Gerroa Sand Resource

Landscape and Rehabilitation Management Plan

Appendix F of Quarry Environmental Management Plan

Version 2 | Revision 3

Issued – December 2022

Contents

Document Control

Version	Date	Reason	Reviewed	Approved
V1	20/8/08	Plan prepared for original Consent	KMA	KMA
V2R1	8/9/22	Draft plan for Agency review	M Hammond	H Cleary
V2R2	11/10/22	Revised plan for DPE approval	M Hammond	H Cleary
V2R3	5/12/22	Revised following DPE feedback	M Hammond	H Cleary / DPE

PART A - INTRODUCTION

1. Background and Scope

This Landscape and Rehabilitation Management Plan (LRMP) forms part of the Quarry Environmental Management Plan (QEMP) for the Gerroa Sand Resource (Project). This LRMP has been prepared to meet the requirements of the Consolidated Approval for Project 05/0099, as modified and approved by the Minister for Planning (the Consent). The LRMP sets out the biodiversity management measures and strategies that will be employed on the Project to meet the requirements of the Consent.

The LRMP comprises three parts; Part A provides the background to the plan, including describing where each of the requirements of the Consent are covered in the LRMP. Part B addresses the requirements of the original Consent, particularly in relation to the conservation of the retained vegetation communities and establishment of the revegetation areas. Part B was originally prepared by Kevin Mills and Associates, and has been updated in 2022 by Cleary Bros to reflect the works undertaken since the original plan was developed. Part C describes the management measures and controls relevant to the Modification Area, and has been prepared by Cleary Bros, compiling the strategies proposed throughout the Modification Environmental Assessment by ecologists from Niche Environment and Heritage. Figure 1 shows the areas covered by Part B of this plan representing the original Consent (Original Extraction Area and Conservation Area), as well as Part C of this plan representing the additional extraction area approved as part of Modification 1 (Modification Sand Extraction Area).

2. Purpose and Objectives

The purpose of this LRMP is to describe how the Project will "maintain or improve" biodiversity in the local area, and to demonstrate compliance with the conditions of the Consent related to biodiversity. Specifically, the LRMP has been prepared to address conditions 16 – 28C of Schedule 3 of the Consent.

The key objectives of the LRMP are as follows:

- establish indigenous vegetation on all land areas disturbed by the sand quarry to create wildlife habitat including wetland habitat within and around the shoreline of the dredge pond;
- nurture to maturity vegetation screens and compensatory planting established during the sand quarrying operation;
- create safe and stable landforms with a natural appearance designed for low maintenance;
- control weed growth within the rehabilitation areas and compensatory planting areas;
- retain a minimum of access tracks for maintenance or as required for ongoing rural use of the property;
- progressively rehabilitate sections of the site when they are no longer required for operations to minimise the extent of work remaining when extraction ceases; and
- continue rehabilitation beyond closure of the sand quarry until these objectives have been achieved; and
- after the conclusion of sand quarrying, leave the site free from all sand mining artefacts including machinery, structures, buildings, signage, products and roads, except as required for rural purposes.

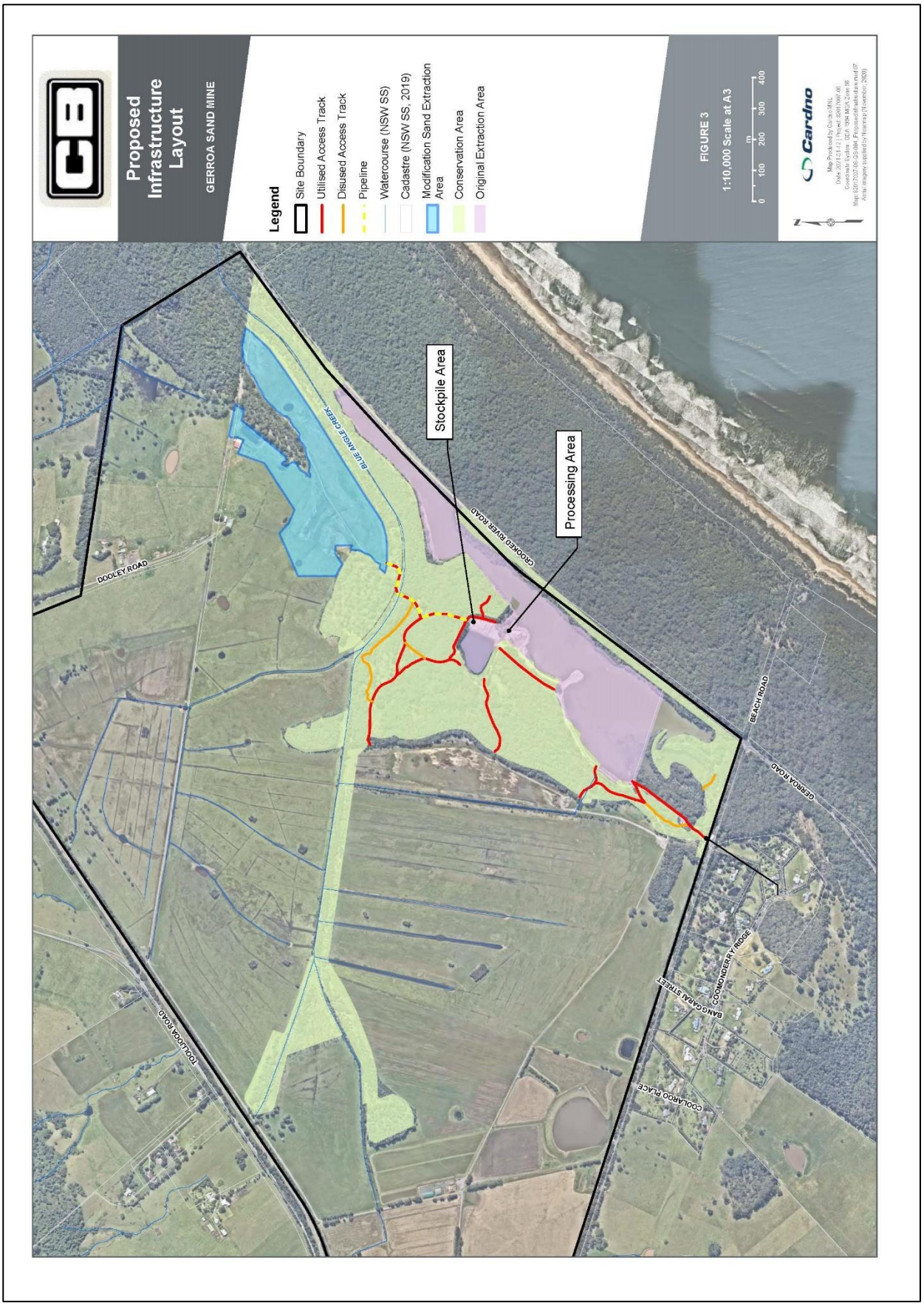

Figure 1 - Original (including Conservation Area) and Modification 1 Extraction Area Approvals

3. Requirements

This Landscape and Rehabilitation Management Plan has been prepared to ensure compliance with the Consolidated Approval for Project 05/0099, as modified and approved by the Minister for Planning (the Consent). A summary of the requirements of the Consent addressed by this plan are described in this section, along with a link to the management measures that address these requirements. Further detail of the Development Consent requirements and where they are address in the LRMP is included as Appendix 3.

Requirement	Link to Landscape and Rehabilitation Management Plan
Sch 3 Cond 17 – Landscaping and Rehabilitation	Part B - Sections 3 and 8 (and LRMP generally)
Sch 3 Cond 18 – Landscaping and Rehabilitation	Part B - Section 7.15
Sch 3 Cond 19 – Landscaping and Rehabilitation	Part B - Sections 6.21, 7.14, Part C – Sections 3, 7
Sch 3 Cond 20 – Landscaping and Rehabilitation	Part B – Sections 6.14, 7.2
Sch 3 Cond 20A – Restriction on clearing of certain land	Part B – Section 6.14
Sch 3 Cond 21-25, 26A – Landscape and Rehabilitation Management Plan	This Plan
Sch 3 Cond 26 – Long Term Management Strategy	Refer to QEMP
Sch 3 Cond 27-28C – Landscape and Rehabilitation Bond	Refer to QEMP

4. Plan Development and Consultation

The LRMP for the original Project was prepared by Kevin Mills, Principal Ecologist of Kevin Mills and Associates. Kevin is an ecologist with over 30 years experience undertaking a wide range of ecological investigations on quarry and other state significant developments throughout NSW. Kevin also has extensive experience developing management plans focused on biodiversity in line with current and historical regulatory settings. Kevin's knowledge of the botany of the local area is unparalleled, with extensive peer-reviewed scientific publications.

The LRMP has subsequently been updated by Mark Hammond, Quality and Environment Manager of Cleary Bros to cover the commitments made as part of the Modification 1 approval, and revised to align with the extensive revegetation works that have occurred in the 14 years since the original approval.

A copy of the draft Landscape and Rehabilitation Management Plan was provided to the Biodiversity and Conservation Division of the DPE for their feedback prior to finalisation. The BCD provided comments on the review process and requested further detail on the outcomes of the plan to date, as well as additional detail on monitoring protocols. The LRMP was subsequently updated and provided to the BCD who advised they had no further comment.

5. Review, Improvement and Reporting

Regular reviews of rehabilitation progress and management strategies will be undertaken to ensure the LRMP meets its objectives. This will include formal and informal checks as follows:

- Quarterly inspection of conservation areas by Site Manager.
- Annual inspection of conservation areas by ecologist.
- Annual Review completed by the Environmental Officer following the end of each financial year (reporting period).
- Independent Environmental Audits conducted on a three-yearly basis.
- Five yearly review of management strategies and future priorities.

5.1 Internal Reviews

The Site Manager or other suitable person will complete a report on works completed and works required on a quarterly basis.

5.2 Annual Review

The Annual Review will be prepared by the Environmental Officer within two months of the end of the reporting year (July to June) and will:

- describe the works carried out in the last 12 months and the works planned for the next 12 months;
- include the report prepared by the ecologist;
- identify any non-compliance during the previous year and describe what actions were (or are being) taken to rectify the non-compliance and avoid recurrence;
- describe any measures that will be implemented over the next year to improve the environmental performance of the project; and
- review the suitability of the LRMP.

An electronic copy of the Annual Review will be provided to the Department and members of the Community Consultative Committee, as well as uploaded to the Cleary Bros website.

5.3 Independent Environmental Audit

Every three years, Cleary Bros will engage a suitable qualified, experienced, and independent person(s) to undertake an independent environmental audit. The audit will be conducted in accordance with Schedule 5 Condition 5 of the Development Consent, with the auditor approved by the Planning Secretary.

5.4 Corrective Actions and Improvement Measures

In the event the objectives of the LRMP are not being met, Cleary Bros will consult with the ecologist to identify suitable actions that can implemented to achieve the objectives. The LRMP will be updated as appropriate.

5.5 Landscape and Rehabilitation Management Plan Review

The LRMP will be reviewed annually as part of the Annual Review process, as well as within one month of an Independent Environmental Audit. The management priorities will also be revised every five years based on advice from the ecologist. This will include a review of the management strategies and progress towards the objectives from the previous plan and a resetting of priorities and objectives for the following five-year period, in consultation with BCD. This will be captured in Sections 8 and 8.6 of Part B.

PART B – 2008 APPROVAL LANDSCAPE AND REHABILITATION MANAGEMENT PLAN

1. Introduction

1.1 Background

This Landscape and Rehabilitation Management Plan has been prepared in response to the project approval issued by the NSW Minister for Planning to Cleary Bros (Bombo) Pty Limited (Cleary Bros), application number 05-0099. The plan addresses those matters set out in the modified conditions of consent, that relate to landscape management.

This document is a plan of management for the land described in the project approval, with the primary aim of setting out the management requirements for rehabilitating disturbed land after quarrying, protecting and enhancing conservation values of existing vegetation and habitats on the land, and extending the vegetated area and habitats as required in the project approval.

Particular attention is given to managing endangered ecological communities existing on the site. The plan sets out a proposal for a major replanting and habitat creation scheme to reafforest certain areas with local communities, thus increasing their area and also providing habitat links (connections) between existing stands of forest.

The area covered by this management plan is shown on Figure 2, and is referred to here as the "management area". The proposal can be divided into two main parts; i.e. (i) managing the existing forests, and (ii) developing forest habitat on existing cleared land.

This plan will be viewed as a dynamic document, in that although quite extensive in its role of guiding the management of biodiversity in the area, new issues will arise that will require additions and modifications to the Plan; this is expected and the assumption under the 'adaptive management' philosophy (see Section 8.5). A review of the Plan is envisaged every 5 years.

Various other documents are available that provide useful information on managing native forest and revegetation of natural bushland; reference will be made to these documents where relevant. For example, *Recovering Bushland on the Cumberland Plain* (DEC 2005), while not directly relevant to the coastal zone, does provide useful information on revegetation methods.

1.2 Requirements of the Landscape and Rehabilitation Plan

The matters to be covered by this plan or are relevant to the preparation of this plan are set out in the conditions of consent**.** The plan has been considerably expanded following extensive discussions during the Land and Environment Court hearing and in deference to the latest conditions of consent. The plan incorporates all relevant best practice guidelines for vegetation clearing, revegetation, recipient site preparation, topsoil translocation and soil management, soil hygiene, seed collection, weed control and management, feral animal control, sediment and erosion control, habitat creation, adaptive management and monitoring relevant to the project.

The intended outcome of the compensatory plantings is the re-creation in accordance with this plan of the complex eco-systems that will be removed or affected by the project.

1.3 The Challenge Ahead

This is a most ambitious proposal, probably the largest ever revegetation project undertaken in the Illawarra region. To ensure its success it will require considerable resources and commitment from the Cleary Bros and its staff. The project will also require a high level of understanding of the ecological requirements for the success of the enhancement and revegetation proposals. Close liaison between the on-ground staff and a qualified ecologist is therefore essential throughout the project. Regular monitoring is also critical, as is immediate action to address any identified problem with the revegetation works or management. There should be no expectation that forest cover will occur quickly; trees take a long time to reach maturity. However, experience shows that a good cover of trees several metres in height can be achieved in a few years with appropriate management, along with a reasonably dense understorey. A high diversity of species will take some time to achieve, but will increase as time goes by; this will occur through natural colonisation by native species and be accelerated through appropriate plantings.

The proposed rehabilitation and conservation works do not involve any significant ground disturbance, and as such the works are unlikely to adversely impact any Aboriginal cultural heritage values. However, in the event any discrepancies between the LRMP and Aboriginal Heritage Management Plan are identified, Cleary Bros will consult with the Registered Aboriginal Parties, Heritage NSW, and BCD prior to updating these plans as appropriate and submitting to DPE for approval.

1.4 Ecologist

The qualified ecologist, bush regeneration or providence nursery group, as required, will be fully involved in the project on a regular basis. This will involve providing advice on issues such as weed management and habitat development, as well as regular monitoring of the project.

2. The Vegetation Management Area

2.1 Character of the Area

The extent of the Vegetation Management Area is shown in Figure 2. The area has been divided into various management zones and sub-zones, depending upon the location, purpose and/or character of the individual area. These zones are described individually in detail in Sections and 7 of this plan.

2.2 Plant Species Present

A native plant list was prepared for the whole of the company's property by Kevin Mills & Associates (2005). This plant list is provided in Appendix 1, where the name of the species, both the botanical and common name, and the family to which each belongs, is stated. The list contains the names of 139 native species. Most of these species can be found in and around the forest on or adjacent to the quarry. This list is used later to identify native species suitable for use in the proposed planting programs.

2.3 Existing Vegetation Communities

The forest covering most of the management area is described and mapped in the 2005 report by Kevin Mills & Associates and the key vegetation types are elucidated below. The following vegetation types have been identified in the area (Kevin Mills & Associates 2005, 2006). It is important to appreciate these communities and their characteristics to successfully revegetate similar communities. The extent of the existing vegetation communities identified within the general area on the company property is shown on Figure 3.

Littoral Rainforest

Key Species: *Glochidion ferdinandi, Guioa semiglauca, Eucalyptus botryoides*

Description: This is a simple rainforest community, being dominated by only a handful of species. The dominant tree is Cheese Tree *Glochidion ferdinandi*, with occasional Guioa *Guioa semiglauca*. A few shrub specimens of Hairy Clerodendrum *Clerodendrum tomentosum*, Native Olive *Notelaea longifolia* and Breynia *Breynia oblongifolia* occur. There is an overstorey of Bangalay *Eucalyptus botryoides* and Blackbutt *Eucalyptus pilularis* above the dense canopy of Cheese Tree. The ground cover is mainly composed of "non-rainforest" species, such as Spiny-headed Mat-rush *Lomandra longifolia*, Wandering Sailor *Commelina cyanea* and Flax-lily *Dianella caerulea*. Creepers are relatively common, with 10 species being recorded. These include Snake Vine *Stephania japonica*, Slender Grape *Cayratia clematidea* and Wombat Berry *Eustrephus latifolius*.

Blackbutt - Banksia Forest

Key Species: *Eucalyptus pilularis, Banksia integrifolia, Eucalyptus botryoides*

Description: This tall forest is dominated by Blackbutt *Eucalyptus pilularis.* The associated trees are Rough-barked Apple *Angophora floribunda* and Bangalay *Eucalyptus botryoides*, although these species are uncommon in the forest in the investigation area. The understorey is composed of small trees and shrubs, including Coast Banksia *Banksia integrifolia*, Cheese Tree *Glochidion ferdinandi*, Tree Broom-heath *Monotoca elliptica* and Maiden's Wattle *Acacia maidenii*. The common smaller shrubs and other plants in the forest include Spiny-headed Mat-rush *Lomandra longifolia*, Bracken *Pteridium esculentum*, Blady Grass *Imperata cylindrica* and Kangaroo Grass *Themeda australis*. Creepers such as Climbing Guinea Flower *Hibbertia scandens* and Native Raspberry *Rubus parvifolius.* Dense stands of the introduced rambling shrub Lantana *Lantana camara* occur in many places.

Bangalay - Banksia Forest (Bangalay Sand Forest)

Key Species: *Eucalyptus botryoides, Banksia integrifolia, Angophora floribunda, Acacia maidenii*

Description: The trees present in this forest are mainly Bangalay *Eucalyptus botryoides* and Rough-barked Apple *Angophora floribunda*, with occasional Maiden's Wattle *Acacia maidenii.* The open understorey is a grassland of native and some introduced species, mainly the result of grazing and "underscrubbing". The common native species include Kangaroo Grass *Themeda australis*, Common Bracken *Pteridium esculentum*, Spiny-headed Mat-rush *Lomandra longifolia*, Couch Grass *Cynodon dactylon*, Small-leaved Bramble *Rubus parvifolius* and Blady Grass *Imperata cylindrica.* Scatttered shrubs include Breynia *Breynia oblongifolia* and Corkwood *Duboisia myoporoides*.

Swamp Sclerophyll Forest

Key Species: *Eucalyptus robusta, Melaleuca linariifolia, Livistona australis, Casuarina glauca, Eucalyptus botryoides*

Description: This forest contains the wetland trees Swamp Mahogany *Eucalyptus robusta*, Swamp Oak *Casuarina glauca* and Narrow-leaved Paperbark *Melaleuca linariifolia*. Other characteristic species, most associated with wet sites, include Cabbage Palm *Livistona australis*, Harsh Ground Fern *Hypolepis muelleri*, Tall Sedge *Carex appressa*, Tall Saw-sedge *Gahnia clarkei*, Common Reed *Phragmites australis* and, climbing the trees, Monkey-rope Vine *Parsonsia straminea*. On drier sites, Bangalay *Eucalyptus botryoides* is common and the following species are prominent, Coast Banksia *Banksia integrifolia*, Golden Wattle *Acacia longifolia* and Corkwood *Duboisia myoporoidoes*.

Swamp Oak Forest

Key Species: *Casuarina glauca*

Description: This community is completely dominated by the tree Swamp Oak *Casuarina glauca,* has largely been cleared from the area of Foys Swamp, there are only a few stands remaining here and there. Various other wetland species occur in the community; these are mainly freshwater species in this location. On clayey soils on the southern margin of the area Forest Red Gum *Eucalyptus tereticornis* occurs with Swamp Oak.

Fresh Wetlands

Key Species: *Phragmites australis, Typha orientalis, Eleocharis sphacelata*

Description: This community covers small areas within the Swamp Sclerophyll Forest and along drainage channels and parts of the dredge ponds. The main species are Common Reed *Phragmites australis,* Cumbungi *Typha orientalis*, Tall Spike-rush *Eleocharis sphacelata,* River Club-rush *Schoenoplectus validus* and some aquatic species such as Water Ribbons *Triglochin procerum*, that generally grows quite densely. It is a part of the identified endangered ecological community, known as Swamp Sclerophyll Forest or Freshwater Wetlands on Coastal Floodplains.

2.4 Significant Vegetation Communities

Five endangered ecological communities occur in the general area; these are Littoral Rainforest, Bangalay Sand Forest, Swamp Sclerophyll Forest on Coastal Floodplains, Freshwater Wetlands on Coastal Floodplains and Swamp Oak Forest. The distribution of these communities in the area is shown on the maps in the reports by Kevin Mills & Associates (2005, 2006). One aim of the management program is to replicate these communities, along with the Blackbutt - Banksia Forest, through an extensive revegetation scheme. Each community grows in a particular environment so that species selection to match site conditions is an important part of the replanting program.

2.5 Biological purpose of the LRMP

The vegetation communities in the locality have been somewhat fragmented by past clearing, but connections exist, albeit tenuous in some cases, between most extant stands of forest. The project has caused one link between two forest areas to be severed. To mitigate this potential impact on the forest biota, measures for creating and strengthening other links nearby form part of the reforestation program of the LRMP. One aim of the reforestation project is to reinstate links between the forest in the national park to the east and the forest west and north of the sand quarry. Reforestation areas have been chosen in these locations. Forest links have been improved through planting appropriate vegetation communities and by improvement in managing the existing forest surrounding the dredge ponds. At the southern end of the existing dredge pond, the existing plantings have been strengthened through additional plantings and control of Lantana and other weeds. Both of these strategies will continue to improve the linkages between the forest in the national park and that to the west of the quarry and, to the north, the forest around Blue Angle Creek.

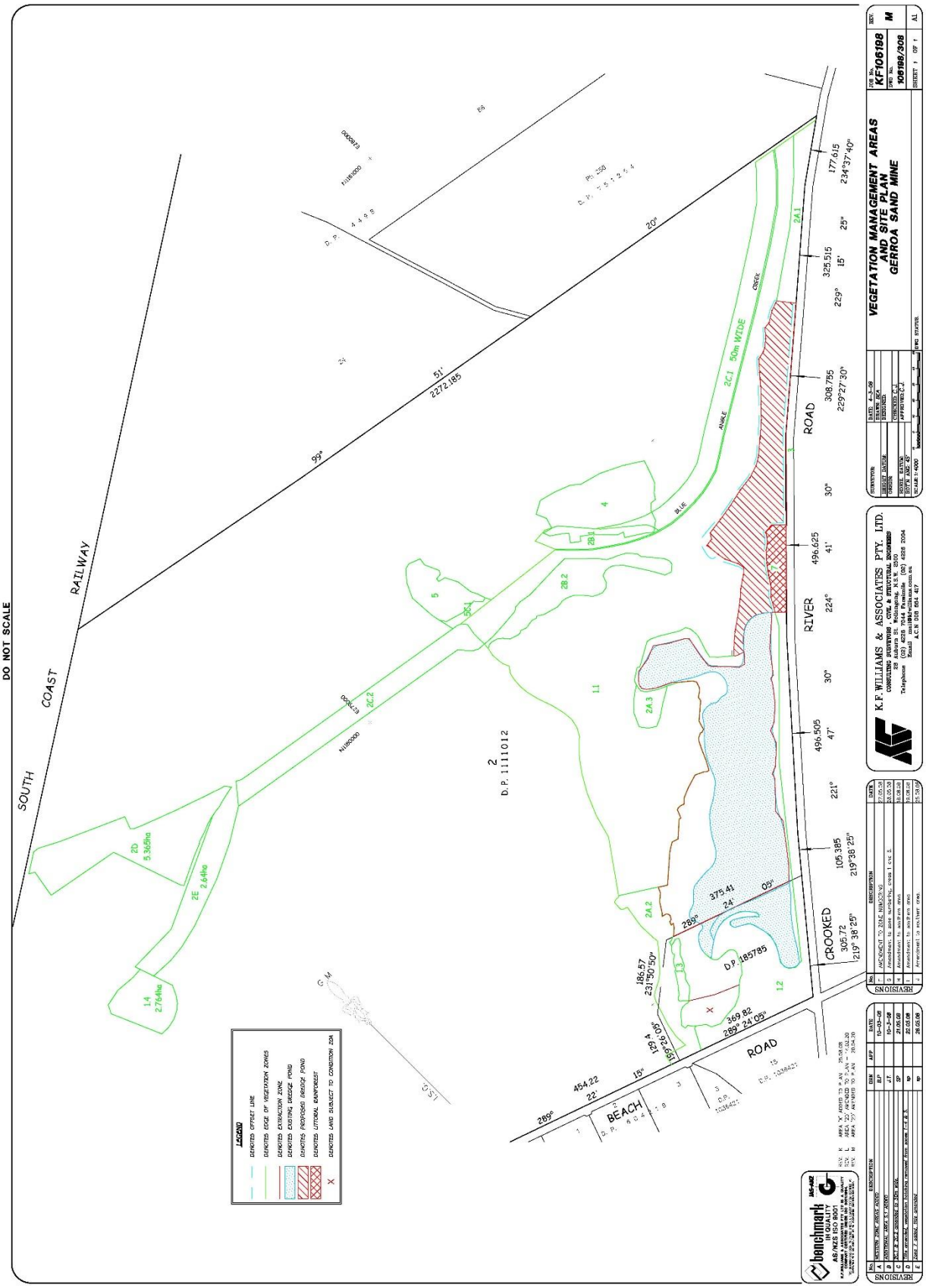

Figure 2 - Vegetation Management Areas and Site Plan

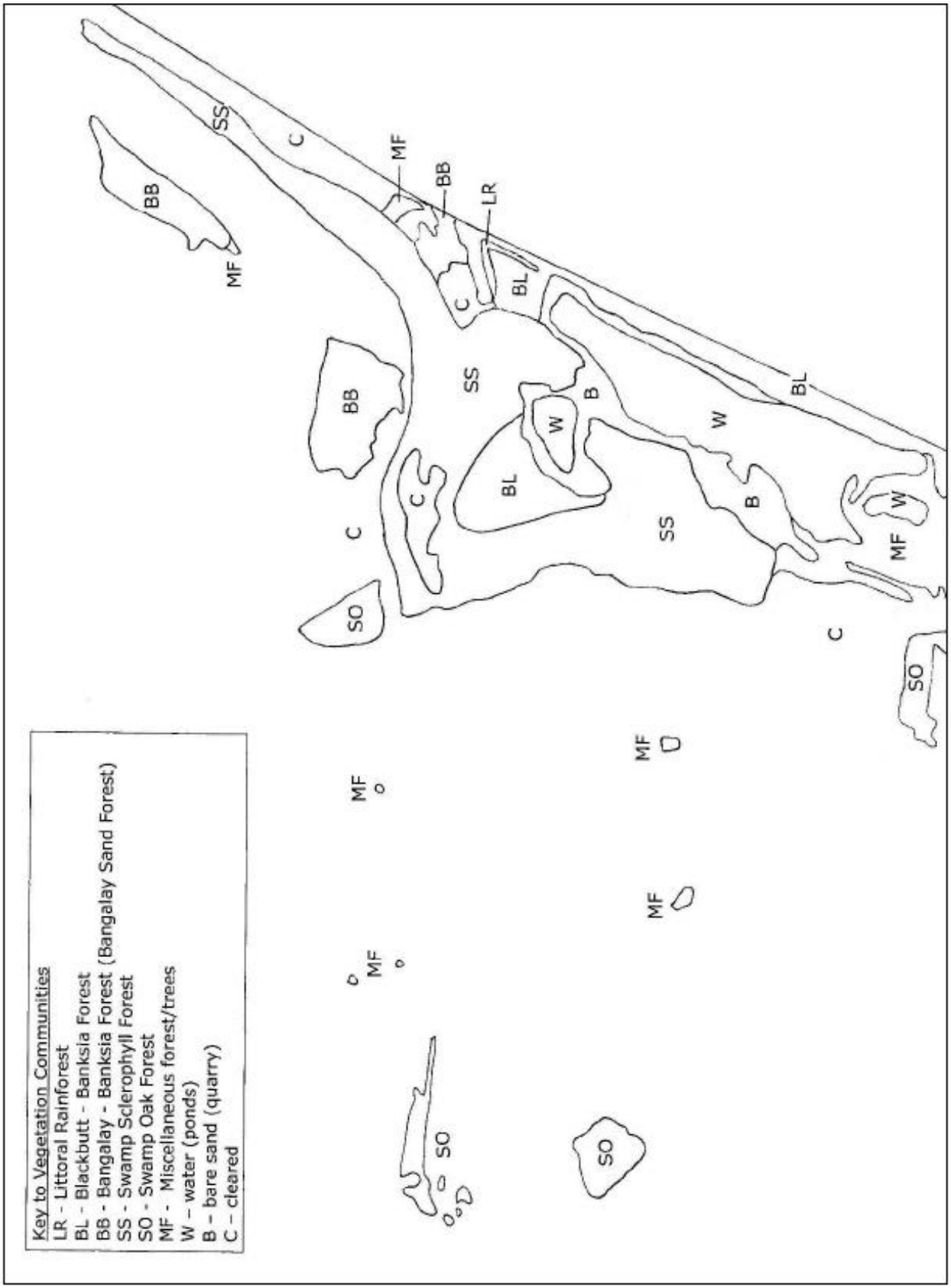

Figure 3 – 2007 Vegetation Communities in the Area

3. Management Objectives

The site rehabilitation objectives from Section 3.8 of the EA are as follows; objectives for each of the management zones are set out in the following section of the report, while each zone and sub-zone is described in detail in Section 7.

- after the conclusion of sand mining, leave the site free from all sand mining artefacts including machinery, structures, buildings, signage, products and roads, except as required for rural purposes;
- create safe and stable landforms with a natural appearance designed for low maintenance;
- establish indigenous vegetation on all land areas disturbed by the sand quarry to create wildlife habitat including wetland habitat within and around the shoreline of the dredge pond;
- nurture to maturity vegetation screens and compensatory planting established during the sand mining operation;
- control weed growth within the rehabilitation areas and compensatory planting areas;
- retain a minimum of access tracks for maintenance or as required for ongoing rural use of the property;
- progressively rehabilitate sections of the site when they are no longer required for operations to minimise the extent of work remaining when extraction ceases; and
- continue rehabilitation beyond closure of the sand mine until these objectives have been achieved.

4. Management Zones

Several distinct management zones have been identified within the conservation area, based primarily on the management input required, e.g. areas requiring extensive planting onto cleared land are differentiated from forest where relatively minor enhancement is required. The zones are described below and their extent is shown on Figure 2**.** More detailed descriptions of the zones and sub-zones are described in Section 7.

Zone 1: Forest Enhancement Zone
(being Zones 1.1, 1.2, 1.3 and 1.4 shown on Figure 1)

Enhancement areas are those sites within the existing forest areas where management input would improve the quality of the forest. The level of management input is generally low; the main action required is the continued removal of troublesome weeds to promote the natural regeneration of indigenous plants. The area of forest, most of which is Blackbutt Forest and Swamp Sclerophyll Forest, is 46.25 hectares.

The objectives for the Forest Enhancement Zone are:

- to promote the regeneration of the forest through the management of threats;
- to fence the zone where required to exclude grazing stock
- to control weeds in recognition of the significant negative impact they have on natural vegetation and habitats;
- to regularly monitor the health of the forest and undertake remedial management actions as required;
- to strengthen the tree cover to the south of the existing dredge pond to enhance the east-west forest link between the preserved forest and Seven Mile Beach National Park;
- to ensure that groundwater flow towards the Swamp Sclerophyll Forest is not significantly altered from the existing hydrological regime; and
- to ensure that best practice guidelines are always followed in managing these areas.

Zone 2: Broad Scale Planting Zone

The following approximate extent of the replanting zones for local forest communities have been calculated based on the management zones shown on Figure 2. Slight differences have occurred in the final areas where the vegetation planted has depended upon the ground level in relation to watertable height.

Bangalay Sand Forest/Littoral Rainforest	8.8 hectares	Areas 2A.1, 2A.2, 2C.1
Blackbutt – Banksia Forest	0.65 hectares	Area 2A.3
Swamp Sclerophyll Forest/Swamp Oak Forest	5.3 hectares	Areas 2B.2, 2C.2
Swamp Sclerophyll Forest/Bangalay Sand Forest	1.3 hectares	Area 2B.1
Swamp Oak Forest	7.94 hectares	Areas 2D, 2E
Total Replanted Forest	23.99 hectares	

Remnant Forest	Bangalay Sand Forest	3.65 hectares	Area 4
(enhancement)	Swamp Oak Forest	1.6 hectares	Area 5

The objectives for the Broad Scale Planting Zone are:

- to develop habitat for a broad range of fauna species, thus maximising the diversity of fauna catered for in the planting areas
- to re-establish appropriate forest communities through a planting program;
- to facilitate the establishment of stronger habitat corridors to the north and south of the existing forest;
- to maximise the success of the planting program through appropriate planting methods and maintenance regime;
- to monitor the plantings and take action where necessary to ensure successful forest regeneration and fauna usage of the created habitats;
- to strengthen east-west forest links across the property between the preserved forest and Seven Mile Beach National Park;
- to ensure that best practice guidelines are always followed in managing these areas.

The broad scale planting zone is divided into several sub-zones, based on the proposed staging plan; these are labelled from Zones 2A to 2E, and Zones 4 and 5 on Figure 2.

Zone 3: Screen Planting Zone

This area was formerly the only part of the site highly visible from public roads (excluding the site entry), and as such Zone 3 was adopted to minimise the visual impacts of the project. This zone now consists of a bund wall constructed from local sand which has now been stabilised by existing trees and new plantings. The site is on the western side of Seven Mile Beach Road, and wholly on Cleary Bros' land. **Figure 1** shows the location of the site.

The objectives for the Screen Planting Zone are:

- to establish a substantial screen of native vegetation along the eastern edge of the quarry extension site, to screen it from view;
- to ensure the screen will be well advanced by the time it is required to screen the quarry operations within the extension area; and
- to establish the screen totally on land owned by Cleary Bros;
- maintain existing trees along the south-eastern boundary, remove Lantana and replace with native plantings.

Zone 4: Bangalay Sand Forest

Zone 4 contains a stand of modified Bangalay Sand Forest, isolated in grazing land, but not far from the Blue Angle Creek corridor. Although historically grazed by stock, the stand generally retains a good tree cover and the ground cover has some native species.

The objectives for this remnant forest are:

- to promote the regeneration of the forest through the management of threats, primarily fencing to exclude stock grazing;
- to establish a forested link to the nearby larger area of forest through plantings;
- to regularly monitor the health of the forest and undertake remedial management actions as required (e.g. weed control).

Zone 5: Swamp Oak Forest

Zone 5 is a stand of Swamp Oak trees, isolated in a paddock to the north of Blue Angle Creek. These trees have apparently been planted many years ago.

The objectives for this remnant forest are:

- to promote the regeneration of the Swamp Oaks through the management of threats, primarily fencing to exclude stock grazing;
- to establish a forested link (i.e. Zone 5C.1) to the nearby larger area of forest through plantings;
- to regularly monitor the health of the forest and undertake remedial management actions as required (e.g. weed control).

Zone 6: Dredge Pond Foreshore

The dredge pond has now reached its greatest extent, with the foreshore now stabilised and will be revegetated with suitable local plant species. The zone includes the minimum five metre set back plus the batter slopes to the pond (reinstated following quarrying). The zone includes the existing dredge pond and the edges of the new pond to be created to the north and west.

The objectives for the dredge pond foreshore zone are:

- to stabilise the batter on the edges of the dredge pond;
- to revegetate the slope as soon as practical after dredging is completed in the area;
- to progressively revegetate the foreshore zone as quarrying progresses northwards;
- to undertake plantings ahead of the quarrying operation within the five metre set back area along the edge with the retained littoral rainforest;
- to continue the rehabilitation work on the existing dredge pond;
- create foreshore habitat;
- to maintain groundwater flow to the Swamp Sclerophyll Forest.

Groundwater monitoring has been conducted on the project site for many years and will be continued to be monitored during the course of the excavation of the pond and the subsequent rehabilitation. Groundwater quality monitoring will occur on a quarterly basis and surface water monitoring on a monthly basis for the duration of extraction activities, as described in the Water Management Plan. This will include sampling for pH, major ions and nutrients. Regular assessment will be made of the data obtained to ensure fluctuation in groundwater levels in the Swamp Sclerophyll Forest do not deviate by more than two standard deviations of the mean groundwater level for more than six months at a time that cannot be attributed to climatic effects.

Where fill material is placed within the dredge pond, high conductivity material is to be placed at intervals along the length of the pond extension. This material is to be of a hydraulic conductivity, and placed at such intervals and in such places, that will maintain comparable typical groundwater flow through to the SSF as existed prior to the proposed excavation. The existing and comparable typical groundwater flow is to be determined in accordance with the calculation based on the existing typical hydraulic gradient and the hydraulic conductivity of the *in situ* strata provided for in Condition 14(c) of the Conditions of Consent.

If the review of the hydrogeologist considers that remedial action is necessary to maintain the pre-existing ground water regime in the vicinity of the SSF they will be requested to recommend an appropriate remedial action plan. This plan may include adjustment to the placement strategy for panels of high hydraulic conductivity material required by Condition 11(d).

Establishment of the upper foreshore zone (i.e. the set-back area) can mostly be planted well ahead of the excavation, in most cases several years in advance. The littoral rainforest edge has been planted, resulting in the establishment of dense shrub/small tree buffer vegetation between the excavation (top of the batter) and the rainforest.

Zone 7: Littoral Rainforest

The littoral rainforest zone is immediately to the east of the new dredge pond; it is primarily a littoral rainforest growing below an open eucalypt canopy. This is part of the retained forest, but is identified separately to Zone 1 because of its special management requirements. The zone is one hectare in extent. The main actions required are protection during quarrying operations and the removal of troublesome weeds to promote the natural regeneration of the rainforest plants.

The objectives for the Littoral Rainforest Zone are:

- to promote the regeneration of the rainforest through the management of threats;
- to control weeds, particularly Lantana, in the forest;
- to regularly monitor the health of the forest and undertake remedial management actions as required;
- to protect the western edges of the site from inadvertent impacts from quarrying;
- to remove weeds and plant the buffer area well ahead of the quarrying operations;
- to ensure that the felling of trees does not impact on the retained rainforest vegetation;
- to ensure that best practice guidelines are always followed in managing the area.

5. Management issues – Retained Forest

5.1 Key Objectives for Forest Areas

The following key objectives have been identified for the areas of retained forest:

- to promote the regeneration of the forest through the management of threats;
- to control weeds in recognition of the significant negative impact they have on natural vegetation and habitats;
- to regularly monitor the health of the forest and undertake remedial management actions as required;
- to strengthen the tree cover to the south and north to enhance the forest habitat linkages between the retained forests and Seven Mile Beach National Park; and
- to ensure that groundwater flow towards the Swamp Sclerophyll Forest is not significantly altered from the existing hydrological regime.

5.2 Key Management Goals for Forest Areas

The aims for each of the management zones covering the retained forest, primarily Zone 1, are set out in the descriptions of each zone in Sections and 7 of this plan. An important goal is the improvement of the existing forest in terms of reduced weed invasion and increased native plant species abundance and diversity. Habitat corridors to the north and south of the retained forest have been described and their importance emphasised elsewhere in this plan.

5.3 Littoral Rainforest

The retained littoral rainforest to the east of the existing dredge pond requires special attention to ensure its survival and enhancement. The following issues have been identified as matters to be addressed in managing this area.

- maintaining the set back distance with the dredge pond;
- careful felling of the trees within the vicinity of the littoral rainforest to ensure that they do not fall towards and impact upon the rainforest;
- individual tree assessment to determine the best way of removal so as to avoid impact on the rainforest (e.g. some stumps may be left in the ground);
- removal of Lantana in a controlled manner so as not to encourage other weeds to invade the area;
- exclusion of cattle;
- planting of the set back areas ahead of the dredging;
- appropriate selection of plant species for use in and near the rainforest;
- planting of the batters nearby as soon as the dredging is completed and batters are stable.

Specific measures for management of this area will be in accordance with the time line found in Section 8.6.

5.4 Swamp Sclerophyll Forest

The relevant issues in regard to the protection of the Swamp Sclerophyll Forest, contained within Zone 1, are as follows:

- ensuring that the dredge pond does not intrude upon the identified area of the forest or the set back area;
- maintaining the existing level of groundwater flow to the area;
- controlling weed species; this is generally a minor problem in the swamp.

5.5 Bangalay Sand Forest

The area of Bangalay Sand Forest north of Blue Angle Creek (Zone 4) already has a good tree cover and some native understorey species. This area only requires fencing and future monitoring to determine if plantings are required, should natural regeneration not be adequate, and to identify any weed problems.

6. Management issues – Planting Areas

6.1 Key Objectives for Planting Areas

The following key objectives have been identified for the revegetation of the area and should be implemented in accordance with this plan:

- to establish natural forest communities in the area
- to re-establish the forest links to the surrounding forest, including that within Seven Mile Beach National Park to the east and south

- only locally occurring indigenous plants will be used on this project;
- to obtain all plants from a local source, derived from plant material obtained on the property or nearby;
- to ensure a range of indigenous plant species (ground covers, shrubs and trees) are used, so that the result is a multi-layered forest with a natural character and high habitat value;
- to maintain the vegetation on the site for the life of the quarry;
- for the consultant ecologist and, if required, a bush regeneration expert, to carry out an annual inspection and submit an annual report to the Secretary on the progress and condition of the vegetation as part of the Annual Review and provide a copy of the Annual Review to the Community Consultative Committee in accordance with Schedule 5 Condition 4 of the Conditions of Consent;
- create foreshore habitat;
- to create habitat for native ground and arboreal fauna through the use of logs and other debris, as well as tree hollows, salvaged from the site;
- to strategically place nest boxes in the area for arboreal mammal and bird use; and
- ensure use of best practice in all management actions.

6.2 Identifying Key Management Goals for Planting Areas

The aims for each management zone are set out in the descriptions of each zone in Section 7 of this plan. An important goal is the creation of habitat corridors to the north and south of the existing forest, to improve connectivity with the nearby forest areas (e.g. within the national park). These areas are most important for fauna although plants also require connectivity. The development of these corridors will be aimed at providing habitat attributes that maximise the value of the habitat for the fauna species known and expected to occur in the existing “east-west link” (i.e. the forest to be cleared). The targeted fauna groups and the related important attributes for each group, along with the standard that should be met and the approximate time scale to achieve that habitat attribute are set out in Table 1. Appendix 2 of this plan details the important habitat attributes for each species recorded in the locality, and identifies those species recorded in the habitat to be removed.

Table 1 – Identification of Attributes, Standards and Time Scales for Creating Vertebrate Fauna Habitat

Group	Species Example	Important Habitat Attributes	Standard to Meet	Time Scale
Large birds	Laughing Kookaburra Pied Currawong	Trees Foraging areas	Trees growing healthily Present now.	10+ years Immediate
Medium-sized birds	Crimson Rosella Satin Bowerbird	Foraging areas (ground and trees)	Trees growing healthily Ground foraging present now	10+ years, Immediate
Small birds	Brown Thornbill Superb fairy-wren	Shrub layer Ground cover Logs/branches/litter debris	Moderately dense shrub layer Healthy ground cover Good cover of logs/debris	3 to 4 years 3 to 4 years Immediate
Arboreal mammals	Common Ringtail Possum Sugar Glider	Trees Tree hollows	Trees growing healthily Translocation of tree hollows	10+ years Immediate
Hollow users	Eastern Rosella Striated pardalote	Tree hollows	Installation of artificial hollows	Immediate, although natural hollows take decades
Large ground mammals	Swamp Wallaby	Shrub/small tree cover Foraging areas	Dense areas of shrubs Present in surrounding area	3 to 4 years Immediate
Medium ground mammals	Long-nosed Bandicoot Short-beaked Echidna	Ground cover Logs/branches/litter debris	Healthy ground cover Good cover of debris	3 to 4 years Immediate
Small mammals	Bush Rat Brown Antechinus	Ground cover Logs/branches/litter debris	Healthy ground cover Good cover of logs/debris	3 to 4 years Immediate
Reptiles	Grass Skink Red-bellied Black Snake	Ground cover Logs/branches/litter debris	Healthy ground cover Good cover of logs/debris	3 to 4 years Immediate
Micro-bats	Chocolate Wattled Bat Large Bentwing-bat	Foraging areas (open areas near trees) Hollows (some species)	Present now Installation of artificial hollows	Immediate Immediate, although natural hollows take decades
Flying-foxes	Grey-headed Flying-fox	Trees (blossom, fruit) Foraging areas	Trees growing healthily Present in surrounding area	10+ years, Immediate

6.3 Best Practice Guidelines

'Best practice' guidelines have been developed over many years for activities related to various aspects of landscape management and the rehabilitation of native vegetation and habitat. Best practice procedures for clearing, soil handling, earthworks, revegetation, plant propagation, among other matters, are covered in the following documents and have been adopted so far as they are relevant on the Gerroa site:

- *Bush Regeneration. Recovering Australian Landscapes*, by R.Buchanan, TAFE NSW, 1989.
- *Best Practice Environmental Management in Mining, Rehabilitation and Revegetation*, by the Environment Protection Agency, 1995.
- *Bringing the bush back to Western Sydney: Best practice guidelines for bush regeneration on the Cumberland Plain.* Department of Infrastructure, Planning and Natural Resources, 2003.
- *Recovering Bushland on the Cumberland Plain: Best Practice Guidelines for the Management and Restoration of Bushland*. Dept. Environment and Conservation, 2005.

Other references referred to in Section 10 'References'.

Native revegetation is an active area of study and new information may over time determine that changes be made to best practice in some areas. The managers of this site will be made aware of this and respond as required to new procedures. This matter will be discussed in the annual reports by the consultant ecologist.

6.4 Initial Site Treatment

Prior to any rehabilitation works on site, the Ecologist inspected each area for regeneration potential, including existing habitat features and natural recruitment. These were then taken into consideration when developing the planting schedule for each area. Each area was divided into several sections, or planting sites. Each section was closely mown before planting, followed by "spot spraying" with herbicide around each plant location for a radius of 0.5 metres. The plant was planted in the centre of the sprayed area when the grass has browned off. Alternatively, the whole section may be sprayed and, following planting, heavily mulched.

The area to be screen planted will where necessary be slashed and fenced before any work is undertaken; it is presently dominated by introduced grasses and other herbaceous plants. Planting would take place as soon as practicable. Initial site treatment for foreshore rehabilitation will include creation of irregular shorelines and the placement of logs, etc. to produce better habitat for native fauna.

6.5 Species Selection

Appendix 1 contains a native plant species list for the Cleary Bros property (Kevin Mills & Associates 2005). The list provides the name of each plant species (botanical and common names) and states the family to which each species belongs. The list contains the names of 135 native plant species occurring on the property. Most of the species occur in the forest on or near the proposed quarry extension site. The list has been used as a basis for species selection for this project.

To establish a cover of trees and shrubs as quickly as possible, plantings of fast growing species will be interplanted with more permanent trees. The fast growing species will include Coast Banksia *Banksia integrifolia*, Golden Wattle *Acacia longifolia*, Maiden's Wattle *Acacia maidenii,* Two-veined Hickory *Acacia binervata* and Hickory Wattle *Acacia implexa*. These species will be planted with the knowledge that the wattles may not live much more than 20-30 years, by which time the permanent trees would be quite large. The more permanent species will include Blackbutt *Eucalyptus pilularis,* Bangalay *Eucalyptus botryoides,* Rough-barked Apple *Angophora floribunda* and Cheesetree *Glochidion ferdinandi.* Ground cover species

can provide a dense cover to about one metre in height, and are useful for weed control purposes. Such species include Climbing Guinea Flower *Hibbertia scandens*, Spiny-headed Mat-rush *Lomandra longifolia* and Kangaroo Grass *Themeda australis*.

Species selected for the initial plantings for the screen plantings are listed in Table 2. Depending on the availability of propagation material at the time, other species in Appendix 1 may also be selected.

Species suitable for planting on the dredge pond foreshore are listed in Table 3**.** The species selected are low-growing plants, as taller plants will generally be unsuitable as they may not be stable when fully grown; the exception is *Casuarina glauca*. A general list of species suitable for planting in the various habitats in the conservation area are listed in Table 4; from this table, a group of species can be identified for each vegetation community.

Table 2 - Species Suitable for the Proposed Screen Planting

Vegetation Type	Scientific Name	Common Name
Main Trees	*Angophora floribunda*	Rough-barked Apple
	Banksia integrifolia	Coast Banksia
	Eucalyptus botryoides	Bangalay
	Eucalyptus pilularis	Blackbutt
	Glochidion ferdinandi	Cheesetree
Other Trees	*Acacia binervata*	Two-veined Hickory
	Acacia implexa	Hickory Wattle
	Acacia maidenii	Maiden's Wattle
	Guioa semiglauca	Guioa
	Myrsine howittiana	Muttonwood
	Pittosporum undulatum	Sweet Pittosporum
	Synoum glandulosum	Rosewood
Shrubs	*Acacia longifolia*	Golden Wattle
	Duboisia myoporoides	Corkwood
	Pittosporum revolutum	Yellow Pittosporum
	Zieria smithii	Sandfly Zieria
Ground Covers	*Hibbertia scandens*	Climbing Guinea Flower
	Kennedia rubicunda	Dusky Coral-pea
	Lomandra longifolia	Spiny-headed Mat-rush
	Themeda australis	Kangaroo Grass

Table 3 - Species Suitable for the Dredge Pond Foreshore

Feature	Scientific Name	Common Name
Batters	*Acacia longifolia*	Golden Wattle
	Carex appressa	Tall Sedge
	Casuarina glauca	Swamp Oak
	Hibbertia scandens	Climbing Guinea Flower
	Lomandra longifolia	Spiny-headed Mat-rush
	Melaleuca ericifolia	Swamp Paperbark
	Phragmites australis	Common Reed
	Themeda australis	Kangaroo Grass
Gentler topography	*Acacia binervata*	Two-veined Hickory

Feature	Scientific Name	Common Name
	Acacia implexa	Hickory Wattle
	Acacia longifolia	Golden Wattle
	Acacia maidenii	Maiden's Wattle
	Angophora floribunda	Rough-barked Apple
	Banksia integrifolia	Coast Banksia
	Duboisia myoporoides	Corkwood
	Eucalyptus botryoides	Bangalay
	Eucalyptus pilularis	Blackbutt
	Glochidion ferdinandi	Cheesetree
	Guioa semiglauca	Guioa
	Hibbertia scandens	Climbing Guinea Flower
	Kennedia rubicunda	Dusky Coral-pea
	Lomandra longifolia	Spiny-headed Mat-rush
	Mysine howittiana	Muttonwood
	Pittosporum revolutum	Yellow Pittosporum
	Pittosporum undulatum	Sweet Pittosporum
	Synoum glandulosum	Rosewood
	Themeda australis	Kangaroo Grass
	Zieria smithii	Sandfly Zieria

Table 4 – Species Suitable for Planting in Key Environments in the Conservation Area

Vegetation Community	Littoral Rainforest	Blackbutt Banksia Forest	Bangalay Banksia Forest	Swamp Sclerophyll Forest	Swamp Oak Forest	Fresh Wetlands
Acacia binervata		B	G			
Acacia implexa	L	B	G			
Acacia longifolia		B	G			
Acacia maidenii		B	G			
Acacia suaveolens		B	G			
Alisma plantago-aquatica						W
Alphitonia excelsa	L					
Angophora floribunda		B	G			
Banksia integrifolia		B	G			
Baumea articulata				S	O	W
Breynia oblongifolia	L	B				
Carex appressa						W
Casuarina glauca				S	O	
Centella asiatica				S	O	W
Cissus hypoglauca	L					
Citriobatus pauciflorus	L					
Clematis aristata	L	B				
Clerodendrum tomentosum	L	B				
Commersonia fraseri	L	B				
Crinum pedunculatum				S	O	W
Dianella caerulea		B	G			
Dodonaea triquetra		B	G			
Duboisia myoporoides	L	B	G			
Eleocharis sphacelata						W
Endiandra sieberi	L					
Eucalyptus botryoides	L	B	G			
Eucalyptus pilularis		B				
Eucalyptus robusta				S		
Eucalyptus tereticornis					O (dry sites)	
Eupomatia laurina	L					

Vegetation Community	Littoral Rainforest	Blackbutt Banksia Forest	Bangalay Banksia Forest	Swamp Sclerophyll Forest	Swamp Oak Forest	Fresh Wetlands
Eustrephus latifolius	L	B				
Ficus coronata	L			S		
Ficus macrophylla	L					
Ficus obliqua	L					
Ficus superba	L					
Gahnia clarkei				S		W
Geitonoplesium cymosum	L	B				
Glochidion ferdinandi	L					
Guioa semiglauca	L					
Hibbertia obtusifolia		B	G			
Hibbertia scandens	L	B	G			
Hypolepis muelleri	L			S		
Isolepis nodosa				S	S	W (edge)
Juncus kraussii					S	W (tidal)
Juncus usitatus						W
Kennedia rubicunda		B	G			
Leptospermum juniperinum				S		W
Livistona australis	L			S		
Lomandra longifolia	L	B	G			W (edge)
Marsdenia rostrata	L					
Melaleuca ericifolia				S	O	W
Melaleuca linariifolia				S	O	W
Melaleuca styphelioides					O (dry sites)	
Melicope micrococca	L					
Monotoca elliptica		B	G			
Morinda jasminoides	L					
Myrsine howittiana	L					
Notelaea longifolia	L	B	G			
Omalanthus populifolius	L			S (dry sites)		
Ozothamnus diosmifolius		B	G			
Pandorea pandorana	L	B				
Parsonsia straminea	L	B		S	O	

Vegetation Community	Littoral Rainforest	Blackbutt Banksia Forest	Bangalay Banksia Forest	Swamp Sclerophyll Forest	Swamp Oak Forest	Fresh Wetlands
Persicaria decipiens						W
Persicaria strigosa						W
Persoonia linearis		B				
Phragmites australis				S	O	W
Pittosporum revolutum	L	B				
Pittosporum undulatum	L	B				
Restio tetraphyllus				S		W
Schoenoplectus validus				S		W
Smilax glyciphylla	L	B				
Stephania japonica	L	B	G			
Synoum glandulosum	L	B				
Themeda australis		B	G			
Triglochin procerum s. lat.						W
Tylophora barbata	L	B				
Typha orientalis						W
Viola hederacea	L	B				
Zieria smithii		B				

6.6 Obtaining Plant Stock

Plants of the selected species will be obtained from a nursery that has propagated them from plant material obtained in the local area or, alternatively, has propagated them from plant material obtained on site, under contract from the company. Depending on the weather conditions at the time, it may be possible to transplant some small plants and seedlings from the quarry extension site, which is to be cleared.

6.7 Weed Control

Weed control in the early stages of the project is crucial. For new plantings in previously grassed areas, the growth of plantings will be severely retarded if the dense sward of grass is not controlled. In later years, woody shrubs such as Bitou Bush and Lantana may become a problem.

Weed control will be achieved by a combination of several methods, depending upon the weeds present and their abundance. These methods will include mowing, removal by hand, the use of thick mulch and judicious spraying with a herbicide (herbicide use on the foreshore will be avoided). Weed control effort will focus on species that are adversely affecting the plantings and the forest, particularly weeds declared as Weeds of National Significance.

The weeds of most concern in the area covered by this plan are listed in Table 5. A few other species are listed that are considered to be locally troublesome and should be removed (unless agreed to be retained by the consultant ecologist or bush regeneration expert); these are generally not as invasive as the other species, grow in discrete clumps and are readily controlled. Note that under the Biosecurity Act 2015, the general biosecurity duty requires that as far as reasonably practical, the biosecurity risk of all weeds be prevented, eliminated, or minimised. Weeds categorised as Weeds of National Significance (noxious weeds) are bolded in Table 5.

Consideration will be given to the methods used to control weeds and any adverse impact that may occur. The control methods for individual species must be those approved by the Illawarra Noxious Weeds Authority. Generally, heavy machinery will not be used for weed control. The removal of lantana may need to be staged as it sometimes provides habitat in the absence of native shrubs.

As part of the quarterly inspection, the Site Manager will include a summary of all weed control activities completed in each zone over the previous 3 months. As part of their annual inspection, the Ecologist will record the status of weed species in all areas and provide recommendations on weed control priorities for the following year.

Table 5 – List of Important Weed Species

Name (Common Name)	Habit
Acacia podalyrifolia (Queensland Wattle)	Perennial Shrub
Ageratina Adenophora (Crofton Weed)	Shrub
Andropogon virginicus (Whiskey Grass)	Annual Grass
Araujia sericifera (Moth Vine)	Climber
Arundo donax (Giant Reed)	Tall Grass
***Asparagus aethiopicus* (Asparagus Fern)**	**Groundcover**
Axonopus Fissifolius (Carpet Grass)	Perennial Grass
Bidens Pilosa (Cobblers Pegs)	Herb
Chloris gayana (Rhodes Grass)	Perennial Grass

Name (Common Name)	Habit
Chyrsanthemoides monilifera **(Bitou Bush)**	**Perennial Shrub**
Eragrostis curvula (African Lovegrass)	Tall Grass
Erythrina x sykesii (Coral Tree)	Tree
Ipomoea purpurea (Morning Glory)	Rampant climber
Lantana camara **(Lantana*)***	**Perennial Shrub**
Paspalum urvillei (Vasey Grass)	Perennial Grass
Pennisetum clandestinum (Kikuyu Grass)	Perennial Grass
Psoralea pinnata (Butterly Bush)	Perennial Shrub
Ricinus communis (Caster Oil Plant)	Shrub
Rubus fruticosus sp. aggr. **(Blackberry)**	**Perennial Shrub**
Senecio madagascariensis **(Fireweed)**	**Annual Herb**
Senna pendula var. glabrata (Cassia)	Shrub
Solanum mauritianum (Tobacco Bush)	Shrub
Xanthium occidentale (Noogoora Burr)	Annual herb

6.8 Watering

The need for watering will depend upon local rainfall and soil conditions. The initial plantings will be planted with water-holding crystals and, in sandy soils, mulch mixed with the soil, and watered once at the time of planting. Follow-up watering will occur at least once per week, depending on rainfall. Watering will cease or be curtailed when the plants are large enough to survive without additional moisture; this will encourage deeper root growth and better plant health.

6.9 Fertilising

The use of strong fertilisers is generally avoided in native planting projects. However, a couple of tablets of a slow-release fertiliser in the hole at the time of planting can be beneficial.

6.10 Protection from Grazing Animals

Grazing stock will be excluded from the planting zones by fencing. Grazing by rabbits and possibly Swamp Wallabies may need to be addressed on a case-specific basis.

6.11 Timber /Litter Debris

Tree trunks, logs, branches and litter cleared from the site can be used in the planting zones to create ground habitat and logs placed on the edges of the pond to provide habitat. Material from nearby can also be utilised; e.g. native free prunings from the side of Gerroa Road.

All mulch used on site will be from native species, preferably obtained elsewhere on the property or at least nearby. The mulch must be free of weed propagules and the seed of non-local plant species.

6.12 Planting Methods

The following planting methods will be used.

Plant Spacing

Trees and shrubs will be planted at a spacing of no more than about two (2) metre centres on average, but these will be arranged randomly and not in straight lines. On the foreshore, smaller plants can be planted at about 0.5 metres centres. Native aquatic plants will readily colonise the edges of the pond, so these do not need to be planted.

Plant Protection

The staking of individual plants will be avoided, as it requires much effort and may be detrimental to the plant, which will be left to grow naturally. Placing plastic bags or 'Grow Tubes' around each plant can improve the success rate. These plant guards are used to protect the plant from grazing animals, reduce weed competition, reduce wind and frost effects, and lower evaporation rates around the plant. Treating individual plants can be high maintenance, but the results are usually worth the effort.

Plant Size

Tubestock or similar sized plants will be used for all plantings. Advanced plants are not usually successful in this type of project and will not be used unless otherwise recommended by the consultant ecologist or bush regeneration expert.

Planting Configuration

For aesthetic reasons, the plants will not be planted in rows, lines or grid patterns. The plantings will be random, with an average density as set out above.

Individual Planting Method

Each plant will be placed in a hole of suitable size. Two slow-release fertiliser tablets will be placed at the bottom of the hole, and a handful of water-holding crystals placed around the plant as the hole is filled in. A tree guard (e.g. plastic bag) may be placed around the planted trees and shrubs, although this may not be necessary for the ground cover plants. Each plant will be watered immediately after planting. The area around the plant will be mulched as soon as possible after planting if required.

Successional Plantings

The planting program has involved a successional planting strategy, with canopy and other tree species targeted for initial plantings throughout the rehabilitation area, which also depended on the ability to source suitable growth stock. As the initial canopy has become established, infill planting will focus on improving species diversity as well as supporting natural recruitment of the soil seed stock.

6.13 Maintenance

The revegetation zones will require ongoing maintenance for the life of the quarry. The maintenance requirements will decrease over time.

The following main maintenance activities will be undertaken on a weekly by Cleary Bros on-site staff:

- check that the fencing is intact;
- carry out weed control;
- water plants as required;
- replace dead plants;
- remove rubbish (e.g. roadside litter);
- treat erosion should this occur; and
- address the impact of grazing animals, if required.

6.14 Vegetation Clearing Protocols

The following tree clearing protocols would be followed; these are summarised from the actions set out in Table 6.

Genetic testing of fauna populations

The conditions of consent contain the following matters regarding genetic testing.

Condition 25

Prior to the severance of the east-west link the Proponent shall:

(c) conduct genetic analysis for a number of key species for whom genetic markers have already been developed (e.g. Brown Antechinus, Bush Rat and at least two skink species) to establish that genetic relatedness exists between individuals within the two corridors, the Conservation Area and National Park.

If no genetic relatedness exists between individuals in the Conservation Area, northern corridor, east-west link and the National Park, then this demonstrates that neither the east-west link nor the northern corridor is functional and therefore the east-west link can be severed without creating additional fragmentation to animal populations.

If genetic relatedness exists between individuals in the northern corridor, Conservation Area and the National Park, but not in the east-west link, then this demonstrates that the east-west link is not functional, but the northern corridor is and therefore, the east-west link can be severed without creating additional fragmentation to animal populations.

If genetic relatedness exists between individuals in the Conservation Area, the east-west link and the National Park, but not the northern corridor, then this demonstrates that the northern corridor is not functional and the east-west link cannot be served until there is compliance with condition 23 and 24.

Search for Koalas prior to tree clearing

The ecologist will inspect the trees to be removed on the day of the clearing to ensure that no animals are present. If animals are present, then clearing must be delayed until the animal has moved away under its own accord.

Clearing Existing Vegetation and Felling of trees

The understorey must be cleared the day prior to trees being felled, to allow fauna to move away if present. Tree with hollows, previously tagged by ecologist, will be shaken by machinery just prior to felling to give fauna within the hollows an opportunity to escape before tree is felled. Trees will not be felled into the forest areas to be retained. The site manager must make sure that tree felling is carried in an appropriate way to avoid harm to the adjoining forest, and in accordance with WorkSafe NSW guidelines.

Trees will not be felled into the forest areas to be retained; this must particularly be ensured along the edge of the littoral rainforest to be retained. All tree hollows are to be inspected after tree felling to determine if animals are still present. The site manager will locate the nearest vet or animal carer prior to clearing taking place. If animals are injured during clearing, then they can be taken directly to the vet/animal carer after their discovery. Clearing is best undertaken in autumn.

Tree hollow salvage

The Environmental Officer and the ecologist will identify and tag tree hollows that will be salvaged and identify and tag suitable host trees in the retained forest. Hollows over 15 cm will be salvaged whenever suitable condition for reuse. The site manager will subsequently organise the removal of the hollows prior to clearing and for the cut hollows to be strapped to the identified trees. The Environmental Officer or consultant ecologist is to inspect all hollow-bearing trees immediately after they have been felled to look

for animals within the hollows or nearby. Any injured animals found are to be taken to WIRES or a similar wildlife care organisation for treatment.

Use of organic debris

The site manager will ensure that any organic material (e.g. logs, tree trunks, mulch) useful in the revegetation program is appropriately stored and re-used to best advantage. The ecologist will advise on the best use of this material, e.g. using logs on edge of pond and in planting zones, use of mulch.

Severance of tree roots

In the event that any trailing roots from trees outside of the extraction area are encountered during excavation of the dredge pond, these are to be severed using a saw (rather than excavator bucket) to ensure a clean cut of the root, limiting potential decay to the tree to be retained.

Area "X"

The Area marked “X” on Figure 2 will not be cleared without written approval from the Planning Secretary.

6.15 Sediment and Erosion Control

Prior to the commencement of any vegetation clearing, sediment and erosion controls will be implemented in accordance with best practice guidelines as set out in the document titled “Soil and Construction and Management Urban Stormwater”, prepared by Landcom (2004).

6.16 Management of Feral Animals

Several species of feral animal occur on the property that have the potential to impact on forest and wetland conservation values. These animals will be controlled in accordance with legislative requirements or where needed to ensure the success of the project.

Rabbits and foxes will be controlled on an ‘as needs’ basis, as they are now on the Cleary Bros’ property as a part of normal farming activities.

Unusual feral animal problems such as European Bees and Deer will be identified and addressed as and when they become a problem.

Any recommendations from the ecologist regarding the control of feral animals will be taken as required.

6.17 Bushfire

Bushfire has not historically been a problem on the company’s property; it has not had a fire for many decades. This is probably because of the extensive areas of cleared land surrounding the area. Seven Mile Beach National Park south of Beach Road is burnt in a widespread fire about once every ten years. The section of the park and the adjoining forest north of Beach Road picnic area has not burnt for a very long time and has developed an extensive rainforest understorey to the tall eucalypt forest.

No special provisions are required in regard to bushfire protection or hazard reduction. Where appropriate, the company will co-operate with the local bushfire brigade and the regional bushfire committee. Bushfire management on this site will be consistent with the Bushfire Plan for Seven Mile Beach National Park and the Regional Bushfire Plan.

6.18 Access

Access to the Conservation Land (as defined in the Voluntary Planning Agreement) will be minimised and only for the purposes of management, monitoring and research. In particular, vehicles are completely

excluded from the Conservation Land except for their use for the above purposes and then, they will be restricted to the existing identified tracks as shown on Appendix 4 of the conditions of consent.

6.19 Soil Testing

There is little need for soil testing on the rehabilitation areas as these are all natural sand dune soils with no known areas of foreign soil. It is proposed to undertake one set of soil sampling and testing to confirm that there is no likelihood of detrimental impact on forest regeneration.

6.20 Reporting

Monitoring the success or otherwise is an important component of the management plan. Regular monitoring of the project will be carried out by Cleary Bros on-site staff. The preparation of an annual monitoring report by an ecologist is required under this management plan. The strategies and actions set out in Table 6 indicate the specific matters to be considered. The desired outcomes set out in column two Table 6 should be the basis of the annual reporting.

The following key matters must be discussed in these annual reports:

- general condition of the retained forest, with particular reference to the Swamp Sclerophyll Forest area;
- general condition of each planted area;
- results of inspections of the screen planting area and the edge of the dredge pond;
- matters relevant to the success of the project, particularly weed invasion. The distribution of the weeds listed in Table 5 will be updated annually.
- relevant photographs to demonstrate points being made;
- the condition of the quarry/forest boundary and any remedial works required;
- production of an updated map that shows the zones planted and any other relevant information; and
- results of the monitoring outlined in Section 8.

6.21 Boundary Marking of Conservation Area

The Department of Environment and Conservation (*in litt*., 22 December 2006) in supporting the compensation proposals of the project stated that:

“The boundary of the extension area must be clearly defined in consultation with a fully qualified ecologist prior to the commencement of any construction works to ensure that an adequate buffer distance is maintained from the dredging activities/mine operations to the conservation area and Swamp Sclerophyll Forest.”

and

“A buffer area should be revegetated with appropriate native species and should be subject to a vegetation management plan for inclusion in the QEMP for its long term restoration and management.”

These matters have been dealt with in this plan. All boundaries have been marked on a survey plan and will be determined on site by an ecologist. The buffer areas have also been identified and incorporated into the design and plans for the project.

7. Descriptions of the Zones

This section provides details of the individual zones to be planted, as delineated on Figure 2. This information provides the basis for revegetation and habitat creation within each zone; this information will

be read in conjunction with the principles outlined in Section 6 and other information on management elsewhere in the report. Note that Zone 1 and 7 cover the existing forest, where the main management actions are removal of stock grazing and weed control; existing native regeneration is generally good and will be improved through these actions.

The timing of the various zones is set out in Section 8.6, although it will be appreciated that site circumstances may change and the availability of species or habitat attributes become available from time to time that will modify the timing of the development of the sites or the actions proposed on a site. As stated later in this report, this is a part of the adaptive management approach.

7.1 Zone 1

(being Zones 1.1, 1.2, 1.3 and 1.4 shown on Figure 2)

Location: Throughout the project area, primarily the large area of forest immediately to the west of the existing and proposed dredge pond.

Extent: 46.25 ha

Existing Vegetation: Indigenous forest; this is mainly Swamp Sclerophyll Forest, with Blackbutt Tall Forest near the Crooked River Road and, to the northwest of the dredge pond, a stand of Swamp Oak Forest in the west of the property.

Primarily Purpose(s): Protection and enhancement of existing forest, particularly endangered ecological communities

Key Actions: (i) fence where required to exclude grazing stock; and (ii) carry out weed control.

Planting schedule: Generally unnecessary; area is existing forest where fencing and weed control will encourage natural regeneration of indigenous species.

Habitat Attributes to be Installed: Salvaged tree hollows and nest boxes.

Special Notes: Key weed infestations to be shown on a map.

7.2 Zone 2A.1

Location: North of quarry extension.

Extent: 2.1 hectares

Existing Vegetation: A few trees in the north, and along eastern fence. Rows of recently planted local trees. Natural regeneration of native plants is occurring. The existing plantings in this zone will be checked to ensure that they are of the correct species; thinning may be required if any unsuitable species are found.

Primary Purpose(s): (i) Connectivity with existing forests to north, east (across Gerroa Road) and west; (ii) Revegetation with local Bangalay Sand Forest with Littoral Rainforest.

Key Actions: (i) Spread timber debris; (ii) Plant key species; (iii) Remove problem weeds; (iv) Initiate monitoring.

Planting Schedule: The following local native species are the key species to be planted; see lists at Table 4 in this report for further information on species from the relevant forest communities. Note that in addition to planting, direct spreading of seeds collected locally across the site will be carried out as this seed becomes available nearby.

Upper Canopy: *Eucalyptus botryoides, Angophora floribunda, Banksia intregrifolia*

Middle canopy: *Glochidion ferdinandi, Guioa semiglauca*, *Acacia implexa, Duboisia myoporoides, Endiandra sieberi, Synoum glandulosum*

Shrub Layer: *Monotoca elliptica, Acacia longifolia*, *Pittosporum revolutum*

Ground Cover: *Lomandra longifolia*, *Hibbertia scandens*, *Themeda australis* (by seed)

Habitat Attributes to be Installed: Timber debris such as tree trunks, branches and litter obtained from local sources. Salvaged hollows installed in trees when available.

Weed Control: Remove Lantana from near western side near creek.

7.3 Zone 2A.2

Location: Southwest of existing dredge pond.

Extent: 2.5 hectares

Existing Vegetation: Planted local trees on bund along eastern side; scattered trees in far south near Beach Road. Understorey mainly exotic.

Primary Purpose(s): (i) Connectivity with existing forests to north and south (across Beach Road); (ii) Revegetation with local forest communities, including Bangalay Sand Forest with Littoral Rainforest and Swamp Oak Forest, depending upon drainage.

Key Actions: (i) Spray Kikuyu Grass; (ii) Spread timber debris; (iii) Plant key species; (iv) Remove problem weeds; (iv) Initiate monitoring.

Planting Schedule: The following local native species are the key species to be planted; see lists at Table 4 in this report for further information on species from the relevant forest communities. Note that in addition to planting, direct spreading of seeds collected locally across the site will be carried out as this seed becomes available nearby.

Upper Canopy: *Eucalyptus botryoides, Angophora floribunda, Banksia intregrifolia, Casuarina glauca* (wet sites), *Eucalyptus robusta* (wet sites),

Middle canopy*: Glochidion ferdinandi, Guioa semiglauca*, *Acacia implexa, Duboisia myoporoides, Endiandra sieberi, Synoum glandulosum, Melaleuca linariifolia* (wet sites)

Shrub Layer: *Monotoca elliptica, Acacia longifolia*, *Pittosporum revolutum*, *Melaleuca ericifolia* (wet sites)

Ground Cover: *Lomandra longifolia*, *Hibbertia scandens*, *Themeda australis* (by seed)

Habitat Attributes to be Installed: Timber debris such as tree trunks, branches and litter obtained from local sources. Nest boxes installed in trees.

Weed Control: Remove Lantana and problem weeds from bund area, spray Kikuyu Grass in patches ready for planting (increase area as planting progresses).

7.4 Zone 2A.3

Location: Clearing in forest, northwest of existing dredge pond.

Extent: 0.65 hectares

Existing Vegetation: Planted local trees; native colonisation good; some weeds need control. Surrounded by forest.

Primary Purpose(s): (i) Consolidation of surrounding forest.

Key Actions: (i) Spray Kikuyu Grass; (ii) Plant key species; (iii) Remove problem weeds.

Planting Schedule: The following local native species are the key species to be planted; see lists at Table 4 in this report for further information on species from the relevant forest community. Note that there is good native regeneration already so that the plantings required are minimal.

Upper Canopy: *Eucalyptus botryoides, Eucalyptus pilularis, Banksia intregrifolia, Eucalyptus robusta* (wet sites)

Middle canopy*: Melaleuca linariifolia* (wet sites), *Acacia implexa*

Shrub Layer: *Acacia longifolia*

Ground Cover: *Lomandra longifolia* (by seed), *Themeda australis* (by seed)

Habitat Attributes to be Installed: None necessary. Salvaged tree hollows installed nearby when available.

Weed Control: Remove Lantana and problem weeds from area, spray Kikuyu Grass if needed.

Special Notes: Management primarily aimed at enhancing the area with tree plantings and allowing the natural colonisation of natives to continue.

7.5 Zone 2B.1

Location: North of Blue Angle Creek, between zones 1 and 4.

Extent: 1.3 hectares

Existing Vegetation: Remnant trees, with mixed native and exotic ground cover, native regeneration good.

Primary Purpose(s): (i) Connectivity between remnant Bangalay Sand Forest in north and Swamp Sclerophyll Forest in south; (ii) buffer to edge of Blue Angle Creek.

Key Actions: (i) Plant key canopy species; (ii) Remove problem weeds.

Planting Schedule: The following local native species are the key species to be planted; see lists at Table 4 in this report for further information on species from the relevant forest community. Note that there is good native regeneration already so that the plantings required are minimal, the primary purpose is to gain a canopy so that native regeneration in the understorey is promoted. The edge of the creek requires swamp species, while the higher land needs Bangalay forest species.

Upper Canopy: *Eucalyptus botryoides, Banksia intregrifolia, Eucalyptus robusta* (wet ground), *Casuarina glauca* (wet ground)

Middle canopy*: Melaleuca linariifolia* (wet ground), *Acacia implexa*

Shrub Layer: *Melaleuca ericifolia* (near creek)

Ground Cover: Not needed.

Habitat Attributes to be Installed: None necessary.

Weed Control: Remove problem weeds from area, spray Kikuyu Grass around plantings if needed.

Special Notes: Management primarily aimed at excluding stock, creating a tree canopy and allowing the natural colonisation of natives to continue.

7.6 Zone 2B.2

Location: South of Blue Angle Creek, northwest of existing dredge pond.

Extent: 2.7 hectares

Existing Vegetation: Remnant trees around edge, with a mixed native and exotic ground cover.

Primary Purpose(s): (i) Consolidation of existing forest (Zone 1).

Key Actions: (i) Plant key species; (ii) Remove problem weeds.

Planting Schedule: The following local native species are the key species to be planted; see lists at Table 4 in this report for further information on species from the relevant forest community. The zone has been filled so may no longer support swamp forest; Blackbutt and Bangalay forest species can be planted in these higher areas.

Upper Canopy: Low areas: *Casuarina glauca*, *Eucalyptus robusta, Livistona australis*

High areas: *Eucalyptus botryoides, Eucalyptus pilularis, Banksia intregrifolia, Banksia serrata*

Middle canopy*:* Low areas: *Melaleuca linariifolia,*

High areas*: Acacia implexa, Duboisia myoporoides, Endiandra sieberi, Synoum glandulosum,*

Shrub Layer: Low areas: *Melaleuca ericifolia*, spread seed of *Gahnia clarkei*.

High areas: *Monotoca elliptica, Acacia longifolia*

Ground Cover: *Lomandra longifolia*, *Hibbertia scandens*, spread seed from nearby species when available.

Habitat Attributes to be Installed: Scatter logs and timber debris when available.

Weed Control: Remove/spray problem weeds from zone.

Special Notes: Management primarily aimed at excluding stock, creating a tree canopy and allowing the natural colonisation of natives to continue.

7.7 Zone 2C.1

Location: West of Blue Angle Creek.

Extent: 4.2 hectares

Existing Vegetation: Grassland or bare ground.

Primary Purpose(s): (i) Connectivity with existing forests to east and south; (ii) buffer to Blue Angle Creek; (iii) Revegetation with local Bangalay Sand Forest with Littoral Rainforest

Key Actions: (i) Plant key species; (ii) Spread timber debris; (iii) Spray problem weeds; (iv) spread “topsoil” from quarry area.

Planting Schedule: The following local native species are the key species to be planted; see lists at Table 4 in this report for further information on species from the relevant forest communities. Note that in addition to planting, direct spreading of seeds collected locally across the site will be carried out as this seed becomes available nearby.

Upper Canopy: *Eucalyptus botryoides, Angophora floribunda, Banksia intregrifolia*

Middle canopy*: Glochidion ferdinandi, Guioa semiglauca*, *Acacia implexa, Duboisia myoporoides, Endiandra sieberi, Synoum glandulosum*

Shrub Layer: *Monotoca elliptica, Acacia longifolia*, *Pittosporum revolutum*

Ground Cover: *Lomandra longifolia*, *Hibbertia scandens*, *Themeda australis* (by seed)

Habitat Attributes to be Installed: Timber debris such as tree trunks, branches and litter obtained from local sources. Salvaged hollows installed in trees when available.

Weed Control: Remove Lantana from near western side near creek.

Special Notes: "Topsoil" from quarry area to be spread when available; if necessary, part of zone to remain unplanted to receive soil. Exclude stock from area; this may require fencing.

7.8 Zone 2C.2

Location: South of channel, western part of conservation area.

Extent: 2.6 hectares

Existing Vegetation: Treeless, mostly an exotic ground cover, with wetland species near drain and scattered elsewhere.

Primary Purpose(s): (i) Develop long term connectivity to west.

Key Actions: (i) Plant key species; (ii) Remove problem weeds.

Planting Schedule: The following local native species are the key species to be planted; see lists at Table 4 in this report for further information on species from the relevant forest community.

Upper Canopy: *Casuarina glauca*, *Eucalyptus robusta, Livistona australis*

Middle canopy*: Melaleuca linariifolia,*

Shrub Layer: *Melaleuca ericifolia*, spread seed of *Gahnia clarkei* and other species in adjacent swamp forest when available.

Ground Cover: *Lomandra longifolia*, *Hibbertia scandens*, spread seed from nearby species when available.

Habitat Attributes to be Installed: Scatter logs and timber debris when available.

Weed Control: Remove/spray problem weeds from zone.

Special Notes: Management primarily aimed at excluding stock, creating a tree canopy and allowing the natural colonisation of natives to continue.

7.9 Zone 2D

Location: North arm, western part of conservation area.

Extent: 5.14 hectares

Existing Vegetation: Remnant trees towards western end of zone, mostly an exotic ground cover, with wetland species near drain and scattered elsewhere.

Primary Purpose(s): (i) Develop long term connectivity to west.

Key Actions: (i) Plant key species; (ii) Encourage existing trees to spread; (iii) Remove problem weeds.

Planting Schedule: The following local native species are the key species to be planted; see lists at Table 4 in this report for further information on species from the relevant forest community. The zone is wet and would primarily support Swamp Oak Forest.

Upper Canopy: *Casuarina glauca*, *Eucalyptus robusta, Eucalyptus tereticornis*

Middle canopy*: Melaleuca linariifolia*

Shrub Layer: *Melaleuca ericifolia*, spread seed of *Gahnia clarkei*

Ground Cover: *Lomandra longifolia*, spread seed of suitable wetland species when available.

Habitat Attributes to be Installed: Nil.

Weed Control: Remove/spray problem weeds from zone as required. May need to spray exotic grasses to establish trees.

Special Notes: Management primarily aimed at excluding stock, creating a tree canopy and allowing the natural colonisation of wetland natives.

7.10 Zone 2E

Location: South arm, western part of conservation area.

Extent: 2.8 hectares

Existing Vegetation: Treeless. Primarily exotic grassland with some wetland natives present.

Primary Purpose(s): (i) Develop long term connectivity to west; (ii) provide link to existing stand of forest.

Key Actions: (i) Plant key species; (ii) Remove problem weeds.

Planting Schedule: The following local native species are the key species to be planted; see lists at Table 4 in this report for further information on species from the relevant forest community. The zone is wet and would primarily support Swamp Oak Forest.

Upper Canopy: *Casuarina glauca*, *Eucalyptus robusta, Eucalyptus tereticornis*

Middle canopy*: Melaleuca linariifolia*

Shrub Layer: *Melaleuca ericifolia*, spread seed of *Gahnia clarkei*

Ground Cover: *Lomandra longifolia*, spread seed of suitable wetland species when available.

Habitat Attributes to be Installed: Nil.

Weed Control: Remove/spray problem weeds from zone as required. May need to spray exotic grasses to establish trees.

Special Notes: Management primarily aimed at excluding stock, creating a tree canopy and allowing the natural colonisation of wetland natives.

7.11 Zone 3

Location: Between northern part of quarry and eastern boundary of property

Extent: approximately 500 metre by 10 metres

Existing Vegetation: Some trees planted, further planting required.

Primary Purpose(s): (i) Screen between quarry and Gerroa Road; (ii) Provision of forest habitat.

Key Actions: (i) Plant screen species; (iii) Remove problem weeds.

Planting Schedule: The following local native species are the key species to be planted; see list at Table 2 in this report for further information on species to plant

Upper Canopy: *Eucalyptus botryoides, Angophora floribunda, Banksia intregrifolia*

Middle canopy*: Glochidion ferdinandi, Guioa semiglauca*, *Acacia implexa, Duboisia myoporoides, Pittosporum undulatum*

Shrub Layer: *Monotoca elliptica, Acacia longifolia (to be used as protection of the rainforest)*, *Pittosporum revolutum*

Ground Cover: *Lomandra longifolia*, *Hibbertia scandens*, *Themeda australis* (by seed)

Habitat Attributes to be Installed: Nil.

Special Notes: Plantings to be undertaken to provide a dense vegetated screen; this involves planting a mixture of canopy to ground cover pats throughout length of the screen.

7.12 Zone 4

Location: North of Blue Angle Creek, north of Zone 2B.1.

Extent: 3.65 hectares

Existing Vegetation: Remnant forest, with mixed native and exotic ground cover, native regeneration good.

Primary Purpose(s): (i) maintenance and improvement of remnant Bangalay Sand Forest (endangered ecological community).

Key Actions: (i) Remove problem weeds.

Planting Schedule: The local native species for Bangalay Sand Forest at Table 4 in this report could be utilised, but fencing and weed control is all that is required to initiate improved natural regenerating. The trees below are the most appropriate.

Upper Canopy: *Eucalyptus botryoides, Angophora floribunda, Banksia intregrifolia*

Middle canopy*: Acacia implexa*

Shrub Layer: Not needed.

Ground Cover: Not needed.

Habitat Attributes to be Installed: None necessary.

Weed Control: Remove/spray problem weeds in the area.

Special Notes: Management primarily aimed at excluding stock, enhancing the tree canopy and allowing the natural colonisation of natives to continue.

7.13 Zone 5 and 5C.1

Location: North of Blue Angle Creek, north of Zone 2C.2/Zone 1.

Extent: 1.6 hectares (existing forest); 0.25 hectares (planting areas)

Existing Vegetation: Remnant forest (apparently planted some years ago), with mainly an exotic ground cover.

Primary Purpose(s): (i) maintenance and improvement of remnant Swamp Oak Forest (endangered ecological community).

Key Actions: (i) Remove problem weeds.

Planting Schedule: The local native species for Swamp Oak Forest at Table 4 in this report could be utilised, but fencing and weed control is all that is required to initiate improved natural regenerating within the existing forest. Planting will occur within the adjourning small area Zone 5C.1; *Casuarina glauca* is the most appropriate tree.

Habitat Attributes to be Installed: None necessary.

Weed Control: Remove/spray problem weeds in the area.

Special Notes: Management primarily aimed at excluding stock, enhancing the tree canopy and allowing the natural colonisation of natives to continue.

7.14 Zone 6

Location and extent: Dredge pond foreshore, on batters above high water mark.

Existing Vegetation: Foreshores will be bare sand following completion of dredging and batter establishment.

Primary Purpose(s): (i) provision of a stable edge to the dredge pond; (ii) establishment of fringing wetland habitat.

Key Actions: (i) prepare final batter slope as soon as practicable after dredging is completed; (ii) spread timber debris across batter; (iii) plant batter with appropriate local species.

Planting Schedule: The appropriate species are set out in Table 3 and Table 4, where suitable local wetland and foreshore species are identified.

Habitat Attributes to be Installed: Logs and timber debris, as available, to be scattered over batter. Local mulch to be used, if available. Some logs to be partly within the pond.

Weed Control: Undertaken as and when required. Hand removal of weeds only to be carried out.

Special Notes: If necessary, sections of permeable sand to be placed on batter to improve groundwater flow, as determined by the hydrogeologist. No chemicals (e.g. herbicides) are to be used on batters or in the pond.

7.15 Zone 7

Location: Retained littoral rainforest, east of dredge pond.

Extent: 1 hectare.

Existing Vegetation: Simple littoral rainforest below a higher canopy of eucalypts.

Primary Purpose(s): (i) retain and enhance the rainforest vegetation.

Key Actions: (i) densely plant 5m wide buffer area ahead of nearby dredging with *Banksia integrifolia*; (ii) ensure tree felling does not impact upon retained forest; (iii) temporary fence buffer during quarrying nearby.

Planting Schedule: The 5m *Banksia integrifolia* buffer area is to be planted within 12 months of the approval of the original Development Consent; the appropriate rainforest species are set out in Table 4.

Habitat Attributes to be Installed: Not necessary as site is retained forest; some minor spreading of logs could be undertaken in buffer area.

Weed Control: Staged removal of Lantana and other weeds; work areas to be identified by ecologist.

Special Notes: No machinery to enter the area, all weed removal by hand and done progressively over at least six months. No chemicals (e.g. herbicides) are to be used. Planting of dense zone of *Banksia* integrifolia was completed in 2009 as required by the Development Consent, and no additional planting in this area required.

8. Management Strategies and Actions

8.1 Key Threatening Processes

Key threatening processes are listed under the *Biodiversity Conservation Act 2016* (BC Act) and the *Fisheries Management Act 1994* (FM Act) and provide a ready list of the main threats to biodiversity in NSW. This management plan has been prepared in part of address the following key threatening processes,

particularly where these threats impact on the endangered ecological communities present within the conservation area.

8.1.1 BC Act

"Clearing of native vegetation"

The majority of the forest and wetland vegetation on the land (43.8 ha) will not be affected by the proposal; 3.3 ha would be removed. The proposal will in fact improve this forest through management actions, while about 19 ha will be revegetated and developed as habitat.

"Competition and grazing by feral European Rabbit"

Rabbits will be controlled on the land.

"Invasion and establishment of exotic vines and scramblers"

Weed vines and scramblers will be controlled as part of the overall weed management of the land.

"Invasion, establishment and spread of *Lantana camara*"

Lantana is one of the key weeds on the land and will be removed almost completely over time and control will be on-going.

"Invasion of native plant communities by *Chrysanthemoides monilifera*"

Bitou Bush occurs occasionally across the land; it will eventually be removed completely and control will be on-going.

"Invasion of native plant communities by exotic perennial grasses"

A few perennial grasses are problem weeds on the site and these will be controlled as required to ensure that they do not significantly impact upon the forest or the revegetation zones.

"Loss of hollow-bearing trees"

As some hollows will be removed, a program of salvage of hollows from trees cut down and their installation into trees to be retained in the forest will be undertaken, along with the installation of nest boxes.

"Predation by the European Red Fox"

Foxes will be controlled as required.

"Predation by the Feral Cat"

Feral Cats will be controlled as required.

"Removal of dead wood and dead trees"

A small amount of dead wood will be removed from the area to be cleared, this material will be spread across the revegetation zones where it will provide ground habitat for small fauna.

8.1.2 FM Act

"Introduction of fish to fresh waters"

Advice from Department of Primary Industries will be taken should control measures be required.

“The degradation of native riparian vegetation”

The proposal will improve the riparian corridor of Blue Angle Creek, through the revegetation of riparian zones, and has been designed to avoid removal or indirect impacts on this vegetation near Blue Angle Creek.

8.2 Addressing Key Management Issues

This section presents, in a tabular form, the management strategies and actions to achieve the objectives identified in the previous section of the Plan. The following tables describe the management issue and the desired management outcomes, followed by strategies and actions that have been identified to address each issue. This table will be read in conjunction with the other information provided in this plan.

The following matters have been identified as the key management issues to be addressed in this plan (refer to Table 6).

- identify the land zones to be replanted/enhanced;
- define the forest communities/habitats to be re-created;
- describe the techniques to be used in the planting program;
- design revegetation and rehabilitation to provide habitat features for keystone species;
- identify and control important weeds;
- installing habitat attributes including use of on-site organic materials;
- salvage of tree hollows
- search for Koalas prior to tree clearing;
- genetic testing of fauna populations;
- identify plant species to be used in the planting program;
- use on-site organic materials;
- describe a maintenance regime;
- develop specific management actions for the quarry-forest boundary;
- develop a monitoring and reporting regime;
- review the plan;

The successful completion of the actions set out in this plan is the responsibility of the Quarry Manager. Cleary Bros has made a commitment to undertake and maintain this reforestation for the life of the sand quarry. Additionally, regular monitoring by a qualified person and reporting to the consent authority will ensure the success of the project. All works would be guided by a qualified bush regenerator or similarly qualified person.

Table 6 – Management Actions

Management Issue	Desired Outcome	Strategy	Actions	2022 Review of Progress	2022-2027 Actions
1. Identify the land zones to be replanted/enhanced	The revegetation zones are delineated and fenced (where necessary to prevent disturbance from stock) as soon as practicable following development approval.	The zones to be planted are identified by survey, marked on a plan and the location of fencing determined on site; each to be endorsed by the consent authority.	1.1 Zones identified (Figure 2). 1.2 Zones to be surveyed and a survey plan prepared. 1.3 Finalise boundaries of zones before fencing, then fence where necessary.	Boundary of zones were identified by the Ecologist in 2008. Boundaries were fenced where adjacent to farm, and survey plan submitted to DPE in February 2009.	Maintain fences as required (Section 8.6)
2. Define the forest communities to be re-created	The distribution of the vegetation types to be re-created is delineated on the plan.	The distribution of the vegetation types is clearly shown on the plan and are to be endorsed by the consent authority.	2.1 Zones of each existing forest type are delineated on Figure 3. Planting zones identified on Figure 1 and described in this plan. 2.2 Proposal to be submitted to the Consent Authority for endorsement and modified, if required. 2.3 Finalise distribution of forest types before planting begins.	Primary planting of all zones completed between 2009 and 2014 based on zones shown in Figure 3. Original LRMP approved by DPE in 2009. Minor infill planting still required in some areas	Minor infill planting required (Section 8.6)
3. Describe the techniques to be used in the planting program	The methods to be used for revegetation are clearly described and ready for field use.	The methods are set out in the plan and are to be endorsed by the consent authority.	3.1 Planting techniques are described earlier in the report. 3.2 Proposals to be submitted to the Consent Authority for endorsement and modified, if required.	Planting techniques utilised on site were approved by the DPE in May 2009. These have largely been successful to date.	No further action
4. Identify plant species to be used in the planting program	Plantings are restricted to local native species, planted in their appropriate communities.	Appropriate species are to be selected and planted in defined locations to re-create the following natural forest communities of the locality: - Littoral Rainforest; - Blackbutt - Banksia Forest; - Bangalay - Banksia Forest; - Swamp Sclerophyll Forest; - Swamp Oak Forest.	4.1 Lists of appropriate species are attached to this plan. 4.2 Proposed lists to be submitted to the Consent Authority for endorsement and modified, if required. 4.3 Finalise species lists for each community and annotate plan.	Planting lists for each community were approved by the DPE in May 2009. These species have been utilised throughout the revegetation program.	No further action

Management Issue	Desired Outcome	Strategy	Actions	2022 Review of Progress	2022-2027 Actions
5. Identify and control important weeds; i.e. those that threaten outcomes of the management plan	Noxious and other important weeds are as far as practical eliminated from the management area.	Weed control is integrated into site management.	5.1 A list of the most important weeds is provided in this plan. 5.2 Map showing distribution of key weeds to be prepared in first stage of project.	Weed list included in Section 6.7. Location and priority areas for weed treatment included in each annual inspection	Continue as part of annual inspection
6. Installing habitat attributes including use of on-site organic materials (other than plantings)	Appropriate use is made of cleared organic material from the development area or elsewhere on site.	The vegetation removed from the site will, where practical, be used to assist in the establishment of the planting zones. The top 20 cm of sandy soil (containing seeds and other propagation material), logs and timber debris are all useful in re-establishing forest habitat on the presently cleared land that is dominated by exotic plants.	6.1 Site manager will ensure that this material is appropriately used to best advantage; soil will not be stored in stockpiles for longer than seven days. Material must be stored for a minimal amount of time before use. 6.2 Ecologist to advise on best use of material, e.g. using logs on edge of pond and in revegetation zones.	Any topsoil encountered reused as soon as made available during stripping activities. Logs and timber debris used in early rehab activities (such as Zone 2A1 works).	No further action
7. Salvage of tree hollows	Maximum number of tree hollows are salvaged and installed in nearby forest.	Tree hollows for salvage will be identified by an ecologist and removed prior to clearing of trees. Host trees to be identified by an ecologist and hollows installed as soon as possible. Trees to be located near to the subject site.	7.1 Site manager and ecologist to identify and tag tree hollows for salvage. 7.2 Site manager to organise removal of hollows prior to clearing. 7.3 Site manager and ecologist to identify and tag suitable host trees. 7.4 Site manager to organise for cut hollows to be strapped to identified trees.	Ecologist inspected all areas during tree clearing activities. No tree hollows suitable for salvage were identified in vegetation to be cleared due to historical clearing of the community.	No further action
8. Search for Koalas prior to tree clearing	No Koalas are present during clearing operations.	Carry out inspection of trees on the day of the clearing to ensure that no animals are present. If animals are present, then clearing is delayed until animal has moved away.	8.1 Site manager to contact ecologist morning before clearing to arrange inspection of trees. 8.2 Ecologist to ensure no Koalas present on site just prior to clearing commencing.	Ecologist on site during clearing activities for each 20m section from 2009 to 2014, with no koalas identified during any clearing event.	No further action

Management Issue	Desired Outcome	Strategy	Actions	2022 Review of Progress	2022-2027 Actions
9. Genetic testing of fauna populations	Information on the genetic makeup of local populations of selected species is obtained, allowing identification of 'genetic populations'.	Engage specialists to undertake the collection, sampling and analysis of target animals.	9.1 Company to engage specialists. 9.2 Ecologist to guide the specialists on the site. 9.3 Specialists to discuss findings with company and ecologist.	Genetic testing of fauna species was undertaken in 2012 by the South Australian Museum in accordance with the LRMP.	No further action
10. Describe a maintenance regime	An appropriate maintenance program is incorporated into the plan and endorsed by the Consent Authority.	A maintenance program is to be developed that covers the following key matters: - slashing/mowing; - watering; - weeds; - replacing dead trees; - feral animals.	10.1 Slashing. Slashing or mowing of the exotic grassland in the planting zones may be required for some time. This will be carried out as required. 10.2 Watering. Watering of plantings will be required for some time after planting. Watering frequency must respond to local rainfall. 10.3 Weeds. Noxious weeds are to be controlled at all times. Other troublesome weeds may occur from time to time; it is the responsibility of the site manager to ensure infestations that threaten the reforestation are dealt with as soon as practicable. 10.4 Replacing dead plants. Dead plants are to be replaced with the same or other appropriate species as soon as practicable after plant death. 10.5 Feral animals. Rabbits and Foxes are to be controlled as required. Control methods must be in accordance with guidelines from the Local Lands Services.	Slashing was undertaken in new planting areas, and around establishing seedlings as required. Watering of recently planted seedlings was undertaken during drier periods Weed control has occurred throughout in response to recommendations from the Ecologist. Dead plants have been replaced throughout the planting program, with infill planting used to strengthen areas. Control of feral animals has principally been through exclusion from planted areas and use of tree guards.	Refer to Section 8.6
11. Develop specific management actions for the	Procedures are in place to ensure that the forests immediately adjacent to	Appropriate measures are to be incorp-orated into the quarry management plan to	11.1 The limits of the approved quarry are to be highlighted on site during clearing works in each area; a temporary, coloured plastic fence would be appropriate.	Steel star pickets have been used to delineate boundary of extraction area. Quarterly inspections have been	Maintain boundary markings

Management Issue	Desired Outcome	Strategy	Actions	2022 Review of Progress	2022-2027 Actions
quarry-forest boundary	the quarry are not adversely affected.	protect adjoining areas of forest.	11.2 The edge of the approved quarry shall be permanently pegged on site and no clearing or excavation is permitted beyond this point. 11.3 The site manager is to include presentation on this plan as part of site inductions for on-site staff.	undertaken and no disturbance outside of pegged limits identified. The Site Induction has included requirements around biodiversity management and land disturbance.	
12. Develop a monitoring and reporting regime	A satisfactory monitoring and reporting regime is in place to ensure the success of the reforestation program and appropriate management of the quarry perimeter.	The revegetation zones are to be monitored for a period of five (5) years to ensure that these are progressing satisfactorily towards the planned forest communities. An annual report by a botanist is to be prepared after a site inspection in autumn each year.	12.1 The site manager is responsible for initiating the required reports. 12.2 Reports to be submitted to the Consent Authority for their information and comment. 12.3 Matters to be covered in the annual reports are set out in this plan. 12.4 Recommendations contained in the reports are to be discussed with the site manager and implemented as appropriate.	Quarterly inspections have been undertaken by Site Manager. Annual inspections have been undertaken by Ecologist. These have been included in AEMR and submitted to DPE each year and adopted in site strategy.	Continue
13. Review of Plan	This plan is reviewed and updated as required after the first five years.	Plan to be reviewed to ensure current conditions and issues are adequately addressed.	13.1 Ecologist to carry out Plan review in consultation with site manager every five years.	LRMP reviewed annually by Environmental Officer. Reviewed by Ecologist in 2016.	Review plan and update as required in 2027

8.3 Performance indicators

The success of the enhancement and revegetation programs will be measured using the following key criteria.

- invasive weeds are controlled and are not hindering the wellbeing of the forest or revegetated zones;
- all plantings are successfully growing and providing a high level of cover and are progressing towards the structure and diversity of a natural forest;
- retained forest and the revegetation zones support increasing populations of native fauna;
- fences or other barriers are maintained where necessary such that no vehicles or stock are impacting in a negative way on the retained forest or revegetation zones;
- all on-site staff have been inducted and are aware of the environmental management requirements of the site.

Monitoring of the edge zone of the quarry is an important part of the proposed monitoring; i.e. from quarry edge 20 metres into the forest.

The following performance indicators have been identified; these would be assessed as part of the annual reporting regime. Some of these indicators are obviously closely linked and over-lapping. These indicators and their monitoring will be discussed with the BCD prior to their implementation.

Monitoring Area: Health of existing forest
Monitoring Regime (annual as part of Ecologist inspection):

- Weed surveys.
- General fauna observations.
- General observations on the condition of the forest.
- Any works suggested to improve the community.

Performance indicated by:

- No incursion of quarry activities.
- No obvious negative impact on forest (e.g. die-back, weed invasion, major species change).
- Weed growth is reduced over time and not negatively impacting upon the forest habitat.
- Fauna use is not diminished and good populations being maintained.

Monitoring Area: Health of existing littoral rainforest
Monitoring Regime (annual as part of Ecologist inspection):

- Weed surveys.
- General fauna observations.
- Photographic history of the rainforest edge over time is recorded.
- General observations on the condition of the rainforest.
- Any works suggested to improve the community.

Performance indicated by:

- No impact of quarry activities, particularly nearby clearing of trees.
- No obvious negative impact on forest (e.g. die-back, weed invasion, major species change).
- Weed growth is reduced over time and not negatively impacting upon the forest habitat.
- Fauna use is not diminished and good populations are being maintained.

Monitoring Area: Health of revegetation zones

Criteria (from conditions of consent)

23. Successful establishment of the Northern Corridor shall be measured by the following criteria:

    (a) presence of native flora species;

    (b) a majority of the flora species recorded from the removed forest occur in the area; (e.g. 60% of flora species recorded in removed forest are present);

    (c) species for all four layers have been planted and at least 50% of the projected cover has been achieved for each of the shrub and ground cover layers;

    (d) self-sustaining native plant populations (e.g. regeneration of a second generation);

    (e) no dominance by single flora species (e.g. Bracken);

    (f) weeds are not significantly impacting on the native vegetation;

    (g) weeds do not represent a majority of the flora species or a higher percentage cover than the native flora species; and

    (h) impacts such as grazing are excluded from the area.

Monitoring Regime (annual as part of Ecologist inspection):

- Permanent plots and/or transects in revegetation zones prior to the severance of the East-West Link.
- Weed surveys.
- General fauna observations.
- General observations on the condition of the revegetation zones.
- Any additional works required to improve the development of the community.

Performance indicated by:

- The majority of plantings survive, including replacement plants.
- Natural regeneration is occurring, including through spread seeds.
- Plant diversity is increasing over time.
- Use by native animals is increasing.
- Successional establishment of second generation plants within the planting zone.

Monitoring Area: Health of fauna populations
Criteria (from conditions of consent)

24. Successful establishment of fauna habitat in the Northern Corridor would be measured by:

    (a) presence of species (e.g. healthy populations of species from all relevant animal groups are established);

    (b) a majority of the resident species recorded from the removed forest occur in the area;

    (c) fauna populations are resident in the area;

    (d) pest animals are controlled and not impacting upon the fauna or its habitat; and

    (e) impacts such as grazing are excluded from the area.

Monitoring Regime (annual as part of Ecologist inspection):

- Permanent sample sites and/or timed transects in revegetation zones prior to the severance of the East-West Link.

- Feral animal surveys.
- General fauna observations.
- General observations on the condition of the revegetation zones.

Performance indicated by:

- Created habitat features are in place and being utilised by fauna.
- Natural regeneration is occurring, increasing habitat complexity.
- Fauna species diversity is increasing over time.
- Use by native animals is increasing over time

Monitoring Area: Weed growth
Monitoring Regime (annual as part of Ecologist inspection):

- Recording the presence of weed growth on permanent plots or along transects prior to severance of the East-West Link.
- Inspection of forest edges.
- Regular surveys of areas where weed control has been undertaken.
- General survey of known weed sites.

Performance indicated by:

- Key weeds are reduced in their extent and abundance and eventually extirpated from the site.
- Weeds are not significantly hindering natural regeneration.
- All noxious weeds are adequately controlled on the land.

Monitoring Area: Presence of feral animals
Monitoring Regime (annual as part of Ecologist inspection):

- Signs of feral animal presence surveyed for during regular inspections and continually by on-site staff.

Performance indicated by:

- Feral animals are not having a significant detrimental impact upon the forest or revegetation zones.
- Rabbits, Foxes and Feral Cats are controlled on the land.

8.4 Monitoring Habitat Corridors

In addition to the above monitoring, the northern and southern habitat corridors will be monitored as to their use by vertebrate fauna. The basis of this monitoring is set out in the conditions of consent.

The following Condition 25 from the conditions of consent is relevant here.

25. Prior to the severance of the east-west link the Proponent shall:

    (a) determine the presence in both the east-west link and northern corridor by conducting standard animal survey techniques at least twice in the first year (eg. Elliot trapping for small mammals, pitfall trapping for reptiles, observational surveys for frogs and birds, and spotlighting transects for arboreal animals);

    (b) determine whether a majority of animal species (particularly those determined to be likely to be impacted by fragmentation) utilising the corridor in the east-west link are present in the conservation area and the northern corridor and the re-created link at the northern boundary;

Monitoring demonstrated in 2014 that the above criteria were satisfied, and as such the severance of the east-west link was permitted. No further monitoring of habitat corridors is required.

8.5 Adaptive Management / Contingency Measures

In terms of native vegetation and other management issues, it is important to monitor and evaluate results on an on-going basis and to modify management actions in the light of these evaluations. This important concept, known as 'adaptive management', must be embraced in managing this project. Adaptive management can be defined as "a systematic process for continually improving management policies and practices by learning from the outcomes of operational programs" (Lawrence, Bennett & Barchiesi 2008). In other words, a management plan should be flexible enough to deal with unforeseen issues that inevitably arise from time to time and also respond to new information that is learned from the project area or elsewhere that improve management outcomes.

The Ecologist will review the performance of the rehabilitation program against each of the Performance Indicators identified in Section 8.3 as part of the annual inspection and report. In the event the Ecologist determines that the site is not progressing towards meeting a Performance Indicator, the Ecologist will provide recommendations for contingency measures that will be implemented on the site. The contingency measures will be as directed by the Ecologist, and could include:

- Increased fencing or installation of a different style of fence;
- Sourcing and planting different species;
- Soil amelioration;
- Focused pest control program;
- Focused weed control program;
- Installation of supplementary habitat features (logs, nesting boxes etc); and/or
- Further training of site staff.

8.6 Long Term Management Strategy

The draft Long Term Management Strategy (LTMS) was provided to the SCC, KMC, BCD, DPI-Fisheries, and the representative of the CCC for consultation prior to finalisation. Feedback was received from each of the Councils and agencies, and one representative of the CCC. Two of the responses provided support for the Strategy, and one requested further information on the Voluntary Planning Agreement which was provided. The other two responses requested further detail on the management measures, as well as consideration of the removal of the floodgates on Blue Angle Creek. The LTMS has now been included as part of the LRMP, which much greater detail on the management and maintenance of the conservation areas. The flood gates on Blue Angle Creek provide protection for the pastoral activities outside of the Project Area, and as directed in the EA, do not form part of the Project. As such, they are not considered further as part of the LTMS.

8.6.1 Objectives

The objectives for the quarry closure and long term management include:

- remove from the site all sand quarrying artefacts including machinery, structures, buildings, signage, products and roads, except as required for site maintenance purposes or ongoing rural use of the property;
- leave safe and stable landforms with a natural appearance, designed for low maintenance;
- establish native vegetation on all land areas disturbed by the sand quarry in accordance with the Landscape and Rehabilitation Management Plan to create wildlife habitat including wetland habitat within and around the shoreline of the dredge pond;

- complete rehabilitation of land disturbed by quarrying as soon as possible following the cessation of extraction;
- in the post-closure period nurture to maturity vegetation planted as part of the quarry project;
- continue to provide protection to the vegetation on the land referred to as the "Conservation Area" in the Voluntary Planning Agreement;
- control weeds within the rehabilitation and compensatory planting areas;

8.6.2 Future Use

Cleary Bros will consider future use of the site when opportunities become available. In the absence of any firm proposal for alternative development the land will remain in rural use with the Conservation Area protected as provided in the Voluntary Planning Agreement.

8.6.3 Ongoing Environmental Effects

Potential ongoing environmental effects from the sand extraction operation would be monitored following completion of sand extraction and managed as follows:

- weather data will continue to be collected from the site weather station for as long as other monitoring continues on the site to assist with the interpretation of changes in dredge pond and groundwater levels;
- the foreshore of the dredge pond and associated batters will be monitored annually and rectification works undertaken for any erosion or slumping until an engineering geologist certifies that the landforms have achieved stability;
- dredge pond levels and groundwater levels will continue to be monitored biannually and remedial action taken as necessary until a hydrogeologist certifies that an equilibrium has been reached where the ongoing effects of the former sand quarry will not exacerbate climatic variations to threaten the survival of Swamp Sclerophyll Forest vegetation or ecosystems;
- revegetation areas and the Conservation Area will continue to be monitored annually and remedial work undertaken until an ecologist recommends that the vegetation is sufficiently mature and stable that monitoring is no longer required.
- Cleary Bros will continue to implement the LRMP and Long Term Management Strategy until such a time that the Project has been completed and rehabilitation objectives completed to the satisfaction of the Planning Secretary.

9. Project Timing

9.1 Status of program in 2022

All primary works across the management zones have been completed. An ecologist from Niche Consulting inspected the site most recently in June 2022 and made the following remarks:

- The 'Northern Corridor' has been shown to be successful in terms of creating habitat and use by native animals, as compared to the 'East-West Link'.
- The quarry has moved northwards and the forest in the East-West Link has been removed, the quarry subsequently reaching its most northern limit.
- Quarterly inspections and reports have continued to be undertaken during 2019-21, providing regular updates of the progress of the revegetation/rehabilitation areas.
- Nearly all plantings within the designated revegetation areas have been completed and these areas are now in maintenance phase.
- Significant effort has been made to reduce the extent of Lantana on the Site through herbicide spraying.

Recent annual reports have detailed inspections of the revegetation areas with a focus of analysing the progress towards native dominant forest and making relevant recommendations to improve management outcomes if required. There have been no wildlife surveys since 2016 as this was deemed no longer necessary by the ecologist from KMA.

A summary of the current status and recommendations for ongoing works by the Ecologist are summarised in Table 7. Note the status comments generally refer to the parts of each Zone which still require the most work, and are not necessarily reflective of the broader zone.

Table 7 – July 2022 Status and Recommendations

Management Zone	Status	Recommendations
1.1	Work in the past has included Lantana control and removal of selected weeds such as Bitou Bush.	Removal of Giant Arundo Grass (*Arundo donax*) from the roadside and lower lying areas via cut and paint method. Ongoing Lantana (*Lantana camara*) treatment to reduce extent throughout the area using cut and paint method. Spraying for African Love Grass (*Eragrostis curvula*) along roadside.
1.2		Efforts of previous Lantana management are evident. Continue cut and paint control methods of woody weeds, specifically Lantana. Moth Vine (*Araujia sericifera*) also requires maintenance particularly in eastern section of the subzone. Control of herbaceous weeds such as Fire weed (*Senecio madagascariensis*), Crofton weed (*Ageratina adenophora*) and Bidens (*Bidens pilosa*) that are encroaching from the eastern roadside. Continue to promote native tree and shrub cover via planting of native species to lessen risk of weed reinvasion.
1.3		Lantana thickets should be the priority weed in this area using cut and paint methods, however, Senna (*Senna pendula var. glabrata*) and Crofton weed (*Ageratina adenophora*) weeds should also be controlled to reduce spreading.
1.4		Unable to inspect subzone due to recent flooding. Previously stated to be a good condition Allocasuarina stand, some Moth Vine starting to creep into swamp extent. If any Moth vine still present continue weed control efforts via cut and paint, be sure not to confuse with nearby native Common Silkpod (*Parsonisa straminea*).
2A.1	This is the main area that has been used to develop the forested link in the northeast corner of the Site. Extensive work has been carried out over the past twelve years to develop this area as habitat for native fauna.	Ongoing maintenance to roadside required – tend to Crofton weed, Asparagus fern (*Asparagus aethiopicus*) and Tobacco bush (*Solanum mauritianum*) along road extent via spray and cut and paint. Multiple, small stands of Lantana encroaching from the eastern sides of the road should be prioritised in the oldest revegetation site to maintain the areas good condition.
2A.2	Planted trees are becoming well established in most places.	Ongoing Lantana management required via cut and paint method. Stands of Senna, Moth vine and Wild Tobacco require continued management.
2A.3	This area was revegetated early in the re-planting program. The plantings that have survived in this area have become well established despite previous impacts from grazing native fauna.	Continued control of Lantana via cut and paint methods should be the main priority in this subzone. Removal of small clustering of Moth vine evident
2B.1	This subzone is a narrow area that was regenerated to link the creek-side forest to that within Zone 4. The subzone was spread with topsoil and timber debris, and plantings were undertaken. Considerable growth of the plantings has since been noted.	Creek area in a moderate condition, access restricted given recent rainfall. Inspection limited to a distance.
2B.2	This area is located in a low-lying swamp and is being colonised by Swamp Oak. Some planting was carried out on a higher	The understorey in this subzone is largely made up of pasture grass. Small stands of Tobacco Bush, Lantana and Thistle are

Management Zone	Status	Recommendations
	part of the subzone in the south and west in previous years. The natural regeneration occurring in this subzone is adequate.	evident near the roadside that should be managed via cut and paint methods.
2C.1 (southwest)	Small revegetation patch that was completed recently to link the forest with Zone 4, located roadside adjacent to subzone 1.1.	This subzone requires continued monitoring and management of noxious woody weed growth. Continue to mow around tree guards and remove Kikuyu grass from within the guards when. The plantings have been subjected to grazing pressures but overall, the plants are in good condition. If grazing continues to impact the plantings, measures to protect them will need to be put into place i.e. A fence similar to the northeast. Continue to promote native tree and shrub cover via planting of native species to lessen risk of weed reinvasion.
2C.1 (northeast)	This subzone is a planted area adjacent to more established vegetation located in subzone 1.1.	This area is in good condition, plantings have become well established and the area is generally free from high threat weeds. This subzone is a good example for techniques that should be implemented on newer plantings. Undertake infill plantings as required to promote native tree and shrub growth and to lessen risk of weed reinvasion.
2C.2	A long narrow area supporting some well-established plantings.	Some plantings have been impacted by recent flooding events. There was also evidence of deer grazing on the plantings, deer control methods may need to be implemented if this continues. Further planting is required to replace plants that were impacted and to promote growth of surrounding native plants. Management of weeds and pasture grasses should be completed once area starts to recover from flood damage.
2D	This area was originally sprayed and partly spread with timber mulch prior to plantings. This area is prone to water inundation during wetter months, limiting some access to areas.	Unable to access area due to recent flooding. When accessible again, continue to mow/slash the exotic grasses to keep competition with plantings to a minimum. Monitor plantings for any evidence of deer grazing and update fencing accordingly if grazing is still occurring.
2E	Plantings in this area have become well established and tree growth continues to be progressing well. This narrow strip of trees extends into subzone 1.4, an established area of trees.	Only able to access northern end of subzone due to recent weather. This area overall is in good condition. Continued treatment of any woody weeds that reappear and monitor for any Moth vine.
3	This zone includes the bund wall which reached its final height early in 2015. A screen of native vegetation was established along the eastern edge of the pond extension. The sand bund is currently stabilised by growth of plants, the majority of which are weeds.	Evidence of previous spraying of Lantana but the bund wall is still currently overrun with Lantana. Continue removal of Lantana using spraying and cut and paint methods. Planting is required to encourage native growth to stabilise bund wall. Removal of old plant guards on mature plants to encourage future growth.
4	This zone is remnant Bangalay Sand Forest vegetation. This area has an intact Bangalay and Blackbutt canopy and is of high habitat value. Lantana has been heavily targeted in this zone and continued maintenance has been completed.	This zone still retains Lantana stands that require attention. Single Coral tree (*Erythrina crista-galli*) that requires cut and paint method.
5	This zone includes remnant Swamp Oak Forest. Area is overall in good condition with a relatively open mid/understorey.	Continue to maintain perimeter fencing to stop stock from grazing on plantings. Undertake weed control on any woody weeds present and carry out future plantings to promote native growth and help out compete pasture grasses.
5C.1	Occurs between the Swamp Oak Forest in zone 5 and the creek that has been planted. The area is dominated by Kikuyu Grass. The shrub *Melaleuca ericifolia* is continuing to expand from the creek-side.	Control of Lantana via cut and paint methods to encourage the growth of native vegetation.
6	This zone occurs within the foreshore areas of the Dredge Pond. The foreshore has been previously shaped, had topsoil spread	Monitor and control of priority weeds such as Lantana, Bitou bush and Tobacco bush using cut and paint method as necessary. Avoid spraying in this area to ensure native species

Management Zone	Status	Recommendations
	and planted as the dredge pond has expanded northwards. Overall, the pond bank is stable with little to no erosion evident. Natural regeneration and pre-existing native growth have helped to stabilise area	retain dredge pond bank stability. Additional plantings may be beneficial to encourage native growth and to control annual weeds and invasive grasses from dominating.
7	This zone occurs along the eastern edge of the Site between zones 3 and 1.2. This zone has cultural significance, therefore only minor control of Lantana has been conducted over time.	Southern end of zone is well maintained with minimal Lantana present. Presence of Lantana increases in the Northern section of the zone. Monitor and control Lantana and Tobacco bush as necessary using the mosaic methods of weed removal (i.e. working in patches). Remove any plant guards that are no longer being used.

9.2 Proposed Works

Works to be undertaken in the next 5-year period are summarised in Table 8.

Table 8 – Management priorities

Management Zone	Priorities 2022-2027
All Zones	Maintenance as required - weed control - maintain existing fencing - pest animal control
Zone 2 **Broad Scale Planting**	Maintenance of completed zones as required - replace dead plants - infill planting to increase abundance and diversity
Zone 3 **Screen Planting**	Maintenance – replace dead plants
Zone 6 **Dredge Pond Foreshore**	• Stabilise foreshore • Place logs, etc. along foreshore (when available). • Undertake plantings • Determine need for addition of permeable material on batters

Targeted works for planned for each zone across the 2022-2027 period are summarised in Table 9.

Table 9 – Targeted works 2022-2027

Management Zone	Specific actions or infill plantings required
1.1, 1.2, 1.3, 1.4	No specific actions – self-sustaining
2A1	No specific actions – self-sustaining
2A2	Minor plantings suggested between canopy – west of office
2A3	Minor plantings suggested between existing plantings – southwest portion of zone
2B1	Monitor success of younger plantings in westernmost extent of zone and replace plants as required
2B2	Minor plantings of *E. botryioides* and/or *E. robusta* suggested between existing plantings and recruitment
2C1	Monitor success of younger plantings in northernmost fenced compound and southernmost extent of zone and replace plants as required. Minor plantings of *E.*

Management Zone	Specific actions or infill plantings required
	botryioides, E. robusta, and/or *A. floribunda* suggested amongst old plantings and recruitment closer to creek, particularly near southern end and central-north parts.
2C2	Monitor success of younger plantings in easternmost extent of zone and replace plants as required
2D	Monitor success of younger plantings in westernmost extent of zone and replace plants as required
2E	No specific actions – self-sustaining
3	No specific actions – self-sustaining
4	No specific actions – self-sustaining
5	No specific actions – self-sustaining
5C1	Minor plantings suggested between existing plantings – central portion of zone
6	Monitor success of current recruitment
7	No specific actions – self-sustaining

10. References

Buchanan, R.A. (1989) *Bush Regeneration. Recovering Australian Landscapes*, TAFE NSW, Sydney.

Department of Environment and Conservation (DEC) (2005). *Recovering Bushland on the Cumberland Plain. Best practice Guidelines for the Management and Restoration of Bushland*. DEC, Sydney, June.

Department of Infrastructure, Planning and Natural Resources (2003). *Bringing the bush back to Western Sydney: Best practice guidelines for bush regeneration on the Cumberland Plain.*

Environment Protection Agency (1995). Best Practice Environmental Management in Mining, Rehabilitation and Revegetation, Canberra, June.

Kevin Mills & Associates (2005). *Overview of the Flora and Fauna, Cleary Bros (Bombo) Property at Gerroa*. Prepared for Cleary Bros (Bombo) Pty Limited, Port Kembla, February.

Kevin Mills & Associates (2006). *Flora and Fauna Assessment, Extension of Cleary Bros (Bombo) Sand Quarry, Gerroa, Municipality of Kiama*. Prepared for Cleary Bros (Bombo) Pty Limited, Port Kembla, March.

Landcom (2004). *Soil and Construction and Management Urban Stormwater*. Landcom, Sydney, March.

Lawrence, P., Bennett, J. & Barchiesi, D. (2008). *An Adaptive Framework to Support Regional Resource Planning*. Coastal CRC, web site, March 2008.

New South Wales (1993). *Noxious Weeds Act*, 1993. NSW Government, Sydney.

New South Wales (1995). *Threatened Species Conservation Act 1995*. NSW Government, Sydney.

Other Useful References

Best Practice Site Rehabilitation

Brennan, K.E.C., Nichols, O.G., & Majer, J.D. (2005). *Innovative Techniques for Promoting Fauna Return to Rehabilitated Sites Following Mining*, Australian Centre for Minerals Extension and Research (ACMER) and Brisbane Minerals and Energy Research Institute of Western Australia, Perth.

DITR (2006). Mine Rehabilitation - Leading Practice Sustainable Development Program for the Mining Industry, Commonwealth Government Department of Industry Tourism and Resources.

Hollows and Fauna Habitat re-creation and Fauna Translocation

Gibbons, P. & Lindenmayer, D. (2002). *Tree hollows and wildlife conservation in Australia*, CSIRO Publishing, Collingwood.

Menkhorst, P.W. (1984). *The Application of Nest Boxes in Research and Management of Possums and Gliders*, Surrey Beatty and Sons Pty Ltd, in association with the Mammal Society.

NPWS (2001). Policy for the Translocation of Threatened Fauna in NSW. Policy and Procedure Statement No. 9, National Parks and Wildlife Service, Sydney.

Vallee, L., Hogbin, T., Monks, L., Makinson, B., Matthes, M. & Rossetto, M. (2004). *Guidelines for the Translocation of Threatened Plants in Australia*, Australian Network for Plant Conservation, Canberra.

Soil Management and Erosion Control

Landcom (2004). Managing Urban Stormwater: Soils and Construction, NSW Government.

Pest and Pest Management

May, S. & Norton, T. (1996). Influence of Fragmentation and Disturbance on the Potential Impact of Feral Predators on Native Fauna in Australian Forest Ecosystems. *Wildlife Research*, Vol. 23, pp. 387-400.

National Parks and Wildlife Service (2007). *South Coast Region. Draft Pest Management Strategy 2008-2001*. Department of Environment and Climate Change, Nowra.

Olsen, P. (1998). *Australia's Pest Animals: New solutions to old problems*, Bureau of Resource Sciences and Australia Kangaroo Press, Canberra.

PART C – MODIFICATION 1 AREA VEGETATION MANAGEMENT PLAN

1. Background and Purpose

Section 3 outlines how construction and extraction activities will be undertaken in the Modification 1 Area to minimise impacts to biodiversity, in line with the Environmental Assessment for the Modification and the Conditions of Consent. The scope of this section is limited to the approved Modification 1 footprint, as well as the vegetation screen which is to be constructed along the western extent of the footprint. Management activities of some adjacent biodiversity conservation areas (such as Zones 2C.1 and 4) are covered in Section 2 of this LRMP.

2. Scope

Section 3 of the LRMP addresses the following aspects associated with the Modification 1 area:

- Identifying the boundary and surveying the Modification 1 area;
- Vegetation clearing within the Modification 1 area;
- Describes the relationship between the dredge pond and the surrounding areas;
- Describes the location and methodology for constructing the vegetation screen;
- Describes the rehabilitation of completed parts of the dredge pond; and
- Outlines the monitoring programs to be employed within the Modification 1 area.

3. Survey of Modification 1 area

Prior to any ground disturbance activities within the Modification 1 area, the Extraction Area extent, as described in Figure 2 of Appendix 1 of the Development Consent was surveyed by an independent registered surveyor. This survey plan, prepared 6 September 2022, is reproduced below as Figure 4. As part of the survey, pegs were placed at all vertices as well as at regular intervals along the boundary. Following pegging, an ecologist inspected the site on 7 October 2022 to confirm the extraction area limit as marked will not impact the Structural Root Zone (SRZ) of any trees to be retained. The ecological inspection identified six trees within the areas zoned E2 or E3 with a SRZ within the pegged boundary. A buffer has been established and marked around each of these trees to prevent disturbance of their SRZ. This Survey Plan with GPS coordinates listed has been submitted to the Department. The boundary pegs will remain permanently in place throughout the project life. These pegs will form the limit of all project-related disturbance.

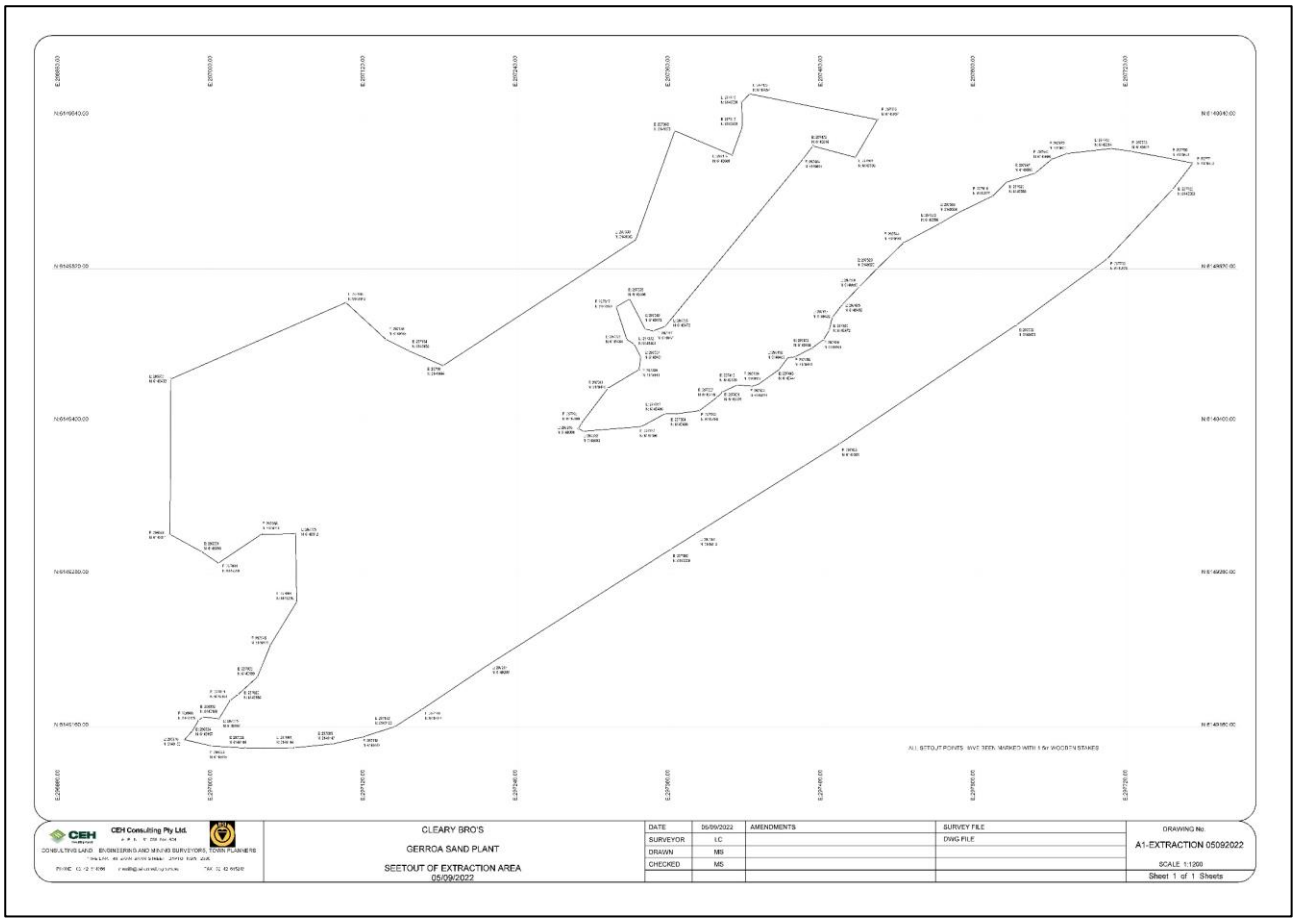

Figure 4 – Modification 1 – Extraction Area

4. Clearing and Grubbing Activities

The Modification 1 area is comprised almost exclusively of cleared exotic grassland. There are a handful of shrubs (casuarina and acacias) within the extraction area that have regrown in recent years which will be cleared prior to extraction in this area. There is also a large fallen log within the extraction footprint that will be relocated to the adjoining remnant vegetation community. No mature trees, including any hollow-bearing trees, will be disturbed as part of the Project. Figure 5 provides an overview of the vegetation clearing required to be undertaken in the Modification 1 area.

All clearing works will be undertaken in accordance with the tree clearing protocol described in Section 6.14. Clearing and grubbing works will generally be undertaken on a campaign basis, and no more than 12 months ahead of predicted extractive activities.

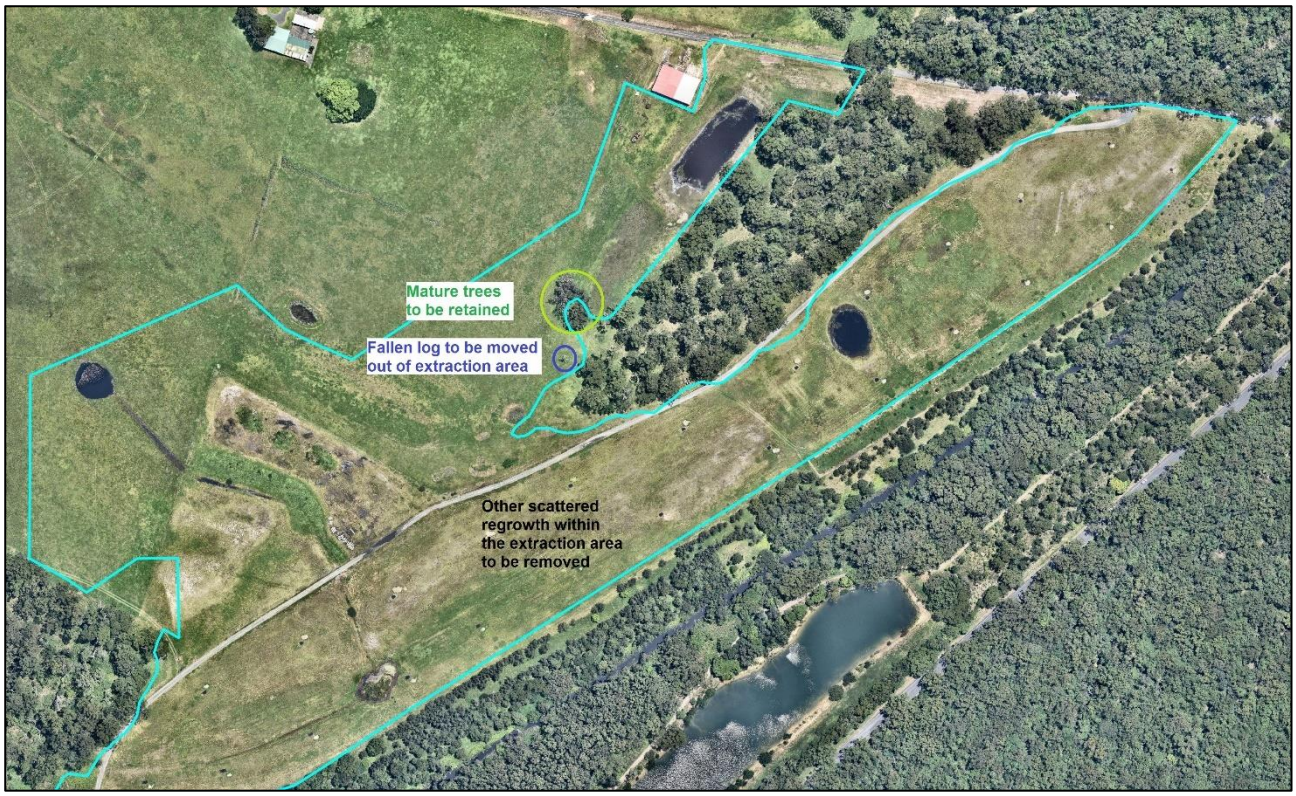

Figure 5 – Parts of the Modification 1 area to be cleared

4.1 Cross-sections

Ground disturbance will continue up to the boundary of the extraction area, with Figure 6 to Figure 8 demonstrating the relationship between the extraction activities and adjoining lands along the parts of the site that are adjacent to areas of rehabilitation or remnant vegetation. Figure 6 describes the interaction between the extractive activities and Conservation Area 2C.1 along the southeast boundary of the Modification 1 area, with the disturbance limit continuing up to the boundary of the conservation area. Figure 7 describes the interaction between the extractive activities and Conservation Area 4 at the southern end of the Modification 1 area, with the disturbance limit continuing up to the boundary of the conservation area, with the existing access track maintained along this section. Figure 8Figure 7 describes the interaction between the extractive activities and the finger of remnant vegetation straddling the Modification 1 area, with disturbance up to the approved Project boundary, while also maintaining a minimum offset of 3 metres from the trunk of any established tree.

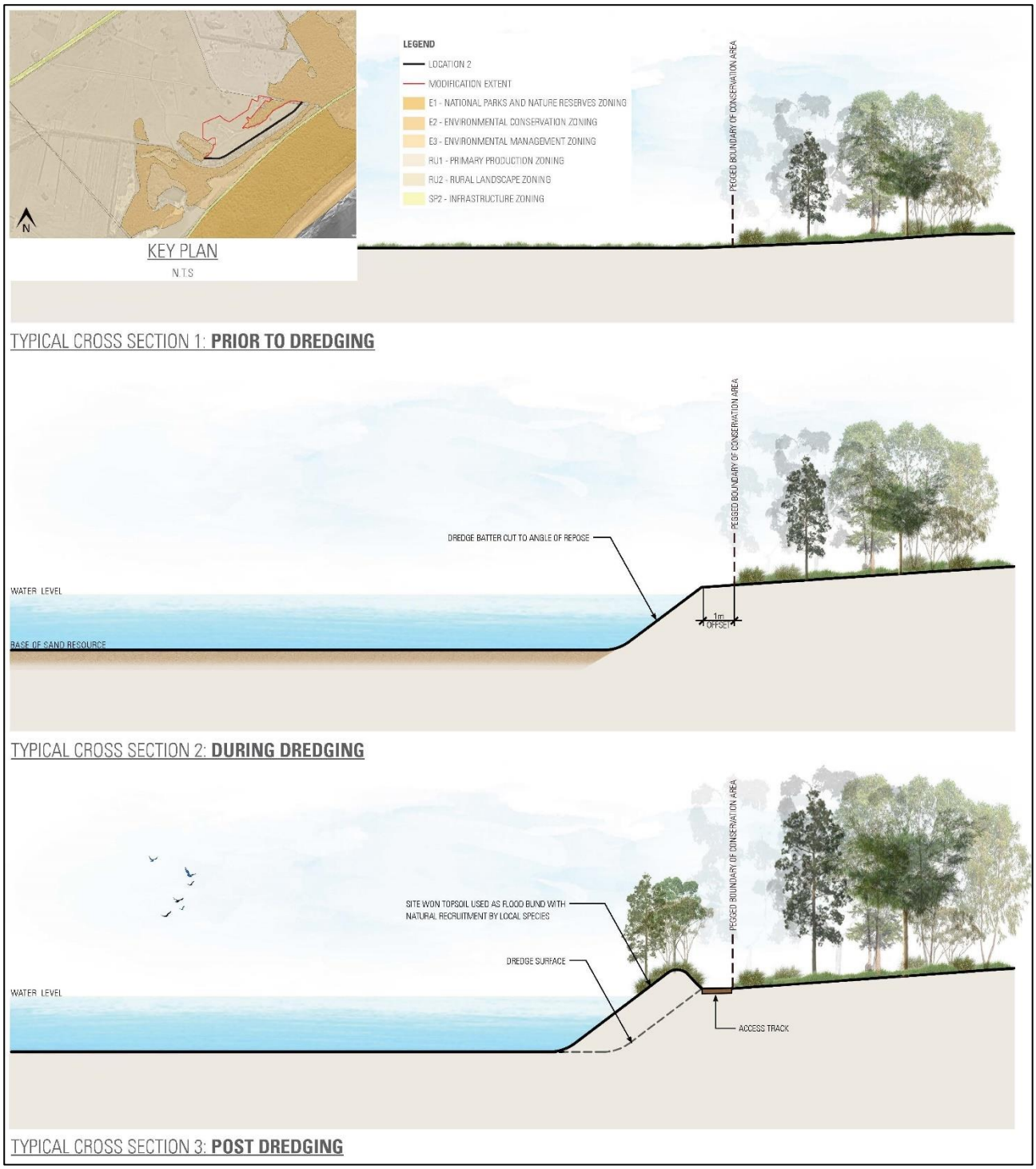

Figure 6 – Typical Cross Section adjacent to Conservation Area 2C.1

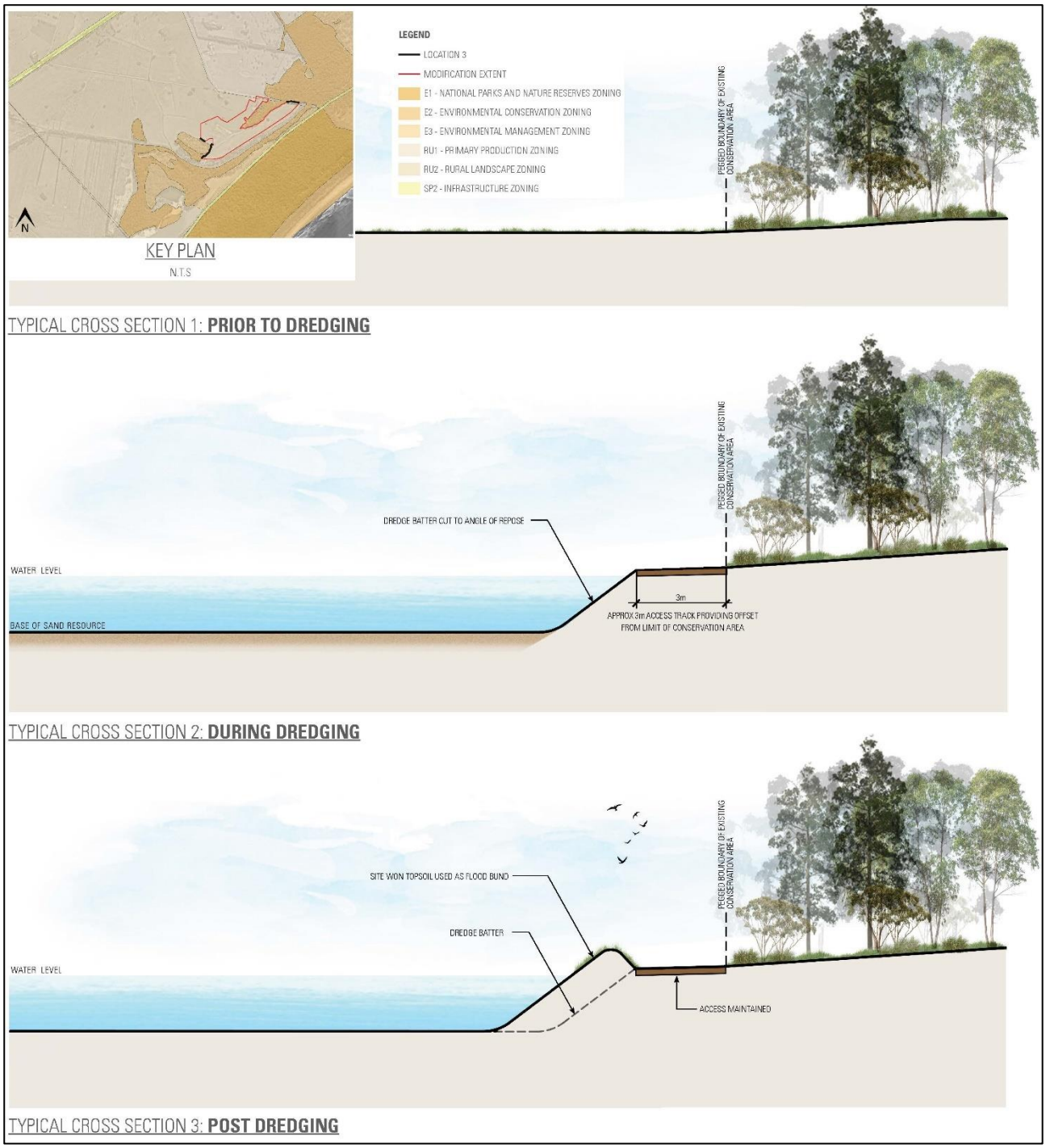

Figure 7 – Typical Cross Section adjacent to Conservation Area 4

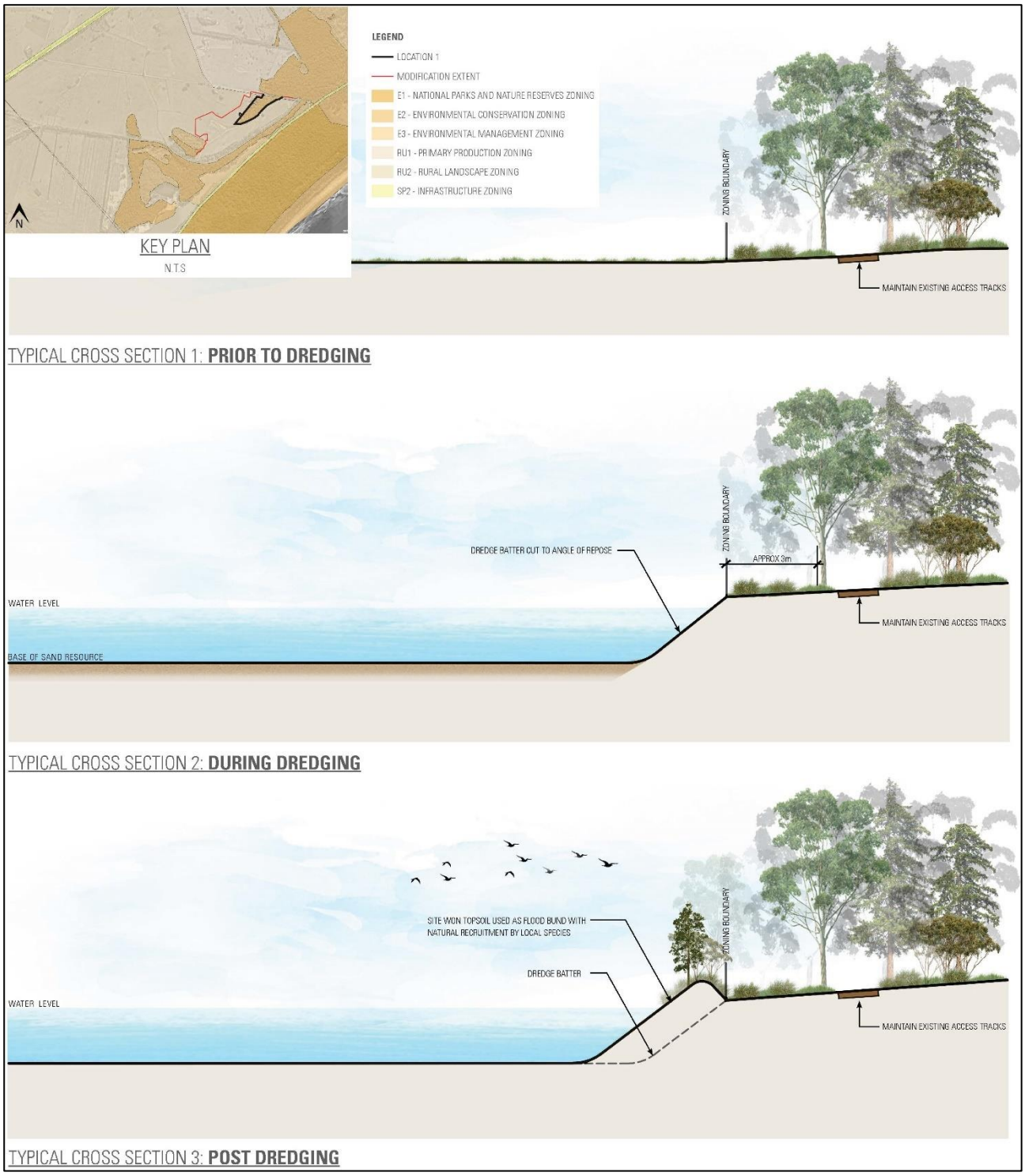

Figure 8 – Typical Cross Section alongside central spur

5. Vegetation Screen

A 350 metre long by 5 metre wide vegetation screen is to be planted along the western extent of the Modification 1 area as shown in Figure 9. The screen will consist of *Melaleuca stypheloides* and *Casuarina glauca* seedlings planted at approximately 2 metre centres. These species have been chosen due to their suitability to the site conditions, as well as being fast growing species. It is intended that the seedlings will be planted within the first 6 months of activities in the Modification 1 area, pending suitable site conditions. Herbicide will be applied to the existing exotic grass prior to planting to provide a mulch bed

suitable for the seedlings. Seedlings will be watered as required to support growth in the early stages, and any seedlings lost will be inspected. Monitoring of the vegetation screen will be undertaken in association with the quarterly conservation areas inspection by the Quarry Manager, which will detail any further works required to support the success of the vegetation screen.

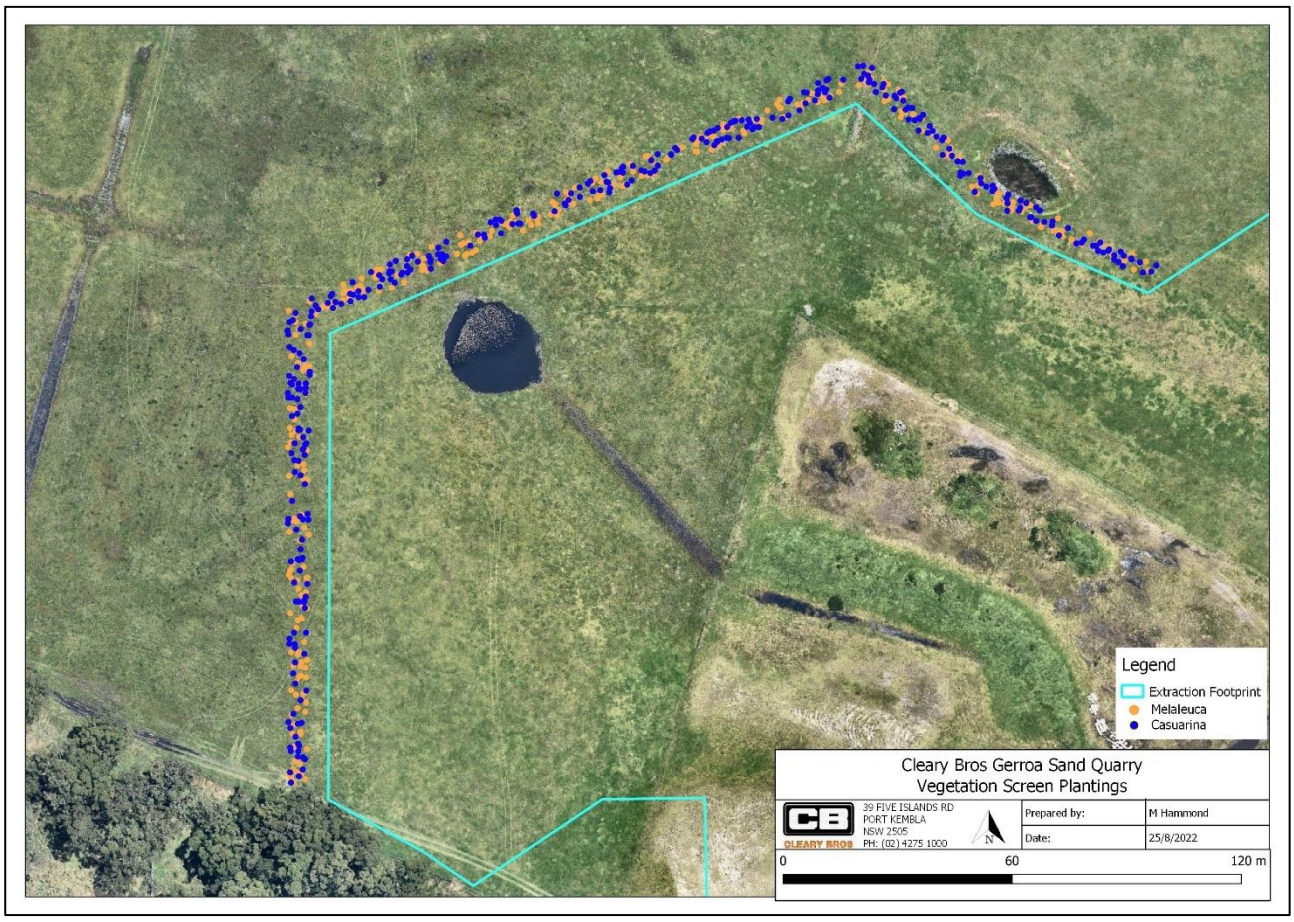

Figure 9 – Vegetation Screen Planting

6. Dredge Pond Rehabilitation

Following final shaping of each section of the dredge pond foreshore, revegetation of the banks will be undertaken in accordance with the processes described for Zone 6 (Dredge Pond Foreshore). See Part 2 Sections and 7.14 for further details on the aims and methodology for these works. The proposed final landform for the Modification 1 area is shown in Figure 10.

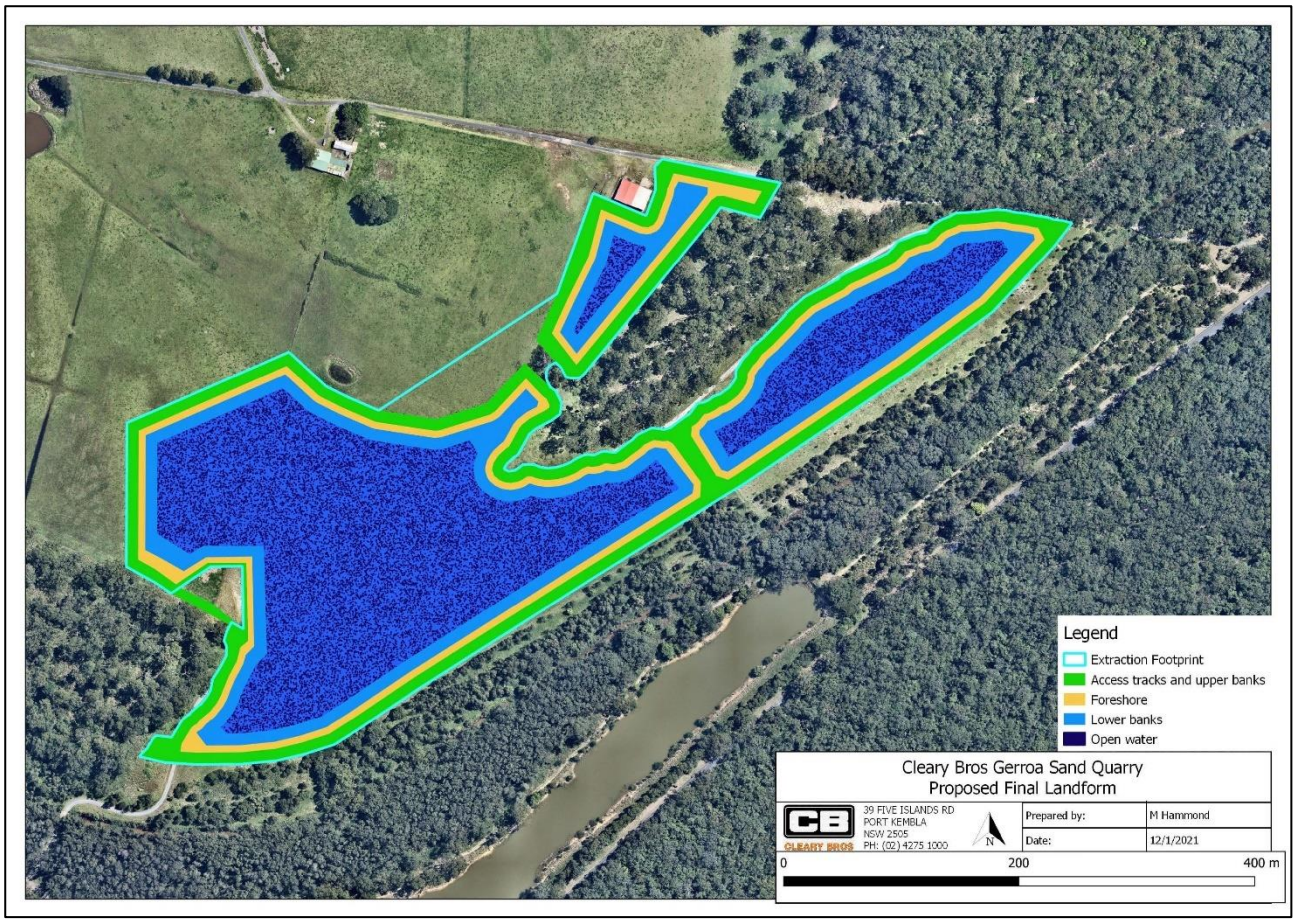

Figure 10 – Final Landform Plan for the Modification 1 area

7. Monitoring

Monitoring of the Modification 1 area associated with the Landscape and Rehabilitation Management Plan includes:

- Boundary monitoring
- Vegetation screen performance
- Rehabilitation (dredge pond foreshore) performance

The monitoring requirements of the Modification 1 area under the LRMP is outlined in Table 10.

Table 10 – Monitoring associated with the Modification 1 area

Focus Area	Responsibility	Frequency	Method
Boundary	Quarry Manager	Quarterly	Visually inspect all boundary pegs to ensure they are in place and there has been no encroachment past pegs. Visually inspect all dredge pond batters to ensure they are stable. Inspection recorded on boundary monitoring inspection template.
Vegetation Screen	Quarry Manager	Quarterly	Visual inspection to identify any plants needing replacement, weed control requirements etc.

Focus Area	Responsibility	Frequency	Method
			Inspection included as part of Biodiversity and Conservation Areas Inspection Report.
Dredge Pond Foreshore Rehabilitation	Quarry Manager	Quarterly	Visual inspection to identify any plants needing replacement, weed control requirements etc. Inspection included as part of Biodiversity and Conservation Areas Inspection Report.
	Ecologist	Annually	Inspection of dredge pond foreshore as described in Part 2 Section 6.20. The foreshore in the Modification 1 area will be monitored in the same way as described in Part 2 for the existing extraction area foreshore.

Appendix 1 – Indigenous Plant Species List for the Property

PTERIDOPHYTA (Ferns)

DENNSTAEDTIACEAE	
Hypolepis muelleri Wakef.	Harsh Ground Fern
Pteridium esculentum (Forster f.) Cockayne	Common Bracken
SINOPTERIDACEAE	
Pellaea falcata (R. Br.) Fee	Sickle Fern

ANGIOSPERMAE (Flowering Plants)

ALISMATACEAE	
Alisma plantago-aquatica L.	Water Plantain
AMARYLLIDACEAE	
Crinum pedunculatum R. Br.	Swamp Lily
APIACEAE	
Centella asiatica (L.) Urban	Indian Pennywort
Hydrocotyle laxiflora DC.	Stinking Pennywort
Lilaeopsis polyantha (Gand.) H. Eichler	Creeping Crantzia
APOCYNACEAE	
Parsonsia straminea (R. Br.) F. Muell.	Monkey-rope Vine
ARECACEAE	
Livistona australis (R. Br.) Mart.	Cabbage Palm
ASCLEPIADACEAE	
Marsdenia rostrata R. Br.	Common Milk Vine
Tylophora barbata R. Br.	Bearded Tylophora
ASTERACEA	
Cassinia aculeata (Labill.) R. Br.	Common Cassinia
Cassinia quinquefaria R. Br.	Rosemary Cassinia
Ozothamnus diosmifolius (Vent.) DC.	Everlasting
Senecio bipinnatisectus Belcher	Groundsel
Senecio hispidulus A. Rich.	Rough Fireweed
Sigesbeckia orientalis L.	Indian Weed
BIGNONIACEAE	
Pandorea pandorana (Andrews) Steenis	Wonga Vine
CAMPANULACEAE	
Wahlenbergia gracilis (Forster f.) A. DC.	Australian Bluebell
CASUARINACEAE	
Casuarina glauca Sieber ex Sprengel	Swamp Oak
CLUSIACEAE	
Hypericum gramineum Forster f.	Small St John's Wort
COMMELINACEAE	
Commelina cyanea R. Br.	Wandering Sailor
CONVOLVULACEAE	
Dichondra repens Forster & Forster f.	Kidney Weed
CYPERACEAE	
Baumea articulata (R. Br.) S. T. Blake	Jointed Twig-rush
Carex appressa R. Br.	Tall Sedge
Carex longebrachiata Boeck.	Bergalia Tussock
Eleocharis acuta R. Br.	Common Spike-rush
Eleocharis equistetina C. Presl	Spike-rush
Eleocharis sphacelata R. Br.	Tall Spike-rush
Gahnia clarkei Benl	Tall saw-sedge
Isolepis nodosa (Rottb.) R. Br.	Knobby Club-rush

Schoenoplectus validus (Vahl) A. & D. Love	River Club-rush
DILLENIACEAE	
Hibbertia obtusifolia DC.	Grey Guinea Flower
EPACRIDACEAE	
Monotoca elliptica (Smith) R. Br.	Tree Broom-heath
EUPHORBIACEAE	
Breynia oblongifolia Muell. Arg.	Breynia
Glochidion ferdinandi (Muell. Arg.) Bailey	Cheesetree
Glochidion ferdinandi (Muell. Arg.) Bailey var. *pubens*	Hairy Cheesetree
Omalanthus populifolius Graham	Bleeding Heart
EUPOMATIACEAE	
Eupomatia laurina R. Br.	Bolwarra
FABACEAE	
FABOIDEAE (subfamily)	
Desmodium varians (Labill.) G. Don.	Slender Tick-trefoil
Glycine clandestina J.C. Wendl.	Twining Glycine
Kennedia rubicunda (Schneev.) Vent.	Dusky Coral-pea
MIMOSOIDEAE (subfamily)	
Acacia binervata DC.	Two-veined Hickory
Acacia implexa Benth.	Hickory Wattle
Acacia longifolia (Andrews) Willd.	Golden Wattle
Acacia maidenii F. Muell.	Maiden's Wattle
Acacia mearnsii De Wild.	Black Wattle
Acacia suaveolens (Smith) Willd.	Sweet Wattle
Acacia ulicifolia (Salisb.) Court	Prickly Moses
GERANIACEAE	
Geranium solanderi Carolin	Native Geranium
GOODENIACEAE	
Goodenia bellidifolia Smith	Rocket Goodenia
HALORAGACEAE	
Gonocarpus teucrioides DC.	Raspwort
HYDROCHARITACEAE	
Ottelia ovalifolia (R. Br.) Rich.	Swamp Lily
JUNCACEAE	
Juncus kraussii Hochst.	Sea Rush
Juncus planifolius R. Br.	Broad Rush
Juncus prismatocarpus R. Br.	Branching Rush
Juncus usitatus L.A.S. Johnson	Common Rush
JUNCAGINACEAE	
Triglochin procerum R. Br.	
LAMIACEAE	
Lycopus australis R. Br.	Australian Gypsywort
LAURACEAE	
Cassytha pubescens R. Br.	Downy Dodder-laurel
Endiandra sieberi Nees	Hard Corkwood
LOBELIACEAE	
Lobelia alata Labill.	Angled Lobelia
Pratia purpurascens (R. Br.) E. Wimmer	Lobelia Pratia
LOMANDRACEAE	
Lomandra longifolia Labill.	Spiny-headed Mat-rush
LORANTHACEAE	
Amyema pendulum (Sieber ex Sprengel) Tieghem	Drooping Mistletoe

LYTHRACEAE	
Lythrum hyssopifolia L.	Hyssop Loosestrife
Lythrum salicaria L.	Purple Loosestrife
MELIACEAE	
Synoum glandulosum (Smith) A. Juss.	Rosewood
MENISPERMACEAE	
Stephania japonica (Thunb.) Miers	Snake Vine
MORACEAE	
Ficus coronata Spin	Sandpaper Fig
Ficus macrophylla Desf. ex Pers.	Moreton bay Fig
Ficus obliqua Forster f.	Small-leaved Fig
Ficus superba Miq.	Deciduous Fig
MYRSINACEAE	
Myrsine howittiana (F. Muell. Ex Mez) Jackes	Muttonwood
MYRTACEAE	
Angophora floribunda (Smith) Sweet	Rough-barked Apple
Eucalyptus botryoides Smith	Bangalay
Eucalyptus pilularis Smith	Blackbutt
Eucalyptus robusta Smith	Swamp Mahogany
Eucalyptus tereticornis Smith	Forest Red Gum
Leptospermum juniperinum Smith	Prickly Teatree
Melaleuca ericifolia Smith	Swamp Paperbark
Melaleuca linariifolia Smith	Narrow-leaved Paperbark
Melaleuca styphelioides Smith	Prickly-leaved Paperbark
OLEACEAE	
Notelaea longifolia Vent.	Native Olive
ORCHIDACEAE	
Acianthus fornicatus R. Br.	Pixie Caps
Dendrobium teretifolium R. Br.	Rat's-tail Orchid
PHILESIACEAE	
Eustrephus latifolius R. Br.	Wombat Berry
Geitonoplesium cymosum (R. Br.) A. Cunn. ex Hook.	Scrambling Lily
PHORMIACEAE	
Dianella caerulea Sims	Flax-lily
PITTOSPORACEAE	
Billardiera scandens Smith	Common Apple-berry
Citriobatus pauciflorus Cunn. ex Ettingsh.	Orange Thorn
Pittosporum revolutum Aiton	Yellow Pittosporum
Pittosporum undulatum Vent.	Sweet Pittosporum
POACEAE	
Cymbopogon refractus (R. Br.) A. Camus	Barbed Wire Grass
Cynodon dactylon (L.) Pers.	Couch Grass
Dichelachne crinita (L.) Hook. f.	Longhair Plumegrass
Echinopogon caespitosus C. E. Hubb.	Tufted Hedgehog-grass
Echinopogon ovatus (G. Forst.) P. Beauv.	Forest Hedgehog-grass
Entolasia stricta (R. Br.) Hughes	Wiry Panic
Eragrostis ? *brownii* (Kunth) Nees	Common Love-grass
Hemarthria uncinata R. Br.	Mat Grass
Imperata cylindrica P. Beauv.	Blady Grass
Microlaena stipoides (Labill.) R. Br.	Weeping Grass
Oplismenus aemulus (R. Br.) Roem. & Schult.	Australian Basket-grass
Oplismenus imbecillus (R. Br.) Roem. & Schult.	Pademelon Grass
Paspalum distichum L.	Water Couch
Phragmites australis (Cav.) Trin. ex Steud.	Common Reed
Themeda australis (R. Br.) Stapf	Kangaroo Grass

POLYGONACEAE	
Persicaria decipiens (R. Br.) K. L. Wilson	Slender Knotweed
Persicaria strigosa (R. Br.) Gross	Spotted Knotweed
POTOMOGETONACEAE	
Potamogeton tricarinatus F. Muell & Benn. ex Benn.	Floating Pondweed
PROTEACEAE	
Banksia integrifolia L. f.	Coast Banksia
Persoonia linearis Andrews	Narrow-leaved Geebung
RANUNCULACEAE	
Clematis aristata R. Br. ex DC.	Australian Clematis
Ranunculus inundatus R. Br. ex DC.	River Buttercup
RESTIONACEAE	
Restio tetraphyllus Labill. subsp. *meiostachyus* L. Johnson & O. D. Evans	Tassel Cord-rush
RHAMNACEAE	
Alphitonia excelsa (Fenzl) Reisseck ex Benth.	Red Ash
ROSACEAE	
Rubus parvifolius L.	Native Raspberry
RUBIACEAE	
Morinda jasminoides Cunn.	Morinda
RUTACEAE	
Melicope micrococca (F. Muell.) T. Hartley	White Euodia
Zieria smithii Jackson	Sandfly Zieria
SAPINDACEAE	
Dodonaea triquetra Wendl.	Long-leaved Hop-bush
Guioa semiglauca (F. Muell.) Radlk.	Guioa
SCROPHULARIACEAE	
Bacopa monniera (L.) Pennell	Bacopa
SMILACACEAE	
Smilax glyciphylla Sm.	Thornless Sarsaparilla
SOLANACEAE	
Duboisia myoporoides R. Br.	Corkwood
SPARGANIACEAE	
Sparganium antipodum Graebner	Floating Bur-reed
STACKHOUSIACEAE	
Stackhousia viminea Smith	Slender Stackhousia
STERCULIACEAE	
Commersonia fraseri Gay	Bush Kurrajong
TYPHACEAE	
Typha orientalis C. Presl	Broad-leaved Cumbungi
VERBENACEAE	
Clerodendrum tomentosum R. Br.	Hairy Clerodendrum
VIOLACEAE	
Viola hederacea Labill.	Native Violet
VISCACEAE	
Notothixos subaureus Oliver	Golden Mistletoe
VITACEAE	
Cayratia clematidea (F. Muell.) Domin	Slender Grape
Cissus hypoglauca A. Gray	Water Vine

Appendix 2 - Key Habitat Attributes for Animal Species Known or Expected in the Project Area

Bold entries are animal species that have been recorded on the site to be cleared or immediately adjacent to it between 1988 and 2008. The other species have been recorded in the Seven Mile Beach locality.

Common Name	Scientific Name	Trees	Tree Hollows	Shrubs	Ground Plants	Woody Debris	Open Areas	Wet Areas
Mammals								
Brown Antechinus	*Antechinus stuartii*	-	-	-	ground plants	woody debris	-	-
Bush Rat	*Rattus fuscipes*	-	-	-	ground plants	woody debris	-	-
Chocolate Wattled Bat	*Chalinolobus morio*	trees	tree hollows	-	-	-	open areas	-
Common Brushtail Possum	*Trichosurus vulpecula*	trees	tree hollows	-	-	-	-	-
Common Ringtail Possum	*Pseudocheirus peregrinus*	trees	tree hollows	shrubs	-	-	-	
Eastern Forest Bat	*Vespadelus pumilus*	trees	tree hollows	-	-	-	open areas	-
Eastern Freetail-bat	*Mormopterus* sp.	trees	tree hollows	-	-	-	open areas	-
East-coast Freetail-bat	*Mormopterus norfolkensis*	trees	tree hollows	-	-	-	open areas	-
Feathertail Glider	*Acrobates pygmacus*	trees	tree hollows	-	-	-	-	-
Gould's Wattled Bat	*Chalinolobus gouldii*	trees	tree hollows	-	-	-	open areas	-
Greater Glider	*Petauroides volans*	trees	tree hollows	-	-	-	-	-
Grey-headed Flying-fox	*Pteropus poliocephalus*	trees	-	-	-	-	-	-
Large Bentwing-bat	*Miniopterus schreibersii*	trees	-	-	-	-	open areas	-
Large Forest Bat	*Vespadelus darlingtoni*	trees	tree hollows	-	-	-	open areas	-
Little Forest Bat	*Vespadelus vulturnus*	trees	tree hollows	-	-	-	open areas	-
Long-nosed Bandicoot	*Perameles nasuta*	-	-	-	ground plants	woody debris	-	-
Short-beaked Echidna	*Tachyglossus aculeatus*	-	-	-	-	-	-	-
Southern Forest Bat	*Vespadelus regulus*	trees	-	-	-	-	open areas	-
Spotted-tailed Quoll	*Dasyurus maculatus*	trees	tree hollows	-	ground plants	woody debris	-	-
Sugar Glider	*Petaurus breviceps*	trees	tree hollows	shrubs	-	-	-	-
Swamp Wallaby	*Wallabia bicolor*	-	-	shrubs	ground plants	-	-	-
White-striped Freetail-bat	*Nyctinomus australis*	trees	-	-	-	-	open areas	-
Birds								
Australian Hobby	*Falco longipennis*	trees	-	-	-	-	-	-

Common Name	Scientific Name	Trees	Tree Hollows	Shrubs	Ground Plants	Woody Debris	Open Areas	Wet Areas
Australian Magpie	*Gymnorhina tibicen*	trees	-	-	-	-	open areas	-
Australian Raven	*Corvus coronoides*	trees	-	-	-	-	-	-
Barn Owl	*Tyto alba*	trees	tree hollows	-	-	-	-	-
Bassian Thursh	*Zoothera lunulata*	-	-	-	ground plants	woody debris	-	-
Black-faced Cuckoo-shrike	*Coracina novaehollandiae*	trees	-	-	-	-	-	-
Black-faced Monarch	*Monarcha melanopsis*	trees	-	-	-	-	-	-
Black-shouldered Kite	*Elanus axillaris*	trees	-	-	-	-	open areas	-
Brown Falcon	*Falco berigora*	trees	-	-	-	-	open areas	-
Brown Gerygone	*Gerygone mouki*	trees	-	shrubs	-	-	-	-
Brown Goshawk	*Accipiter fasciatus*	trees	-	-	-	-	-	-
Brown Thornbill	*Acanthiza pusilla*	trees	-	shrubs	-	-	-	-
Brown-headed Honeyeater	*Melithreptus brevirostris*	trees	-	-	-	-	-	-
Brush Cuckoo	*Cacomantis variolosus*	trees	-	-	-	-	-	-
Channel-billed Cuckoo	*Scythrops novaehollandiae*	trees	-	-	-	-	-	-
Cicadabird	*Coracina tenuirostris*	trees	-	-	-	-	-	-
Collared Sparrowhawk	*Accipiter cirrhocephalus*	trees	-	-	-	-	-	-
Common Koel	*Eudynamys scolopacea*	trees	-	-	-	-	-	-
Crested Pigeon	*Ocyphaps lophotes*	trees	-	-	-	-	open areas	-
Crested Shrike-tit	*Falcunculus frontatus*	trees	-	-	-	-	-	-
Crimson Rosella	*Platycercus elegans*	trees	tree hollows	-	-	-	-	-
Dollarbird	*Eurystomus orientalis*	trees	tree hollows	-	-	-	-	-
Double-barred Finch	*Taeniopygia bichenovii*	-	-	shrubs	ground plants	woody debris	open areas	-
Dusky Woodswallow	*Artamus cyanopterus*	trees	-	-	-	-	open areas	-
Eastern Rosella	*Platycercus eximius*	trees	tree hollows	-	-	-	open areas	-
Eastern Spinebill	*Acanthorhynchus tenuirostris*	trees	-	shrubs	-	-	-	-
Eastern Whipbird	*Psophodes olivaceus*	-	-	shrubs	ground plants	-	-	-
Eastern Yellow Robin	*Eopsaltria australis*	trees	-	shrubs	ground plants	-	-	-
Emerald Dove	*Chalcophaps indica*	trees	-	shrubs	ground plants	-	-	-
Fairy Martin	*Hirundo ariel*	-	-	-	-	-	open areas	-
Fan-tailed Cuckoo	*Cacomantis flabelliformis*	trees	-	-	-	-	-	-
Figbird	*Sphecotheres viridis*	trees	-	-	-	-	-	-
Galah	*Cacatua roseicapilla*	trees	-	-	-	-	-	-

Common Name	Scientific Name	Trees	Tree Hollows	Shrubs	Ground Plants	Woody Debris	Open Areas	Wet Areas
Gang-gang Cockatoo	*Callocephalon fimbriatum*	trees	-	-	-	-	-	-
Golden Whistler	*Pachycephala pectoralis*	trees	-	-	-	-	-	-
Grey Butcherbird	*Cracticus torquatus*	trees	-	-	-	-	-	-
Grey Fantail	*Rhipidura fuliginosa*	trees	-	shrubs	-	-	-	-
Grey Goshawk	*Accipiter novaehollandiae*	trees	-	-	-	-	-	-
Grey Shrike-thrush	*Colluricincla harmonica*	trees	-	shrubs	-	-	-	-
Horsfield's Bronze-Cuckoo	*Chrysococcyx basalis*	trees	-	-	-	-	-	-
Laughing Kookaburra	*Dacelo novaeguineae*	trees	tree hollows	-	-	-	-	-
Leaden Flycatcher	*Myiagra rubecula*	trees	-	-	-	-	-	-
Lewin's Honeyeater	*Meliphaga lewinii*	trees	-	-	-	-	-	-
Little Eagle	*Hieraaetus morphnoides*	trees	-	-	-	-	-	-
Little Lorikeet	*Glossopsitta pusilla*	trees	-	-	-	-	-	-
Little Wattlebird	*Anthochaera chrysoptera*	trees	-	-	-	-	-	-
Magpie-lark	*Grallina cyanoleuca*	trees	-	-	-	-	open areas	-
Mistletoebird	*Dicaeum hirundinaceum*	trees	-	-	-	-	-	-
Musk Lorikeet	*Glossopsitta concinna*	trees	tree hollows	-	-	-	-	-
Nankeen Kestrel	*Falco cenchroides*	trees	tree hollows	-	-	-	open areas	-
New Holland Honeyeater	*Phylidonyris novaehollandiae*	trees	-	shrubs	-	-	-	-
Noisy Friarbird	*Philemon corniculatus*	trees	-	-	-	-	-	-
Noisy Miner	*Manorina melanocephala*	trees	-	-	-	-	-	-
Olive-backed Oriole	*Oriolus sagittatus*	trees	-	-	-	-	-	-
Pallid Cuckoo	*Cuculus pallidus*	trees	-	-	-	-	open areas	-
Peregrine Falcon	*Falco peregrinus*	trees	-	-	-	-	-	-
Pied Currawong	*Strepera graculina*	trees	-	-	-	-	-	-
Powerful Owl	*Ninox strenua*	trees	tree hollows	-	-	-	-	-
Rainbow Lorikeet	*Trichoglossus haematodus*	trees	tree hollows	-	-	-	-	-
Red Wattlebird	*Anthochaera carunculata*	trees	-	-	-	-	-	-
Red-browed Finch	*Neochmia temporalis*	trees	-	shrubs	ground plants	-	open areas	-
Richard's Pipit	*Anthus novaeseelandiae*	-	-	-	ground plants	-	open areas	-
Rose Robin	*Petroica rosea*	trees	-	-	ground plants	-	-	-
Rufous Fantail	*Rhipidura rufifrons*	trees	-	shrubs	-	-	-	-
Rufous Whistler	*Pachycephala rufiventris*	trees	-	shrubs	-	-	-	-

Common Name	Scientific Name	Trees	Tree Hollows	Shrubs	Ground Plants	Woody Debris	Open Areas	Wet Areas
Sacred Kingfisher	*Todiramphus sanctus*	trees	tree hollows	-	-	-	-	-
Satin Bowerbird	*Ptilonorhynchus violaceus*	trees	-	-	-	-	-	-
Scarlet Honeyeater	*Myzomela sanguinolenta*	trees	-	-	-	-	-	-
Shining Bronze-Cuckoo	*Chrysococcyx lucidus*	trees	-	-	-	-	-	-
Silvereye	*Zosterops lateralis*	trees	-	shrubs	-	-	-	-
Southern Boobook	*Ninox novaeseelandiae*	trees	tree hollows	-	-	-	-	-
Spangled Drongo	*Dicrurus bracteatus*	trees	-	-	-	-	-	-
Spotted Pardalote	*Pardalotus punctatus*	trees	-	-	-	-	-	-
Striated Pardalote	*Pardalotus striatus*	trees	tree hollows	-	-	-	-	-
Striated Thornbill	*Acanthiza lineata*	trees	-	shrubs	-	-	-	-
Sulphur-crested Cockatoo	*Cacatua galerita*	trees	tree hollows	-	-	-	-	-
Superb Fairy-wren	*Malurus cyaneus*	-	-	shrubs	ground plants	woody debris	-	-
Tawny Frogmouth	*Podargus strigoides*	trees	tree hollows	-	-	-	-	-
Topknot Pigeon	*Lopholaimus antarcticus*	trees	-	-	-	-	-	-
Tree Martin	*Hirundo nigricans*	trees	tree hollows	-	-	-	open areas	-
Varied Sittella	*Daphoenositta chrysoptera*	trees	-	-	-	-	-	-
Variegated Fairy-wren	*Malurus lamberti*	-	-	shrubs	ground plants	woody debris	-	-
Welcome Swallow	*Hirundo neoxena*	trees	-	-	-	-	open areas	-
Whistling Kite	*Haliastur sphenurus*	trees	-	-	-	-	-	-
White-bellied Sea-Eagle	*Haliaeetus leucogaster*	trees	-	-	-	-	-	-
White-browed Scrubwren	*Sericornis frontalis*	-	-	shrubs	ground plants	woody debris	-	-
White-naped Honeyeater	*Melithreptus lunatus*	trees	-	-	-	-	-	-
White-throated Needletail	*Hirundapus caudacutus*	completely aerial						
White-throated Nightjar	*Eurostopodus mystacalis*	trees	-	-	ground plants	-	-	-
White-throated Treecreeper	*Cormobates leucophaeus*	trees	tree hollow	-	-	-	-	-
Willie Wagtail	*Rhipidura leucophrys*	-	-	-	ground plants	-	open areas	-
Yellow Thornbill	*Acanthiza nana*	trees	-	shrubs	-	-	open areas	-
Yellow-faced Honeyeater	*Lichenostomus chrysops*	trees	-	shrubs	-	-	-	-
Yellow-rumped Thornbill	*Acanthiza chrysorrhoa*	-	-	shrubs	ground plants	-	open areas	-
Yellow-tailed Black-Cockatoo	*Calyptorhynchus funereus*	trees	-	-	-	-	-	-

Common Name	Scientific Name	Trees	Tree Hollows	Shrubs	Ground Plants	Woody Debris	Open Areas	Wet Areas
Reptiles								
Black-bellied Swamp Snake	*Hemiaspis signata*	-	-	-	ground plants	-	-	wet areas
Delicate Skink	*Lampropholis delicata*	-	-	-	ground plants	woody debris	-	-
Diamond Python	*Morelia spilota*	trees	tree hollows	-	-	-	-	-
Eastern Blue-tongued Lizard	*Tiliqua scincoides*	-	-	-	ground plants	woody debris	-	-
Eastern Tiger Snake	*Notechis scutatus*	-	-	-	ground plants	woody debris	-	-
Eastern Water Dragon	*Physignathus lesueurii*	-	-	-	ground plants	woody debris	-	wet areas
Eastern Water Skink	*Eulamprus quoyii*	-	-	-	ground plants	woody debris	-	wet areas
Grass Skink	*Lampropholis guichenoti*	-	-	-	ground plants	woody debris	-	-
Jacky Lizard	*Amphibolurus muricatus*	-	-	-	ground plants	woody debris	-	-
Lace Monitor	*Varanus varius*	trees	tree hollows	-	ground plants	woody debris	-	-
Long-necked Tortoise	*Chelodina longicollis*	-	-	-	-	-	-	wet areas
Oak Skink	*Cyclodomorphus casuarinae*	-	-	-	ground plants	woody debris	-	-
Red-bellied Black Snake	*Pseudechis porphyriacus*	-	-	-	ground plants	woody debris	-	wet areas
Southern Water Skink	*Eulamprus heatwolei*	-	-	-	ground plants	woody debris	-	wet areas
Three-toed Skink	*Saiphos equalis*	-	-	-	ground plants	woody debris	-	-
Frogs								
Bleating Tree Frog	*Litoria dentata*	-	-	-	ground plants	woody debris	-	wet areas
Brown-striped Frog	*Limnodynastes peronii*	-	-	-	ground plants	woody debris	-	wet areas
Common Eastern Froglet	*Crinia signifera*	-	-	-	ground plants	woody debris	-	wet areas
Green and Golden Bell Frog	*Litoria aurea*	-	-	-	ground plants	woody debris	-	wet areas
Green Tree Frog	*Litoria caerulea*	-	-	-	ground plants	woody debris	-	wet areas
Jervis Bay Tree Frog	*Litoria jervisiensis*	-	-	-	ground plants	woody debris	-	wet areas
Peron's Tree Frog	*Litoria peronii*	-	-	-	ground plants	woody debris	-	wet areas
Tyler's Tree Frog	*Litoria tyleri*	-	-	-	ground plants	woody debris	-	wet areas
Verreaux's Tree Frog	*Litoria verreauxii*	-	-	-	ground plants	woody debris	-	wet areas
All Species : 141 (100%)		103 (73%)	31 (22%)	24 (17%)	41 (29%)	30 (21%)	28 (20%)	15 (11%)
Species on Site : 53 (100%)		43 (81%)	12 (23%)	17 (32%)	12 (25%)	7 (13%)	7 (13%)	2 (4%)
Note: Some frogs utilise trees, tree hollows and shrubs								

Appendix 3 – Requirements of Development Consent

Schedule 3 Condition 17 – Landscaping and Rehabilitation

Summary of Requirement	Link to Landscape and Rehabilitation Management Plan
Progressively rehabilitate the site consistent with the rehabilitation objectives in Chapter 3.8 of the EA	Part B - Section 3
Northern Corridor and Southern Rehabilitation Areas plantings	Part B – Section 8.3
Establishment, conservation and maintenance of approximately 23.99 hectares of native vegetation;	Part B – Section
Enhance 5.25 hectares of the vegetation in Areas 4 and 5	Part B – Section
Conservation and maintenance of approximately 46.25 hectares of the remnant vegetation	Part B – Section
Consistent with: *Bringing the bush back to Western Sydney: Best practice guidelines for bush regeneration on the Cumberland Plain Department of Infrastructure, Planning and Natural Resources (2003) ("DIPNR (2003)")* and *Recovering bushland on the Cumberland Plains: Best practice guidelines for the management and restoration of bushland Department of Environment and Conservation (2005) ("DEC (2005))";*	Part B – Section

Schedule 3 Condition 18 – Landscaping and Rehabilitation

Summary of Requirement	Link to Landscape and Rehabilitation Management Plan
Densely plant Banksia Integrifolia along the 5 metre setback zones to the Littoral Rainforest vegetation	Part B – Section 7.15

Schedule 3 Condition 19 – Landscaping and Rehabilitation

Summary of Requirement	Link to Landscape and Rehabilitation Management Plan
Clearly identify the boundary of the extension area and the Modification 1 – Extraction Area in consultation with a suitably qualified ecologist	Part B – Section 6.21 Part C – Section 3

Summary of Requirement	Link to Landscape and Rehabilitation Management Plan
Ensure that all dredging activities and associated quarry operations remain within the defined boundary of the Extraction Area	Part B – Section 6.21
Develop a monitoring program to maintain the boundary of the area	Part C – Section 7
Revegetate the buffer areas	Part B – Section 6.21

Schedule 3 Condition 20 – Landscaping and Rehabilitation

Summary of Requirement	Link to Landscape and Rehabilitation Management Plan
Commence the Compensatory Planting within 12 months of the approval	Part B - Sections 6.14, 7.2
Not sever the east-west link until Performance Criteria are met	Part B – Section 8.3

Schedule 3 Condition 20A – Restriction on Clearing of Certain Land

Summary of Requirement	Link to Landscape and Rehabilitation Management Plan
Not clear within area marked “X” without approval	Part B - Section 6.14

Schedule 3 Condition 21 – Landscape and Rehabilitation Management Plan

Summary of Requirement	Link to Landscape and Rehabilitation Management Plan
Prepare and implement a Landscape and Rehabilitation Management Plan	This Plan
This plan must be submitted to the Planning Secretary for approval within 3 months of the date of this approval;	Not relevant to content of Plan
Generally in accordance with the draft Landscape and Rehabilitation Management Plan	Part B
Plan preparation	Part A – Section 4
Biological purpose of the linkage	Part B – Section 2.5
Collect baseline data for the Project Area	Part B – Section 6.2
Include a figure	Figures 1, 2, 3, 9
Local source of propagation material	Part B – Section 6.6
Initial site assessment	Part B – Section 6.4

Summary of Requirement	Link to Landscape and Rehabilitation Management Plan
Short, medium and long-term measures to rehabilitate the site	Part B – Sections 8.6 & 9.2
Implement the Compensatory Planting	Part B – Section 7
Manage the remnant vegetation	Part B – Section & Table 7
Landscape the site to mitigate visual impacts	Part B – Section & 7.11 Part C – Sections 5 & 7
Protect the Littoral Rainforest	Part B – Section 5.3
Measures that would be implemented over the first 5 years and every subsequent 5 year period	Part B – Section 9.2
Setting clear targets	Part B – Sections 8.3 & 8.5
Monitoring each vegetation type	Part B – Section 8.3
Set completion criteria	Part B – Section 8.3
Monitoring the performance of measures	Part B – Section 8.3
Include a Long Term Management Plan	Part B – Section 8.6

Schedule 3 Condition 21A – Landscape and Rehabilitation Management Plan

Summary of Requirement	Link to Landscape and Rehabilitation Management Plan
Develop a program	Part B – Section 6
Soil testing	Part B – Section 6.19
On site collection of propagation material	Part B = Section 6.6
Develop plants on site	Part B = Section 6.6
Successional plantings and management	Part B – Section 6.12
Targets for planting and management	Part B – Sections 8.6 & 9.2
Monitoring requirements	Part B – Sections 6.20 & 8.4
Reporting	Part B – Section 6.20
Consultation	Part A – Section 5.5
Water quality monitoring	Part B – Section (Zone 6)
Quantitative vegetation monitoring	Part B – Section 8

Schedule 3 Condition 22 – Landscape and Rehabilitation Management Plan

Summary of Requirement	Link to Landscape and Rehabilitation Management Plan
The objectives for the rehabilitation	Part B – Sections 3 &
How the rehabilitation would be integrated with the surrounding vegetation	Part B – Section Part C – Sections 6 & 7
Short, medium and long-term measures to rehabilitate the site	Part B – Sections 8.6 & 9.2
Implement the Compensatory Planting	Part B – Section 7
Manage the remnant vegetation	Part B – Section & Table 7
Landscape the site to mitigate visual impacts	Part B – Section & 7.11 Part C – Sections 5 & 7
Performance and completion criteria	Part B – Section 8.3
Measures to be implemented over the next 5 years	Part B – Sections 6, 8 & 9
Pre-clearance surveys	Part B – Section 6.14
Conserving and reusing topsoil	Part B – Section 6.19
Collecting and propagating seed	Part B – Section 6.6
Salvaging and reusing material	Part B – Section 6.11
Controlling weeds and feral pests	Part B – Sections 6.7 & 6.16
Controlling access	Part B – Section 6.18
Bushfire management	Part B – Section 6.17
Managing any potential conflicts between rehabilitation and any Aboriginal cultural heritage values	Part B – Section 1.3
Progressively rehabilitate the site	Part B – Section (Zone 6)
Implementing revegetation and regeneration	Part B – Section 7
Reducing the visual impacts	Part B – Section & 7.11 Part C – Sections 5 & 7
Protecting areas outside the disturbance areas	Part B – Section 6.21 Part C – Section 3
Monitoring requirements	Part B – Sections 6.20 & 8.4
Potential risks and contingency measures	Part B – Section 8
Responsibilities under the plan	Part B – Sections 1.4 & 8.2; Part C - Section 7

Schedule 3 Condition 23 – Landscape and Rehabilitation Management Plan

Summary of Requirement	Link to Landscape and Rehabilitation Management Plan
Successful establishment of the Northern Corridor - presence of native flora species	Section 8.3
Majority of the flora species recorded from the removed forest occur in the area	Section 8.3
Species from all 4 layers have been planted and at least 50% of the projected cover has been achieved	Section 8.3
Self-sustaining native plant populations	Section 8.3
No dominance by single flora species	Section 8.3
Weeds are not significantly impacting on the native vegetation	Section 8.3
Weeds do not represent a majority of the flora species or a higher percentage cover than the native flora species	Section 8.3
Impacts such as grazing are excluded from the area	Section 8.3

Schedule 3 Condition 24 – Landscape and Rehabilitation Management Plan

Summary of Requirement	Link to Landscape and Rehabilitation Management Plan
Successful establishment of fauna habitat - presence of species;	Section 8.3
Majority of the resident species occur	Section 8.3
Fauna populations are resident	Section 8.3
Pest animals are controlled	Section 8.3
Impacts such as grazing are excluded	Section 8.3

Schedule 3 Condition 25 – Landscape and Rehabilitation Management Plan

Summary of Requirement	Link to Landscape and Rehabilitation Management Plan
Prior to the severance of the east-west link determine the presence of species	Part B – Section 8.4
Determine whether a majority of animal species are present	Part B – Section 8.4
Conduct genetic analysis	Part B – Section 6.14, Table 6

Schedule 3 Condition 26 & 26A – Long Term Management Strategy

Summary of Requirement	Link to Landscape and Rehabilitation Management Plan
Long Term Management Strategy prepared in consultation with agencies	Part B – Section 8.6
Quarry closure and post-extraction objectives	Part B – Section 8.6
Future use of the site	Part B – Section 8.6
Measures that would be implemented to manage the ongoing environmental effects	Part B – Section 8.6
Monitoring of performance over time	Part B – Section 8.6
Implement the Landscape and Rehabilitation Management Plan and Long Term Management	Part A – Section 1 Part B – Section 8.6