of new technologies. Progressive landform changes will be detailed in each POOP.

Table 4 Summary of the area (ha) of each land capability of the surface area of granted Mining Leases, New Oakleigh Mine.

Capability (Class) #	Pre-mining		Post-mining Target	
	(ha)	(%)	(ha)	(%)
I				
II				
III	167.6	40.9	94.6	23.0
IV				
V			88.6	21.6
VI	41.5	10.1	68.8	16.8
VII	148.5	36.2	119.8	29.2
VIII	52.7	12.8	38.5	9.4
TOTAL	410.3	100.0	410.3	100.0

Rosser et al, 1974.

Land Use Changes

As stated earlier, the project site has been previously extensively cleared by past land use practices. Land uses in areas surrounding the mining leases are a blend of urban and rural residential development, a tourism venture (historical railway) and small scale grazing. The Rosewood Structure Plan (ICC 2001b) defines the preferred future urban form within the project area as 'rural/open space' and 'scenic frame'.

Mining has the potential to substantially change the landform of the area and may alienate certain forms of land use. However, mining operations will not sterilise all forms of land use.

New Oakleigh Coal Pty Ltd intends to return the land to a grazing capability with areas of nature conservation. Grazing as the major final land use will not preclude future rural resident development or other forms of recreational activities. The proposed final land use is also in keeping with the preferred future urban form of the Rosewood Structure Plan (ICC 2001b).

New Oakleigh Coal Pty Ltd will monitor rehabilitation activities to ensure that the proposed land use capabilities are achieved by the time of lease surrender. A summary of the relevant environmental monitoring activities and demonstrated rehabilitation success will be provided in a Final Rehabilitation Report (FRR) and Environmental Audit Statement (EAS) for each mining lease surrender proposed by

New Oakleigh Coal Pty Ltd. The EPA is responsible for assessing the FRR and EAS, and if the assessment is successful, approving the progression of the mining lease surrender process.

New Oakleigh Coal Pty Ltd is commercially motivated to ensure that rehabilitation is successful and the final proposed land use is achieved by the time of mining lease surrender. This statement is based on three important assumptions.

1. New Oakleigh Coal Pty Ltd will want to reduce its liability (financial assurance) held by the Department of Natural Resources and Mines through the successful surrender of each of its mining leases.
2. As background landowner, New Oakleigh Coal Pty Ltd will want to ensure that the land is free of its mining tenure status to allow other commercial uses of the land.
3. New Oakleigh Coal Pty Ltd as a company will not want to incur a penalty under the *Environmental Protection Act 1994* for failing to meet the conditions of its Environmental Authority in relation to rehabilitation.

3.4.3 COMMITMENTS FOR LAND MANAGEMENT

3.4.3.1 Objective for Land

New Oakleigh Coal Pty Ltd's main objectives for land management are:

- to create a landform that is geotechnically stable and blends with the surrounding landscape;
- to ensure that vegetation cover is self-sustaining and erosion rates are compatible with the surrounding environment;
- to ensure downstream water quality is of acceptable standard for the protection of downstream water users; and
- to create a landform that is compatible with the agreed beneficial final land use.

The New Oakleigh Mine has successfully rehabilitated areas previously mined with pasture grasses. These areas have been used for cattle grazing. Other areas have been planted with hardwood tree species to evaluate timber production. A range of native species has been planted on site, including 'Rosewood Scrub' tree and shrub species from seed collected by the company.

As a result, New Oakleigh Coal Pty Ltd will continue to promote the following revegetation objectives, that is:

- rehabilitation of mined land with pasture grasses to allow the land use practice of grazing;
- rehabilitation of some mined land with native trees and shrub species to create diversity; and
- revegetation of selected areas with 'Rosewood Scrub' trees and shrubs species to establish as many of the principal plant species of the 'Rosewood Scrub' as possible and to encourage recolonisation of native fauna.

A stable condition will be established that will not deteriorate substantially with the projected land use. In other words, if the rehabilitated land is properly managed in terms of the final land use (grazing) the stability of the land will not deteriorate significantly. With any land use practice such as grazing, you can expect some influence on the land depending on the level of management. However, as stated, if properly managed the influence can be kept to a minimum. It is planned that the maintenance requirements for the rehabilitated land will be consistent with the proposed major final land use (grazing).

New Oakleigh Coal Pty Ltd's mine planning will integrate the landform configuration needed to achieve the desired rehabilitation standard with engineering requirements to establish the most cost efficient technique of mining and spoil handling to create the required shape.

The major design limitations will be slope angle and slope length. These parameters, in association with the properties of the material being handled, will determine the erosion potential of the dumped materials. Long term geotechnical and surface erosion stability will be maintained within acceptable standards. The final landform and rehabilitated surface will require minimal maintenance by subsequent land users and maintenance requirements will be consistent with the proposed land use.

3.4.3.2 Indicators for Land Management

The key indicators of successful land management will be:

- a post mining landform design (e.g. slopes, slope lengths, etc.) that is compatible with the accepted final land use;
- a vegetation cover that is compatible with the accepted final land use in terms of species selection; % vegetation cover and self-sustainability;
- a land surface that is geotechnically stable (e.g. not subject to slumping);
- achievement of the stated post mining land capabilities;
- the minimisation of erosion to a rate compatible with the surrounding landscape;
- the creation of a drainage pattern that will allow the control of water run-off to an acceptable standard during and after establishment of rehabilitated land in terms of hydraulic design and water quality;
- a post mining landform design that will contain all spoil placement and disturbance within the mining lease in a form that is compatible with the existing topography;
- the efficient recovery and use of the on site top soil resource;
- the minimisation of disturbance to what is required for safe operation;
- the rehabilitation of land as soon as possible after it is freed from operational use;
- the efficient recovery of the known coal reserves and prevention of the sterilisation of surrounding coal resources;

- the minimisation of the haul distance between the mining face and overburden dumps;
- the creation of usable final voids that do not impact on other properties;
- the burial of all adverse material on site (e.g. tailings); and
- the successful management of declared plants and other environmental weeds within the mining lease boundaries as an indicator of nature conservation standards.

3.4.3.3 Standards for Land Management

The final conceptual landform has been developed based on future mine planning and the proposed post mining land use (Figure 5). The mine plan was developed by the New Oakleigh Mine's Engineer using standard strip mining (open cut) methods, current delineated coal reserves, projected overburden removal and a production rate of 0.5 Mtpa of washed or product coal. Currently, a void is envisaged at the end of mine life to the south towards Keates Road (Figure 5).

The proposed post mining land use has been proposed with due consideration to past and current land use practices in the region. The final conceptual landform is based on standard open cut mining methods practiced in Australia. The Rosewood area and the mining industry are undergoing change and other beneficial land uses will be investigated and considered as mining proceeds. Community consultation will be used to obtain input into the proposed final land use. The Administering Authority will be kept informed of final landform development through consultation and each subsequent POOP.

Disturbed areas will be progressively rehabilitated to the land capability shown in Table 4 of the EMOS by the time of lease surrender. All areas to be disturbed will be recontoured to final landform and revegetated using the designs and methods outlined as soon as possible after disturbance ceases or when no longer reserved for infrastructure or further disturbance. Rehabilitation will be conducted on a progressive basis.

The Schedule of Rehabilitation in each POOP will outline the cost, rate and areas of rehabilitation for the period of the plan. The POOP provides details of the extent of disturbance. The maximum disturbed area not rehabilitated will not exceed the area nominated in each POOP.

Landform design is an integral part of mine planning and is developed ahead of the mine path using specific computer design packages. This task is the responsibility of New Oakleigh Coal Pty Ltd's Planning Officer, Engineer and Mine Manager. Dump elevations, slope angles and lengths are modelled to ensure geotechnical stability and compatibility with the surrounding topography. Landform design parameters are detailed in each POOP.

The proposed landform stability standards for the New Oakleigh Mine are:

- the absence of rill erosion deeper than 100 mm; and
- maintenance requirements consistent with the nominated land uses.

Mine planning is continually re-evaluated to ensure that the coal reserves are efficiently extracted to maximise recovery and minimising haul distances and the landform design is to suitable specifications.

New Oakleigh Coal Pty Ltd recognises that topsoil is a valuable natural resource. Therefore, all topsoil will continue to be recovered, managed and used to optimise rehabilitation. All topsoil with suitable edaphic characteristics and where the electrical conductivity (1:5 soil water solution) is < 1.0 mS/cm or the exchangeable sodium percentage is < 6 will be stripped ahead of the mine path for later use. In the event that insufficient quality soil exists for the rehabilitation plan, spoil or other material with suitable physical and chemical properties will be used. Topsoil will either be used immediately or stockpiled for later use. Stockpiled topsoil will be seeded with grass species to reduce erosion loss and to help maintain its biological qualities.

To allay the concerns of one of the local community groups (Rosewood District Protection Organisation), New Oakleigh Coal Pty Ltd will undertake additional soil testing in the Western Extension area (MLA 50175) to confirm that physical and chemical parameters of each of the identified soil types are consistent with the results obtained for the same soil types in the adjacent mining area, the West Pit (ML 4698).

The revegetation species mix for trees and shrubs will be dominated by native species local to the area. Introduced and native grass species will be used for grazing and erosion control. ACARP (Australian Coal Association Research Program) research has demonstrated that revegetation will be considered adequate when the vegetation cover measured as basal cover exceeds 70%. For areas designated as rehabilitated to 'Rosewood Scrub', there shall be greater that 150 stems per ha.

Weed management will continue to be conducted to the requirements of the *Rural Lands Protection Act 1985* and NRM and local government guidelines.

Re-established drainage lines will be engineered with suitable hydraulic properties using specific channel widths, depths and ground covers to cope with a proposed maximum flow event. Computer modelling is used to develop a suitable drainage design for the circumstance at hand. Drainage design is monitored and continually re-evaluated by mine planning. Details of drainage design are provided in each POOP.

At the end of mine life, all remaining mine infrastructure will be removed if not required by the subsequent land user. Any contaminated material considered unacceptable to the proposed end land use will be treated by bioremediation or other procedures, diluted by burial or transported to an approved landfill to remove the contamination. Roads not required for future land use will be ripped and revegetated by the methods outlined in this document.

Coarse reject and tailings will be disposed of within existing voids and will be buried in a minimum of 1 m of spoil. Dams and ponds are to remain after relinquishment of

the leases for the use of the landowners and for wildlife and stock. No specific rehabilitation activities will be required for dams and ponds, apart from ensuring their stability at close of mine life.

Final voids are a valuable landform with a number of options for use during and subsequent to mining. Potential uses include water storage, recreation and waste landfill. In any potential use, New Oakleigh Coal Pty Ltd is committed to effective decommissioning of final voids. Final voids are subject to stringent safety and environmental guidelines. The current Administering Authority and NRM monitor these guidelines during operations and at lease surrender.

In the event that no alternative final use of the void is implemented, the void or voids left will posses the following minimum standard for decommissioning. Any exposed coal seams in the final voids will be covered with inert material. The high and low wall will either be bunded or appropriately fenced to restrict vehicular and stock access. Drainage channels will not discharge over the walls. Final void terraces and slopes will be revegetated with pasture grasses and native trees. Access for light vehicles will be maintained. This will also provide an escape route for stock or wildlife.

New Oakleigh Coal Pty Ltd will continue to reassess rehabilitation techniques and standards based on current research and 'best practice' environmental guidelines including the Department of Mines and Energy's 'Technical Guidelines for Environmental Management of Mining Activities' and Environment Australia's 'Best Practice Environmental Management in Mining'. In consultation with the administering authority, New Oakleigh Coal Pty Ltd will amend its environmental authority to incorporate any appropriate developments in rehabilitation techniques and/or standards.

3.4.3.4 Control Strategies to Land Protection

3.4.3.4.1 Landform Stability

The major design limitations will be slope angle and slope length. These parameters, in association with the properties of the material being handled, will determine the erosion potential of the dumped materials.

The design criteria for the landforms presented in the attached drawings are drawn from relevant guidelines and rehabilitation experience at New Oakleigh Mine. All future mining operations will ensure overburden is dumped and treated in accordance with the nominated principles.

The rehabilitation methods outlined in this EMOS are based on proven technology established in the successful rehabilitation of existing spoil at New Oakleigh Mine and on similar spoil at the nearby Jeebropilly Mine. These methods have evolved from initial rehabilitation trials to successful treatment and maintenance of completed sections of rehabilitation at the three operations.

The design also addresses the issues of spoil placement procedures, compaction, post placement settlement, control of water run off and sediment, slope profiles and

aesthetics of the final landform. In particular, there is a need to minimise the area of land disturbed by the mining operations.
Given the existing steep topography of the site (Figure 4), slopes over 20% will be necessary (Figure 5). Rehabilitation of steep slopes of 40 % and lengths of approximately 100 m has been successfully undertaken on site without the need for special treatment. Development of this type of slope is only undertaken when abnormal constraints impinge on normal operations. Monitoring of these slopes for vegetation success and erosion will continue on a regular basis until lease surrender to ensure slope stability and a sustainable vegetative cover is achieved. Additional monitoring of rehabilitation using a photographic record will also be implemented to help confirm long term success (see Table 7).

Where it is necessary to use steep slopes, the catchment area above the slope is minimised to reduce the run off water reporting over the slope. If required, special precautions such as terracing or rock armouring are used.

To limit erosion potential of the landform, the slope length will be reduced as the slope angle is increased. Climatic influences, especially rainfall intensity, and the properties of the spoil are also considered during design.

The following criteria have been adopted as the recommended maximum slope lengths (Table 5). Future landform development will use these slope lengths as a guide. Future landform design will also attempt to create a drainage pattern to break up slope length and direct the water into controlled waterways.

Table 5 Landform design criteria for the New Oakleigh Mine.

Slope Angle (%)	Vertical Height (m)	Maximum Slope Length (m)
40	5	13
30	7	23
20	10	50
15	20	133
10	22	220
5	26	520
3	28	900

Soil erosion stability within the mine site will be monitored by:

- regular visual inspection and maintenance of a photographic record, particularly after major runoff events;
- assessment of suspended solids in runoff water at key water management structures;

- assessment of the maintenance routine of on site sediment control structures;
- assessment of suspended solids in runoff water at the main water discharge points from the site (i.e. during periods of low flow); and
- assessment of suspended solids in runoff water captured by the rising stage samplers at the main water discharge points from the site (i.e. during major discharge events).

Where possible, landform design is undertaken using the 'best practice' methods defined in EA (1998b). For example, in terms of the methodology applied on site in relation to landform design (e.g. computer design, survey methods, etc.).

3.4.3.4.2 Land Use

As stated earlier, the proposed post mining land use is light grazing using introduced and native pasture grass species. However, other beneficial land uses will be investigated and considered as mining progresses. New Oakleigh Coal Pty Ltd will develop a Community Consultation and Awareness Program to incorporate input from the local community on this matter (see 3.9.3.4 Control Strategies for Social Conditions).

To-date, grazing of rehabilitated areas has established an acceptable level of management at the Jeebropilly Mine to ensure productive use of the rehabilitated land. The aim is to control the grazing intensity and management to protect the integrity of the rehabilitation. New Oakleigh Coal Pty Ltd will undertake the necessary grazing trials involving the rehabilitated land designated for grazing and a nearby analogous grazing site to:

1. establish that the rehabilitated land can support grazing at a realistic stocking rate; and
2. develop the correct management strategies for long term sustainable use of the land as grazing land.

The company is establishing 'Rosewood Scrub' plantings to enhance the protection of flora species and to create native fauna habitats. This practice is conducted within selective areas on site (e.g. in an area adjacent the historical railway and possibly on areas of steeper slopes). The methodology is detailed in 3.4.3.4.7 Revegetation Methods.

Discussions have also commenced on the creation of sport or recreation areas in the landform to be created in ML 4698. Consultation will continue with the local community to develop these and other possible alternatives for rehabilitation. As stated earlier, this consultation will be detailed in a Community Consultation and Awareness Program (see 3.9.3.4 Control Strategies for Social Conditions).

The post-mining landform will permit:

- grazing of introduced and native pastures;
- growing of tree species suitable for timber production;

- reintroduction of threatened native flora species to the site;
- the use of the rehabilitated area by local fauna;
- active and passive recreation; and/or
- other appropriate land uses.

The proposed rehabilitation plan will ensure that the disturbed area does not adversely affect land outside the proposed mining area. The establishment of grasses, trees and shrubs and the proposed landform will allow land owners the opportunity to select future uses for the site as long as the proposed uses or intensity of use does not result in degradation of the landscape.

3.4.3.4.3 Final Voids

Final voids will be left as part of the final landform. Given the location of the final voids, the opportunity to use the voids as water storage structures/features. Final use of the voids for water storage will be assessed in terms of predicted water quality and other hydrological aspects of runoff catchment, rainfall input and evaporation loss. The possibility of decommissioning the final void as a landfill is currently not proposed. The EPA's waste management strategies for southeast Queensland are focussed on reducing the amount of mining voids used as landfills and encouraging communities and industries to reduce and recycle waste where possible. In addition, any proposal for a landfill licence would also be subject to community acceptance and approval prior to application.

The high wall and low wall will be protected by a diversion bank (1 in 100 year design capacity) to stop uncontrolled water ingress. Vehicular and stock access will be restricted either by the use bunds or fencing. Drainage channels will not discharge over the walls. The walls will be left in a geotechnically stable condition as demonstrated during the Mine's operational phase and based on the advice of a competent geotechnical engineer. Access for light vehicles will be maintained. This will provide an escape route for stock or wildlife. All safety requirements for final voids will be established prior to mine closure (i.e. to the satisfaction of the Administering Authority).

New Oakleigh Coal Pty Ltd will ensure that all rehabilitation requirements for the final void are completed for the FRR and EA (i.e. as part of the mining lease surrender process). In addition, if a water storage proposal is feasible and accepted by all stakeholders, all licensing requirements will be completed prior to surrender of the mining lease and included in the applicable FRR and EA.

The anticipated location of the final void is shown in Figure 5.

3.4.3.4.4 Rehabilitation

Rehabilitation methods will be included in the POOP. Where possible, rehabilitation methods employed at New Oakleigh Mine are based on 'best practice' management strategies (EPA 1995; Bell 1996). New Oakleigh Coal Pty Ltd has employed certain rehabilitation practices to improve or enhance rehabilitation success and will continue

this practice to ensure rehabilitation is successful. The following is an overview of general rehabilitation practices.

To meet the criteria for successful rehabilitation and stability, rehabilitation will consist of:

- topsoil recovery prior to mining;
- burial of any material adverse to plant growth;
- contouring to acceptable slopes;
- surface preparation;
- topsoiling;
- seedbed preparation;
- application of fertiliser, seed and/or seedlings;
- establishment of a vegetative cover;
- maintenance of vegetation during establishment; and
- monitoring to confirm the required standards are met.

Disturbed areas will include spoil dumps, co-disposal ponds, sediment dams, raw water dams, diversion banks, bunds, haul roads, built elements and final voids. The current location of the various disturbance types is depicted in Figure 3. Certain disturbed area types, bunds and haul roads, will change during the life of the mine. These changes will be reflected in each subsequent POOP.

3.4.3.4.5 Topsoil Recovery

Prior to topsoil recovery, all cleared timber will be dealt with using the following hierarchy:

1. all suitable timber will be recovered for commercial use (sawn timber, fence posts or firewood);
2. timber unsuitable for commercial use will be stockpiled for later use on site (rehabilitation use, fencing, etc.);
3. as a less preferred option, timber not used on site may be buried in the pit or overburden dumps; and
4. as the final and least preferred option, timber not used on site may be burnt after the appropriate permits are obtained from Ipswich City Council and the local fire authority.

The above strategies for cleared timber are compliant with the Disposal of Cleared Vegetation Section of the Ipswich City Council's Commercial and Industrial Development Code (ICC 2001a).

Smaller organic debris and organically enriched topsoil will be stripped to a depth where the electrical conductivity of a 1:5 soil water solution is < 1.0 mS/cm or the exchangeable sodium percentage is < 6. The depth of topsoil recovery is in

accordance with a topsoil recovery survey undertaken prior to disturbance. This information is used to guide the Mine's Operators responsible for topsoil stripping. The Operators at the Mine have also developed considerable skill and experience at picking the topsoil horizon (i.e. based on colour and texture changes as you move down the soil horizon). This activity is only conducted on an as required basis (i.e. periodically ahead of the current path of mine development).

Topsoil management procedures will be detailed in the POOP. In general, where operationally possible, topsoil is:

- directly returned to rehabilitation areas after stripping operations;
- not excessively handled by equipment during operations;
- if stored as bunds/stockpiles, stored for the minimum amount of time possible and not as medium-long term bunds;
- if stored as bunds/stockpiles, placed in an area where the bunds/stockpiles will not receive further disturbance;
- if stored as bunds/stockpiles, kept to a height of two metres or less; and
- if stored as bunds/stockpiles for any length of time, revegetated to reduce loss by erosion, reduce weed growth/invasion and help maintain soil microbial activity.

The above topsoil management strategies are in keeping with 'best practice' topsoil management (EPA 1995; Bell 1996).

In the event that insufficient quality soil exists (i.e. as defined above) for the rehabilitation plan, spoil or other material with suitable edaphic properties will be investigated as a substitute or for enhancement of existing soil stocks. If biosolids or other forms of soil conditioner are used, the Administering Authority and the Ipswich City Council will be consulted prior to the planned use. If required, only fully composted soil conditioners will be used on site for rehabilitation activities. The handling and application of biosolids or other forms of soil conditioner on site will be conducted in accordance with the EPA's current guideline on the use of biosolids to prevent the occurrence of environmental harm from leachate or environmental nuisance from odour.

3.4.3.4.6 Surface Preparation

An overview of the methods required for surface preparation follows.

- Potential acid material is defined as having a nett acid producing potential > 0 kg H2SO4/t. Drilling programs and active mining have not identified any overburden that may produce toxic material. Surveillance for this type of material will continue, and if identified, samples will be taken for testing. Any adverse material will be buried to a minimum of 1 m using inert spoil. To date, no spoil adverse to plant growth has been identified.
- Spoil dumps account for the bulk of the disturbed area and will be progressively created to meet the specified final landform by end of mine life.

- Impoundments used for disposal of reject and fine tailings will be decommissioned by removal of excess water, capping with at least 1 m of inert material as required, topsoiling and revegetating to the designated landform design.
- Infrastructure sites including plant and equipment not required by subsequent landholders will be removed. The sites will be recontoured, deep ripped and revegetated.
- Roads not required for future land use will be ripped and revegetated.
- All dams and ponds will be left for the use of current and subsequent landowners after relinquishment of the lease. Rehabilitation activities planned include progressive revegetation of embankments and provision of permanent access for wildlife and stock. These dams are already extensively used by wildlife.

3.4.3.4.7 Revegetation Methods

Erosion control is achieved by the installation of erosion control structures (e.g. graded banks), designed land surfaces with suitable slopes and slope lengths, surface contour ripping initially and development of an appropriate vegetative cover thereafter.

A soil profile will be recreated to provide the basis for the establishment of soil forming processes. While existing topsoil is of low nutrient value it will contain soil microorganisms and plant propagules. As stated earlier, all available topsoil is recovered prior to disturbance and stockpiled for use in the rehabilitation program (i.e. to ensure rapid revegetation of all areas).

Revegetation methods on site will comprise the following actions.

- As required, deep ripping is applied to compacted surface layers. Past rehabilitation experience at Oakleigh and Jeebropilly Mines has demonstrated that this practice is not always required (i.e. infiltration is sufficient) or successful (i.e. it possesses a tendency to bring large rocks to the surface ruining the final profile).
- Topsoil is spread as evenly as possible over the surface. The final depth will depend on the quantity available, but a minimum of 75 mm (average 100 mm) will be used. If feasible, greater topsoil depths or soil conditioners will be used in critical areas.
- Appropriate fertiliser is applied for pasture establishment.
- Seed of pasture grass, legume, tree and/or shrub species appropriate to the desired land use are normally sown between October to April, depending on seasonal conditions and operational requirements.
- Selected native tree and shrub species are planted as required.
- The details on the selection of the type and rate of fertiliser and seed will depend on the physical and chemical properties of the surface being treated,

commercial availability, the season, prevailing climatic conditions and the available machinery.

- An average of 150 trees/ha of rehabilitated area will be established using direct seeding techniques supplemented by planting of tube stock.
- Indigenous 'Rosewood Scrub' tree seed from within the mine site and nearby areas will continue to be collected, propagated in the Mine's nursery and replanted to provide a nil net reduction of indigenous trees on the mine site. In recent years as part of open cut mining rehabilitation, the previous owner of New Oakleigh Mine has planted over 5,000 trees propagated from seed collected from the site prior to mining.

On ML 4698 (current rehabilitation area), the initial plantings on the slope facing the historical railway station of Cabanda have been established in rows to allow follow-up maintenance (e.g. watering, weeding, etc.). Specialised surface preparation was undertaken along these rows to improve revegetation success (e.g. mulching; windrowing; ripping; and addition of water retaining additives, fertilizer and coarse rejects).

Five upper storey native species from the 'Rosewood Scrub' were planted in this area – *Acacia harpophylla*, *Acacia maidenii*, *Acacia salicina*, *Cupaniopsis parvifolia* and *Ficus platypoda*. These species are confirmed as local natives in a flora checklist of 'Brigalow semi-evergreen vine thicket' located at Oakleigh Colliery, Perry's Knob, Rosewood (Bird & Reick 1993). An initial assessment of the success of the initial plantings of December 2001 during mid January 2002 found that 702 plants survived creating a density of approximately 880 trees/hectare in an area of 0.8 hectares.

The next rehabilitation phase in this area will involve follow-up planting with further upper storey species and lower storey species. This follow-up planting will be designed to remove the current 'plantation' look to the rehabilitation. Rehabilitation with 'Rosewood Scrub' species will be in areas close to the historical railway, and if possible, link across to the remnant stand of 'Rosewood Scrub' to the north of MLA 50175. This rehabilitation approach is consistent with the preferred future urban form proposed for the area (ICC 2001b).

The Mine understands that two 'endangered regional ecosystems' exist in the area:

> Regional Ecosystem 12.9/10.6 *Acacia harpophylla* and/or *Acacia fasciculifera* open forest and vine thicket on Cainozoic to Proterozoic sediments; and
>
> Regional Ecosystem 12.9/10.15 Low microphyll rainforest and semi-evergreen vine thicket on Cainozoic to Proterozoic sediments (Ison Environmental Planners 2001).

The Mine intends to re-establish an *Acacia harpophylla* dominated system of 'Rosewood Scrub' in its rehabilitation areas designated for conservation. The use of other 'Rosewood Scrub' species will be influenced by availability of the appropriate species. Further work will be undertaken into the methodology. For example, New Oakleigh Coal Pty Ltd may locate and assess a suitable analogous site to establish

an appropriate species selection for rehabilitation and/or enlist the expertise of 'local experts' (i.e. as a long term goal).
The Mine has recently sourced another 30 'Rosewood Scrub' species from a local source (a member of the Society for Growing Australian Plants) and undertaken some propagation activities. The Mine has also identified several other potential sources for 'Rosewood Scrub' species. The Mine will give priority to the use of local provenance species selection.

The Mine intend to fence areas of conservation rehabilitation from areas of grazing rehabilitation to ensure that no conflict occurs between the two land use types. Further rehabilitation details will be provided in the POOP.

The company has successfully returned rehabilitated land to cattle grazing and established a range of native plants, including 'Rosewood Scrub' species. A number of alternative land use options are also being considered. The prime requirement remains to provide a stable post mining landform, and as a result, any potential land use must satisfy the primary rehabilitation aims.

Revegetated areas will be monitored annually until the nominated standards have been met for 3 years. Maintenance will be performed to promote acceptable cover or to repair failed areas. Regular monitoring and surveillance will be undertaken to identify any problems. Actions considered appropriate to rectify any causes of revegetation failure will be commenced immediately after identification of the problem.

New Oakleigh Coal Pty Ltd will investigate, in conjunction with the Ipswich City Council, a legal or other local government mechanism for protecting the areas of conservation rehabilitation within the project site from future adverse development by a subsequent landowner (e.g. land clearing).

Draft EA Conditions

Land Management - EA Conditions

EA Condition 16. The Environmental Authority Holder will comply with the Schedule of Rehabilitation in each Plan of Operations. Any significant variation (>10%) from the Schedule of Rehabilitation in each Plan of Operations will be reported to the Administering Authority within 10 business days of identification of the variation.

EA Condition 17. Disturbed areas will be progressively rehabilitated to the land capabilities listed in Table 4 of the Environmental Authority Holder's current EMOS by the time of lease surrender (i.e. within a tolerance of plus or minus 10%), unless the Administering Authority approves a variation to the proposed final land use.

EA Condition 18. The proposed post mining land use at New Oakleigh Mine is grazing using introduced and native pasture grass species. However, other beneficial land uses will be investigated and considered as mining proceeds.

EA Condition 19. The Environmental Authority Holder will seek approval from the Administering Authority for any significant variation to the proposed post mining land use at New Oakleigh Mine.

EA Condition 20. The landform stability standards for New Oakleigh Mine are to ensure:

- **the absence of rill erosion deeper than 100 mm; and**
- **that maintenance requirements are consistent with the proposed post mining land uses.**

EA Condition 21. All disturbed areas at New Oakleigh Mine will be recontoured to the proposed final landform design and revegetated using the methods outlined in the EMOS, as soon as possible, after disturbance ceases or when no longer reserved for infrastructure or further disturbance.

EA Condition 22. The revegetation standards for New Oakleigh Mine require vegetation cover measured as basal/ground cover to exceed 70%, or where applicable, aerial/canopy cover to exceed 50%, when mapped at a scale of 1: 1,000 for 3 consecutive years.

EA Condition 23. By the time of mining lease surrender, all mine infrastructure not required by the subsequent landowner/user will be removed and the former infrastructure sites will be rehabilitated to the land stability and revegetation standards specified by this environmental authority.

EA Condition 24. By the time of mining lease surrender, all contaminated material considered unacceptable to the proposed final land use at New Oakleigh Mine will either be treated (e.g. bioremediation), diluted by burial or transported by a licensed operator to an approved land fill.

EA Condition 25. By the time of mining lease surrender, all roads at New Oakleigh Mine not required by the landowner will be rehabilitated to the land stability and revegetation standards specified by this environmental authority.

EA Condition 26. All identified hazardous material at New Oakleigh Mine will be covered by a minimum of 1 m of spoil capping and rehabilitated to the land stability and revegetation standards specified by this environmental authority.

EA Condition 27. The Environmental Authority Holder will leave dams and ponds on site after relinquishment of the mining leases for use by the landowner and for wildlife and stock.

EA Condition 28. In relation to final voids on site, the Environmental Authority Holder will ensure by the time of mining lease surrender:

- **all exposed coal seams are covered with inert material;**
- **adequate bunds and/or safety fences are constructed along the edge of the high and low walls to restrict vehicular and stock access;**
- **drainage channels are not allowed to discharge over the walls of the void without adequate protective measure to minimise erosion;**

- **final void terraces and slopes are revegetated with pasture grass and native tree species; and**
- **access for light vehicles is maintained for the landowner and as an escape route for stock or wildlife.**

EA Condition 29. If biosolids or other forms of soil conditioners are proposed for use at New Oakleigh Mine, the Administering Authority and Ipswich City Council will be consulted prior to their use to ensure the appropriate conditions for use are obtained.

EA Condition 30. Tree and shrub species used for revegetation at New Oakleigh Mine will be dominated by local native species especially 'Rosewood Scrub' species.

EA Condition 31. Introduced and native grass species will be used for grazing and erosion control at New Oakleigh Mine.

Note: If this application proceeds, the EPA will develop streamline licence conditions based on the information provided in the EMOS, statutory requirements and EPA policies and guidelines.

3.5 NOISE AND VIBRATION

3.5.1 ENVIRONMENTAL VALUE OF NOISE

The area is a predominantly rural environment. As a result, the ambient noise levels are generally low, particularly during evening and night time periods. The main influence on the ambient noise levels is from insect activity. During the warmer months – generally from October through to April – insect noise is the predominant feature of the ambient noise levels and at this time they are at their loudest. During the cooler months the insect noise is either at a lower level or not present at all. The quietest ambient noise levels, therefore, occur during the cooler months. In addition to insect noise, the ambient noise environment is also affected at irregular intervals by noise from traffic, railway, aircraft, and agricultural and residential activities.

In accordance with the Environmental Protection (noise) Policy 1997, the environmental values to be enhanced or protected are:

> "… 10. The environmental values to be enhanced or protected under this policy are the qualities of the acoustic environment that are conducive to –
>
> the wellbeing of the community or a part of the community, including its social and economic amenity; or
>
> the wellbeing of an individual, including the individual's opportunity to have sleep, relaxation and conversation without unreasonable interference from intrusive noise. …"

The "acoustic quality objective" is defined in the Environmental Protection (Noise) Policy 1997 as follows:

"… 11.(1) The "acoustic quality objective" is the objective of achieving an ambient level of 55 dB(A) or less for most of Queensland's population living in residential areas…"

It is intended that the acoustic quality objective be achieved as part of progressively achieving the object of this policy over the long term.

It is not intended that, in achieving the acoustic quality objective, any part of the existing acoustic environment be allowed to significantly deteriorate.

For subsection (1), the ambient level in a residential area is measured over 24 hours as the long-term Leq outside a dwelling in the area. …"

For those residences closest to the proposed mining, the acoustic quality objective would be met if their existing acoustic amenity does not "significantly deteriorate" as a result of mining the western extension.

3.5.2 IMPACTS OF NOISE

There are a number of residences in the vicinity of the Mine. The edge of the town of Rosewood, the nearest commercial centre, is within 2 km (Figure 3).

The major noise sources are:

- blasting;
- operation of mining equipment - overburden handling and coal extraction;
- operation of haul trucks and other mine vehicles; and
- operation of the coal washplant.

Due to the distance between surrounding houses and current and future operations, noise nuisance from the project is a potential problem. Noise nuisance may also be compounded by the sensitivity of the receptor (i.e. people perceive noise levels differently and are affected in different ways). Importantly, adverse noise levels possess the potential to affect the amenity of the receptor (e.g. sleep patterns, etc.).

Ambient noise levels were determined from previous studies conducted in similar areas, site specific noise surveys at residences and modelling of the noise for the proposed operations (David Moore and Associates Pty Ltd 2001). Assessments were conducted in accordance with Australian Standard AS 1055-1997, Acoustics - Description and Measurement of Environmental Noise.

The World Health Organisation provides up-to-date guidelines with respect to time-varying noise that is applicable to the noise from a mine and the incidence of sleep disturbance. The World Health Organisation (1999) Guideline for Community Noise states that good sleep is achieved when the maximum noise level inside a bedroom does not exceed approximately 45 dB(A) more than 10 to 15 times per night. This is approximately equivalent to an average of the maximum noise level of 45 dB(A) outside the residence.

When this criteria is applied to the likely mining noise levels for the extension of the western pit, only 5 of the closest privately owned residences exceed this criteria, and for 3 of these residences this criteria is only exceeded for a limited time during the life

of the mine current to end of year 2003, based on computer modelling for end of year 2002.

Therefore, for virtually all of the closest residences, mining the extended western pit would not result in sleep disturbance. From this, it can be concluded that the acoustic amenity at most of the closest privately owned residences has not significantly deteriorated and, therefore, the criteria of the *Environmental Protection (Noise) Policy 1997* will be complied with, with respect to mining in the western pit extension.

Blasting of overburden will be required. Blasts may be heard at various locations depending on climatic conditions (wind direction and strength and cloud cover), and the blast size, number of holes, hole pattern, type of charge and amount of charge. However, if properly prepared, blasting will not exceed the current statutory levels for ground vibration and airblast over pressure as stated in Section 6I of the *Environmental Protection Regulation 1998*.

To-date, monitoring of blasting by New Oakleigh Coal Pty Ltd and NRM has shown that ground vibrations have been well below the statutory level. Airblast over pressure has been compliant with respect to legislation. However, during early to mid 2001 there were a small number of single events where airblast over pressure was close to or just exceeded the limit of 115 dB (linear). Exceedance is not allowed four out of any five consecutive blasts. Blasting operations have since been adjusted to ensure all blast levels are below the statutory limits.

3.5.3 COMMITMENTS FOR NOISE CONTROL

3.5.3.1 Objective for Noise Environment

New Oakleigh Coal Pty Ltd will ensure that no unreasonable intrusive noise attributable to the mining activities will be heard at any noise sensitive place (e.g. nearby residences). New Oakleigh Coal Pty Ltd will also ensure that blasting remains below statutory levels at any noise sensitive place.

3.5.3.2 Indicators for Noise

Noise indicators employed at New Oakleigh Mine include:

- noise levels measured at any noise sensitive place;
- airblast over pressure measured at any noise sensitive place;
- ground vibration levels measured at any vibration sensitive place or at the mine site perimeter;
- the number of legitimate complaints received from surrounding sensitive receptors in relation to noise; and
- the installation of control strategies and verification that these achieve the design operating parameters.

3.5.3.3 Standards for Noise

Noise, airblast over pressure and ground vibration levels will be maintained below nuisance levels with due consideration of the EPP (Noise) 1997.

All noise complaints shall be dealt with using NHCA's complaints handling procedure to ameliorate legitimate problems.

The applicable noise limits are the World Health Organisation's criteria for good sleep and conversation amenity, namely that the maximum noise levels should not exceed more than approximately 45 and 50 dB(A) inside any of the privately owned residences more than 10 to 15 times per night and day, respectively. Therefore, mining noise should not exceed the levels specified in Table 6.

Table 6 Criteria for Sleep Disturbance/Conversation Amenity Criteria in dB(A) for Mining Noise Levels at Closest Privately Owned Residences.

Time Period	Maximum (External)	Average of Maximum (External)
Daytime (0700 to 1800 hours)	60	50
Evening (1800 to 2200 hours)	55	45
Night-time (2200 to 0700 hours)	55	45

On site blasting operations will be conducted in accordance with Australian Standard AS 2187.2 Explosives - Use of Explosives. Blasting will not exceed the statutory limits defined in Section 6I of the Environmental Protection Regulation 1998 at any noise sensitive place. Those limits are:

ground vibration:- >35 Hz - <25 mm/second (peak particle velocity);

ground vibration:- <35 Hz - <10 mm/second (peak particle velocity); and

airblast over pressure:- 115 dB (linear) for 4 out of any 5 consecutive blasts.

3.5.3.4 Control Strategies for Noise

Assessment of noise impact and control is addressed by the EPP (Noise) 1997, EPA and NRM technical guidelines and AS 1055.2 for off site activities.

To reduce mining noise and vibration impacts one or more of the following control options will be considered and implemented as necessary.

- Overburden material will be selectively placed as bunds to provide acoustic and visual shields/barriers between operations and nearby residences (including the township of Rosewood).
- Equipment will be operated in the correct manner and will receive appropriate maintenance to reduce operational sound power levels.

- Blasting parameters including size and timing will be controlled to ensure compliance.
- Noisier operations will be schedule during daylight hours only or in-pit during night time hours.
- When purchasing new mining equipment, NHCA will consider the sound power outputs of the machinery.
- NHCA will continue to investigate new technologies that may assist in the reduction of noise levels such as alternatives to reversing beepers.

The above control strategies are consistent with the 'best practice' environmental management approaches outlined by Cliff (1996) and EA (1998a).

In addition, New Oakleigh Coal Pty Ltd will develop specific control strategies for mitigation and control of noise complaints/issues that may develop at those sensitive receptors identified by David Moore and Associates (2002) for particular worst case scenario events. These specific control strategies depending on circumstances and agreement between the affected sensitive receptor and New Oakleigh Coal Pty Ltd, may include:

- establishment of noise control devices at the affected residence (e.g. noise barriers/fences);
- special treatment of the affected residence (e.g. air conditioning); and
- purchase of the affected residence.

Currently, mining operates 20 hours per day (6:00 am – 2:00 am) Monday to Friday and 12 hours per day (6:00 am – 6:00 pm) Saturday, while the washplant operates 24 hours per day, normally from 10:00 pm Sunday to 10:00 pm Friday each week. The hours of operation of the washplant and ROM and clean coal haulage will not change from the existing operation. Clean coal haulage will continue to operate within the limits of the current voluntary agreement between New Oakleigh Coal Pty Ltd and Ipswich City Council (i.e. in relation to coal haulage through the centre of Rosewood). Therefore, no significant changes in the period of noise impact are expected.

New Oakleigh Coal Pty Ltd is investigating alternate transport routes for clean coal haulage in an attempt to reduce the number of trucks travelling through the centre of Rosewood within the bounds of the Department of Main Roads heavy vehicle road limits. New Oakleigh Coal Pty Ltd will also continue to explore other possibilities for clean coal haulage. As required, the Department of Main Roads and the Ipswich City Council will be consulted in relation to any new haulage proposals.

Residents potentially impacted by the current and proposed operations have been identified and discussions with the relevant owners have commenced. Implementation of the Community Consultation and Awareness Program (see 3.9.3.4 Control Strategies for Social Conditions) will provide an additional avenue for the local community to consult with the company over noise-related issues. The

company has established a complaint response policy to ensure a timely response to perceived problems.

Independent monitoring by an acoustic consultant will be commissioned as required to check operational noise levels and in response to complaints to establish if perceived noise levels are compliant. Legitimate noise complaints will be dealt with promptly using NHCA's complaint handling procedure. All statutory requirements will continue to be addressed. A noise monitoring program based on selected sites within the residential areas surrounding West Pit has been in operation during 2001. These sites are monitored during the night time once per month at a random time selected by the consultant. NHCA is not advised of when this monitoring is to occur but is provided post assessment with details of the results of each monthly noise assessment.

New Oakleigh Coal Pty Ltd has purchased the relevant properties with habitation close to the pit area and will assess future requirements in terms of maintaining a suitable buffer around operations.

Draft EA Conditions

Noise Management - EA Conditions

EA Condition 32. The Environmental Authority Holder undertakes to maintain noise, airblast over pressure and ground vibration levels below nuisance levels at all sensitive receptors surrounding New Oakleigh Mine.

EA Condition 33. The recommended noise limits for good sleep and conversation amenity state that the maximum mining noise level should not exceed approximately 45 dB(A) and 50 dB(A) inside more than 10 to 15 times per night and day, respectively (World Health Organisation 1999). As a result, the noise limits Good Sleep/Conversation Amenity for New Oakleigh Mine are:

Time Period	Maximum Inside	Maximum Outside	Average of the Maximum Outside.
Daytime (0700 to 1800 hours)	**50 dB(A)**	**60 dB(A)**	**50 dB(A)**
Evening (1800 to 2200 hours)	**45 dB(A)**	**55 dB(A)**	**45 dB(A)**
Night-time (2200 to 0700 hours)	**45 dB(A)**	**55 dB(A)**	**45 dB(A)**

EA Condition 34. All noise complaints shall be dealt with in accordance with New Hope Coal Australia's Complaints Handling Procedure to reduce the noise to reasonable levels and resolve legitimate noise complaints.

EA Condition 35. The Environmental Authority Holder will ensure all blasting at New Oakleigh Mine complies with Section 6I of the Environmental Protection Regulation 1998 for ground vibration and airblast over pressure at surrounding vibration and noise sensitive places.

EA Condition 36. On site blasting operations at New Oakleigh Mine will be conducted in accordance with Australian Standard AS 2187.2 Explosives - Use of Explosives.

EA Condition 37. The method of measuring and reporting of noise levels for checking compliance by or on behalf of the Environmental Authority Holder will comply with the Environmental Protection Agency's Noise Measurement Manual, Third Edition, 1 March 2000 and Australian Standard AS 1055.1-1997 Acoustics – Description and Measurement of Environmental Noise.

Note: If this application proceeds, the EPA will develop streamline licence conditions based on the information provided in the EMOS, statutory requirements and EPA policies and guidelines.

3.6 WASTE MANAGEMENT

3.6.1 ENVIRONMENTAL VALUE OF WASTE MANAGEMENT

The life, health and well-being of people on and off the mine site, and the diversity of ecological processes and associated ecosystems in and surrounding the mine site that may be affected by waste produced at New Oakleigh Mine.

3.6.2 IMPACTS OF WASTE

There are a number of potential sources of land and water contamination from operations at New Oakleigh Mine, for example:

- vehicle and plant maintenance operations;
- refuelling operations including storage;
- used tyres;
- chemical and process reagent spillage;
- disposal of waste materials;
- putrescable waste; and
- septic treatment.

Uncontrolled waste disposal could potentially create land and/or water contamination that may eventually cause serious or material environmental harm.

3.6.3 COMMITMENTS FOR WASTE MANAGEMENT

3.6.3.1 Objective for Waste Management

New Oakleigh Coal Pty Ltd will manage all wastes to avoid any direct or indirect impacts on the health and well being of people and the environment on and surrounding the mine site.

3.6.3.2 Indicators for Waste Management

The main indicators for waste management at New Oakleigh Mine are:

- the level/degree of management of all wastes on site in terms of the waste management hierarchy;
- the development of specific methods and targets for reducing regulated wastes and wastes disposed of from the site;
- the regularity of audits to review current waste management practices;
- the types of materials used on site in terms of their potential harm to cause environmental harm if spilt or mis-used);
- the storage and handling practices employed for wastes on and off site;
- the level of on site education in terms of waste management practices;
- the number of legitimate complaints received from surrounding sensitive receptors in relation to waste management; and
- the installation of control strategies and verification that these achieve the design operating parameters.

3.6.3.3 Standards for Waste Management

New Oakleigh Coal Pty Ltd employs a waste management strategy, which incorporates in order of preference the principles of:

1. waste minimisation;
2. waste reuse/recycling;
3. waste treatment; and
4. waste disposal.

Disposal will be the last option where no other reasonable economic option is available for minimisation, reuse, recycling or treatment.

A continual review of waste management practices is undertaken as part of the waste management plan for New Oakleigh Mine. The waste management plan will be detailed in the POOP and set the standard for waste management on site by defining targets for waste reduction.

Waste will be managed in a manner that avoids any injury or adverse effect on people and the environment on and surrounding the New Oakleigh Mine especially incidents of environmental harm. Fencing and barriers will be erected and maintained to manage stock and wildlife access to waste storage and disposal areas. The period wastes are stored on site for future removal will be minimised.

Licensed operators will be used to remove any regulated wastes off site. Licensed or registered off site specialist facilities will be used for disposal, recycling or re-use of wastes.

Any potential for land contamination will be minimised by the implementation of the strategies to be presented in the POOP.

A register of hazardous materials and their location will be kept on site.

New Oakleigh Mine's septic systems will be maintained to specification and serviced on a regular basis by a licensed operator. The site's main septic system is an 'Enviroflow Treatment Plant' and is located in the West Pit area (ML 4698). New Oakleigh Mine has received official approval from the Ipswich City Council for construction and use of the system (D/A App. No. 1407/01). An external professional services the septic system on a quarterly basis and reports to the Mine Manager on the performance of the system. Two smaller and older septic systems (approx. 1600 L), next to the former Administration Block, above the current Washplant (ML 4584), are also maintained by a licensed plumber.

Fuel storage facilities will be designed, constructed and maintained according to Australian Standard AS 1940.

3.6.3.4 Control Strategies for Waste Management

A waste management plan will be developed for New Oakleigh Mine, and as a minimum, will include:

- a waste inventory for the site (e.g. waste types, method of management, etc.);
- waste reduction targets based on the waste management hierarchy;
- waste handling and storage practices and procedures using bunding and signage for the various wastes generated on site including hazardous wastes;
- an education program based on the site's waste management plan; and
- an audit program for continual improvement and promotion of cleaner production.

Specific 'standards' listed above are also employed as control strategies for waste management at New Oakleigh Mine such as the use of licensed operators for off site handling of wastes.

NHCA employs a policy of buying 'environmentally-friendly' chemical products. This is a progressive system, which seeks to continually improve the chemicals used on site.

Draft EA Conditions

Waste Management - EA Conditions

EA Condition 38. New Hope Coal Australia will continue to maintain a central register for all chemicals and hazardous materials used and stored at New Oakleigh Mine. Material Safety Data Sheets will also be maintained for all chemicals listed on the register.

EA Condition 39. Fuel storage and fuel handling facilities at New Oakleigh Mine will be designed, constructed and maintained according to Australian Standard AS 1940.

EA Condition 40. All wastes at New Oakleigh Mine will be managed in a manner, which prevents environmental harm and reduces the risk to the environment surrounding the mine site.

Note: If this application proceeds, the EPA will develop streamline licence conditions based on the information provided in the EMOS, statutory requirements and EPA policies and guidelines.

3.7 NATURE CONSERVATION

3.7.1 ENVIRONMENTAL VALUE OF NATURE CONSERVATION

The integrity of ecological processes and associated ecosystems (including rare and threatened ecosystems); biological diversity at genetic, species and ecosystem levels and conservation values for flora and fauna that may be affected by operations at New Oakleigh Mine.

3.7.2 IMPACTS ON NATURE CONSERVATION

Surveys of the site have been undertaken to establish the existing flora and fauna of the site, especially the potential presence of rare and threatened flora and fauna species (Ison Environmental Planners 2001). None of the plants in the areas where active mining has been proposed are listed as rare or threatened. The majority of the site is almost completely cleared and has a long history of disturbance from grazing, agriculture and mining. Any significant occurrences of rare and threatened flora species on site are clear of proposed mining activities.
The only permanent water on the site is small dams constructed for stock watering or mining needs.

3.7.3 COMMITMENTS TO NATURE CONSERVATION

3.7.3.1 Objective for Nature Conservation

New Oakleigh Coal Pty Ltd will ensure that mining activities do not cause adverse impacts upon the biological values of nearby 'Rosewood Scrub' remnants and will minimise the risk of impacts on flora and fauna outside the immediate mine site area.

3.7.3.2 Indicators of Nature Conservation

- Knowledge of conservation status of local flora and fauna with respect to Queensland's Regional Ecosystems (Vegetation Management Act 1999 and Environment Protection and Biodiversity Conservation Act 1999 and the Nature Conservation Act 1992 and Nature Conservation (Wildlife) Regulation 1994).
- Percentage of the mining lease area providing natural habitat taking into account the proposed final land use.
- Recorded occurrences of outbreaks of and area affected by declared plant or environmental weed species.

3.7.3.3 Standards of Nature Conservation

On the New Oakleigh Mine site, the extent of disturbance to flora and fauna will be the minimum required for safe and efficient operations. New Oakleigh Coal Pty Ltd will prevent the unnecessary destruction of other vegetation especially areas holding conservation values or significant ecosystems. In particular, disturbance of 'Rosewood Scrub' remnants by activities on and off the mining leases under the control of the company will be minimal or nil. Rehabilitation techniques at New Oakleigh Mine will ensure that there is no net loss of 'Rosewood Scrub' species at the site by the end of mine life.

All declared plant or environmental weed species will be controlled in accordance with the requirements of the *Rural Lands Protection Act 1985* and any pest management plans or policies prepared by the Ipswich City Council.

3.7.3.4 Control Strategies for Nature Conservation

As the majority of the land to be disturbed within the mining lease is cleared grazing country, there should be no significant issues associated with clearing fauna habitat (Ison Environmental Planner 2001). Prior to disturbance, areas to be cleared are checked for the presence of obvious fauna. If significant fauna is noted, New Oakleigh Coal Pty Ltd may use one of a number of sources, including use of Queensland Parks and Wildlife Services' expertise, to assist in the relocation of the identified fauna species to a suitable new location of similar habitat.

The company has adopted the previous Mine owner's policy of propagating 'Rosewood Scrub' species and has re-established a nursery to continue propagation practices. A variety of sources for seed and seedlings of 'Rosewood Scrub' species have been identified. Advanced tube stock is sourced for certain scrub species that are difficult to obtain in terms of seed collection or are recalcitrant species in terms of propagation efforts. Where possible, local provenance species are selected for rehabilitation purposes. The above practices are designed to:

- improve the number of 'Rosewood Scrub' species within the project area;
- attempt to link the current rehabilitation on ML 4698 to the existing 'Rosewood Scrub' remnant to enhance the protection of flora species; and
- where practicable, improve wildlife habitat.

In terms of 'Rosewood Scrub' species, an average of at least 150 trees/ha will be planted on selected areas of rehabilitated land. Consultation with Ipswich City Council and local vegetation experts will continue to be undertaken to determine the most effective areas to plant these species. Further studies will be conducted to improve the methodology of conservation rehabilitation. This will provide a nil net reduction of indigenous trees on the mine site. In recent years as part of open cut mining rehabilitation, New Oakleigh Mine under the previous Mine owner has planted over 5,000 trees propagated from seed collected from the site prior to mining. It is proposed to continue this successful practice in selected areas of the Western Extension (see also Section 3.4.2.4.7 Revegetation Methods).

New Oakleigh Coal Pty Ltd will establish a buffer of 50 metres around the remnant stand of 'Rosewood Scrub' located on MLA 51075. The remnant stand and conservation rehabilitation areas will be fenced to prevent conflict/disturbance between mining operations and the other proposed land use on site (grazing). In addition, New Oakleigh Coal Pty Ltd will not cause any actual disturbance within the 50 metre buffer. However, New Oakleigh Coal Pty Ltd will conduct various minor maintenance activities within the 50 metre buffer (e.g. weed maintenance, etc.).

The spread of declared plants and environmental weeds is controlled by preventative measures as well as biological, mechanical and/or chemical control methods. All control measures seek to ensure weeds are managed in accordance with statutory requirements and to prevent the set of seed. Declared plants identified on site in the past, include Bathurst burr and Noogoora burr (*Xanthium spp*.). These weeds continue to be controlled in some of the old mining areas. A small number of Saffron thistles (*Carthamus lanatus*) were found 2 years ago but were removed. African boxthorn (*Lycium ferocissimum*) is often found along fencelines in the district and has also been removed from the mining lease areas in the past.

Draft EA Conditions

Nature Conservation - EA Conditions

EA Condition 41. 'Rosewood Scrub' remnants located on the Environmental Authority Holder's mining leases outside of coal resources will not be disturbed by mining activities. If an area of 'Rosewood Scrub' remnants is accidentally disturbed, the Environmental Authority Holder will rehabilitate the disturbed area immediately with plant species similar to what existed prior to disturbance.

EA Condition 42. The extent of disturbance of flora and fauna on the Environmental Authority Holder's mining leases will be the minimum required for safe and efficient operations and in accordance with the Schedule of Rehabilitation in the Plan of Operations.

EA Condition 43. 'Rosewood Scrub' remnants and other vegetation areas holding conservation or significant ecosystems values off the mining leases will not be disturbed by the Environmental Authority Holder's mining activities.

EA Condition 44. All declared plant and environmental weed species will be controlled in accordance with the requirements of the Rural Lands Protection Act 1985 and any pest management plans prepared by the Ipswich City Council.

Note: If this application proceeds, the EPA will develop streamline licence conditions based on the information provided in the EMOS, statutory requirements and EPA policies and guidelines.

3.8 CULTURAL HERITAGE (HISTORIC AND INDIGENOUS)

3.8.1 ENVIRONMENTAL VALUE OF CULTURAL HERITAGE

Places and objects of cultural and heritage significance within and near New Oakleigh Mine.

3.8.2 IMPACTS ON CULTURAL HERITAGE

A cultural heritage assessment of the New Oakleigh Mine and potential new development areas was undertaken (Richter and Thompson 1998). A systematic ground search located 12 sites with artefact scatters, mostly isolated finds, while 3 were much more complex and indicated foci for particular activities in the area. Many of the artefacts exhibited extensive use wear that was suggestive of wood working and reinforces reports from ethnohistoric sources that the area was known for its 'Rosewood spears'.

Due to past land use practices, ploughing and grazing, and the deflated nature of the remains, artefacts were considered to have decreased significance. While it is considered that scientific analysis would confirm the use and function of the cultural material, Ugarapul Elders have requested that all artefactual material remains on site and that the overburden be replaced on site with appropriate rehabilitation.

Four historic places were also noted near or within the possible development area: the Tallegalla Cemetery, the church hall/shop adjacent to the cemetery, Embrey's farm, and the Rosewood Railway Museum. All historic places are considered to have historical significance. Two other historical structures located during the survey; the wooden coal hopper and chute at Lanefield - 2 Colliery and the old dairy on RP893629, are considered to have little historic importance. Further, the remnant stand of 'Rosewood Scrub' on Wallace Rae's property, RP211350, is considered to have heritage significance. None of these sites will be disturbed by the proposed operation.

The Australian Railway Historical Society operates public steam train rides on part of the abandoned railway line to the west of the Marburg-Rosewood Road on ML 4698. They also store wagons on part of the railway line to the east of the Marburg-Rosewood Road on ML 4584.

Recommendations from this assessment concluded that, with the exception of the 4 significant historic places and the remnant stand of 'Rosewood Scrub', no heritage constraints be placed on the proposed mining development.

3.8.3 COMMITMENTS TO CULTURAL HERITAGE

3.8.3.1 Objective for Cultural Heritage

New Oakleigh Coal Pty Ltd will ensure that the integrity of intrinsic or attributed values of cultural and heritage features within or near the New Oakleigh Mine are retained and appropriate interactions are held with any parties with affinity to those sites.

3.8.3.2 Indicators for Cultural Heritage

- The presence of sites of potential heritage value and appropriate management of those sites.
- The number of legitimate complaints received in relation to cultural heritage issues.

3.8.3.3 Standards for Cultural Heritage

The appropriate recommendations of the Archaeological and Cultural Heritage Assessment will be implemented.

Should future activities associated with mining uncover anything which may be interpreted as Aboriginal or historic in origin, this information will be immediately passed on to the Southern Region (Cultural Heritage Section), EPA and the Traditional Owners for further discussion and the development of impact mitigation and management strategies.

All staff will be inducted in cultural and heritage issues relevant to the site.

3.8.3.4 Control Strategies for Cultural Heritage

The following recommendations were made to minimise detrimental impact on the archaeological and cultural record in the study area.

1. It is recommended that no cultural heritage constraints other than as detailed in (2), (4) and (5) be placed on the proposed development.
2. It is recommended that the wishes of the Ugarapul Elders be followed, that is, all artefactual material remains on site and that the overburden be replaced on site with appropriate rehabilitation.
3. It is recommended that Ugarapul Elders be notified should further Aboriginal cultural material be uncovered during the proposed development.
4. It is recommended that the four places of historical importance; the Tallegalla Cemetery, the church hall/shop, Embrey's farm and the Rosewood Railway Museum, should be excluded from any open cut mining activities.
5. It is recommended that preservation of significant areas of remnant 'Rosewood Scrub' be included in the environmental management plan for the proposed development.
6. It is recommended that should remains of Aboriginal or historical significance be uncovered during the proposed development, work should cease immediately and the Southern Region, EPA be notified.

New Oakleigh Coal Pty Ltd has accepted the above archaeological and cultural heritage recommendations.

New Oakleigh Mine will comply with any statutory requirements of the EPA as covered by the terms of the Cultural Record (Landscapes Queensland and Queensland Estate) Act 1987.

Draft EA Conditions

Cultural Heritage – EA Conditions

EA Condition 45. The Environmental Authority Holder will implement the recommendations of the Archaeological and Cultural Heritage Assessment (Richter and Thompson 1998).

EA Condition 46. Should future activities associated with mining uncover anything at New Oakleigh Mine, which may be interpreted as Aboriginal or historic in origin, then the following actions will be put in place:

- **all work in the area will cease immediately;**
- **relevant information about the find will be immediately passed on to the Heritage Section, EPA and the Traditional Owners for further discussion and impact mitigation;**
- **work will not recommence until directed by the Administering Authority; and**
- **any required changes to management practices will be in accordance with the requirements of the administering authority.**

Note: If this application proceeds, the EPA will develop streamline licence conditions based on the information provided in the EMOS, statutory requirements and EPA policies and guidelines.

3.9 SOCIAL CONDITIONS

3.9.1 ENVIRONMENTAL VALUE OF SOCIAL CONDITIONS

The amenity and livability, harmony and well being, sense of community, access to recreation, and access to social and community services and infrastructure in the region surrounding New Oakleigh Mine, including economic conditions and benefits within the affected community.

3.9.2 IMPACT ON SOCIAL CONDITIONS

3.9.2.1 General Discussion

New Oakleigh Coal Pty Ltd does not believe the project will have a major impact on the social conditions of the local area. The Company is aware that sections of the local community possess different perceptions of the project and its potential impacts. As a result, it is New Oakleigh Coal Pty Ltd's responsibility to establish a good relationship with the local community based on trust, the facilitation of open discussions of the issues and the provision of pertinent project information. The local community must be made aware of the overall benefits of the project. However, more importantly, the local community must be assured that the surrounding environment won't be irreparably damaged by the project and that the former project area will be left in an unproductive state for future generations.

In general, being on private land, the Western Extension area is not available for public use. The project itself will be self-contained and will not place undue demand on local facilities. The company will not be providing accommodation, and therefore, staff will continue to live in existing houses and accommodation. Families of

employees will generally either live in the local area or in nearby suburbs of Ipswich. There will not be any excessive demands on schools or other infrastructure.

The local community that may be affected to the greatest degree is the town of Rosewood and surrounding landholders.

3.9.2.2 Positive Impacts

The mining industry is responsible for providing significant economic and social benefits to the Australian economy. During 1997-1998, the mining sector added $8.6 billion to Australia's wealth generating a range of direct (e.g. employment) and indirect (e.g. regional development) benefits. As a result, the mining industry remains a positive contributor to the consumption and lifestyle of individual Australians (Cassimatis 2000). QMC (2002) states a series of recent economic statistics supporting the importance of mining to the Australian economy.

From a Queensland perspective, the mining industry is an essential component of the State's economy. During 1989-1999, the mining sector contributed 5% to Queensland's Gross State Product (Cassimatis 2000). During 2000-2001, mining generated $8,961 million dollars (33%) in overseas export revenue for Queensland (QMC 2002). Considerable economic value is generated from Queensland's mining industry, which translates into an improved lifestyle for the people of Queensland (i.e. in terms of both direct and indirect benefits).

All levels of government gain revenue from the mining industry through direct and indirect taxation, royalties, port charges, rail freight, stamp duty and other government charges. For example, during 2000-2001, coal mining royalties generated $412.3 million dollars for the Queensland Government (QMC 2002). This money benefits the community as a whole through the provision of goods and services by the Queensland Government.

From an Ipswich perspective, mining is Ipswich's third largest export industry. In 1996, mining produced $162.7 million, comprising $108 million as export to overseas, $10.8 million as export to elsewhere in Australia outside the Ipswich area, $39.5 million as local consumption within the Ipswich area and $4.4 million as stock. In terms of Gross Regional Product, which is an indicator of economic activity, mining generated $94.2 million dollars in 1996 for the Ipswich economy (ICC 2002).

In 1996, the Ipswich coal mining industry directly employed around 500 persons and was estimated to generate a further 1,100 indirect jobs in the city through support industries, such as laboratories, engineering, transport, mechanical and construction businesses (ICC 2002). The importance of mining to the local economy is clearly evident in economic assessments conducted by the Ipswich City Council.

The maintenance of employment in the area positively impacts upon a number of small businesses in Rosewood and Ipswich. For example, currently over 80% of personnel employed by NHCA live in the Ipswich area. Assuming an average disposable income of $30,000 per employee, local employees contribute over $1.3 million directly to the local community. At a 4:1 flow on ratio, the greater community

of Ipswich employs 216 people and receives in excess of $5 million per annum in benefits from the disposable income of employees.

NHCA owns and operates three of the four remaining coal mines in the West Moreton District - Swanbank, New Oakleigh and Jeebropilly Mines. Importantly, NHCA's mines currently supply coal to approximately 110 local businesses in southeast Queensland (including the Ipswich and Brisbane areas) and northern New South Wales. This coal is the most economical form of fuel for most of these businesses. If this source of coal were to suddenly cease or be drastically reduced, a negative flow-on effect would be experienced in terms of:

- greater prices for goods and services provided by these businesses, particularly as potentially more expensive coal would have to be sourced from other coal producing areas or alternative energy sources would need to be developed;
- the cessation of certain businesses that were unable to locate another economic source of coal or were unable to convert economically to an alternative energy sources; and
- the loss of employment from those businesses forced to close.

In terms of the Rosewood district, 41% of NHCA's employees live in the district and surrounding areas, which obviously generates a beneficial economic flow-on effect from their disposable income. More importantly, during the period 30 April 2000 to 30 April 2002, NHCA has spent approximately $2.2 million directly in the Rosewood district on goods and services and provided $41,049.95 for donations. Together, these facts indicate that mining is a significant positive economic contributor to the Rosewood district.

The Rosewood Structure Plan recognises mining as a local industry and acknowledges the contributions of mining to the prosperity and growth of Rosewood. In addition, mining is referenced in the future vision for Rosewood (ICC 2001c).

Overall, it can be clearly demonstrated that the economic benefits of mining are significant and positive for Rosewood, Ipswich, Queensland and Australia. New Oakleigh Coal Pty Ltd and the other local NHCA companies contribute to these economic benefits, particularly at the local scale.

3.9.2.3 Negative Impacts

A negative social impact of New Oakleigh Mine is the degradation of the amenity of the area surrounding the Mine. For example, the impact of visual amenity is perceived differently amongst members of the local community. Therefore, the level of impact is subjective and difficult to quantify on a community level.

The greatest impact to visual amenity has been during the first 12 to 15 months of operations at the West Pit during development of the initial box-cut and out-of-pit dump. For operational reasons, rehabilitation was unable to be conducted during this period, which is a typical operational feature of most open cut mines. Nevertheless, operations have since progressed to a state that has allowed revegetation of the

out-of-pit dump to commence. Rehabilitation will continue to follow the mine path on a progressive basis. Rehabilitation has improved the visual impact.

It is important to note that bunding of the operations to reduce noise impacts also add to the degradation of visual amenity. As temporary and evolving structures as they follow operations across the mining leases, it has not been feasible to revegetate bunds to improve their visual appearance.

In the long term, rehabilitation will return the site to a suitable visual state. This improvement in visual amenity has been demonstrated by rehabilitation of previously mined areas. Several good examples are apparent on site and at Jeebropilly Mine.

The perceived loss of amenity from other impacts from the Mine may also be of concern to sections of the local community (e.g. air quality, noise, etc.). This problem can be largely addressed by:

- ensuring that environmental management is of a high standard to properly mitigate the impacts;
- public reporting of environmental monitoring results is undertaken to allay concerns about operations; and
- response times to actual problems and complaints are expedient to show that the Mine is genuinely concerned with making sure that its impacts on the local community are minimised or negligible.

The actions of Local and State Government planning authorities do not support the suggested economic losses brought about by the presence of New Oakleigh Mine in the Rosewood area. Clear buffer areas have been established around resource areas in a bid to reduce land use conflicts and to assist the development of these resources for the benefit of the Queensland public. The importance of mining to the Rosewood and Ipswich communities both past and present is also clearly documented in several local government publications (ICC 2001b; ICC 2002).

In relation to land values, it is difficult to quantify the impacts of mining on actual values, particularly as mining has been present in the district for 80 years (including open cut mining for nearly 30 years). New Oakleigh Coal Pty Ltd is a significant landowner in the district and currently owns all the land where surface mining rights are held (Figure 2). In addition, the Mine has tried to establish a buffer around its operations and create a possible transport corridor to the west of Rosewood. In obtaining these properties, the Mine has payed above market value prices for the land. As many of these people still live on their former properties or in the district, a nett financial gain can be inferred for those individuals, which must also provide a positive flow-on effect to the economy.

A recent area of concern expressed by the local community has been the lack of public consultation by New Oakleigh Coal Pty Ltd. The Company now recognises that this is an important issue in terms of the social environment and its social responsibility as a good corporate citizen. As a result, New Oakleigh Coal Pty Ltd have taken the necessary steps to rectify the concern, and are in the process of

developing a Community Consultation and Awareness Program in consultation with local community groups.

3.9.3 COMMITMENTS TO SOCIAL CONDITIONS

3.9.3.1 Objective for Social Conditions

New Oakleigh Coal Pty Ltd will manage operations at New Oakleigh Mine to minimise negative impacts on the community during and after mining, and as far as practicable, to improve amenities and well-being in the community.

3.9.3.2 Indicators of Social Conditions

- The level of public consultation conducted by New Oakleigh Coal Pty Ltd, particularly in terms of dissemination of information about current operations, future operations/projects and monitoring results and an open process to allow discussion of issues between the local community and the Mine. (This is a key indicator for the Rosewood area).
- The development and implementation of procedures to manage risks to the public from current operations.
- The development and implementation of procedures to manage post project risks.
- The level of impact of current mining operations on the objectives of the Rosewood Structure Plan (ICC 2001b).
- The number of community projects involving formal participation by New Oakleigh Coal Pty Ltd.
- The number of complaints lodged annually by the public in relation to operations at New Oakleigh Mine.

3.9.3.3 Standards of Social Conditions

New Oakleigh Coal Pty Ltd will develop an on-going Community Consultation and Awareness Program in conjunction with the community and monitor and address relevant social issues as they arise. The Company will continue to consult with the Ipswich City Council and/or relevant State government departments in relation to mining related issues.

Procedures and policies to control risks to the public from site and associated operations (during both operational and post-mining phases) will be included in operational manuals. Public safety issues will be a priority.

The Company will ensure that mining operations do not interfere with the objectives of the Rosewood Structure Plan, i.e. in terms of the relevant issues (e.g. D. Environmental Management and Green Space) (ICC 2001b).

All complaints/environmental issues will receive a response from the Company within 24 hours using NHCA's complaints handling procedure with the intention of resolving legitimate concerns as quickly as possible.

3.9.3.4 Control Strategies for Social Conditions

New Oakleigh Coal Pty Ltd will development a Community Consultation and Awareness Program as a key strategy for managing social issues in the Rosewood area. The following points are an overview of the main proposals/strategies/methodologies put forward by New Oakleigh Coal Pty Ltd for the proposed Community Consultation and Awareness Program.

- New Oakleigh Coal Pty Ltd will establish a shop front in Rosewood to handle queries/feedback and to provide up-to-date information about the project. Initially, the shop front will be staffed one day per week and monitored to establish its value as a consultation tool.
- New Oakleigh Coal Pty Ltd suggests that the current Advisory Body meet on a quarterly basis to discuss project matters (i.e. at a time and place convenient to all members). Alternatively, a new consultation forum could be formed involving the current Advisory Body participants and other interested local community groups. The focus of discussions should be on the local Rosewood area.
- New Oakleigh Coal Pty Ltd will continue to maintain its presence on various other local community groups (e.g. Ipswich Environmental Consultative Committee, etc.).
- New Oakleigh Coal Pty Ltd will review its community support program to ensure that suitable donations/contributions are made to local clubs, groups, projects, etc. in the Rosewood area (i.e. to create a greater focus on the town in terms of financial support). Feedback will be sought from local community groups in relation to this matter. New Oakleigh Coal Pty Ltd believes this is an important issue/matter.
- New Oakleigh Coal Pty Ltd will seek feedback and suggestions on the proposed Community Consultation and Awareness Program from the local community groups represented on the current Advisory Body and any other local groups who wish to participate.
- New Oakleigh Coal Pty Ltd will develop a scheme for public reporting of its environmental monitoring results (e.g. at the shop front, via the Internet, etc.).
- New Oakleigh Coal Pty Ltd will ensure that all relevant project information is disseminated with sufficient time for feedback from the local community and local community groups (i.e. well prior to major decisions). For example, on issue such as the proposed re-alignment of the Rosewood-Marburg Road.
- New Oakleigh Coal Pty Ltd will establish a suggestions/feedback mechanism for its shop front to help gauge community issues and concerns.
- New Oakleigh Coal Pty Ltd will ensure that the community/local community groups are involved in mine closure issue (e.g. uses for the final void).
- On finalisation of a framework/approach following consultation, New Oakleigh Coal Pty Ltd will document its proposed Community Consultation and Awareness Program. This document will be live (i.e. it will be able to be edited or updated at any time to facilitate changing circumstances) and reviewed on an annual basis in consultation with the local community groups represented

on the current Advisory Body and any other local groups who wish to participate.

Additional control strategies adopted by New Oakleigh Coal Pty Ltd to address social issues include:

- restrictions on public access to the mine site, including suitable signage and fencing where necessary and the use of security guards during non-operating periods (Note: The 24 hour movements of staff on site also assists security issues.);
- development of stable post mining landforms through appropriate rehabilitation methods as described in the EMOS and current POOP;
- preferential use of suitable qualified local personnel for employment or work contracts;
- continuation of the 'buy local' purchasing policy where possible;
- maintenance of good relations with nearby neighbours;
- assessment of future bunding and tree screening requirements based on projected mine planning to improve attenuation of air, noise and visual impacts;
- maintenance of NHCA's complaints handling procedure with a minimum of 24 hours initial response time;
- continuation of research into viable alternatives for coal haulage routes (which will if an alternative is identified, include consultation with the local community, Ipswich City Council and the Department of Main Roads);
- investigations into alternate beneficial post mining land uses; and
- consultation with relevant government departments.

Draft EA Conditions

Social Issues – EA Conditions

EA Condition 47. New Oakleigh Coal Pty Ltd will implement and maintain the Community Consultation and Awareness Program described in 'Section 3.9.3.4 Control Strategies for Social Conditions' of this EMOS.

Note: If this application proceeds, the EPA will develop streamline licence conditions based on the information provided in the EMOS, statutory requirements and EPA policies and guidelines.

3.10 MONITORING

3.10.1 ENVIRONMENTAL VALUE OF MONITORING

Not Applicable

3.10.2 IMPACTS OF MONITORING

Monitoring is required to ensure operational controls are functioning and effective and to demonstrate compliance with environmental obligations.

3.10.3 COMMITMENTS TO MONITORING

3.10.3.1 Objective of Monitoring

New Oakleigh Coal Pty Ltd will undertake monitoring of applicable parameters to demonstrate that the project is operating in accordance with all of the conditions of the environmental authority and that control strategies, structures and programs are operating consistently with those conditions.

3.10.3.2 Indicators for Monitoring

- A comprehensive monitoring regime will be established to ensure the conditions of the environmental authority are met.
- Sampling and analytical techniques will be conducted in accordance with relevant industry or government standards or guidelines.
- The frequency of sampling will be designed to include data indicative of peak potential impacts to the environment.
- Appropriate protocols for the storage and retrieval of all monitoring data will be developed.

3.10.3.3 Standards for Monitoring

The monitoring programs outlined in Table 7 are being or will be undertaken to demonstrate compliance with statutory requirements and the conditions of the environmental authority.

Continuous assessment of monitoring results will be carried out as results are received. Actions considered appropriate to rectify any causes of unacceptable results will be commenced immediately after identification of the problem.

Monitoring plans will be developed for the POOP to meet the conditions of the environmental authority and will be implemented to demonstrate performance of operational systems, including pollution control devices and licence compliance. Up-to-date tables and figures providing sampling locations, frequency and parameters to be measured will be presented in the POOP.

Sampling techniques will be consistent with relevant EPA manuals and the ANZECC Water Quality Guidelines (Australian and New Zealand Environment and Conservation Council 2000) and all chemical analysis will be undertaken at a laboratory NATA accredited for each analyte.

All raw and processed data will be maintained and catalogued in a central location such that it accessible on request by EPA officers (refer also to Reporting EA Conditions).

Table 7 Proposed environmental monitoring programs, New Oakleigh Mine.

Aim	Methods	Schedule	Reporting
Land Resources			
Identify gully erosion (> 100 mm depth)	Surveillance (including a photographic record)	Monthly in wet season	Annual
Detect failure of contour/ diversion banks, and waterways	Inspection (including a photographic record)	After runoff events	Annual
Evaluate the maintenance routine of key sediment control structures	Inspection of maintenance records	Monthly in wet season	Annual
Evaluate vegetative cover and growth stability	Surveillance and Transects	May	Annual
Measure tree/shrub establishment	Count trees and shrubs > 1m in height	Annual	Annual
Evaluate rehabilitation success	Photographic record	Quarterly	Annual
Monitor rehabilitated areas disturbed by mining to validate the quantified erosion targets.	Procedure adopted dependent on industry sponsored trials being conducted by the Centre for Mined Land Rehabilitation	As required	Annual
Water Resources			
Monitor surface water quality	Sample any site runoff and key water management structures	Monthly	Annual
Monitor water quality in the rainwater tanks of nearby neighbours	Sample the rainwater tank at the outlet closest to the tank	Monthly	Monthly until a reasonable sample period establishes that no water quality issues exist.
Monitor main discharge points during major discharge events	Rising stage samplers	As required following major discharge events	Monthly/ Annual
Final voids	Measure water levels and quality until lease surrender	Quarterly	Annual/Final
Air Quality			
Monitor dust deposition	Deposition gauges	Monthly	Monthly/ Annual
Particulate matter (PM_{10})	High volume samplers (24 hour average)	As required to assess compliance	Monthly/ Annual
Noise			
Check compliance	Noise monitors	As required to address complaints	At time of sampling
Check compliance	Noise monitors	Monthly	Monthly/ Annual
Vibration and Airblast Over Pressure			
Check compliance	Measure airblast over pressure and ground vibration of blasts	At each blast event	At time of sampling/ Annual

Vegetation monitoring will be annual until criteria for successful rehabilitation have been achieved. After this time, monitoring of vegetation and stability will proceed

every 3 years to ensure that success continues up to relinquishment of the mining leases.

3.10.3.4 Control Strategies for Monitoring

Continuous assessment of monitoring results will be carried out as results are received. Actions considered appropriate to rectify any causes of unacceptable results will be commenced immediately after identification of the problem. The Administering Authority will be kept informed as soon as possible of any identified problems with the potential to cause environmental harm or that has caused environmental harm.

An internal assessment and interpretation will be conducted annually and completed to:

- meet the reporting requirements of each Annual Return;
- ensure successful operation of control strategies; and
- establish if compliance with statutory requirements has been met.

Water and air quality results, erosion control and revegetation success and disturbance area statistics will be prepared annually as part of the assessment.

Draft EA Conditions

Monitoring – EA Conditions

EA Condition 48. Monitoring will be conducted as indicated in Table 7 of the Environmental Authority Holder's current EMOS to demonstrate compliance with statutory requirements and the applicable conditions of this environmental authority.

EA Condition 49. Continuous assessment of monitoring results will be conducted to demonstrate compliance with statutory requirements and the applicable conditions of this environmental authority.

EA Condition 50. If monitoring results identify a problem (e.g. results exceed parameters stipulated in this environmental authority), the Environmental Authority Holder will investigate the problem and actions considered appropriate to rectify any causes of unacceptable results will be commenced immediately after identification of the problem including installation of control strategies and verification that these achieve the design operating parameters.

EA Condition 51. The Environmental Authority Holder will report to the Administering Authority within 14 days of receiving results indicating actual or possible serious Environmental Harm. The report will include an analysis of the possible source of exceedance and a commitment to ameliorate the identified problem within a specified timeframe.

EA Condition 52. Sampling techniques will be conducted in accordance with relevant EPA manuals and the ANZECC Water Quality Guidelines and all chemical analysis will be undertaken at a laboratory NATA accredited for each analyte.

EA Condition 53. All raw and processed monitoring data collected by the Environmental Authority Holder will be maintained and catalogued in a central location and be accessible on request by officers of the Administering Authority.

EA Condition 54. Vegetation monitoring will be conducted on an annual basis until the criteria for successful rehabilitation have been achieved. After this time, monitoring of vegetation and stability will proceed every three years to ensure that success continues up to relinquishment of the mining lease.

Note: If this application proceeds, the EPA will develop streamline licence conditions based on the information provided in the EMOS, statutory requirements and EPA policies and guidelines.

3.11 REPORTING

3.11.1 ENVIRONMENTAL VALUE OF REPORTING

Not Applicable

3.11.2 IMPACTS OF REPORTING

Regular reporting of environmental controls is required to satisfy legislative requirements.

3.11.3 COMMITMENTS TO REPORTING

3.11.3.1 Objective of Reporting

New Oakleigh Coal Pty Ltd will provide timely, relevant and appropriately presented information to the Administering Authority on the environmental performance of New Oakleigh Mine.

3.11.3.2 Indicators for Reporting

- The timely completion of the Annual Return requirements of New Oakleigh Mine's environmental authority.
- The timely completion of other statutory reporting requirements for New Oakleigh Mine such as NPI (National Pollutant Inventory) reporting and company laws.
- No negative feedback in relation to reporting of environmental matters at New Oakleigh Mine from the Administering Authority.
- Availability of public reports and information.
- Number of public meetings held annually.
- Feedback from the public and government agencies on the adequacy and clarity of report information.

3.11.3.3 Standards for Reporting

As a minimum, the requirements of each Annual Return will be provided to the Administering Authority within the specified timeframe. All reports on specific investigations undertaken at New Oakleigh Mine to demonstrate compliance or improve environmental management will be made available to the Administering Authority. As requested, any relevant audit reports on operations at New Oakleigh Mine will be provided to the Administering Authority.

As requested, other research, reports and summaries (hard copy and electronic format) of environmental issues and performance at New Oakleigh Mine will be provided to the Administering Authority.

Summary information on environmental performance will be provided to the public at public consultation meetings and displays held in Rosewood.

3.11.3.4 Control Strategies for Reporting

The results of environmental monitoring will be assessed on a monthly basis and reported within the timeframes specified in the POOP. Monitoring data will be maintained in an accessible format for quick and efficient retrieval and review.

Audit reports and associated information will be freely available to the Administering Authority and relevant government agencies.

Community consultation will be conducted on a regular basis to provide environmental information on New Oakleigh Mine (see 3.9.3.4 Control Strategies for Social Conditions).

New methods of data storage and presentation will be investigated to improve reporting of environmental information.

Draft EA Conditions

Reporting – EA Conditions

EA Condition 55. All the Annual Return requirements of this environmental authority will be completed within the timeframe specified by the Administering Authority and to the satisfaction of the Administering Authority.

Note: If this application proceeds, the EPA will develop streamline licence conditions based on the information provided in the EMOS, statutory requirements and EPA policies and guidelines.

3.12 CONTINUOUS IMPROVEMENT

In relation to continuous improvement, New Oakleigh Coal Pty Ltd will:

- as required, commission research and investigations into technical issues (Table 8) and legitimate complaints to resolve outstanding problems, improve environmental management and maintain statutory compliance;

- continue to assist in the incorporation of New Oakleigh Mine into NHCA's EMS (Environmental Management System);
- provide environmental awareness training to all staff;
- establish an on site environmental incident reporting system; and
- where appropriate, forward investigation/research results and reports to the EPA to support amendments to the EMOS, POOP or environmental authority (i.e. to improve environmental management on site).

Currently, investigations are being conducted into the possible use of old underground workings for future tailings disposal as an alternative disposal method when the North Pit's void space is exhausted. If feasible, the current POOP will be amended to reflect any changes to operations on site.

Table 8 Proposed research programs, New Oakleigh Mine.

Proposed Research	Desired Outcome	Proposed Timeframe
Trial monitoring of water quality of the rainwater tanks of the Mine's nearest neighbours	• To establish if the Mine's operations are affecting the of water quality of the rainwater tanks of the Mine's nearest neighbours	2002 until sufficient proof of no impacts is established
Grazing trials	• To establish that the rehabilitated land can support grazing at a realistic stocking rate • To develop the correct management strategies for long term sustainable use of the land as grazing land	Prior to the availability of the first rehabilitated grazing (To be advised prior in the appropriate POOP)
'Rosewood Scrub' species determination	• To establish a representative species selection for conservation rehabilitation (long term)	2002-2003
Investigations into possible legal or other local government mechanisms for future protection of areas of conservation rehabilitation	• To protect all areas of conservation rehabilitation on site from future adverse development by subsequent landowners	2002-2003 (To be advised prior in the appropriate POOP)
Final Void - Water storage proposal	• To establish if the final void could function as a long term water storage at the end of min life. (i.e. in terms of water quality, hydrological parameters, final landform design downstream impacts and safety issues)	2006 or at an earlier date when mine planning allows (To be advised prior in the appropriate POOP)

Staff Training

Staff Training seeks to ensure a well trained, environmentally aware work force able and willing to incorporate environmentally relevant actions in their day-to-day work, identify emerging issues and respond proactively to incidents.

New Oakleigh Coal Pty Ltd will provide environmental awareness training to the staff at New Oakleigh Mine as part of the implementation of NHCA's EMS. Initial environmental awareness training will cover topics, such as:

- the recent changes to environmental regulation of mining;
- the legislative requirements applicable to New Oakleigh Mine including the Environmental Protection Act and Regulation, environmental harm and general environmental duty;
- the statutory requirements of New Oakleigh Mine's environmental authority; and
- environmental incident reporting.

All staff and contractors will be trained in, and visitors informed of, general environmental awareness during induction.

Following initial environmental awareness training, further training is expected to cover specific environmental issues of air, noise, water etc. and their relevance to New Oakleigh Mine. It is envisaged that training will continue to evolve over time. Environmental awareness issues will also eventually be incorporated into site inductions as part of the implementation of NHCA's EMS.

Environmental incidents recorded at New Oakleigh Mine will be investigated and training programs amended or special training conducted to reduce the risk of recurrence.

Environmental Auditing

Environmental Auditing of procedures will increase awareness of the maintenance of standards and demonstrate adequacy of environmental protection and management. New Oakleigh Coal Pty Ltd will conduct an internal audit and interpretation of monitoring data annually to:

- ensure successful operation of the control strategies outlined in the current EMOS;
- confirm compliance with the conditions of the environmental authority and other statutory requirements; and
- identify operational areas for continuous improvement.

When developed and implemented, New Oakleigh Coal Pty Ltd will comply with the administering authority's audit protocol for mining projects. New Oakleigh Coal Pty Ltd will also commission external third party audits from time to time to check compliance and identify operational areas for continuous improvement.

4. REFERENCES:

Australian and New Zealand Environment and Conservation Council 2000, *Australian Water Quality Guidelines for Fresh and Marine Waters*, (October 2000).

Bell, L.C. 1996, 'Rehabilitation of Disturbed Land', In *Environmental Management in the Australian Minerals and Energy Industries – Principles and Practices*, D. Mulligan (ed.), Australian Minerals and Energy Environment Foundation, University of New South Wales Press, Sydney.

Bird, L.H. & Reick, A. 1993, *Flora checklist of 'Brigalow Semi-evergreen Vine Thicket' located at Oakleigh Colliery, Perry's Knob, Rosewood 27°36'S, 152°35'E Ipswich 9442-593455*, P.D. Bostock (ed.), Queensland Herbarium.

Bureau of Meteorology (BOM) 2002, http://www.bom.gov.au/cgi-bin/climate/cgi_bin_scripts/map_script_new.cgi?40004

David Moore and Associates (2001), *Ambient Noise Level Measurements*, Lanefield Road, Rosewood. December 2001.

David Moore and Associates (2002), *Environmental Noise Level Impact Assessment for New Mining Area for New Oakleigh – West Pit Extension (MLA 50175) – for Worst Case Scenario of Mining Equipment*, January 2002.

Cassimatis, V. 2000, *The Importance of the Mining Industry to the Economy*, Presented at 29th Annual Conference of Economists, Gold Coast, Queensland (4 July 2000).

Cliff, D.I. 1996, 'Management of Air Quality and Noise', In *Environmental Management in the Australian Minerals and Energy Industries – Principles and Practices*, D. Mulligan (ed.), Australian Minerals and Energy Environment Foundation, University of New South Wales Press, Sydney.

Environment Australia 1998a, *Best Practice Environmental Management in Mining – Noise, Vibration and Airblast Control*, Supervising Scientist Group, Environment Australia, Canberra (31 March 1998).

Environment Australia 1998b, *Best Practice Environmental Management in Mining – Landform Design for Rehabilitation*, Supervising Scientist Group, Environment Australia, Canberra (May 1998).

Environment Australia 1998c, *Best Practice Environmental Management in Mining - Dust Control*, Supervising Scientist Group, Environment Australia, Canberra (June 1998).

Environment Australia 1999, *Best Practice Environmental Management in Mining – Water Management*, Supervising Scientist Group, Environment Australia, Canberra.

Environment Protection Agency 1995, *Best Practice Environmental Management in Mining – Rehabilitation and Revegetation*, Supervising Scientist Group, Environment Protection Agency (now Environment Australia), Canberra.

Ipswich City Council (ICC) 2001a, *Commercial and Industrial Development Code – Ipswich Planning Scheme*, Planning Branch, Ipswich City Council, Ipswich City.

Ipswich City Council (ICC) 2001b, *Rosewood Structure Plan – Ipswich Planning Scheme*, Planning Branch, Ipswich City Council, Ipswich City.

Ipswich City Council (ICC) 2001c, *Rural Development Code – Ipswich Planning Scheme*, Planning Branch, Ipswich City Council, Ipswich City.

Ipswich City Council (ICC) 2002, http://www.econdev.ipswich.qld.gov.au/General_Pages/Economic%20Perspective%20Colour.pdf.

Ison Environmental Planners (2001), *Soil Survey, Land Capability, Flora and Fauna Assessment*, New Oakleigh Western Extension, October 2001.

Ison Environmental Planners (2002), *EMOS: New Oakleigh Mine ML 4568, 4584 4675, 4683, 4698, 4699 and MLA 50175, January 2001* (EMOS3.4 - Draft for EPA Advisory Body Process for MLA 50175).

Katestone Environment / Scientific (2002), *Air Quality Assessment of the Proposed Oakleigh Mine West Pit Extension*.

McQuade C.V. and Riley S.J. 1996, 'Water Management', In *Environmental Management in the Australian Minerals and Energy Industries – Principles and Practices*, D. Mulligan (ed.), Australian Minerals and Energy Environment Foundation, University of New South Wales Press, Sydney.

Minerals Council of Australia (MCA) 1997, Minesite Water Management Handbook, Minerals Council of Australia, Dickson, Australian Capital Territory.

Queensland Mining Council (QMC) 2002, http://www.qmc.com.au/docs/general/industry-statistics_qld-minerals-stats.pdf (last update: 02 April 2002).

Richter, J and Thompson, S. (1998), *A Cultural Heritage Assessment of the Proposed Extension of Oakleigh Colliery*, Report to Ison Environmental Planners, May 1998.

Rosser, J., Swartz, G.L., Dawson, N.M. and Briggs, H.S. (1974), *A Land Capability Classification for Agricultural Purposes*, Division of Land Utilisation Technical Bulletin No. 14, Queensland Department of Primary Industries.

Telfer D., Carter D., Johnson D. & Moller G. 1998, *State of the Rivers – Bremer River and Major Tributaries – An Ecological and Physical Assessment of the Conditions of the Streams in the Bremer River Catchment*, Department of Natural Resources (now Natural Resources and Mines), Resource Science Centre, Indooroopilly.

World Health Organisation (1999), *Guideline for Community Noise*, Birgitta Berglund, Thomas Lindvall and Dietrich H Schwela (eds), http://www.who.int/peh/noise/guidelines2.html (publication date: 4 September 2001).

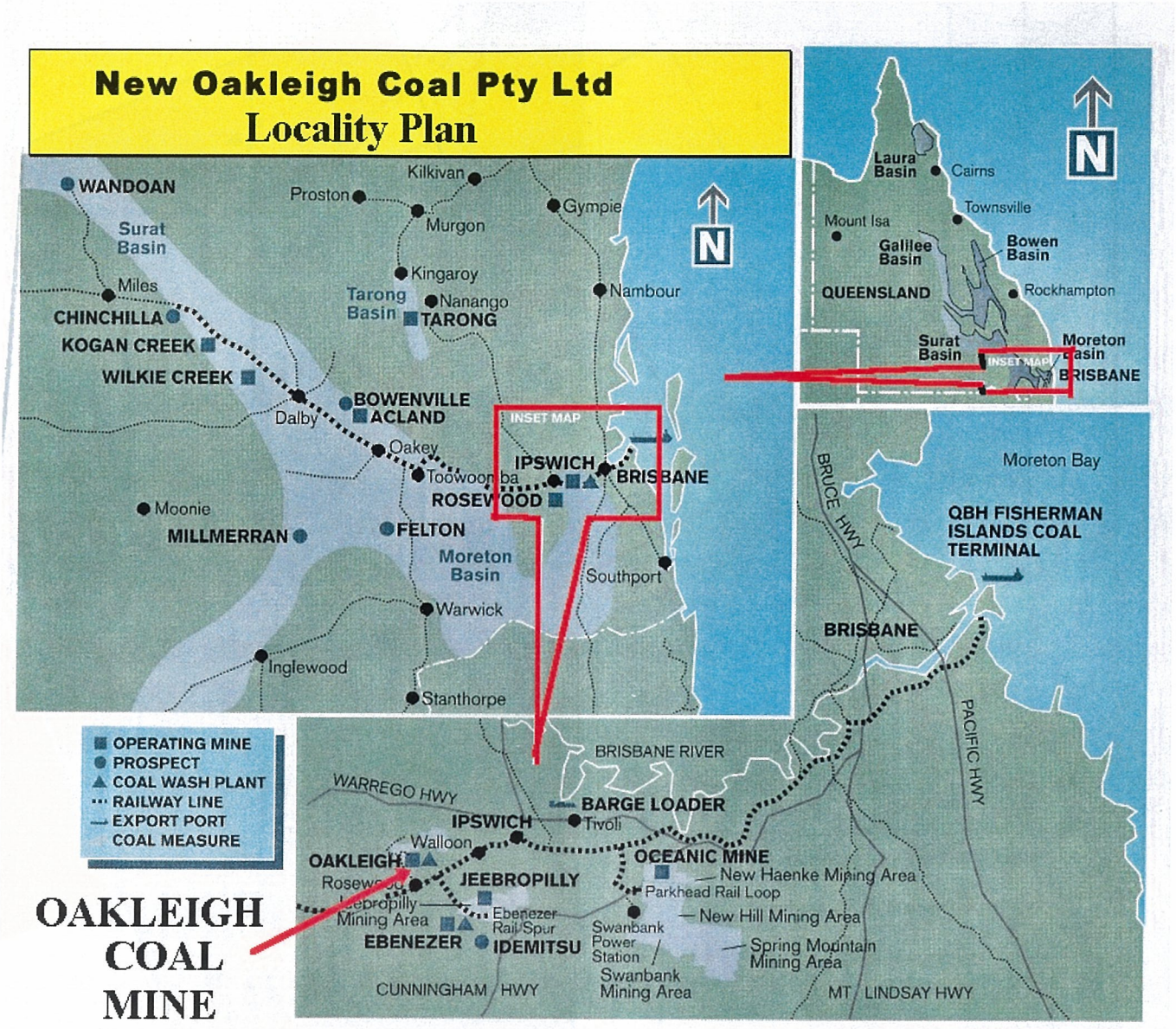


Figure 1 Locality Plan

EPC 642

MDL54

ML 4683

ML 4699

ML 4584

ML 4698

MLA 50175

ML 4675

ML 4568

458000

460000

462000

6946000

6944000

N

New Oakleigh Freehold Land

Surface Area Boundary

Mining Lease Boundary

MDL Boundary

EPC Boundary

200 100 0 200 Metres 400 600 800

SCALE 1 : 15,000

NEW HOPE COAL AUSTRALIA

NEW OAKLEIGH MINE – ROSEWOOD
PLAN SHOWING MINING AND LAND
TENURE BOUNDARIES

SCALE	1:15000			A3	emos_ml_0901_a3
		DRAWN	SRR		
		CHECKED	SRR		Figure 2
DATE	23-01-02	APPROVED	DBK		

MDL54

ML 4683

ML 4699

ML 4584

ML 4698

MLA 50175

ML 4675

ML 4568

RESOURCE AREA

OD15

OD13

Coffee Shop

OD12

OD6

Cabanda Station

OD10

OW1

North Pit

OW4

Active Pit

Workshop

Transfer Station

Washplant

OW6

OW5

OD9 Keates Rd

Scraper Camp

OD5

Normanton Pit

Herschell

OD7

Urry Rd

OW9

OW10

OD8

OD2

OD14

Ahearn St

N

458000

462000

6946000

6944000

6942000

Legend:

- Sealed Road
- Unsealed internal road
- Railway
- Building
- Mining Lease or Application
- Freshwater / Sediment dams
- Coal reserve area
- Mined area (Rehabilitated)
- Active Mining Area (Void)
- Spoil Dump
- Reject Disposal Area
- Underground Workings (Abandoned)
- OD1 Dust / Noise Monitoring Station
- EW1 Air blast / Vibration Monitoring Station
- OW1 Water Sampling Location
- Private Residence

200 100 0 200 400 600 800 Metres

SCALE 1 : 15,000

NEW HOPE COAL AUSTRALIA

NEW OAKLEIGH MINE – ROSEWOOD
GENERAL ARRANGEMENT PLAN AND
LOCATION OF RESOURCES

SCALE	1:15000			A3	smos_gen_0402_a3
		DRAWN	JSB		
		CHECKED	DLG		FIGURE 3
DATE	10-04-02	APPROVED	DBK		

ML 4683

ML 4699

ML 4584

ML 4698

MLA 50175

ML 4675

ML 4568

N

6946000

6944000

6942000

458000

200 0 200 Metres 400 600 800

SCALE 1 : 15,000

NEW HOPE COAL AUSTRALIA

NEW OAKLEIGH MINE – ROSEWOOD
PLAN OF EXISTING TOPOGRAPHY
AS AT SEPTEMBER 2001

SCALE	1:15000				
		DRAWN	JSB	A3	emos_topo_0102
		CHECKED	DG		
DATE	23-01-02	APPROVED	DBK		Figure 4

ML 4683

ML 4699

ML 4584

ML 4698

POSSIBLE OUT OF PIT DUMP AREA (IF REQUIRED)

MLA 50175

ML 4675

ML 4568

6946000

6944000

458000

N

Legend:

- Land undisturbed by mining operations
- Grazing
- Native Trees / Rosewood Scrub
- Final Void
- Remnant Native Trees / Rosewood Scrub

200 0 200 Metres 400 600 800

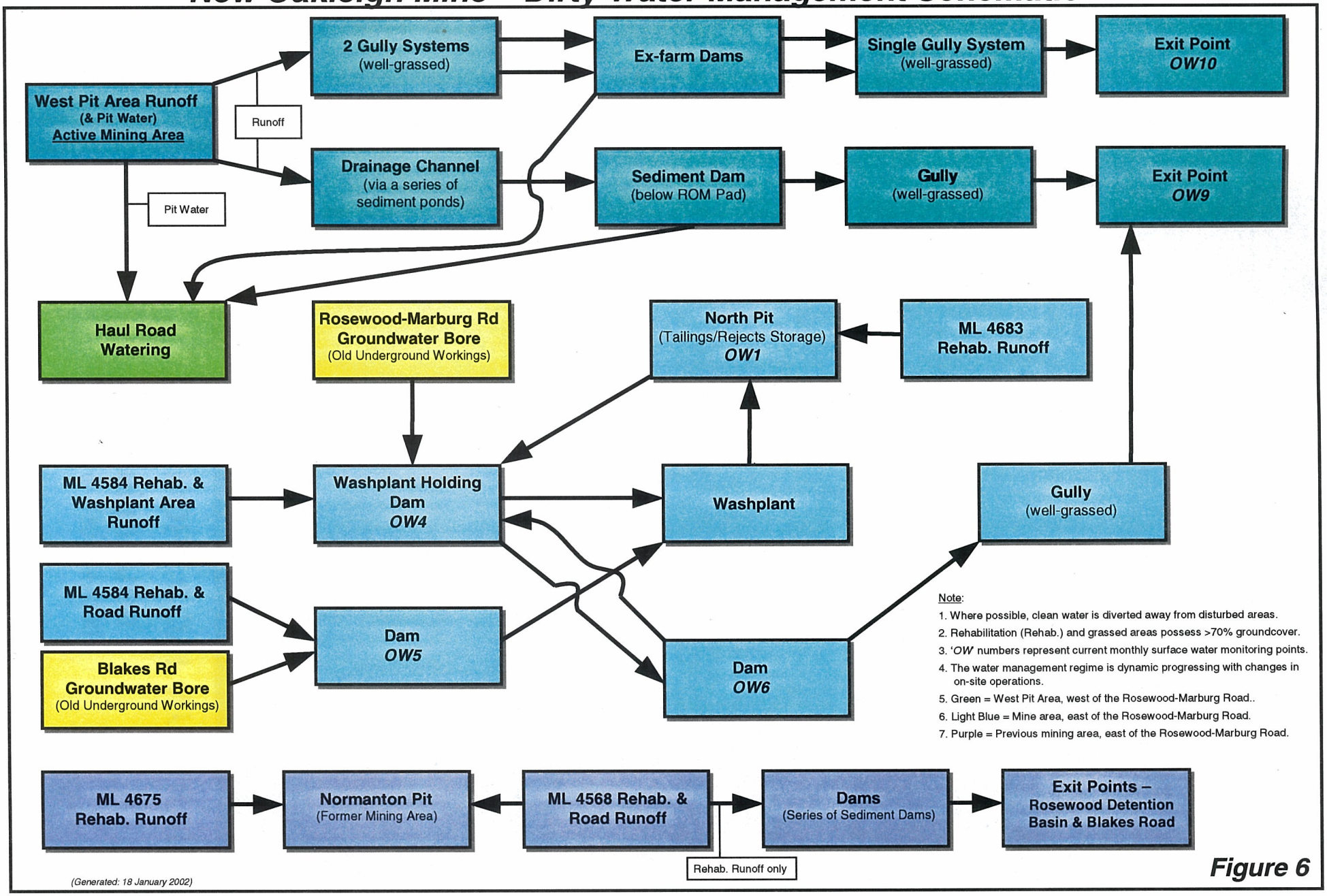
SCALE 1 : 15,000

NEW HOPE COAL AUSTRALIA

NEW_OAKLEIGH MINE – ROSEWOOD
CONCEPTUAL FINAL LANDFORM
AND FINAL LAND USE PLAN

SCALE	1:15000			A3	EMOS_FIN_0102_A3
		DRAWN	SRR		
		CHECKED	DG		
DATE	23-01-02	APPROVED	DBK		Figure 5

New Oakleigh Mine – Dirty Water Management Schematic



(Generated: 18 January 2002)

Figure 6

NEW HOPE COAL AUSTRALIA

New Oakleigh Area

Date of Exposure - 13th July 2001

Produced By:

Qasco
Phone: (07) 3846 2161
Fax: (07) 3844 4947

450 0 450 900

metres

Approximate Scale

FIGURE 7