BLOOMFIELD

MINING OPERATIONS

(RIX'S CREEK MINE)

REHABILITATION MANAGEMENT PLAN

Ver	Date	Description	By	Chk	App
1	15/3/10	Original Draft	LC	JH	
2	24/3/10	Draft Rix's Creek	JH	KH	SD
3	9/11/11	Revision of RMP	JH	JD	GB

CONTENTS

INTRODUCTION

This rehabilitation management plan (RMP) has been prepared in response to Notice of Modification to Development Consent (DA 49/94 MOD 4) granted under Section 96(2) of the Environmental Planning and Assessment Act, 1979 (EP&A).

The RMP takes into consideration the Environmental Impact Assessment for the Proposed Modification of Mining Operations – Rix's Creek Coal Mine (1995), Environmental Assessments for previous modifications in addition to the various conditions outlined in schedule 2 of the consolidated 1995 consent (as modified). In addition, commitments outlined in Bloomfield Group Environment Management Policy are also taken into account.

PURPOSE AND OBJECTIVES

The purpose of the RMP is to:

- address the relevant conditions of the development consent;
- address commitments made within the Environmental Assessment;
- address legislative requirements and guidelines relevant to the RMP and related management plans; and
- provide a clear and concise description of responsibilities in relation to Landscape Management (including Rehabilitation, Final Void Management & Mine Closure) during the operation and subsequent closure of the Bloomfield group mining operations.

SCOPE

This RMP addresses rehabilitation management of the Rix's Creek mining operation area shown in Plan 1. It should be noted that although the scope of this plan specifically addresses the area covered by the Approval, the general approach and methodologies are also applied across the Bloomfield Group operations.

RELATIONSHIP WITH OTHER PLANS

The EMS establishes the overall environmental management strategy for mining and related activities on the site. The LMP provides the framework for rehabilitation and mine closure related issues. This document, the RMP addresses specific rehabilitation objectives and measures that are used to monitor the success of rehabilitation initiatives on site.

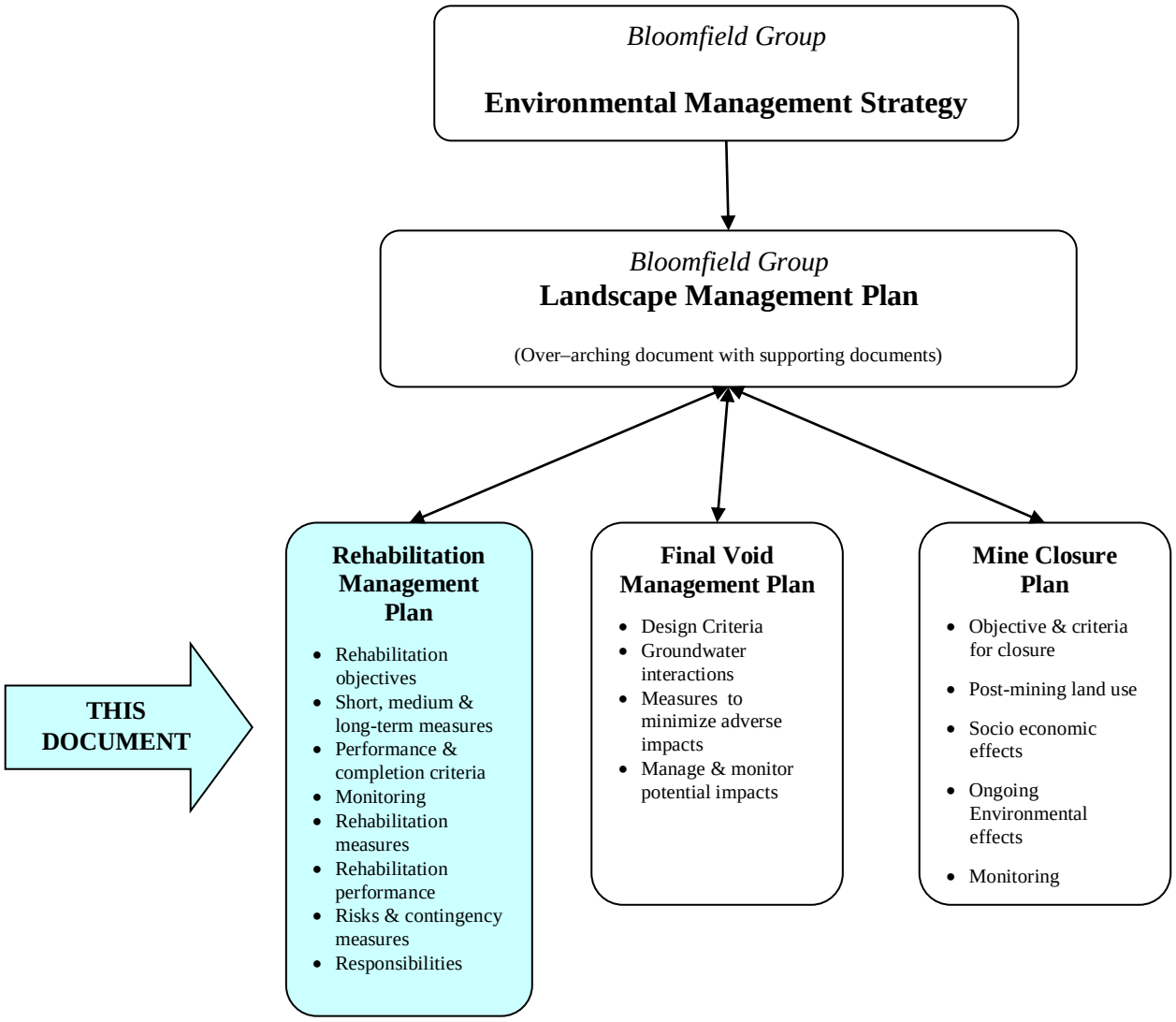

Figure 1 Relationship With Other Documents

STATUTORY OBLIGATIONS

Approval was granted by the Minister for Planning on 27 August 2009 under Section 75J of the Environmental Planning and Assessment Act, 1979. A modification to the Development Consent (DA 49/94 MOD 4) was granted under Section 96(2) of the Environmental Planning and Assessment Act, 1979 (EP&A) for a Cut and Cover Tunnel second crossing of the New England Highway. The Notice of Modification includes a number of conditions including Condition 16B of Schedule 2 that states that:-

The Rehabilitation Management Plan must include:

(i) the objectives for rehabilitation of the site of the development;
(ii) a description of the short, medium, and long term measures that would be implemented to rehabilitate the development and the remnant vegetation and habitat on the site;
(iii) detailed performance and completion criteria for the rehabilitation of the site;
(iv) a detailed description of how the performance of the rehabilitation of the mine would be monitored over time to achieve the stated objectives;
(v) a detailed description of what measures would be implemented over the next 3 years, including the procedures to be implemented for:

- *minimizing and rehabilitating disturbed areas;*
- *protecting vegetation and soil outside the disturbance areas;*
- *undertaking pre-clearance surveys;*
- *managing impacts on fauna;*
- *landscaping the site to minimize visual impacts;*
- *conserving and reusing topsoil;*
- *collecting and propagating seed for rehabilitation works;*
- *salvaging and reusing material from the site for habitat enhancement;*
- *controlling weeds and feral pests;*
- *controlling access; and*
- *bushfire management;*

(vi) a program to monitor the effectiveness of these measures, and progress against the performance and completion criteria;
(vii) a description of the potential risks to successful rehabilitation and/or revegetation, and a description of the contingency measures that would be implemented to mitigate these risks; and
(viii) details of who is responsible for monitoring, reviewing, and implementing the plan.

In addition to the Approval granted under the Environmental Planning and Assessment Act, 1979 there is a range of other relevant legislation that has been taken into consideration in developing the RMP. These include various Mining Leases and requirements of the Environment Protection Licence (EPL) that must be satisfied.

CONSULTATION WITH REGULATORY AUTHORITIES

The rehabilitation, decommissioning and closure, process will be regulated by DII. Relevant agencies will be consulted throughout the process and include the following:

- environmental inspections following the submission of the Annual Environmental Management Report;
- relinquishment of security deposit report submission;
- submission of Mining Operations Plan for Closure, Decommissioning and Rehabilitation;
- periodic inspections with Departmental throughout closure process; and
- the preparation and submission to DII of "as constructed" drawings of final landforms on completion of decommissioning.

Throughout the mining phase, copies of the AEMR will continue to be distributed to the relevant authorities to enable feedback on the strategy and overall progress of rehabilitation.

ROLES AND RESPONSIBILITIES

The company directors are responsible for the overall rehabilitation and environmental performance of Bloomfield Colliery. Senior Operational managers have direct responsibility for the rehabilitation process. The Environmental Officer provides direction and advice to ensure site environmental compliance is maintained. The key management positions are shown are shown in Table 1.

The Senior Environmental Officer and Environmental Officer are responsible for the implementation of the RMP for the Rix's Creek mine site. This involves insuring all aspects of the rehabilitation processes, as outlined in this document are followed and carried out. This commences with clearing permits and topsoil stripping prior to mining commencing. Then following the completion of mining final landform design, revegetation design, monitoring vegetation establishment and finishing with final signoff of rehabilitated areas.

Table 1 Management Team

Position	Name
Board of Directors	Reg Crick, Paul Taylor, Brett Lewis
Managing Director	John Richards
General Manager Mining	Garry Bailey
Mine Manager/ Manager Mining Engineering	Luke Murray
Senior Environmental Officer	John Hindmarsh
Environmental Officer	Jason Desmond

REHABILITATION APPROACH

The methodology and approach taken in developing the rehabilitation management plan for the site is described in detail in Appendix A. In summary, there are a number of key steps which include:

- identification and agreement on the objectives for rehabilitation;
- establishment of short, medium & long-term rehabilitation measures;
- identify performance and completion criteria in which to assess the success of rehabilitation;
- monitor rehabilitation performance ;
- develop contingencies to identify and address risks that might reduce the success of rehabilitation; and
- outline responsibilities with regard to monitoring, reviewing and implementation of the RMP.

Rix's Creek Lease comprising 1818 ha is located approximately 1.5 km northwest of Singleton.

The existing landform within the lease is undulating with steeper grades (5 to 10 degrees) on the upper and middle slopes and flatter areas adjacent to Rix's Creek. The majority of the lease area is comprised of land capability class IV, V and VI. These lands are generally suitable for grazing with classes V and VI comprising the less productive grazing lands (Enviroscienses 1994).

Coal had been mined from the lease area intermittently from the 1870s through until 1948 (Croft & Associates 1989). Other pre-mining landuses included cattle and sheep grazing as well as quarries used as a source of road gravel. The old mining activities, coupled with grazing had substantially degraded the land and disturbed the soils within some parts of the lease area.

The 1994 EIS (Enviroscienses 1994) stated "*While it is the intention of the company to return the land to a condition suitable for a range of post mining landuses it is proposed in the short term to establish the area for grazing. This landuse would be in accordance with the existing Rural Land Capability Classification of IV and V.*"

The rehabilitation study undertaken for the original Environmental Impact statement (Croft & Associates 1989) looked at tree establishment as part of the rehabilitation process. "*The proposal to establish large areas of trees is believed to have valid short and long term benefits. The incorporation of extensive tree planting will assist in achieving the rehabilitation objectives, in restoring trees lost in clearing for mining and in helping conceal the operations and facilities while they are there and improve the appearance of the area."*

The original 1989 Environmental Impact Statement (Croft & Associates 1989) investigated alternate post mining landuse options. "*Growth in the Singleton Shire has been unprecedented, and although the earlier rate of development predicted on the basis of a rapid mining expansion has slowed, a steady population needs to be planned for*." This can now be extended to cover the growth experienced in the last two decades.

These post-mining landuse options included:-

- Agriculture – cattle or horse grazing on hobby farms
- Open space – retention of areas as grassed and woodland open space
- Recreation – various activities
- Residential - subdivision of varying density for rural areas
- Other landuse options such as:- Industrial – heavy buildings and factories; Commercial – sections along the New England Highway; and Waste disposal – areas could be retained for waste disposal. May also be viable options surrounding land owned by the Company.

These options are reflected in the Rix's Creek *Rehabilitation Aim* and *Rehabilitation Objectives* with specific conditions to achieve these reflected in the *Completion Criteria*. The rehabilitation areas will be monitored against the rehabilitation progress indicators and assessed for relinquishment against the completion criteria, as described in the body of the *Rehabilitation Management Process* document.

REHABILITATION AIM

The aim of rehabilitation at Rix's Creek Colliery is to reinstate the pre-mining land capability of grazing land, with stable landforms, compatible with the surrounding landscape, and allow for a range of possible post-mining land-uses.

OBJECTIVES

Rix's Creek Colliery will provide rehabilitated land that meets the following objectives.

General

- ❑ Land will be rehabilitated in accordance with relevant DPI-MR standards applicable at the time of rehabilitation.
- ❑ Rehabilitated land will represent a minimal source of offsite environmental impacts, such as dust, water pollution, visual amenity and weeds.
- ❑ Rehabilitated land will require ongoing management inputs no greater than similar adjacent land.
- ❑ Rehabilitation will be compatible with the proposed post-mining land-use.

Landform

- ❑ Rehabilitated land will be safe and stable.
- ❑ Land capability will be returned to a class similar to that existing prior to the commencement of mining.
- ❑ Mined land will be re-contoured to a landform compatible with the surrounding natural landscape.
- ❑ Reinstate a stable drainage network.

Vegetation

- ❑ Rehabilitated land will be topsoiled, fertilised and sown with grass and/or native vegetation species.
- ❑ A sustainable vegetation cover will be established on rehabilitated land
- ❑ Grazing areas will be established with a range of species suitable for pasture production in the area.

  An example of a species mix that may be used is:-
  Rhodes Grass, Couch, Rye, Sub. Clover, Wolly Pod Vetch, Green Panic, Sirosa Phalaris, Sephi Barrel Medic, Lucerne, and Kikuyu.
- ❑ Tree area will be established with native species by either direct seeding or

tubestock planting techniques.

An example native species that may be used is:-
Eucalyptus crebra, E. fibrosa, , E. moluccana, E. melliodora, Corymbia maculata, Acacia decora, A. falcata, A. implexa, A. paradoxa, A. salicina, Casuarina luehmannii, Hardenbergia violacea, and hybrid *Eucalyptus* spp. suitable for plantations.

Rehabilitation will be undertaken in accordance with the procedures outlined in *Appendix A – Rehabilitation Methodology*, which includes short, medium and long term measures to achieve these objectives.

Short Term Rehabilitation Measures.

- Scheduling rehabilitation to minimise the disturbance footprint of the mining operation;
- Pre-clearing surveys, topsoil stripping and stockpiling;
- Final landform shaping involving the reconstruction of a drainage pattern, construction of erosion and sediment control works;
- Topdressing using topsoil and application of soil ameliorants as required, such as biosolids and mulch;
- Sowing/fertilizing with selected species mix.

Medium Term Rehabilitation Measures

- Maintenance programs including: weed control, bushfire management through managing fuel loads by slashing or grazing and re-sowing where vegetation establishment has been poor;
- Control access to rehabilitated areas;
- Assessment program, annual maintenance inspections, scheduled rehabilitation monitoring and review of inspection/measurement data over time to assess rehabilitation performance.

Long term Rehabilitation Measures

- Final maintenance inspection and rehabilitation monitoring;
- Review monitoring results to determine progress is on a trajectory to achieving the rehabilitation objectives;
- Submission for rehabilitation signoff from Regulators and stakeholders.

Plan 1. Shows the predicted schedule of rehabilitation and proposed landform at the end of the current MOP time frame 2012. The present rehabilitation schedule is on trajectory to achieving this rehabilitation outcome.

Plan 2. This is a representation of the predicted final end of mine landform at 2035. This will be dependent on gaining approval to continue the mining operation past the current development consent which expires in 2016.

REHABILITATION INDICATORS AND COMPLETION CRITERIA

Rehabilitated land less than five years old will be monitored against the progress indicators outlined in Table 2. Also presented in Table 2 are the completion criteria that all rehabilitation will be assessed against when determining suitability for relinquishment.

MONITORING METHODOLOGY

Monitoring methodology will generally follow the protocol presented in Appendix A – Rehabilitation Methodology document. The aim of soil analysis at Rix's Creek is to demonstrate that the surface growth media is not likely to inhibit the development of a sustainable vegetative cover and contains nutrient levels suitable for pasture growth.

- As well as field observations and tests made during monitoring, soils samples will be taken from the root zone for analysis.

Table 2 Rehabilitation Objectives and Criteria

Objective	Completion Criteria	Progress Indicators
General		
Land will be rehabilitated in accordance with relevant DPI-MR standards applicable at the time of rehabilitation.	❑ DPI-MR sign-off on land submitted for relinquishment.	❑ Findings from annual DPI-MR rehabilitation audits addressed or rectified.
Rehabilitated land will: ❑ represent a minimal source of offsite environmental impacts; ❑ require ongoing management inputs no greater than similar adjacent land; ❑ be compatible with the proposed post-mining land-use.	❑ All completion criteria regarding landform stability and vegetation cover met. ❑ No significant infestations of declared weeds.	❑ All progress indicators regarding landform stability and vegetation cover met. ❑ Weeds reported and treated during monitoring program.
Landform		
Rehabilitated land will: ❑ be safe and stable; ❑ be compatible with the surrounding natural landscape; and ❑ incorporate a stable drainage network	❑ No rehabilitated areas of greater than 18^{o} slopes ❑ No evidence of failed sediment control structures (dams, drains and drops structures). ❑ Surface tailings emplacement areas will be capped with 2m of overburden and rehabilitated. ❑ Erosion rills remaining stable. No significant increases in number and/or size of rills since last monitoring.	❑ Year 1: Rehabilitated areas of greater than 10^{o} slopes will be minimised during re-contouring; ❑ Year 1: Appropriately designed water/sediment management structures (contour banks, drains and drop structures) to be incorporated into landform design and constructed during re-contouring. ❑ Year 3: No evidence of slumping, settling or subsiding landform. ❑ Year 3: Erosion rills stabilising, compared to Year 1 results. ❑ Year 5: No evidence of failed water management structures.

Table 2 Rehabilitation Objectives and Criteria (Cont)

Objective	Completion Criteria	Progress Indicators
Land capability will be returned to a class similar to that existing prior to the commencement of mining (generally Classes IV, V and VI).	❑ Land meets capability classes as per Emery (1986); ❑ Land capability classes mapped on relinquishment plan.	Landform stability progress indicators met.
Vegetation		
Rehabilitated land will be topsoiled, fertilised and sown with grass and/or native vegetation species.	❑ Rehabilitation documented, indicating the required works completed.	❑ Year 1: Biosolids to be applied in accordance with Environmental Guidelines: Use and Disposal of Biosolids Products (NSW EPA, 1997); ❑ Year 3: 50 % vegetation cover, with evidence of tree establishment in tree lots.
A sustainable vegetation cover will be established on rehabilitated land.	❑ Achieve a vegetation cover of 70%, or combined live and litter cover of 70% in established tree belt areas. ❑ Tree belts or plots established, with evidence of continued recruitment. ❑ Surface litter layer present at 75% of sites.	❑ Year 3: Evidence of litter layer developing ❑ Year 3: Tree plots indicating good tree growth. ❑ Year 5: Tree species displaying successful recruitment.
A sustainable vegetation cover will be established on rehabilitated land (*soils*).	Soils in the rootzone should meet the following criteria: ❑ EC <0.6 dS/m (Grigg *et al*, 2001). ❑ pH between 4.5 and 9 (Qld EPA, 1995a) ❑ EAT Class 3 – 8 ❑ Nutrient levels acceptable for pasture establishment.	❑ Year 3: pH, EC and nutrient levels moving towards completion criteria. ❑ Year 5: pH, EC and EAT at or near completion criteria. Nutrient levels acceptable.

MONITORING PROTOCOL

Representative monitoring sites will be established in newly rehabilitated areas at an average of one site per 10 hectares of newly rehabilitated land. Each site will be monitored within 12 months of establishment and then every 2 years after. This will provide 3 sets of monitoring data in the first 5 years following rehabilitation.

Each monitoring site will be permanently marked using steel pickets or similar. The inspection protocol includes assessment of the following parameters:

- site establishment;
- general condition of rehabilitation;
- weeds;
- fauna;
- vegetation;
- nutrient recycling;
- soils/surface condition; and
- erosion and stability.

A standard monitoring plot design as shown in Figure 2 will be utilised. Further details are provided in the methodology provided in Appendix B.

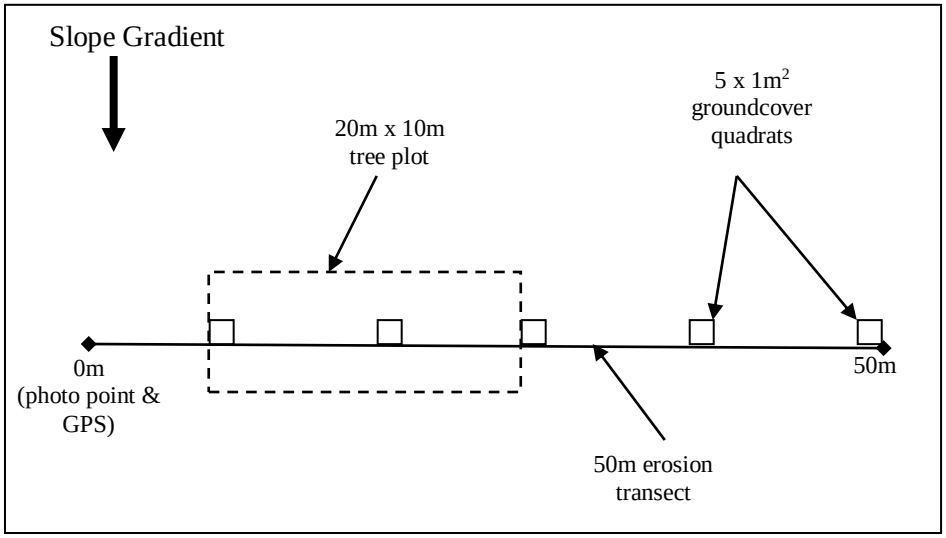

Figure 2 Standard Layout of Rehabilitation Monitoring Transect

Soil analysis will be undertaken to confirm that growth media is not likely to inhibit the sustainable development of a vegetative cover. As well as field observations and tests made during monitoring, soils analysis will consist of:

- ❑ collecting representative root zone soil samples during field monitoring; and
- ❑ testing for pH, EC and Emerson Aggregate Test (indication of erosion potential).

All rehabilitated areas are also inspected on a general basis to note any problem areas (such as bare patches, failed vegetation, drainage structure failure, significant erosion or significant weed infestation) requiring maintenance or further treatment. Remedial works will then be scheduled to address these areas.

ASSESSMENT PROGRAM

The assessment program is designed to collect sufficient data to compare the results of rehabilitation against the agreed completion criteria. The assessment program consists of three components:

- the annual maintenance inspections,
- scheduled rehabilitation monitoring; and
- the review of inspection/measurement data over time to assess rehabilitation performance.

In the event that the annual inspection finds there are problems, further investigations should be undertaken to determine the possible causes and identify an appropriate remediation strategy. Factors to consider include:

- nutrient levels;
- soil limitations such as depth, pH, salinity;
- insect attack, weeds or other pests;
- drought or storm damage; and
- excessive grazing.

Where appropriate, the rehabilitation procedures will be amended to improve the standard of rehabilitation.

FINAL ASSESSMENT

Prior to submission of a sign-off proposal, the land proposed for signoff will be subjected to a final maintenance inspection. This inspection will cover the whole area proposed for sign-off. The outcome of the inspection will be a documented description and photographic record of the general condition of rehabilitation, highlighting any areas of potential concern. This report will be included in the submission to DII.

Once a rehabilitated area is deemed to be potentially suitable for sign-off, a Sign-off Report will be submitted to the regulators. This report will include the following information for the proposed sign-off area:

- Survey Plan clearly showing the proposed area;
- Area size, disturbance and rehabilitation history;
- Monitoring data compared against rehabilitation aim, objectives and completion criteria;
- Final maintenance inspection findings;
- Photographs of the proposed area; and
- Analysis of rehabilitation development and sustainability.

RISKS TO REHABILITATION

There are risks associated with mine site rehabilitation, that could result in the failure of the rehabilitation process to reach a successful outcome, that is signoff and relinquishment of the post mining landscape by Regulators and stakeholders.

Some of these risks include such factors as:-

- Poor objectives and completion criteria and not being able to achieve them,
- Climate - drought and floods,
- Weed infestations,
- Vertebrate pest management,
- Bushfire,
- Illegal access/dumping of rubbish,
- Poor management operational and rehabilitation. I.e. Failure to schedule operations resulting in excessive bare areas.

Contingency measures to mitigate many of these risks are included as an integral components of the rehabilitation management planning process including:-

- Setting objectives and criteria that are relevant and achievable for the site as outlined in *Rehabilitation Aim and Objectives*.
- Rehabilitation operations as outlined in Short term objectives and *Rehabilitation Methodology Appendix A*.
- Maintenance programs as outlined in Medium term objectives to over come the effects of poor climatic conditions and weed infestations,
- Assessment program as outlined in Long term objectives.
- Assigning responsibility for achieving outcomes as outlined in *Roles and Responsibilities.*

AUDIT AND REVIEW

The ongoing effectiveness and efficiency of this Management System is monitored as part of the operation's day-to-day management. Feedback from this and other more formal reviews and/ or following special occurrences, form the basis for System improvement and re-design.

GENERAL CONDITIONS OF REVIEW

In general Management Systems are reviewed and up-dated conditional as follows:

- ❑ Every three years; or
- ❑ Whenever there is a significant change to relevant legislation; or
- ❑ If required to do so by the Regulations; or
- ❑ Whenever there is a significant change to the operations; or
- ❑ If required (in writing) to do so by the Chief Inspector; or
- ❑ Whenever control measures are found to be ineffective either through:
  - ♦ changes to the working environment; or
  - ♦ changes to operating systems; or
  - ♦ subsequent risk assessments; or
  - ♦ the findings of an audit; or
  - ♦ following a fatality or dangerous incident that could reasonably have been expected to result in a fatality; or
  - ♦ following an assessment of a related safety alert.

CONTINUAL IMPROVEMENT

Operational activities will be subject to regular review to ensure conformance with commitment made in the EMS and subordinate plans and strategies. The RMP will be reviewed every three years or more frequently if required to identify areas that may require improvement.

The review process may include formalized procedures such as internal and external audits or feedback from consultation.

DOCUMENT MANAGEMENT

Copies of this document are managed under the Group Document Management, Management System. This document and other relevant documents are kept on site and are available to all employees.

APPENDIX A

REHABILITATION METHODOLOGY

INTRODUCTION

During mining operations, the landscape is subjected to substantial disturbance. This disturbance results mainly from the excavation of the open cut pits, and placement of overburden dumps. Land disturbance is also caused by the construction of infrastructure, such as roads, dams, drains, buildings, workshops, CHPP facilities, hardstands and stockpile areas. Once no longer required, these disturbed areas are progressively rehabilitated. Rehabilitation works generally consist of reshaping overburden dumps and re-establishment of a vegetative cover, as outlined in the Rehabilitation Works section of this document.

Following these works, the rehabilitated land is managed to ensure continued development and sustainability. Bloomfield must demonstrate to all relevant stakeholders that the disturbed land has been suitably rehabilitated. Rehabilitation development and sustainability is monitored via a program of periodic assessments, which measure rehabilitation parameters (such as soil characteristics, landform stability and vegetation establishment) against specific criteria for the completion of rehabilitation (referred to as "completion criteria" for the remainder of this document). As well as completion criteria used for final assessment of rehabilitation, appropriate indicators have also been selected to assess rehabilitation development.

This document forms part of the Rehabilitation Management Plan (RMP) implemented by the Bloomfield Group (Bloomfield) to facilitate the preparation, management and sign-off of rehabilitated lands at Bloomfield mining operations. The key processes of this system (i.e. selection of rehabilitation objectives) are described generically in this document.

REHABILITATION PROCESS

The key elements of the rehabilitation process include:

- setting overall rehabilitation aim and objectives;
- developing appropriate rehabilitation indicators and completion criteria;
- undertaking land rehabilitation;
- developing and implementing a rehabilitation assessment program;
- continuing rehabilitation management and maintenance; and
- presenting a request for rehabilitation sign-off to regulators, supported by results from the assessment program.

Where required, these elements are completed with input and agreement from relevant external parties, such as landowners and regulators. A flowchart of the rehabilitation process is presented in Figure 3. System elements are discussed in the following subsections.

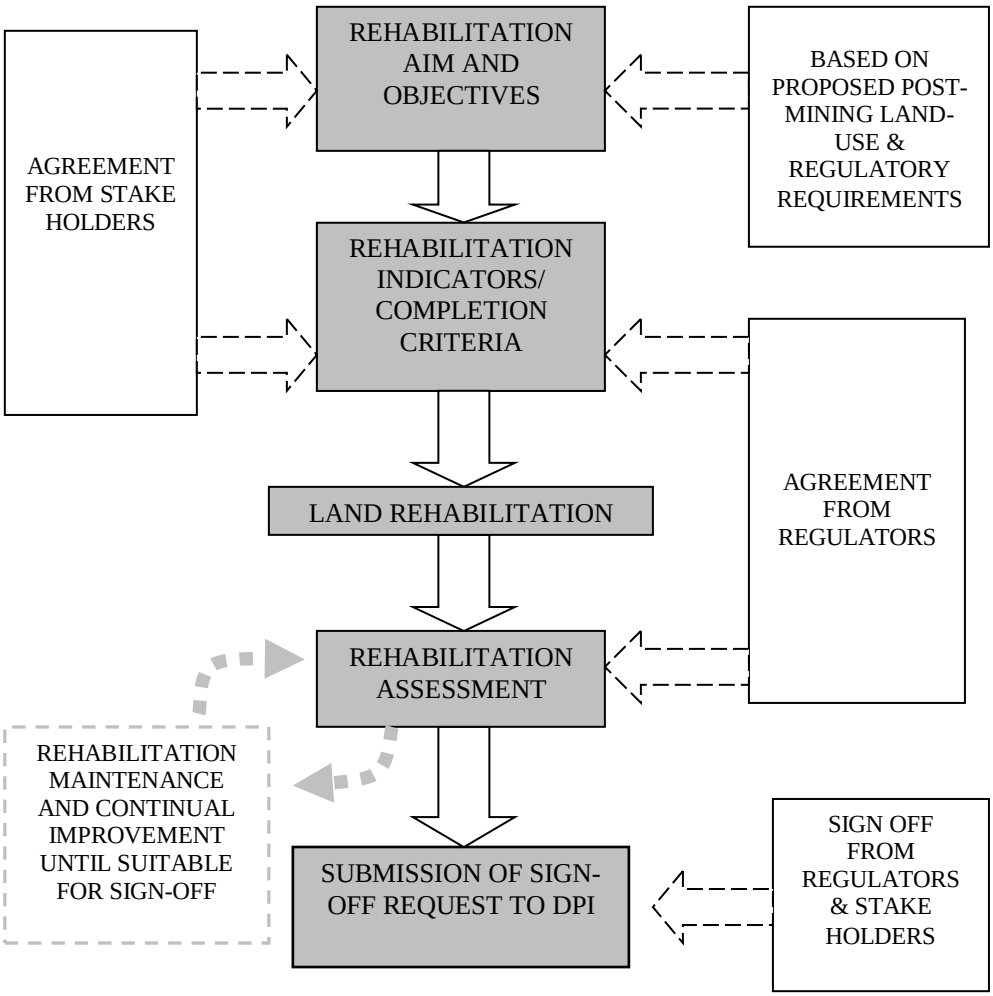

Figure 3 Bloomfield Group Rehabilitation Management Process

REHABILITATION AIM, OBJECTIVES & CRITERIA

Before rehabilitation assessment commences, suitable completion criteria must be agreed upon. These criteria are drawn from the rehabilitation aim and objectives which, in turn, reflect the proposed post-mining land-use. The following subsections outline the purpose of these various elements. Rehabilitation aim, objectives and criteria for Bloomfield mining operations are presented in the individual operation Rehabilitation Plans attached to this document.

Rehabilitation Aim

The rehabilitation aim is a broad overview statement which outlines the strategic intention for rehabilitation works at the site. It is a general statement drawn largely from the proposed post-mining land-use, as previously negotiated with regulators and other relevant stakeholders. The aim should be relatively concise, with little technical detail included.

The aim may apply to an entire site or, where distinctly different post-mining land-uses are proposed, may apply to specific areas, or domains, of rehabilitation within a site.

Rehabilitation Objectives

The rehabilitation aim should be expanded into a set of rehabilitation objectives that clearly describe the desired outcome for the rehabilitated land. These objectives further describe the specific rehabilitation attributes required to achieve the proposed post-mining land-use. Although completion criteria will be specific to the location and proposed land-use at each mining operation, generic industry leading practice for rehabilitation completion should, at a minimum, include reference to (Nichols, 2006):

- the return of a safe and geotechnically stable landform, compatible with the surrounding landscape;
- the establishment of a sustainable vegetation community;
- minimal offsite impacts (i.e. dust, water quality, visual amenity, weeds);
- minimal requirement for ongoing maintenance; and
- a demonstrated post-mining land-use compatible with adjacent, district and regional land-uses.

Completion Criteria and Indicators

Completion criteria present a series of agreed values or characteristics that indicate when rehabilitated land is resilient and sustainable, without the need for excessive continued maintenance. If achieved, completion criteria indicate that rehabilitated land is considered suitable for sign-off. At a minimum, completion criteria should address landscape parameters such as stability, soils, vegetation establishment and potential for off-site impacts and suitability for the agreed post-mining land-use.

To assist with the assessment of rehabilitation development and enable the early identification of problems, progress indicators should also be selected. These indicators should be closely linked to the completion criteria and should trigger remedial action, if required, to ensure rehabilitated land is progressing towards the agreed completion criteria in a timeframe consistent with the overall mine plan.

Rehabilitation Works

If the initial rehabilitation of a disturbed area is compromised due to inadequate planning or provision of resources, failure of the rehabilitation is a likely outcome, resulting in costly maintenance and remedial treatment. In order to ensure rehabilitated land meets the agreed outcomes in a cost-efficient manner, the considerations presented in this section should be integrated into rehabilitation planning and works.

Resource Planning

A diverse range of resources, including natural resources, mobile plant, rehabilitation supplies and technical expertise are required to ensure the successful and cost effective rehabilitation of disturbed areas. Some of these resources may require substantial forward planning. A list of common resources required for the rehabilitation of disturbed areas is presented below. This list is only indicative and additional resources may also be required.

Natural Resources recovered from site

- Pre-clearance surveys will be conducted as per the Land Disturbance Management Procedure.
- Water – rainfall or irrigation. Landform design can be used to enhance water retention and availability.
- Tree and grass seed – provenance seed from on-site/district/regional vegetation communities is preferable, but seed is more likely to be bought as a seed mix from seed vendors.
- Topdressing material – if available and of suitable quality, natural topsoil is preferable for topdressing of rehabilitation, due to various physical, chemical and biological advantages.
- Mulch – if practicable, mulch shredded from cleared vegetation pushed up during clearing should be used to supplement topsoil as a growth medium during rehabilitation.
- Rock – competent rock is sometimes required for armouring of water drop structures or steep faces on benched landforms.

Rehabilitation supplies

- Soil ameliorants – depending on overburden/soil geochemistry, may require lime, dolomite or gypsum.
- Seed mix – seed mix may need to be purchased through seed vendors, as opposed to being collected on-site. Species selection should be based on post-mine land-use (i.e. grazing, habitat, landform stability, etc). Seed should be stored in a cool and secure location.
- Tubestock – Tubestock will need to be stored in a cool, secure place and should be purchased as close to the planned planting date as possible. Tubestock should be planned for approximately 200 plants per hectare.
- Fertiliser – A starter fertilizer, usually Granulock 15, or as advised, at approximately 200 kg/ha.
- Mulch – where sufficient topsoil is not available and not practical to shred and spread timber cleared in advance of mining, imported mulch may be arranged through green waste contractors (usually operating out of waste landfills or transfer stations). Ensure the mulch is shredded before delivery, otherwise it is deemed to be a waste product, which may breach EPL conditions. As mulch should only be stored in stockpiles up to 3m high, and requires stockpiling for a minimum of three weeks for weed pasteurisation, substantial stockpile area is required as close as possible to the area under rehabilitation. Mulch should also be co-located with biosolids for mixing before spreading.

- Biosolids – a good source of supplementary topdressing material where sufficient natural topsoil is not available. Biosolids should be handled, stored and spread in accordance with the NSW EPA guidelines (1997), including appropriate soil testing to ensure heavy metals threshold concentrations are not exceeded (conducted by biosolids contractor). As with imported mulch, biosolids require stockpile area as close as possible to the area under rehabilitation. Biosolids stockpile areas should be isolated from surface drainage and natural watercourses to prevent contamination.
- Fencing and signage – may be required to isolate or protect established rehabilitation from interference or vehicle access. This may also include temporary sediment control fencing.
- Geotextiles or fibre matting – sometimes specialist materials such geotextile fabric (for drainage structures) or fibre matting (erosion protection and weed suppression) may also be required.

Plant and machinery

- Internal transport/haulage – trucks (rear dumps or road trucks) may be required for bulk relocation of rehabilitation resources (i.e. mulch/biosolids or topsoil) from stockpiles to rehabilitation. To eliminate the need for unnecessary double handling, all efforts should be made to establish delivery stockpile pads as close as possible to the areas under rehabilitation.
- Considerable mobile plant hours will be required, especially during the landform reshaping and rock raking phases. Likely plant include; dozer, tractor and spreader, grader and water truck. Mobile plant will generally be supplied "in-house", with contractors only required where specialist services are necessary.
- Access to field service support may also be required. In addition to plant operational hours, downtime should be allowed for on long-term projects for routine servicing and maintenance.

Human

- Human resources will also be required, and may include:
  - technical experts (i.e. drainage design, native species selection);
  - surveyors (landform design and planning);
  - project management (daily supervision, co-ordination and decision making);
  - media testing (soil/spoil characterisation, biosolids analysis);
  - plant operators; and
  - maintenance (fencers and weed sprayers).

Scheduling

The following considerations should be integrated into scheduling for rehabilitation projects:

- Prioritisation – the rehabilitation program will usually be decided on well in advance and will be presented in the most recent mining operations plan (MOP). However, where there is a backlog, or multiple sites to select from, the rehabilitation program should be decided on in consultation with representatives from across the mine, based on selection criteria such as:
  - Specific rehabilitation requirements due to regulatory conditions or landowner agreement;
  - High profile areas (i.e. visible to the public);
  - Areas with the greatest potential for offsite or watercourse impact; and
  - Resource intensive areas due to reshaping requirements.

- Mining schedule – logically, rehabilitation will usually follow the disturbance resulting from mining operations, to minimize the amount of disturbed area between the active mining operation and rehabilitating land. Therefore, the mining schedule and rehabilitation program should be closely integrated. The mining schedule will also dictate availability of mobile plant and operators. It will also indicate other proposed infrastructure (pads, roads or drains) that will influence or limit the extent of rehabilitation. The mining schedule also includes the proposed pre-stripping plan and, therefore, potential availability of topsoil.
- Land availability – it is preferable to rehabilitate large areas of landform to take advantage of the economies of scale offered through bulk rehabilitation. Rehabilitation of small sections of land is not only less economical, but increases the likelihood of rehabilitation failure due to the impacts of edge effects. To prevent interference with mining operations, ensure the Mine Manager specifies that an area is available for rehabilitation, before commencing.
- Climate - although the potential for successful rehabilitation may be increased from timely rainfall, climatic patterns should be considered a lesser priority in rehabilitation scheduling than the availability of plant, resources and land. However, predicted weather patterns (summer vs winter) may influence selection of species in the seed mix to suit the anticipated temperature and moisture levels.
- Maintenance - time and resources also need to be allocated for post-rehabilitation maintenance activities, such as weed treatment, grass slashing, remedial treatment of bare patches and wash outs.

Landform Reshaping

Reshaping principally involves re-contouring overburden dumps into the designed shape for final rehabilitation. The bulk movement of overburden is usually undertaken using bulldozers. Ideally, reshaping will result in a stable landform with slopes and drainage patterns which blend in with the surrounding natural topography. Slope stability is integral to rehabilitation design and slopes in excess of 10 degrees are not favoured. However, slopes steeper than 10 degrees may be necessary in some locations to ensure rehabilitation merges seamlessly with adjacent undisturbed land.

Particular attention should be paid to the placement of overburden exhibiting hostile characteristics (low pH, sodicity, etc). Such material should be identified and isolated from vegetation root zones and areas of potentially high surface run off. If possible, such material should be covered with a layer of more inert capping material, if available. Likewise, any reject emplacements integrated into the landform being reshaped will be covered by at least two meters of inert material. Site experience has found this to be the minimum cover required to ensure successful long-term revegetation over reject materials.

Once bulk reshaping is completed, the landform is deep-ripped and the final trim/rock raking is undertaken. The ripping loosens up any near surface strata within the landform that have been compacted during placement, aiding root penetration during vegetation establishment. The final trim smooths out any wash-outs and gullies, rough edges, temporary access tracks, local steep slopes and prepares the surface for revegetation. Rock-raking is the final stage of reshaping and removes or buries exposed surface rock greater than 200 mm in diameter. This raking is usually done along the contour, leaving a cultivated surface that assists with erosion minimisation until vegetation can be established.

Suitable drainage must also be integrated into the rehabilitation design, to ensure the final landform can safely shed surface runoff without erosion damage being caused. Until an adequate vegetation cover is re-established, there is a high potential for erosion, resulting in resource loss, gully formation and the need for expensive remedial treatment. Therefore, long or steep slopes should be divided up by the construction of contour banks to collect and divert water off the slopes. Contour banks should run the surface water at a drop of no greater than 1 in 100 into a drainage line (via a sediment dam) or into some form of protected drop structure that will run the water down the gradient in a controlled or protected manner.

It is essential that drainage design for rehabilitation projects is fully integrated with the drainage features on the adjacent landscape, whether mine disturbed, rehabilitated or natural. Sufficient sediment control structures should be integrated into the drainage system to reduce, or intercept, sediment load being transported by surface run-off.

Revegetation

Most vegetation establishment during land rehabilitation is via direct seeding. Tubestock planting is only used when required for rapid establishment of tree screens or forestry plots. Tree seed mix, as opposed to pasture grass mix, will generally be sown so as to establish tree communities on areas such as steep slopes and hill tops. This assists in breaking up landform profiles and increasing slope stability. Efforts should be made to ensure that rehabilitated tree areas are not straight edged, but blend in with adjacent remnant vegetation. Trees should not be established on capping layers (i.e. rejects emplacements or hostile spoil) or other structures designed for long term exclusion and shedding of water.

Revegetation of the reshaped landform is generally undertaken in accordance with the steps below. These steps are indicative only and the order may vary, with some steps being excluded completely, based on the specific landform requirements and resource availability

- Soil amelioration – spreading and integration of soil/spoil ameliorants into surface layer to address soil acidity and assist with soil structural properties. Ameliorants usually include lime and gypsum at a rate of up to 200kg/ha each (or as advised by biosolids contractor), ploughed into the tope 30cm of the profile.
- Topdressing - topsoil stripped ahead of mining will be applied to the reshaped surface in an even layer generally not less than 100mm. Depending on the quality of the topdressing material, ameliorants may be integrated with topsoil at this stage. Topsoil will be used as a first priority but where topsoil has not been available in sufficient volumes, biosolids and biosolids/mulch mix have been successfully used to improve soil structure and act as a source of nutrients, improving establishment of vegetation. Biosolids are generally applied at a rate no greater than 100 tonnes/ha (wet weight), using a tractor towed spreader trailer. A biosolids/mulch mix (1:1 ratio) has been shown to be very successful topsoil supplement and is usually applied at a rate of 200 – 250 tonnes/ha.

Integration – once the material has been topdressed, the surface will be contour disc or chisel ploughed to integrate the topdressing material. This assists in binding the topdressing material with the underlying spoil and is a requirement of the EPA biosolids guidelines. The area is then contour cultivated to create seed entrapments and microclimates prior to sowing

- Sowing/fertilising - the area is then sown and fertilised with the selected grass and/or tree seed mixes. These works are undertaken shortly after spreading the topsoil to avoid loss in activity of pre-existing micro flora, it also minimises the loss of topsoil due to wind and rain action. Fertiliser is not required, where biosolids has been applied.
- Bushfire Management - a hazard reduction plan has been drawn up in consultation with the Rural Fire Service. The Rural Fire Service conduct hazard reduction activities on Company managed lands surrounding the mining operation. The ongoing maintenance program on rehabilitated areas involves slashing to reduce the bulk of vegetative matter. As well as providing surface mulch, this also reduces the fire hazard of those areas. Grazing on older established rehabilitation area may also be conducted to reduce fuel loads.

Table 3 Rehabilitation information to be recorded post-establishment.

Rehab Area	Location:	
	Minescape polygon ID:	
	Approx Area:	
	Date of Rehab:	
Landform	Average slope gradient:	
	Steepest slope gradient:	
Drainage	Contour bank design (number, interval, gradient)	
	Contour banks discharge into?	
	Other drainage structures (dams, drops structures, diversions)	
Surface preparation	Topsoil used (source, depth of spreading)	
	Ameliorants or supplements used (rate/ha)	
	Ripping (depth, type)	
Vegetation Establishment	Method (Direct seeding or tubestock)	
	Seed mix (species/rate/ source)	
	Tubestock (species/density/ source)	
	Fertiliser type/rate	
Other notes:		

MONITORING METHODOLOGY

The following rehabilitation monitoring methodology is based on research into rehabilitation completion criteria for rehabilitation establishment on coal mines by Nichols (2005) and Grigg, Emmerton & McCallum (2001). Provided that it is conducted by experienced and independent operators, it will reliably indicate long term rehabilitation sustainability. The following considerations were incorporated into monitoring program design.

Representative monitoring sites should be established in rehabilitation of different ages. Density of monitoring sites should be based on age and heterogeneity of rehabilitation. For new rehabilitation, or rehabilitation established within the last five years, one monitoring site per 10 ha is recommended. Although no specific density is recommended for older established rehabilitation (>5 years), sufficient density of sites should be monitored to ensure coverage of different rehabilitation types and standards. Sites locations should be selected, so that all rehabilitated landscape and vegetation types are covered (i.e. treed, pasture, slopes, flat ground). If required to meet operation-specific completion criteria, analogue sites should also be selected from adjacent non mining disturbed land for comparative monitoring purposes.

Sites should be monitored within the first 12 months after establishment then every 2 years. This should provide 3 sets of monitoring data in the first 5 years following rehabilitation.

A standard monitoring plot design is shown in Figure 2. The standard measurements to be conducted at each measurement site are outlined in the Standard Monitoring Protocol section. Any operation-specific modifications or additions to this standard protocol will be presented in the Rehabilitation Plans attached.

In addition to the measurement protocols conducted every two years, all rehabilitated areas should be inspected every year. These inspections should note problem areas (such as bare patches, failed vegetation, drainage structure failure, significant erosion or significant weed infestation) requiring maintenance or further treatment. Remedial works should then be scheduled to address these areas.

Standard monitoring protocol

Site Establishment

Each site will consist of a 50m transect, positioned along the contour of the slope, and permanently marked using steel pickets, or similar.

Photo and General Rehabilitation Condition

- GPS co-ordinates will be recorded for the 0m picket.
- Direction of the transect (to nearest cardinal point – N, SW, etc) from the 0m picket will be noted.
- A photo will be taken from the 0m marker of the general condition of rehabilitation in the vicinity of the transect.
- A brief word picture describing general condition (i.e. "rhodes dominated pasture grass with scattered shrubs and trees") and any stand-out issues (evidence of fire, bare patches, weed infestations, tree die back or erosion) will be provided.
- A sketch will be made of the transect location in relation to prominent nearby landmarks.
- Landform gradient in the vicinity of the transect will be noted.

Weeds

Note presence of declared noxious weeds in vicinity of transects, or substantial

infestations of weeds that may out compete or otherwise hinder rehabilitation establishment.

Fauna

Note evidence of fauna re-colonisation in rehabilitation along transect, including insects and birds.

Vegetation

The following measurements will be recorded to assess vegetation establishment:

- Five x $1m^2$ quadrats will be established (at the 0m, 10m, 20m, 30m & 40m marks). Groundcover estimate (%), number of groundcover species and dominant groundcover species (top 2 spp.) to be recorded for each quadrat.
- If trees or shrubs are present, one 20m x 10m plot, located 5m either side of the transect centreline will be established. Number of trees and shrubs taller than 1.2m will be recorded by species (if not known, allocate a number and record by genus – Acacia 1, Euc 2, etc). Stems/ha (total and for dominant spp/genus) should be calculated by multiplying plot results by 50.
- Evidence of recruitment (seedlings and small saplings) along transect should be noted. If possible, note species/genus and distance to nearest mature tree of that species/genus.
- Record general condition of tree health along the transect. Specifically recording evidence of senescence, drought stress, nutrient deficiencies, disease or severe insect attack. If applicable, note if specific species/genus are impacted.

Nutrient Recycling

- Record the percent coverage and average depth of litter layer in each quadrat.
- Note the degree of litter layer composition.
  - 0 = Nil: Litter lying loose on surface with little indication of decomposition or incorporation;
  - 1 = Minor: Litter broken down into smaller fragments in contact with soil surface or slightly incorporated.
  - 2 = Moderate or greater: Litter has started to form layers, with lower layers demonstrating evidence of decomposition activity.
- Record the presence of cryptograms (algae, fungi, mosses, lichens, etc):
  - 0 = Nil evidence;
  - 1 = Minor: <10% cover.
  - 2 = Moderate or greater: >10% cover.

Soils/surface condition

For the characterisation of soil properties, the following actions should be taken along each transect:

- Note significant soil surface characteristics likely to influence rehabilitation development, including excessive surface rockiness, surface cracking, surface precipitates (salts, gypsum, etc), surface hardsetting, etc.
- In each of the 5 vegetation plots, note surface rockiness (0=nil surface rock; 1= <10% coverage and/or rocks generally < 25mm diameter; 2 = >10% rock coverage or rocks largely > 25mm diameter), surface horizon soil field texture and surface roughness (0 = surface generally smooth with little capability of impeding surface flow; 1 = some minor cracking or undulations generally <2cm; 2 = dense surface cracking or undulations generally >2cm)
- Excavate a representative soil profile hole and record the surface horizon characteristics – depth, colour, structure, root zone depth, rock content and field texture.
- Collect surface soil samples for analysis, as required to meet operation-specific soil

characterisation criteria. Soil analysis requirements will be outlined in individual operation Rehabilitation Plans.

Erosion and Stability

The following landform attributes should be noted to monitor for evidence erosion and stability:

- Note the presence and, if possible, the cause of scalds or bare patches > $2m^2$ along the length of the 50m transect.
- Record the location and dimension of all erosion rills >30cm wide and/or 30cm deep, where they intersect the 50m transect. Note whether the rills are active or inactive (inactive rills are usually found in areas of well established ground-cover and are filled/partially filled with sediment and/or vegetation established within the rill). The number of active rills deeper or wider than 30cm will be converted to a density per 50m for comparison with subsequent monitoring data.
- Note any failed water management structures (contour banks, drop structures, sediment ponds, etc).

Monitoring Review

Monitoring data will be reviewed upon completion of monitoring. Remedial actions for significant anomalies detected during monitoring (i.e. failed rehabilitation, failed water management structures, significant weed infestations) will be included in environmental works planning.

Monitoring data will be compared with previous years' data, to identify long-term trends in rehabilitation development. Once three sets of data have been collected, this information will be compared to completion criteria and areas deemed suitable for sign-off will be identified. Rehabilitated areas that are not progressing towards the completion criteria will also be identified and corrective strategies devised.

Final Assessment

Prior to submission of a sign-off proposal, the land proposed for sign-off will be subjected to a final maintenance inspection. This inspection will cover the whole area proposed for sign-off. The outcome of the inspection will be a documented description and photographic record of the general condition of rehabilitation, highlighting any areas of potential concern. This report will be included in the submission to DPI-MR.

FINAL REHABILITATION SIGN-OFF

Once a rehabilitated area is deemed to be potentially suitable for sign-off, a Sign-off Report will be submitted to the regulators. This report will include the following information for the proposed sign-off area:

- Survey Plan clearly showing the proposed area;
- Area size, disturbance and rehabilitation history;
- Monitoring data compared against rehabilitation aim, objectives and completion criteria;
- Final maintenance inspection findings;
- Photographs of the proposed area; and
- Analysis of rehabilitation development and sustainability.

Areas that have already been rehabilitated more than five years may display sufficient evidence of sustainability and be considered suitable for sign-off, without need for further monitoring.

REFERENCE MATERIAL

Emery, K.A. (1986) Rural Land Capability Mapping, - pamphlet. NSW Department of Land and Water Conservation, Sydney

Grigg, A.H., Emmerton, B.R. and McCallum, N.J. (2001). The Development of Draft Completion Criteria for Ungrazed Rehabilitation Pastures after Open-cut Coal Mining in Central Queensland. Australian Coal Association Research Program Project C8038.

Nichols, O.G. (2005). Development of rehabilitation completion criteria for native ecosystem establishment on coal mines in the Hunter Valley. Australian Coal Association Research Program Project C13048.

NSW Department of Land and Water Conservation (2001). Assessing the Texture of your Soil.

NSW Department of Primary Industries – Mineral Resources Division (2006). Guidelines to the Mining, Rehabilitation and Environmental Management Process.
NSW Coal Association (1987). Coal Mine Rehabilitation – End of Gant Report. Prepared by the NSW Soil Conservation Service.

Qld Department of Resource Industries (1990). Guidelines for Rehabilitation of Central Queensland Coal Mines.

APPENDIX B

Site Monitoring Field Sheet

SITE MONITORING FIELD SHEET

Site:	Date: / /	Name:
GPS:		Photo no:

General Description (incl. slope gradient, transect direction, general veg):	Sketch of transect area:
Declared Weeds:	
Fauna Notes:	

Groundcover Plots	Q1	Q2	Q3	Q4	Q5
Groundcover %:					
Number of species:					
Top g/c 2 species:					
Litter cover/depth (%/cm):					
Litter decomposition (0=nil/ 1=minor/2=>mod):					
Cryptogram presence (0=nil/ 1=minor/ 2=>mod):					

Tree Plots (Gen health, height range, stress indicators, recruitment, etc):

Spp/genus	Count/plot (> 1.0m)	Stem/ha	Spp/genus	Count/plot (> 1.0m)	Stem/ha
Total:					

Soil Surface- General surface condition (cracking, hardsetting, etc):

Surface Plots	Q1	Q2	Q3	Q4	Q5
Surface rockiness (0 = nil/ 1 = <10%/ 2 = >10% coverage)					
Surface horizon field texture					
Surface roughness (0-2)					

Topsoil Profile Description (at sampling point):

Sampling location:	pH:	EC:	EAT Class:

Erosion (General notes, failures, scalds, etc)

Erosion rills > 30cm depth or width (Number, Location (along transect), width (cm), depth (cm), A= active:

	L	W	D		L	W	D		L	W	D
1				5				9			
2				6				10			
3				7				11			
4				8				12			

APPENDIX C

Management Plan- Copy of Approval DPE

NSW GOVERNMENT | Planning & Infrastructure

Contact: Scott Brooks
Phone: 6575 3402
Fax: 6575 3415
Email: scott.brooks@planning.nsw.gov.au
Our ref: DA 49/94

Mr John Hindmarsh
Environmental Officer
Rix's Creek Pty Limited
PO Box 4
EAST MAITLAND NSW 2323

Dear John

Rix's Ck – Approval of Management Plans

Thank you for forwarding a number of management plans for review as required by your mine Approval DA 49/94. We have reviewed the following management plans.

Traffic Management Plan (Condition 9, Schedule 2);
Water Management Plan (Condition 15, Schedule 2);
Erosion and Sediment Control Plan (Condition 15a, Schedule 2);
Landscape Management Plan (Condition 16, Schedule 2), this includes;
- Rehabilitation Management Plan (Condition 16b, Schedule 2);
- Final Void Management Plan (Condition 16c, Schedule 2);
- Mine Closure Plan (Condition 16d, Schedule 2).

The Department has reviewed the management plans identified above and can advise they have been approved by the Director General.

Accordingly, the Department requests that a copy of the management plans marked "final" are forwarded to the Singleton office, by the end of January 2014, as a soft copy for our records.

If you require further information please contact Ann Hagerthy on 6575 3403 or by email to ann.hagerthy@planning.nsw.gov.au.

Yours sincerely

Scott Brooks
Team Leader Compliance
2-1-2014
As nominee for the Director-General

APPENDIX D

Evidence of Consultation

NSW GOVERNMENT | Office of Water

John Hindmarsh
Rixs Creek Coal Mine
PO Box 4
East Maitland NSW 2323

Contact: Fergus Hancock
Phone: 02 4904 2532
Fax: 02 4904 2503
Email: Fergus.Hancock@dnr.nsw.gov.au

Our ref: NEW0003707-2
Your ref:

February 18 2010

Dear John

Subject: Rixs Creek Coal Mine Landscape Management Plan

I refer to your letter dated 10 February 2010, requesting input from the Department of Environment, Climate Change and Water (NSW Office of Water) (NOW) on the Landscape Management Plan (LMP) for Rixs Creek coal mine.

NOW is the State water management regulator, including statutory regulation regarding riverine corridor management, water access and aquifer interference, and management and protection of groundwater dependent ecosystems. Therefore, those elements of the LMP which involve reconstruction or remediation of riverine corridors, management or recovery programmes to groundwater dependent ecosystems or final void configuration and management require consideration of relevant State policies and the principles of the *Water Management Act 2000* (WMA).

Specific issues for inclusion in the LMP include:

- Identification of any groundwater dependent ecosystems which exist on the site or may be included in rehabilitation of the post-mining landscape, and;
- Justification for final void(s) in terms of groundwater salinity, displacement of groundwaters from account water(s) managed under Water Sharing Plans, and final landscape design, including minimising risk of dryland salinity
- Objectives for mine closure related to landscape design to manage saline/hypersaline groundwater, riparian land management to maximise ecosystem and post-mine life land use options

If you require any further information or clarification of information provided in this submission, please contact Fergus Hancock on (02) 4904 2532.

Yours sincerely

Per Mark Mignanelli
Manager, Major Projects Assessments
NSW Office of Water

Department of
Environment, Climate Change and Water NSW

Mr Fergus Hancock
Major Projects, Mine Assessments & Planning Unit
NSW Office of Water
Dept Environment Climate Change & Water
PO Box 2213
DNAGAR NSW 2309

Wednesday, February 10, 2010

Dear Fergus,

DA49/94 – Bloomfield Collieries Pty Ltd, Rix's Creek Mine.
Landscape Management Plan – DECCW Consultation.

The modified conditions of consent issued in September 2009 relating top the Rix's Creek Mine, require consultation with Office of Water for the preparation of a Landscape Management Plan.

> ***Landscape Management***
> *16A. The Applicant shall prepare and implement a detailed Landscape Management Plan for the development to the satisfaction of the DII and the Director-General. This plan must:*
> *(i) be prepared in consultation with DECCW, the Office of Water and Singleton Shire Council by suitably qualified expert/s whose appointment/s have been approved by the Director-General;*
> *(ii) include a:*
> - *Rehabilitation Management Plan to be submitted for approval by the Director- General by 31 March 2010;*
> - *Final Void Management Plan to be submitted for approval by the Director- General by 31 December 2011; and*
> - *Mine Closure Plan to be submitted for approval by the Director-General by 31 December 2011.*

Please notify the Company of any recommendations you wish you make on matters to be included in the preparation of the Landscape Management Plan.

If you would you like to receive a draft of the Plan for comment prior to submission to the Dept of Planning also let us know.

If you require any further information please do not hesitate to contact me.

Yours faithfully

John Hindmarsh
Environmental Officer
Telephone:- 02 65788806
Mobile:- 0427 436285
E-mail:- jhindmarsh@rixs.com.au

General Manager
Singleton Council
PO Box 314
SINGLETON NSW 2330

Wednesday, February 10, 2010

Dear Sir,

DA49/94 – Bloomfield Collieries Pty Ltd, Rix's Creek Mine.
Landscape Management Plan – Singleton Shire Council Consultation.

The modified conditions of consent issued in September 2009 relating top the Rix's Creek Mine, require consultation with Singleton Shire Council for the preparation of a Landscape Management Plan.

> ***Landscape Management***
> *16A. The Applicant shall prepare and implement a detailed Landscape Management Plan for the development to the satisfaction of the DII and the Director-General. This plan must:*
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If you would you like to receive a draft of the Plan for comment prior to submission to the Dept of Planning also let us know.

If you require any further information please do not hesitate to contact me.

Yours faithfully

John Hindmarsh
Environmental Officer
Telephone:- 02 65788806
Mobile:- 0427 436285
E-mail:- jhindmarsh@rixs.com.au

Mr Mitchell Bennett
Head Regional Operations Unit – Hunter Region
Dept Environment Climate Change & Water
PO Box 488G
NEWCASTLE NSW 2300

Wednesday, February 10, 2010

Dear Mitchell,

DA49/94 – Bloomfield Collieries Pty Ltd, Rix's Creek Mine.
Landscape Management Plan – DECCW Consultation.

The modified conditions of consent issued in September 2009 relating top the Rix's Creek Mine, require consultation with DECCE for the preparation of a Landscape Management Plan.

> ***Landscape Management***
> *16A. The Applicant shall prepare and implement a detailed Landscape Management Plan for the development to the satisfaction of the DII and the Director-General. This plan must:*
> *(i) be prepared in consultation with DECCW, the Office of Water and Singleton Shire Council by suitably qualified expert/s whose appointment/s have been approved by the Director-General;*
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If you require any further information please do not hesitate to contact me.

Yours faithfully

John Hindmarsh
Environmental Officer
Telephone:- 02 65788806
Mobile:- 0427 436285
E-mail:- jhindmarsh@rixs.com.au