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Boral Dunmore Operations

Dunmore Lakes Sand Project
Rehabilitation Management Plan

October 2023

Document control

Rev No.	Date	Prepared By	Approved By	Comments
1	27/04/2016	Peter Rand (Arcadis)	Brad Searle (Arcadis)	Draft Rehabilitation Management Plan
2	19/05/2016	Peter Rand (Arcadis)	Brad Searle (Arcadis)	Draft 2 Rehabilitation Management Plan
3	03/06/2016	Peter Rand (Arcadis)	Brad Searle (Arcadis)	Final Rehabilitation Management Plan
4	16/12/2016	Peter Rand (Arcadis)	Brad Searle (Arcadis)	Final Rehabilitation Management Plan – DPE Comments Addressed
5	17/03/2017	Peter Rand (Arcadis)	Brad Searle (Arcadis)	Final Rehabilitation Management Plan – DPE Further Comments Addressed
6	25/05/2021	Mark Nolan (Cambium Group)	Emilie Mascarenhas (Cambium Group)	Updated to Modification 2 Consolidated Comments
7	29/06/2021	Emilie Mascarenhas (Cambium Group)	Mark Nolan (Cambium Group)	Updated to incorporate Shellharbour Council, Kiama Council and BCD comments
8	14/07/2021	Emilie Mascarenhas (Cambium Group)	Mark Nolan (Cambium Group)	Updated to incorporate DPIE comments
9	27/10/2023	Emilie Mascarenhas (Cambium Group)	Mark Nolan (Cambium Group)	Updated following annual review

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Abbreviations

AEMR	Annual Environmental Management Report
BCD	Biodiversity & Conservation Division within the Department
CAA	Controlled Activity Approval
CoA	Condition of Approval
DLSP	Dunmore Lakes Sand Project
DPI&E	Department of Planning, Investment & Environment
EEC	Endangered Ecological Community
EPA	Environment Protection Authority
FFMP	Flora and Fauna Management Plan
HTE	High Threat Exotic
MCP	Mine Closure Plan
MOP	Mine Operations Plan
PCT	Plant Community Type
PIRMP	Pollution Incident Response Management Plan
RAMP	Riparian Areas Management Plan
SECP	Sediment and Erosion Control Plan
SEPP	State Environmental Planning Policy
RMP	Rehabilitation Management Plan
VENM	Virgin excavated natural material
WMP	Water Management Plan

1 INTRODUCTION

1.1 BACKGROUND

The Dunmore Lakes Sand Project (DLSP) is a sand dredging and processing operation producing a range of sand and landscaping products into the local and Sydney markets. The Project is located on the Princess Highway approximately seven kilometres north of Kiama on the NSW South Coast.

Development Consent (DA 195-8-2004) as modified in 2020 for Stage 5 requires the preparation and maintenance of a range of management plans to guide the environmental management of the development throughout its operational life.

DLSP currently rehabilitates the site in accordance with an approved Rehabilitation Management Plan (RMP) prepared by Arcadis (2017). This RMP incorporated a Riparian Area Management Plan. The Consolidated Consent as modified in 2020, Schedule 3, Condition of Approval 43, requires the RMP to be updated. The RMP has been updated by Mark Nolan and Dr Emilie Mascarenhas Cambium Group, who have been endorsed by the Planning Secretary (Appendix A).

1.2 PROJECT DESCRIPTION

The DLSP is owned and operated by Boral Resources (NSW) Pty Ltd. The site is located at Tabbita Road, Dunmore within the Shellharbour Local Government Area.

The existing site (Stages 2, 3 and 4) covers 88 hectares and is bound by the Princes Motorway (Kiama Bypass) to the east and private property, predominantly agricultural grazing land, to the south, north and west. Operation of the quarry involves the sequential dredging and excavation of approximately 8 million tonnes of sand and soil from Stage 2, 3 & 4 and 1.35 million tonnes of sand and soil from stage 5.

Stage 5 is located approximately 1.1 km south- south east of the existing site, covers approximately 38 ha and is located on an alluvial coastal flood plain, adjacent to the tidal reaches of the Minnamurra River. The northern portion of the extraction area has been partially cleared and has historically been used for grazing. Stage 5 is bound by Riverside Drive to the north and Princes Highway to the west.

The method of extraction of these resources includes both sand and soil extraction by excavator and dredge sand extraction, followed by washing, processing and material blending.

During and post the completion of sand extraction, progressive backfilling of each stage with virgin excavated natural materials (VENM) will be undertaken, to progressively reconstruct and rehabilitate the site. The reconstructed landform will ultimately support lakes, wetlands and revegetated Endangered Ecological Communities and grazing land.

1.3 PURPOSE AND OBJECTIVES OF THE PLAN

The purpose of this Rehabilitation and Management Plan (RMP) is to meet the requirements of summary environmental management measures and DA conditions of consent applicable to rehabilitation. Additionally, this RMP provides a single operational document that clearly identifies key management issues, management objectives and actions to be implemented, the proposed schedule for implementation or the monitoring and review of commitments. This RMP will also include a set of clear and concise maps and diagrams showing the locations of management areas.

This RMP includes a Riparian Areas Management Plan (Appendix B), which describes and details the methods concerning work involving construction/rehabilitation of riparian areas and within 3m of an existing riparian area.

1.4 CONSULTATION

The previous version of the RMP (Arcadis 2017) was prepared in consultation with the NSW Department of Planning and Infrastructure, Shellharbour Council, Kiama Council DEC, DPI, and the CCC.

Shellharbour Council, Kiama Council and the Biodiversity and Conservation Division (BCD) have been consulted in the development of this updated plan (supplied with version 06 in June 2021) and their comments were addressed in version 07 of the RMP. The Department of Planning, Investment & Environment (DPIE) has also been consulted in the development of this updated plan (supplied with version 07 in July 2021) and their comments addressed in this version 08 of the RMP. Evidence of correspondence with these agencies is provided in Appendix G and responses to their comments are provided in Table 1 below.

Table 1 Response to comments from Kiama Council, Shellharbour Council, BCD and DPIE

Comment	Response	Update to FFMP
Kiama Council		
Why Bangalay Sand Forest vegetation community is not included in the 5B replanting/rehabilitation, only freshwater fringing wetland.	Fringing freshwater wetland species were chosen as only the fringing edge of the Stage 5B pond is being revegetated. This replanting is done for stability and at the landowner request. Banagaly Sand Forest Vegetation will be offset via retiring the biodiversity credit (71) of PCT659 as detailed in Condition 37A of the consent proir to vegetation clearing in Stage 5B.	Required detail entered into the document.
Whether Kiama Council had a position on the Consultative Committee	Mark Miller (Manager of Compliance and Regulation) currently attends on behalf of SHCC. We would be happy to invite the KCC equivalent to the meeting	No proposed changes to the document. An email reply with an answer to the comments given provided KCC had no concern on the plan. This is included in the KCC correspondence.
Shellharbour Council		
Page 6- 2.4.2 Fisheries Permit Application, should include reference to 'any impacts on a Saltmarsh vegetation community will require the Fisheries Permit Application'	Disturbance area is outside the salt marsh area. If any impacts are observed then the Fisheries Permit Application will be completed	Required detail entered into the document.
Page 28- 5.6 Maintenance, replace the word phrase 'additional planting will be considered' to 'will be replanted to achieve 80% native coverage'	Acknowledged	Required detail entered into the document.
Biodiversity and Conservation Division (BCD)		
We have reviewed the above document and support the proposed approach to rehabilitation overall.	Acknowledged	Required detail entered into the document.

Department of Planning, Investment & Environment (DPIE)		
Section 1.1 and Appendix A. This section should state names of persons from Cambium who were endorsed by the Planning Secretary to prepare the Rehabilitation Management Plan (RMP) and the date of endorsement. It was not the entire Cambium Group that was endorsed.	Acknowledged	Required detail entered into the document.
Section 1.4 – update with recommended edits / comments included in the draft Rehabilitation MP pdf.	Acknowledged	Required detail entered into the document.
Address the minor edits / clarification included throughout the draft RMP pdf document.	Acknowledged	Required detail entered into the document.

1.5 DOCUMENT STRUCTURE

The structure of this RMP is outline in Table 2.

Table 2 Structure of the Rehabilitation Management Plan

Section	Content
1	Provides an overview of the project, previous environmental assessments of the Project, and the purpose and scope of this plan.
2	Details of the statutory requirements for the Plan as outlined in the Conditions of Approval issued by the NSW Department of Planning and Infrastructure and other legislative requirements.
3	Describes the existing environment of the study area and significant biodiversity values contained within the project.
4	Describes the management actions to be undertaken to effectively implement and manage the rehabilitation values of the project.
5	Outlines the monitoring, reporting and review requirements pertaining to rehabilitation management within the project.
6	Specifies the environmental induction training delivered to all staff and subcontractors involved in the Project.
7	Outlines the requirement pertaining to contingency planning, including emergency incident reporting and management.
8	Lists the references used in the preparation of this plan

2 RELEVANT LEGISLATION, GUIDELINES AND PLANS

2.1 LEGISLATION AND PLANNING INSTRUMENTS

Key environmental legislation relating to rehabilitation management includes:

- *Commonwealth Environment Protection and Biodiversity Conservation Act* 1999 (EPBC Act)
- *NSW Environment Planning and Assessment Act 1979* (EP&A Act)
- *NSW Environment Planning and Assessment Regulation 2000*
- *NSW Fisheries Management Act 1994* (FM Act)
- *NSW Protection of the Environment and Operations Act* 1997
- *NSW Biosecurity Act 2015* (BS Act)
- *NSW Biodiversity Conservation Act 2016* (BC Act)
- *NSW Water Management Act 2000* (WM Act)
- *Mining Act 1992*
- *Illawarra Regional Environmental Plan No. 1*
- *Shellharbour Local Environmental Plan 2013*
- *Shellharbour Rural Local Environmental Plan 2004*
- *State Environmental Planning Policy (Coastal Management) 2018* (Coastal SEPP)
- *State Environmental Planning Policy (SEPP*) (Mining, Petroleum Production and Extractive Industries) 2007

2.2 GUIDELINES

Department of Industry Resources and Energy *EDG03 Mining, Rehabilitation and Environmental Management Process Guideline* provides guidance in the preparation of Mine Operations Plans (MOP), Mine Closure Plans (MCP) and Annual Environmental Management Reports (AEMR). The guideline document aims to enable mining activities throughout NSW to proceed safely, efficiently extract resources, protect the environment and deliver a rehabilitated landform at the completion of mining activities. This Rehabilitation Management Plan aligns with the intent of this Guideline document.

The rehabilitation process requires the establishment of a performance framework in order to measure the success of the rehabilitation process and to facilitate a consistent approach. The ANZMEC (Australian and New Zealand Minerals and Energy Council) Strategic Framework (2000) provides a framework for rehabilitation and performance assessment for mining operations.

The performance framework should cover the following:

- Rehabilitation principles and objectives, including final land use;
- Decommissioning requirements;
- Community objectives and criteria;
- Consent criteria;
- Standards and issues related to whole-of-life considerations;
- Financial costing and provisioning;
- Legal requirements;
- Environmental and social management requirements; and
- Safety considerations.

This plan has been prepared in accordance with the Constructed Wetlands Manual, Volumes 1 & 2 and the Shellharbour Visual Management plan User Manual.

2.3 CONDITIONS OF APPROVAL

The quarry operates under Development Application DA 195-8-2004 first granted on 29 June 2005 which has been modified three times. The latest modification occurred in 2020 (MOD 2 Consolidated Consent).

A number of the Conditions of Approval (CoA) from MOD 2 Consolidated Consent are relevant to this Plan and have been considered in its preparation (Table 3).

Table 3 Conditions of Approval

Condition of Approval	Condition Requirements	Where addressed in this document
Rehabilitation		
42	The Applicant must progressively rehabilitate the site to the satisfaction of the Planning Secretary, in a manner that is generally consistent with the concept final landform in the documents listed in condition 2(c) of Schedule 2 (see Appendix 2), and in accordance with the conditions of this consent	Whole document
Rehabilitation Management Plan		
43	Prior to commencing extraction in Stage 5, the Applicant must update the Rehabilitation Management Plan for the development to the satisfaction of the Planning Secretary: This plan must:	Whole document
	a) be prepared: (i) by suitably qualified consultants, including a specialist hydrologist, wetlands ecologist and landscape architect, whose appointments have been approved by the Planning Secretary; (ii) in consultation with Shellharbour Council, Kiama Council, BCD and the Department; and (iii) in accordance with extant guidelines including the *Constructed Wetlands Manual, Volumes 1 & 2 and the Shellharbour Visual Management Plan User Manual*;	Section 1.1 Section 1.4
	b) provide detailed plans of the final landform based on current backfill estimates;	Section 3 &4
	c) set detailed performance indicators and completion criteria for the rehabilitation of all areas disturbed by the development;	Section 5.9
	d) describe the measures that would be implemented to achieve the criteria in paragraph (c) and triggers for remedial actions;	Section 4, 5, 7 Section 6.4
	e) include detailed design plans and scheduling for progressive rehabilitation to be initiated, undertaken and/or completed in the next 5 years;	Section 5
	f) include a program to monitor, independently audit and report on progress against the criteria in paragraph (c) and the effectiveness of the measures in paragraph (d); and	Section 5.7
	g) include any Riparian Area Management Plan/s prepared in accordance with condition 45 for those riparian areas to be disturbed/rehabilitated in the next 5 years.	Appendix B

Riparian Area Management Plan		
45	The Applicant must prepare a Riparian Area Management Plan in consultation with BCD and to the satisfaction of the Planning Secretary. For works involving:	Appendix B
	a) disturbance within 3m of an existing riparian area, the plan must: • describe the broader extraction staging and justify the need for extraction in the Riparian Area; • describe in detail the methods and timing for extraction within the Riparian Area; • provide for construction and stabilisation of appropriate diversion channels to divert the waterbody around the disturbance area, unless otherwise approved by BCD and the Planning Secretary; and • describe the methods for rehabilitation of the Riparian Area and diversion channels; and	Appendix B
	b) construction/rehabilitation of Riparian Areas, the plan must: • detail proposed channel/bed designs, including scour protection measures; • Include hydraulic modelling supporting the proposed design; • where applicable, include measures to replicate pre-existing tidal-estuarine conditions; • include detailed plans for rehabilitation and revegetation of the Riparian Area using locally endemic species; • describe measures for the protection, enhancement and integration with adjacent threatened communities, including *Freshwater Wetlands on Coastal Floodplains, Swamp Oak Floodplain Forest* and *Bangalay Sand Forest of the Sydney Basin and South East Corner Bioregions.*	Appendix B

2.4 LICENCES AND PERMITS

2.4.1 Environmental Protection licence

The Environment Protection Authority (EPA) issues environment protection licences to the owners or operators of various industrial premises under the *Protection of the Environment Operations Act 1997* (POEO Act). Licence conditions relate to pollution prevention and monitoring, and cleaner production through recycling and reuse and the implementation of best practice. All licence holders must:

- Comply with the conditions of their licence.
- Prepare pollution incident response management plans.
- Publish and/or make pollution monitoring data available.

The DLSP operates under Environment Protection Licence EPL 11147.

2.4.2 Fisheries Permit Application

If mangroves occur, a permit must be applied for prior to their removal in the eastern portion of Rocklow Creek constructed channel, an application for a Fisheries Permit Application (to harm marine vegetation) must be submitted to NSW Department of Primary Industries (Fisheries). Upon

receipt of the permit, the removal of mangroves in the eastern portion of Rocklow Creek constructed channel must be undertaken prior to the expiration of the Fisheries Permit Application.

No Saltmarsh vegetation community is within the disturbance area. If any impacts are observed on areas of Saltmarsh, a Fisheries Permit Application will be completed.

2.5 ALIGNMENT WITH OTHER PLANS RELEVANT TO THE PROJECT

This Plan has also been informed by:

- Previous and updated management plans for the Project.
- Flora and Fauna Assessment for the Dunmore Lakes Sand Extraction Proposal Stage 2, 3 and 4 (Kevin Mills & Associates 2004).
- Dunmore Lakes Sand Extraction Proposal Stage 2, 3 and 4 Environmental Impact Assessment (R.W. Corkery & Co. 2004).
- Dunmore Lakes Sand Extraction Project Modification 2 Environmental Assessment updated April 2019 and associated Response to Submissions updated June 2019.

A number of other management plans and strategies apply to the Project including a Flora and Fauna Management Plan (FFMP), Water Management Plan (WMP), and Long Term Management Strategy. The management actions in these plans complement one another and should be considered holistically.

3 EXISTING ENVIRONMENT

3.1 SITE DESCRIPTION

Dredging commenced for stages 2 to 4 in June 2007. Since then, due to the high demand for sand in the Sydney market, sand in Stage 2 has been extracted with dredging recently moving into Stage 3. Given recent high demand, the sand resource in Stage 3 is expected to be exhausted during 2021. Stage 4 encompasses an area containing the road access and private rail line to the approved project, supporting infrastructure for stages 2 to 4 and Boral's adjacent Dunmore Hard Rock Quarry. Given this, Stage 4 cannot be extracted until these activities are relocated. Stages 5A and Stage 5B are the next sand extraction areas to be developed providing product sand for the next 4 to 5 years.

Four stages (Stages 2 -5) of sand extraction within the site are shown in Figure 1.

Stage 2

Stage 2, covering 37 hectares, adjoins the northern boundary of Tabbita Road and encompasses a large area of cleared and disturbed grassland and the footprint of sand extraction activities, which is now being rehabilitated.

Stage 2 also contains the sand processing infrastructure, which will continue to be utilised during sand extraction activities in Stage 3, 4 and 5. Several tributaries drain into the sand extraction boundary; the Western tributary flows east into the western sand extraction boundary, and the Northern Tributary flows south into the northern sand extraction boundary. Stage 2 is largely drained by the Western Tributary in the south- east corner, which eventually flows into to Rocklow Creek downstream of the site.

Stage 3

Stage 3, covering 21 hectares, adjoins the southern boundary of Tabbita Road. Rocklow Creek transects Stage 3, which flows into a wetland located to the east of Kiama Bypass, conveyed by a culvert beneath Kiama Bypass.

Stage 4

Stage 4, covering five hectares, encompasses the Tabbita Road corridor, which includes the current road and rail access to Dunmore Hard Rock Quarry, located to the west of the site. Stage 4 is unlikely to be subject to sand extraction in the near future.

Stage 5

Stage 5, covering 38 hectares, is located approximately 1.1 km south- south east of the existing site and is on an alluvial coastal flood plain, adjacent to the tidal reaches of the Minnamurra River. The northern portion of the extraction area has been partially cleared and has historically been used for grazing. Stage 5 is bound by Riverside Drive to the north and Princes Highway to the west.

3.1.1 Land Use

The site is characterised by existing sand extraction activities (i.e., in Stage 3), land under rehabilitation and agricultural land that has been predominantly cleared of native vegetation for the grazing of cattle. Land use in the surrounding locality includes:

- Agricultural land, primarily cattle grazing.
- Commercial and industrial development, including Dunmore Hard Rock Quarry and Dunmore Concrete Batching Plant immediately to the west and Dunmore Resource and Recycling Facility in the east.
- Residential development, including Dunmore Lakes Estate to the south west of Stage 5 and Minnamurra to the east of stage 5.
- Infrastructure development, including the Princes Highway and the South Coast Rail Line divides the site.
- Minnamurra River and associated wetland (protected under State Environmental Planning Policy (Coastal Management) 2018) (Coastal SEPP) is located adjacent to Stage 5.

3.1.2 Hydrology

The existing site is located within the catchment of Rocklow Creek, a tributary of the Minnamurra River. The confluence of Rocklow Creek and the Minnamurra River is located one kilometre downstream of the site.

Rocklow Creek has been highly modified from its natural state and is predominantly conveyed through man-made channels. In some areas the Creek has been re-directed for agricultural activities. Rocklow Creek flows from west to east through the southern portion of Stage 3 to a culvert in the south-eastern of the site, which channels the creek under the Princes Highway and Railway line to a Coastal SEPP wetland (Cumberland Ecology 2010). The tidal influence of these wetlands extends a short distance upstream of the Princes Highway into the Stage 3 area. Tidal inundation to Stage 3 only occurs during above average high tides (R.W. Corkery & Co. 2004).

Several tributaries drain into the sand extraction boundary; the Western tributary flows east into the western sand extraction boundary, and the Northern Tributary flows south into the northern sand extraction boundary. Stage 2 is largely drained by the Western Tributary in the south-east corner, which eventually flows into to Rocklow Creek downstream of the site.

The Northern Tributary drains into the Western Tributary, and the Eastern Tributary runs in a southerly direction along the north eastern boundary of the site. The Eastern Tributary is mostly contained within the adjacent Roads and Traffic Authority easement, however flows across the north-eastern corner of the site (Cumberland Ecology 2010).

The Stage 5A and Stage 5B extraction areas are located between the Minnamurra River to the south, an unnamed tributary almost directly west, and Rocklow Creek to the north (South East engineering and environmental 2019).

3.1.3 Topography

The existing site is located upon the Illawarra Coastal Plains and is characterised by low lying alluvial land (Cumberland Ecology 2010). The site lies within an area of flat to gently inclined alluvial plains on the Illawarra Coastal Plain. Surrounding relief is generally less than 20m and slopes are generally less than 30%. The entire site is low lying at approximately 1.5m to 2m AHD (R.W. Corkery & Co 2004).

The site is subject to periodic inundation caused by flooding of Rocklow Creek and Minnamurra River (Cumberland Ecology 2010).

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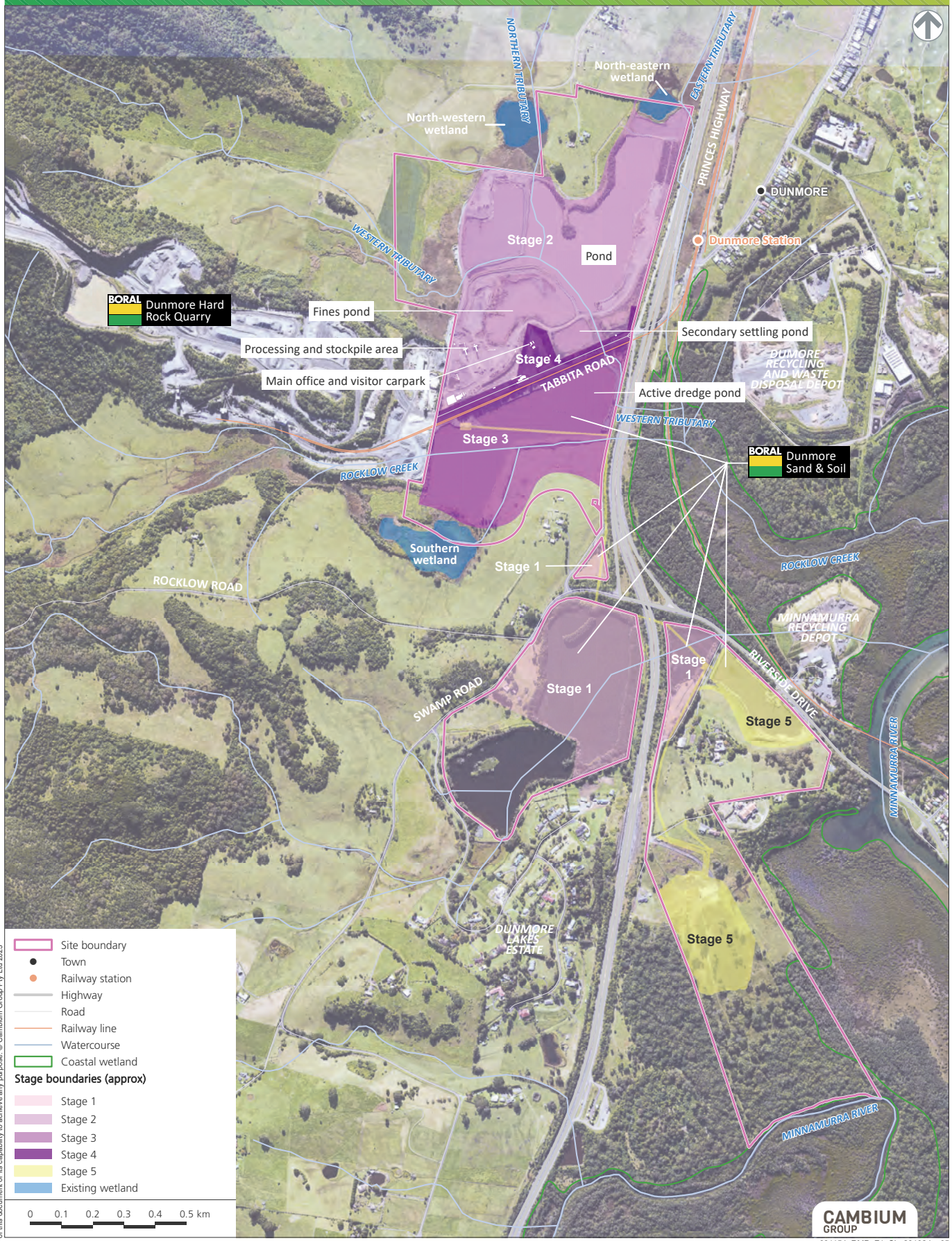
Figure 1
Site layout
Rehabilitation Management Plan / Dunmore Lakes Sand Project



Source: LPI (2017), Aerometrex (2023), Boral (2016), Cambium Group (2019, 2023).

3.2 CURRENT BACKFILL ESTIMATES

Backfilling of extractive areas will continue to be progressive in Stages 2 ,3 and 5, dependent upon the dredge pond being maintained at a sufficient size for dredging to continue effectively. The current backfill estimates are summarised in Table 4.

Table 4 Current backfill estimates

Stage	Backfill Estimate (tonnes)
2	Approximately 2.5 million tonnes*
3	Approximately 2.5 million tonnes*
4	To be determined
5	Approximately 325,000 tonnes*

* Includes site overburden and imported VENM

3.3 RECENT REHABILITATION MANAGEMENT

The rehabilitation management at the site takes a progressive rehabilitation approach. Rehabilitation is able to occur concurrent to extraction activities, in areas that will not be disturbed by future dredging activities and not required for processing or stockpiling purposes.

Rehabilitation activities undertaken to date have been in accordance the RMP prepared by Arcadis (2017). Dredging is completed in the Stage 2 area.

Rehabilitation works are ongoing along the northern area of stage 2 with 6,300 native plants from the Swamp Oak Floodplain Forest and Freshwater Wetlands in Coastal Floodplains community types planted along the north western edge of Stage 2 in 2017. A bird island was also constructed and planted out with the communities and species described above.

The banks of the realigned Western Tributary channel in Stage 3 commenced rehabilitation in 2017, with the laying of jute matting and approximately 2,600 tube stock of freshwater wetland species planted out.

In December 2019 a further 8500m^2 of Swamp Oak Floodplain Forest was planted on the NE section of Stage 2. These saplings are progressing well. The tree screens planted in 2007 are progressing well with individuals now 13 years old. Landform construction using VENM is ongoing along the southern and eastern section of Stage 2. This landform will form the foundations for a further section of Swamp Oak Floodplain Forest to be planted.

Backfilling and landform construction in Stage 3 has commenced starting with the Eastern edge and the south eastern tidal zone.

The location of rehabilitation areas can be seen below in Figure 2.

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Figure 2
Recent rehabilitation management
Rehabilitation Management Plan / Dunmore Lakes Sand Project

Source: LPI (2017), Aerometrex (2023), Boral (2016), Cambium Group (2019, 2021, 2023).

4 SITE REHABILITATION AND LANDSCAPE PLAN

4.1 REHABILITATION CONTEXT

4.1.1 Extraction Area

The development conditions specify limitations on the extraction area:

For stages 2 to 4;

- Extraction cannot occur within 3m of the site boundary;
- Extraction cannot occur within 3m of the bank of the Eastern Tributary.
- Extraction of and within 3m of the bank of the Northern and Western Tributaries will be in accordance with an approved Riparian Management Plan;
- Extraction cannot occur within 10m of the bank of the southern or north-eastern wetlands;
- Extraction within 40m of the southern, north-eastern and north-western wetlands must only occur towards the end of dredging when the dredge pond water volume is maximised, and in accordance with an approved Riparian Management Plan; and
- Extraction must not occur within 3m of the bank of the realigned Rocklow Creek.

For stage 5;

- Extraction cannot occur within 3m of the site boundary for 5A adjacent to Riverside Drive or for 5B adjacent to private property at 79 Fig Hill Lane.

4.1.2 Extraction Sequencing and Timing

The current progress of the extraction sequencing and timing is as follows:

- DLSP completed Stage 1 and Stage 2 dredging;
- The Processing Area in Stage 2 has been established and no extraction will be undertaken here during the course of site operations and possibly beyond;
- The majority of Stage 2, south of the Western Tributary, has undergone progressive filling and been converted to form part of the processing area until project completion;
- The Realignment of Western Tributary was completed in 2016 under CAA 10 ERM2010/1116 granted on 14/12/15. Details of these works are contained in Appendix D;
- Extraction in Stage 3 commenced following the realignment of the Western Tributary;
- Prior to commencing any works (including extraction) within 40m of Rocklow Creek, a Controlled Activity Approval under Water Management Act 2000 was obtained. Controlled Activity Approval 10CX122266 was approved on 18 December 2017 and has been extended to an expiry date of 17/12/23 (Appendix E). This allows for extraction up to 10m from Rocklow Creek in Stage 3;
- Rocklow Creek has yet to be realigned as landowners consent for commencement of substage 3C1 has not been granted. A controlled activity to complete the Rocklow Creek will be obtained prior to works commencing in substage 3C1 as per S3.C10; and
- Once dredging in Stage 3 is completed the dredge will move to stage 5A and then stage 5B

4.2 PROGRESSIVE REHABILITATION APPROACH

A high standard of progressive rehabilitation and landscaping of sand mining areas will be undertaken throughout the lifespan of the sand mine, initially focusing on rehabilitation of Stage 2 following the completion of resource extraction. Rehabilitation activities will commence in areas that will not be

disturbed by future dredging activities and not required for processing or stockpiling purposes. This approach will allow for rehabilitation to progress adjacent to extraction activities and consequently the establishment of vegetation in various areas of the site as they become available following the completion of extraction, backfilling and re-profiling.

4.3 REHABILITATION OBJECTIVES

This RMP has been prepared in accordance with Conditions 42 through 46 of DA 195-8-2004. The overall objectives of the RMP, as derived from these conditions, are to describe:

1. The progressive rehabilitation of all disturbed areas to a final land use in general accordance with final landform outlined in the Dunmore Lakes Sand Extraction Proposal 2, 3 and 4, EIS; EA Mod 1, EA Mod 2, SEE Mod 3.
2. The rehabilitation measures for the site that would be implemented to:
   - Manage remnant vegetation and habitat on the site; and
   - Ensure compliance with the rehabilitation objectives and progressive rehabilitation obligations in the CoA;
3. The measures that would be implemented over the next five years, including the procedures to be implemented for:
   - Ensuring compliance with the rehabilitation objectives and progressive rehabilitation obligations in this approval;
   - Providing connectivity between vegetation communities re-established on the site and between the site surrounding areas;
   - Realignment of the Western Tributary and rehabilitation the Western Tributary and Rocklow Creek; and
   - Controlling erosion.
4. A program to monitor the effectiveness of these measures and progress against the performance and completion criteria; and
5. Identify and allocate responsibility for monitoring, reporting, reviewing and implementing the plan.

4.4 LANDSCAPING PLAN

The following sections discuss the landscape plan for the areas to be rehabilitated.

4.4.1 Landscape Concept Plan

Condition 42 of the CoA requires that the site be rehabilitated in a manner generally consistent with the EIS Final Landform for stages 2 - 4 and EA Mod 2 final landform for Stage 5 (Appendix B) and, approved in principle by DoP.

4.4.2 Landscape Design

The proposed final landform for Stages 2-4 is illustrated in Figure 3 and includes developing the dredged area into lakes located within Stages 2 and 3 with habitat islands and extensive areas of wetlands and Swamp Oak Floodplain Forest being established via progressive rehabilitation. Stage 5A will be backfilled and restored to pre-existing conditions with Stage 5B remaining as an open water pond with a fringing wetland of Littoral zone species (Figure 4). No access roads will be retained in the final landform in Stage 5 as per landowners consent.

Where possible, the final landform has been designed to blend in with the surrounding landscape to reduce the visual impact of the site. The final landform is indicative at this point as it will depend on availability of appropriate materials for the task.

The perimeter of sections of the extracted areas in Stage 2 will be backfilled to create an area of predominantly flood-free land with sufficient width around the lake to accommodate the proposed final land uses.

The final landform is shown in Figure 3 and Figure 4 and features the following:

Stage 2:

- A lake that includes a bird island connected to the lakes edge by a thin strip of land. The floor of the lake will reflect the final depth of the dredging area and is approximately down to 12 m deep. The eastern edge of the lake has a been rehabilitated to create a fringing wetland vegetation community;
- A wetland environment has been created above the fines in the north-western section covering an area. This wetland would provide habitat for native flora and fauna and supplement the habitat of nearby protected wetlands
- Two areas of elevated land north of Tabbita Road have been created by a combination of fines and/or backfill with VENM. The lands have been completed to an elevation of approximately 3.7m AHD;
- Reinstatement of the channel for the Western Tributary has been completed in a similar alignment to the existing alignment with localised curvi-linear sections. The lower reaches of the Western Tributary have been re-aligned to direct runoff beneath the upgraded Princes Highway through Culvert 4; and
- The existing Tabbita Road corridor will be reinstated to either the existing level or raised to the level of the existing flood-free land.

Stage 3:

- A lake including bird islands ;
- Most areas surrounding the lake will be rehabilitated to Swamp Oak forest and Freshwater wetland communities while the area to the south-east will continue to be used for grazing;
- Areas in Stage 3 will be backfilled to approximately 2m AHD, a level comparable to pre-extraction levels; and
- The channel for Rocklow Creek would be re-instated to its former natural alignment.

Stage 5A:

- Stage 5A will be backfilled to create grazing land to its pre-extraction activity land form;
- The final land form levels are expected to be between 1-3 m AHD, depending on the existing natural slopes.

Stage 5B:

- Stage 5B will remain a lake that will be approximately 5 ha
- The bunds around the lake will remain until water quality has returned to appropriate levels that do not represent a risk to the downstream environment and can be integrated back into the floodplain storage.
- The lake edge will be rehabilitated to create a ribbon of riparian vegetation around the edges of the pond forming fringing wetland community of littoral zone species.

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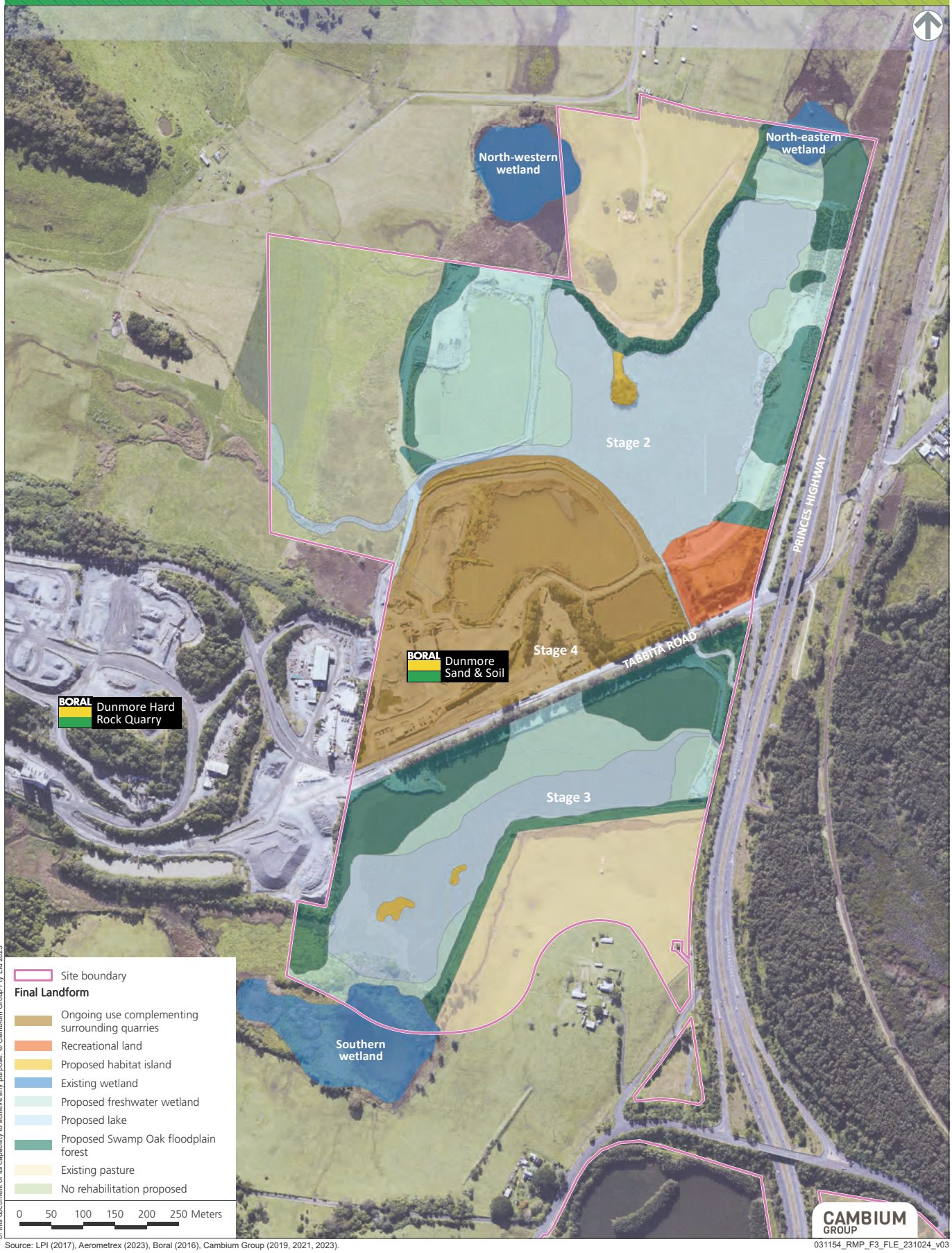
Figure 3
Final landform - stages 2, 3 and 4

Rehabilitation Management Plan / Dunmore Lakes Sand Project



Source: LPI (2017), Aerometrex (2023), Boral (2016), Cambium Group (2019, 2021, 2023).

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Figure 4
Final landform - stage 5
Rehabilitation Management Plan / Dunmore Lakes Sand Project

Source: LPI (2017), Aerometrex (2023), Boral (2016), Cambium Group (2019, 2021, 2023).

4.5 REHABILITATION SCHEDULE

The following section discusses the short-term (1-5 years) rehabilitation measures to be completed within the next five years, and the medium term (6-15 years) measures to be completed in the following six to fifteen years. Long-term rehabilitation measures are no longer applicable on the basis of the remaining resource life at DLSP.

4.5.1 Short and Medium Term Measures

The aim of the rehabilitation plan is to progressively encourage a sustainable vegetative cover in accordance with the rehabilitation and final land use objectives of the site. Progressive rehabilitation will occur in areas that will not be disturbed by future dredging operations and will consist firstly of backfilling and re-profiling the land. Backfilling of extracted areas will be progressive within each of the stages, contingent on the dredge pond being maintained at a sufficient size for dredging to continue effectively. During rehabilitation works, sediment and erosion control management actions will be undertaken in accordance with the Sediment and Erosion Control Plan included in the DLSP Water Management Plan. Once the re-profiling is complete, planting of appropriate native species will occur in accordance with the Flora and Fauna Management Plan.

The following recommendations outline the various approaches to the staged, progressive rehabilitation of the DLSP site. Rehabilitation activities are broadly separated into short and medium term measures to coincide with progressive stages of extraction and eventual decommissioning and formation of the final landform. To correspond with the extraction plans for the remaining stages, the timeframes for rehabilitation activities have been defined and discussed in the following sections:

The rehabilitation measures are covered in this document as short (1-5 years) and medium-term (6-15), are broadly outlined below (Table 5) and illustrated in Figure 5 and Figure 6.

Table 5 Short- and medium-term measures

Timing	Measures
Short-term (< 5 years)	Landform construction using VENM is ongoing along the southern and eastern section of Stage 2 and eastern section of stage 3
	Maintenance of native vegetation previously planted within Stage 2.
	Evaluation of vegetation plantings thus far and revision of species list, if successful establishment of desired plant communities has not occurred.
	Backfilled areas no longer required for access and dredge anchoring will be progressively vegetated as per the FFMP.
	Creek and riparian areas are managed in accordance with the relevant Riparian Area Management Plan (refer to Appendix B).
Medium-term (6-15 years)	Ongoing maintenance of all revegetated areas undertaken as required i.e. weed and pest control.
	Progressive rehabilitation of Stage 3 and 5 as permitted by the extraction process.
	Progressive rehabilitation of Stage 4 if commenced and rehabilitation of the processing area.
	Landscape to final landform.

4.6 REHABILITATION PROCEDURES

The following section details the rehabilitation procedures specific to different areas around the site. Any rehabilitation pertaining to riparian areas are discussed in the RAMP (Appendix B).

4.6.1 Sand Mine Site Boundary

i. Fencing

The boundary of the existing site was fenced prior to extraction to prevent cattle, horses and other livestock from entering the site and will be remain as part of the final landuse. Fencing for Stage 5 will be reviewed and replaced if necessary.

ii. Tree Screening

Along the eastern boundary, as well as the north eastern and south eastern corners of the site, a tree screen was established prior to commencement of any works to screen the processing area, as required by the Conditions of Approval. The vegetation is intended to act as a visual screen to enhance the lakes' visual appeal and to restrict and soften views of the site activities. No screen is proposed for Stage 5.

iii. Weed control

The control of invasion of competing grasses from surrounding land will be undertaken in accordance with the Pest and Weed Management Plan found in Appendix D of the Flora and Fauna Management Plan.

iv. Erosion and sediment control

Erosion and sediment control will be undertaken in accordance with the Sediment and Erosion Control Plan (SECP) found in the (WMP).

4.6.2 Active Sand Mine Areas

As previously discussed, the rehabilitation of the site is undertaken in a progressive manner. This approach will allow for rehabilitation to progress within active quarry areas, adjacent to extraction activities. Consequently, vegetation can be established in various areas of the site as they become available, following the completion of extraction, backfilling and re-profiling.

It is recognised that a strategy of progressive rehabilitation and landscaping through the lifespan of Stages 2, 3 and 4 is limited in effect due to ongoing disturbance of the areas.

i. Stockpiling of Topsoil

Topsoil from extraction areas will be stored in processing and stockpiling area until it is required for blending and/or rehabilitation works. Stockpiles will be free of weed seeds and stabilised with a sterile cover crop if they are to be in place for greater than 10 days if required.

ii. Backfilling and re-profiling

Backfilling and re-profiling will be undertaken progressively in areas where dredging is complete with VENM in accordance with EPL 11147 and the final landform presented in Figure 3.

iii. Revegetation

The areas prepared for revegetation adjacent to extraction activities will be revegetated in accordance with the final landform. Details for revegetation are discussed in Section 5.

iv. Weed control

All weed control will be undertaken in accordance with the Pest and Weed Management Plan found in Appendix D of the Flora and Fauna Management Plan.

v. Erosion and sediment Control

Erosion and sediment control will be undertaken in accordance with the Sediment and Erosion Control Plan (SECP) found in the (WMP).

4.6.3 Lakes

The final lakes within Stage 2, 3 and 5 have been designed to maximise the extent and diversity of habitats. Plant species planted along the lakes edges will be selected to maximise the bank stability. Each lake in Stages 2 and 3 will be edged with freshwater wetlands. A “bird island” tied to the edge of the lake by a thin strip of land has been constructed in Stage 2.Islands are also planned in Stage 3 to provide additional habitat for native fauna. In Stage 5 the lake will be edged in a fringing wetland community of littoral zone species. Further details are provided in Section 5.

Stage 2 Lake

i. Edging treatment

It is proposed that the eastern edge of the lake be treated to create a fringing wetland community, and this would be complemented by adjoining tree stands. Topsoil and/or processing fines will be dispersed over all areas of foreshore wetlands to provide a suitable substrate for the growth of wetland species. The edge treatment will provide for vegetation to be planted to stabilise the banks of the lakes and enhance habitat diversity intermittently around the lake edges. The boundary of the lake will be reinforced with measures described in the SECP. Detailed vegetation measures for the wetlands are discussed in Section 5.

ii. Bird habitat island

A bird habitat island has been constructed using VENM as per EPL conditions and the approved Waste Management Plan.

Stage 3 Lake

A similar treatment is envisaged for Stage 3 Lake, with the exception that the wider area surrounding Stage 3 Lake would continue to be used for grazing. The EIS (R.W. Corkery & Co. 2010) notes that in the event the lake overflows, this water would be directed via two depressions aligned with Culverts 2 and 3 to enable the flows to pass beneath the Princes Highway. Bird Islands are also planned.

Stage 5 Lake

i. Edging treatment

It is proposed that the edge of the lake be treated to create a fringing wetland community which is complemented by adjoining tree stands to the west and south. Topsoil and/or processing fines will be dispersed over all areas of lake edge to provide a suitable substrate for the growth of wetland species. The edge treatment will provide for vegetation to be planted to stabilise the banks of the lakes and enhance habitat diversity around the lake edges. The boundary of the lake will be reinforced with measures described in the SECP. Detailed vegetation measures for the lake are discussed in Section 5.

4.6.4 Fines Pond

After completion of Stage 3 extraction, the flood bund around the fines pond area will be removed to increase habitat connectivity between the wetland and Stage 2 Lake. It is planned that this area will be left last to rehabilitate due to the ongoing use of the wash plant facility.

4.6.5 Processing Area

It is likely that the Processing Area will remain functioning until the completion of Stage 4. Rehabilitation of this area would not commence until all extraction works have been completed in Stage 4 and possibly later if the area is used for processing for other quarries.

4.6.6 Northern Property

The hill separating the northern eastern and north western wetlands is owned by DLSP. The land contains a homestead, a cluster of farm infrastructure and pastureland. The hill area will not be affected by extraction and therefore no rehabilitation will be necessary.

i. Fencing

A fence will be constructed at the base of the hill to prevent livestock from entering the adjacent wetlands or Stage 2 Lake. A screen of Swamp Oak Floodplain Forest will be established along the lake edge as a further buffer between the northern property and the Stage 2 lake system.

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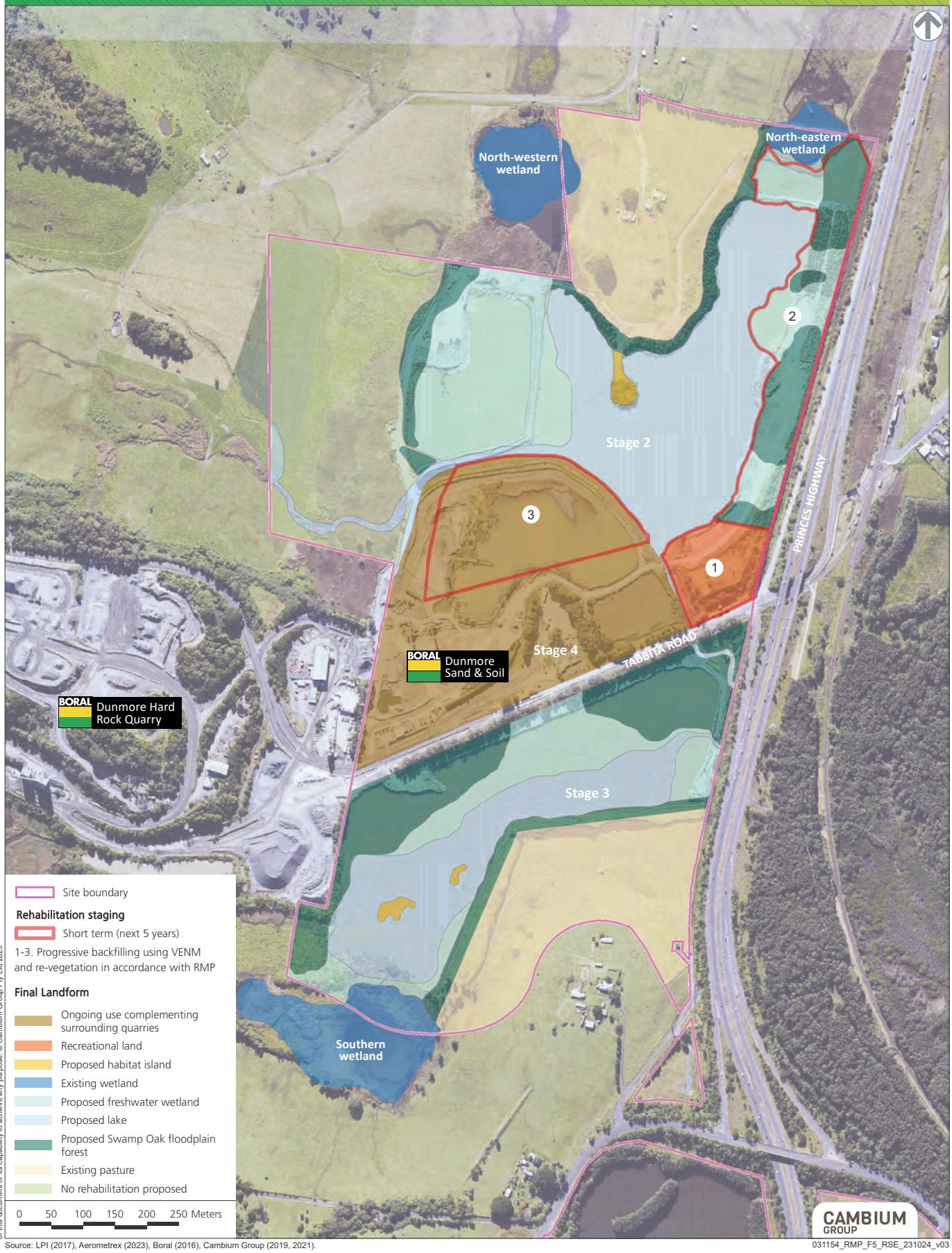
Figure 5
Rehabilitation - short term (next 5 years)
Rehabilitation Management Plan / Dunmore Lakes Sand Project



Source: LPI (2017), Aerometrex (2023), Boral (2016), Cambium Group (2019, 2021).

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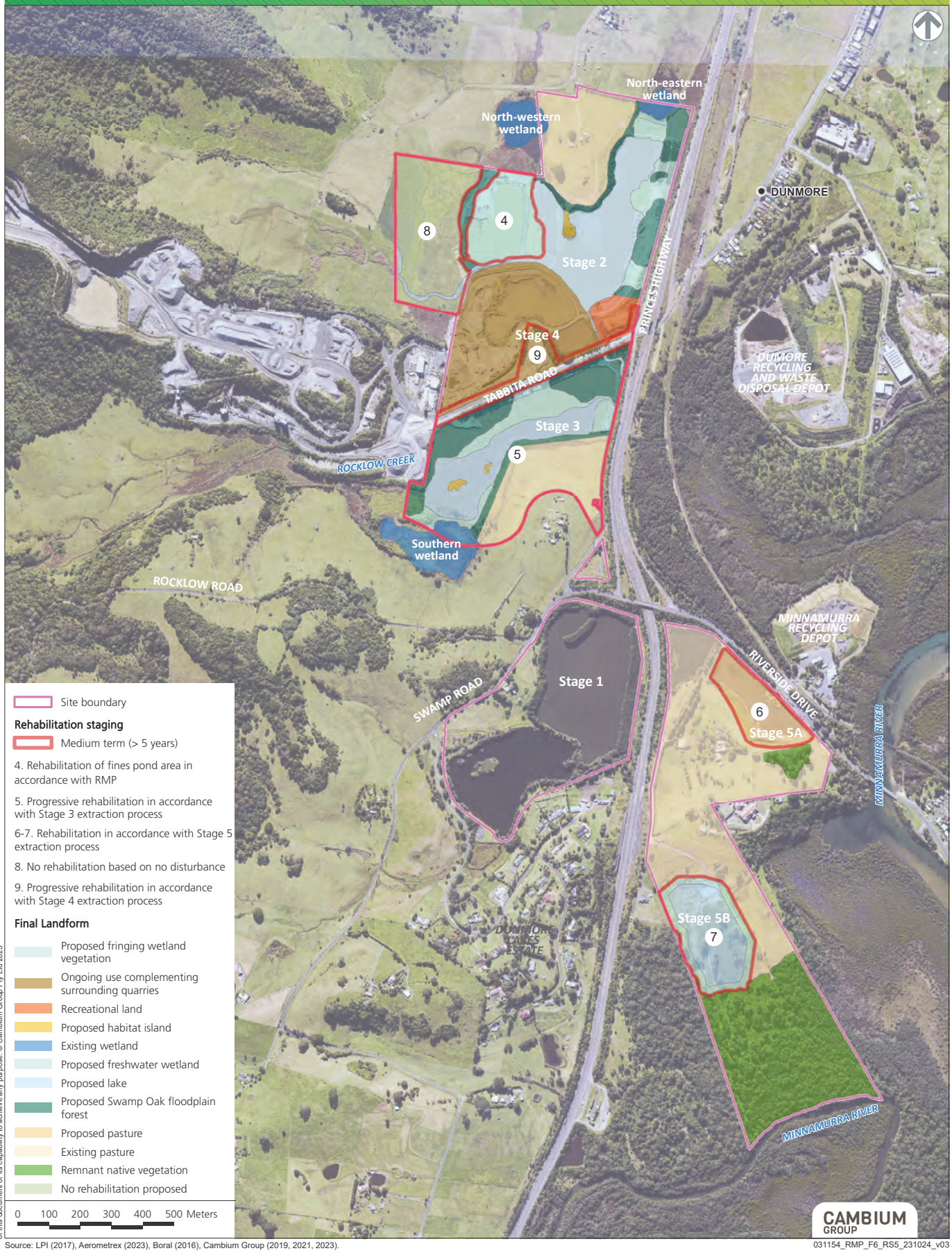
Figure 6
Rehabilitation - medium term (> 5 years)
Rehabilitation Management Plan / Dunmore Lakes Sand Project



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Source: LPI (2017), Aerometrex (2023), Boral (2016), Cambium Group (2019, 2021, 2023).

5 REVEGETATION

Revegetation works undertaken as part of rehabilitation activities will be guided conducted by a qualified bush regenerator or ecologist with at least five years of experience.

5.1 STAGED REVEGETATION

The site will be rehabilitated in a manner that is generally consistent with the EIS Final Landform (Figure 3 and Figure 4). Rehabilitation and subsequent revegetation will be undertaken in Stage 2 first, followed by Stages 3, 5 and then Stage 4

Within each stage, revegetation will be undertaken progressively, as the final landform is gradually backfilled and re-profiled. This aims to stabilise re-profiled areas as soon as possible, minimise potential erosion and degradation of areas of exposed topsoil, and reduce supply pressure on local providers of seed and tubestock that will be required to provide the plantings (see Section 5.2.4).

5.2 NATIVE SPECIES SELECTION

5.2.1 Swamp Oak Floodplain Forest

Revegetation of Swamp Oak Floodplain Forest EEC will be undertaken in areas identified on Figure 3. Much of the eastern boundary of Stage 2 and Stage 3 will be revegetated with Swamp Oak Floodplain Forest, and this forest vegetation will serve as a visual screen of the site from the adjacent Princes Highway.

Locally occurring species have been selected for revegetation, to maximise plant survival and provide habitat resources to local wildlife. Species selected include native species presently occurring on the site and characteristic species of Swamp Oak Floodplain Forest (DECC 2007, NSW Scientific Committee 2011a).

The spatial arrangement of plantings will emulate a natural vegetation formation such that plants will be placed in a random arrangement. Ground layer species will be planted in small dense groups to create a mosaic effect, while trees will be planted as more widely spaced individuals. Planting densities were determined in accordance with the lessons learned from Stage 1.

The planting of tubestock will be complemented with direct seeding of locally occurring grass species, such as *Microlaena stipoides* (Weeping Grass). This grass has been previously recorded within the site (Cumberland Ecology 2015), is commonly used for revegetation of river and stream edges to reduce erosion and has high shade tolerance (Native Seeds 2016).

Species selected for revegetation will depend upon availability at the time of ordering and may not include all species listed in Table 6.

Table 6 Planting species selection and density for Swamp Oak Floodplain Forest

Scientific name	Common name	Planting density
Trees		
Casuarina glauca	Swamp Oak	1 plant per 2-4m²
Acmena smithii	Lilly Pilly	1 plant per 5m²
Glochidion ferdinandi	Cheese Tree	
Melaleuca spp. (Melaleuca quinquenervia, ericifolia, and/or styphelioides)	Paperbarks	
Groundcovers		
Lomandra longifolia	Spiny-headed mat-rush	2 plants per 1 m²
Carex appressa	Tussock Sedge	
Centella asiatica	Indian Pennywort	
Commelina cyanea	Commelina	
Gahnia clarkei	Tall Saw Sedge	
Oplismenus imbecillis	Basket Grass	
Persicaria decipiens	Slender Knotweed	
Microlaene stipoides	Weeping Grass	20-25kg seed per hectare
Vines and climbers		
Parsonsia straminea	Common Silkpod	1 plant per 5m²
Geitonoplesium cymosum	Scrambling Lily	
Stephania japonica	Snake Vine	

5.2.2 Wetlands

Revegetation of Freshwater Wetlands on Coastal Floodplains EEC will be undertaken in areas identified on Figure 3. Locally occurring species have been selected for revegetation, to maximise plant survival and provide habitat resources to local wildlife. Plantings will comprise of grasses, sedges and rushes that are characteristic of Freshwater Wetlands (DECC 2008, NSW Scientific Committee 2011b), and will be planted in clumps of the same species. Species selected for revegetation will depend upon availability at the time of ordering and may not include all species listed in Table 7. Revegetation will occur in two zones:

Littoral zone

The littoral zone surrounds the wetland edge and is frequently dry, although it undergoes regular water level fluctuations. The primary role of plants in the littoral zone is to provide an edge buffer zone to protect banks from erosion. Dense plantings of sedges and *Gahnia* species (Table 7), to achieve 80% vegetation coverage, will be established in the littoral zone.

Shallow Marsh

Shallow marsh is flooded most of the time, but plants will be tolerant of some exposure to dry conditions. The primary role of plants in the shallow marsh zone is to provide a substratum for algal epiphytes and biofilms to enhance soluble pollutant uptake. A diversity of edges and rushes (Table 7) will be established in the shallow marsh zone.

Table 7 Planting species selection and density for Freshwater Wetlands

Scientific name	Common name	Planting density
Littoral zone		
Baumea articulata	Jointed Twig-rush	~3 plants per m²
Baumea rubiginosa	Twig-rush	
Bolboschoenus caldwellii	Marsh Club-rush	
Carex appressa	Tall Sedge	
Cyperus lucidus	Leafy Flat Sedge	
Hemarthria uncinata	Matgrass	
Juncus usitatus	Common Rush	
Panicum obseptum	White Water Panic	
Paspalum distichum	Water Couch	
Pseudoraphis spinescens	Spiny Mud Grass	
Shallow marsh (to 20cm depth)		
Baumea acuta	Pale Twig-rush	~6 plants per m²
Baumea rubiginosa	Soft Twig-rush	
Bolboschoenus fluviatilis	Marsh Clubrush	
Cyperus lucidus	Leafy Flat Sedge	
Eleocharis acuta	Common Spike rush	

5.2.3 Habitat Island

The habitat islands (one in Stage 2, two in Stage 3) will remain dry. Vegetation to be established will include tall grasses, shrubs and trees characteristic of Swamp Oak Floodplain Forest (Table 6).

5.2.4 Native Seed Provenance

All plants (seeds and tubestock) sourced for revegetation will be of local provenance (i.e. Illawarra region). Local provenance plants are often better adapted to local environmental conditions and have a greater capacity to provide habitat, food, and other resources for local wildlife.

Canopy trees such as eucalypts and certain pioneer shrubs (often species of the family *Fabaceae* such as peas and wattles) are generally the most easily obtained, collected, and propagated species that are most commonly used in revegetation projects. Groundcovers, particularly in any quantity or diversity, are less often used. Accordingly, the final species selection depends on the availability of species listed in Table 6 and Table 7, and not all species may be used.

Seeds and tubestock are to be sourced from a reputable supplier of local provenance plants, such as:

- Shellharbour City Council Nursery: 02 4221 6191
- Jamberoo Native Nursery: 02 4236 0445
- Native Seeds (for native grasses): 03 9555 1722

Plants will be ordered with sufficient time prior to the commencement of proposed revegetation works to determine the availability of various species.

5.2.5 Fringing Wetland Community

The vegetation to be established on the edges of the Stage 5B lake will include species characteristic of Freshwater Wetland community (Table 6).

5.3 EXOTIC GRASSLAND SPECIES SELECTION

Stage 5a will be rehabilitated with pasture grasses and forbs in consultation with the landowner.

5.4 SOIL PREPARATION

A successful planning program starts with appropriate soil management. Ground preparation techniques are used to soften the soil and increase water infiltration, root area and soil aeration. Any damage to the soils' biological and chemical properties are most likely to happen through inappropriate stockpiling. The physical properties of the soil can be damaged through excessive compaction, over working, or working the soil at the wrong moisture content.

The following recommendations will be implemented with respect to the management of soils (Landcom, 2004):

- Use topsoil on all lands to be revegetated;
- Before spreading topsoil, scarify the ground surface along the line of the contour to break any compacted and / or smooth materials and enable key bonding of the materials to one another;
- Apply topsoil to a depth appropriate for the gradient of the slope, generally between 50 and 100mm. Topsoil must not be placed on slopes steeper than 2h:1v without any additional means of stabilisation; and
- On completion of the respreading process, leave disturbed lands with a scarified surface to inhibit soil erosion, encourage water infiltration and help with keying topsoil later.

Prior to seeding or planting of tubestock, areas to be revegetated must be free of weeds. Weed management and control is to be undertaken in accordance with the *Pest and Weed Management Plan* (Appendix D of *Dunmore Lakes Sand Project Flora and Fauna Management Plan* (Boral 2021).

5.5 PLANTING

Revegetation will involve two methods:

- Direct seeding: Sowing seeds directly onto the site on which you wish to establish them by mechanical or hand methods; and
- Planting: Planting nursery-grown seedlings such as cell or tube-grown plants by mechanical or hand methods.

5.5.1 Timing

Ideally, planting will be undertaken during wetter and milder conditions during the year (spring/summer). Seeds and tubestock need to have been ordered with sufficient time prior to the proposed planting period. If the upper soil horizon is not moist at the time of planting, it may be appropriate to water seedlings.

5.5.2 Plant Protection

Stakes and ties will be used if necessary, to protect tubestock.

5.5.3 Watering

Watering is to be undertaken regularly to promote plant growth, in accordance with water restrictions imposed by Council or the NSW State Government at that time. It is recommended that watering of

plants be conducted twice per week during their initial establishment phase (0-3 months), before 10am or after 4pm. Between 6-12 months, watering will be undertaken on a monthly basis or as required to ensure continued plant growth.

5.5.4 Record keeping

For each discrete patch of native revegetation (ie each area of Swamp Oak Floodplain Forest or Freshwater Wetland as shown in Figure 3), the following data will be recorded:

- Date of planting;
- Species planted;
- Type of planting (seed or tubestock);
- Number of plants of each species planted;
- Provenance of each species and source nursery;
- Whether any protective treatment has been applied and
- Depth of water planted in (for shallow marsh species).

5.6 MAINTENANCE

5.6.1 Replacement of Plant Losses

If, during monitoring of revegetation works (see Section 5.7), 80% vegetation coverage is not achieved (as a result of plant failure), the area will be replanted to achieve 80% native coverage.

5.6.2 Weed Control

Weed control will be undertaken in accordance with Pest and Weed Management Plan (Appendix D of Dunmore Lakes Sand Project Flora and Fauna Management Plan (Boral 2021).

The contractor is to obtain materials for planting works from disease free and weed free areas. Additionally, to minimise the risk of any new plant diseases or destructive insects being brought into the area, planting equipment will be washed down before being brought onto the construction site.

If disease or insect infestations are identified during monitoring of revegetation work (see Section 5.7), appropriate measures will be implemented in accordance with the Pest and Weed Management Plan (Appendix D of Dunmore Lakes Sand Project Flora and Fauna Management Plan (Boral 2021).

5.6.3 Other Maintenance

Other maintenance will include:

- Adjust stakes and ties to plants as necessary;
- Prune and shape plants if necessary; and
- Address any erosion of soil subsidence issues which may occur in revegetation zones.

5.7 MONITORING OF REVEGETATION

A monitoring program will be undertaken to measure the success of native revegetation efforts against the completion criteria in Section 5.9. This will allow DLSP to:

- track progress against performance criteria and attainment of completion criteria;
- provide feedback for continuous improvement; and
- assess and manage impacts/potential impacts on biodiversity.

Native revegetation monitoring will be undertaken by a suitably qualified bush regenerator or ecologist in areas identified as proposed Swamp Oak Floodplain Forest and proposed Wetland on the Final Landform (Figure 7).

Monitoring of native revegetation will comprise 2 components:

- Vegetation establishment monitoring: to assess the successful establishment of planting in the short term (measured biannually for 3 years); and
- Ecosystem development monitoring: a seasonally based monitoring program to assess changes in the structure and composition of the vegetation and key fauna habitats in the medium – long term (measured every 2 years).

5.7.1 Vegetation Establishment Monitoring

Vegetation establishment monitoring will be undertaken in areas that have recently been revegetated (see section 5.5). The objectives of the vegetation establishment monitoring are to:

- assess the need for replacing plant losses; and
- address deficiencies with the system (such as any observed bank slumping or weed invasion).

5.7.1.1 Timing

Upon the completion of the revegetation, the performance of the seedling establishment is to be monitored by a suitably qualified bush regenerator or ecologist. Inspections will be undertaken on a six-monthly basis for the first 3 years.

5.7.1.2 Methods

Monitoring will be undertaken at 5 x 5m quadrats (size may vary where revegetation zones are narrow). Indicative monitoring locations area shown on Figure 7, and:

- At least one quadrat is to be located in each discrete patch of Swamp Oak Floodplain Forest community as shown on Figure 3. Additional quadrats will be required in the larger patches of Swamp Oak Floodplain Forest; and
- At least one quadrat is to be located on the margin of each discrete patch of Freshwater Wetland, where it adjoins the lake, as shown on Figure 3.

Each quadrat will be demarcated by a starpicket that is tagged with a unique identifying number on a steel tag, and its location recorded with a GPS. A proforma has been developed that will be completed for each quadrat, for each monitoring period (Appendix C).

5.7.1.3 Photopoint monitoring

At each vegetation establishment monitoring quadrat, a photopoint will be established at the starpicket. A series of photos (north, east, south, west and ground) will be taken at each monitoring event or on a minimum annual basis. This will provide a visual record of:

- Rehabilitation works;
- Changes to vegetation structure and fauna habitats; and
- Emerging threats such as erosion or weed infestations.

5.7.1.4 Reporting

Reporting will comprise a collation of the monitoring proformas completed for each monitoring period, in addition to a summary memo to record compliance with this requirement.

5.7.2 Ecosystem Development Monitoring

Ecosystem development monitoring will be undertaken in areas where native plants have been established. The objectives of the ecosystem development monitoring are to assess:

- the success of the revegetation efforts in establishing the target PCT; and
- the protection of retained biodiversity values at the site.

5.7.2.1 Timing

This seasonally based monitoring program will be undertaken in Spring, commencing the first Spring after an area has been revegetated for 1 year (i.e. once Vegetation Establishment monitoring has been undertaken on a monthly basis for 12 months). Monitoring will be undertaken every 2 years.

5.7.2.2 Methods

The Biodiversity Assessment Method (BAM) (DPIE 2020) is a methodology defined under the *Biodiversity Conservation Act* 2016 (BC Act), which has been developed for the consistent and streamlined assessment of biodiversity values within NSW. The BAM is described in OEH (2017) and includes survey of a range of attributes within a 20 x 50 metre plot. The attributes collected are then entered into the BAM calculator to generate scores for composition, structure, function and vegetation integrity. The scores are based on comparison with standard benchmarks for the relevant plant community type (PCT).

Attributes measured by the BAM include:

- plant species richness in each growth form group;
- native vegetation cover in each growth form group;
- fallen logs;
- hollow-bearing trees;
- leaf litter cover;
- high threat exotic cover; and
- stem size classes (regeneration).

A subset of the Vegetation Establishment plots will be used for Ecosystem Development monitoring to capture both target vegetation communities and Stages 2-5. Indicative plots for Ecosystem Development are indicated in Figure 7.

5.7.2.3 Reporting and deliverables

Reports are to be prepared and submitted to DLSP for every monitoring period.

Each monitoring report will include:

- Introduction;
- Methods;
- Results;
- Maps and figures presenting data graphically, wherever possible;
- Discussion (including an assessment of progress against completion criteria); and
- Recommendations.

Additionally, the monitoring data (xls format) and photopoint images will be submitted to DLSP.

5.8 MONITORING OF EXOTIC GRASSLANDS

Monitoring will be undertaken to measure the success of pasture revegetation efforts in Stage 5A against the completion criteria in Section 5.9

5.8.1 Timing

Upon the completion of revegetation for Stage 5A, the performance of the revegetation is to be monitored on a six-monthly basis for the first 12 months, to allow for any failings in pasture establishment or regrowth of weeds to be addressed quickly. Monitoring will be undertaken on a yearly basis for the following two years.

5.8.2 Methodology

The monitoring will involve an inspection of the site looking at pasture establishment. Monitoring will be undertaken at ten random 1 x 1m quadrats. Each quadrat will measure the % cover of

- desired pasture species; and
- unwanted species.

5.8.3 Reporting and deliverables

Reports are to be prepared and submitted to DLSP for every monitoring period.

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Figure 7
Indicative monitoring plot locations
Rehabilitation Management Plan / Dunmore Lakes Sand Project

Source: LPI (2017), Aerometrex (2023), Boral (2016), Cambium Group (2019, 2021, 2023).

5.9 COMPLETION CRITERIA

Completion criteria and monitoring measures have been developed for application in accordance with the Conditions of Consent (Table 8).

Table 8 Completion criteria

Rehabilitation Aspect	Rehabilitation Performance Indicator	Target
Safety	No. of site hazards	Significant hazards removed or controlled
Landform stability	Minimal rilling, erosion, sediment deposition in drains and water retention basins Stability of voids Diversion of water flows	No significant erosion or soil loss from site No collapsing of voids
Water quality	No dirty water leaving the site	Any water leaving the site should meet consent and EPL limits
Land function	Land capability aligned to proposed future use Maintenance of environmental assets currently on or within proximity to the site	Land function commensurate with the surrounding land fabric that doesn't compromise the value of the surroundings. Works undertaken to maintain environmental assets on the site
Landscaping	Visual continuity of landscape Consistent vegetation cover	Comparable to the future use of the surrounding landscape Land rehabilitated in accordance with the Final Landform
Revegetation of disturbed areas – Vegetation Establishment	Establishment of Swamp Oak Floodplain Forest, Freshwater wetlands and habitat island in accordance with the Final Landform A success rate (survival) of 80% for all plants in Swamp Oak Floodplain Forest, Freshwater wetlands and habitat island Monitoring of revegetated areas in accordance with timing and methodology prescribed in the Rehabilitation Management Plan Within 24 months of the rehabilitation of each stage, achieve a percent cover of 5% (or less) of woody noxious weeds across this same stage	Vegetation establishment monitoring of revegetated areas in accordance with timing and methodology prescribed in the Rehabilitation Management Plan Progressive revegetation of Swamp Oak Floodplain Forest, Freshwater wetlands and habitat island in accordance with the Final Landform A success rate (survival) of 80% for all plants in Swamp Oak Floodplain Forest, Freshwater wetlands and habitat island Within 24 months of the rehabilitation of each stage, achieve a percent cover of 5% (or less) of woody weeds across this same stage
Revegetation of disturbed areas – Ecosystem Development	Resilient and self-sustaining vegetation community, aligning with the target PCT and providing fauna habitat	Ecosystem development monitoring of revegetated areas in accordance with timing and methodology prescribed in the Rehabilitation Management Plan The Composition score (derived from the BAM calculator) is at least 50% of the scores from PCT benchmark.

		The Structure score (derived from the BAM calculator) is at least 50% of the scores from PCT benchmark. The Function score (derived from the BAM calculator) is at least 50% of the scores from PCT benchmark. The Vegetation Integrity score (derived from the BAM calculator) is at least 50% of the scores from PCT benchmark. In the Swamp Oak Floodplain Forest, the density of native trees is at least 50% of that of the analogue site (no./ 1000m2 plot). Exotic plant cover is <20%. The total cover of high threat exotic species (HTEs) is <10%.
Pasture establishment	An established pasture community with a low abundance of weeds	The % cover of desired pasture species is >70% The total cover of high threat exotic species (HTEs) is <10%.

6 REPORTING AND REVIEW

6.1 ENVIRONMENTAL PERFORMANCE REVIEW

Rehabilitation management actions will be measured through regular environmental performance reviews. A status update of the rehabilitation of the site is reported in the Annual Review as per Schedule 5 Condition 9.

These will be based on the measurable outcomes identified in each environmental management plan. The reviews will be used to assess progress in meeting project environmental objectives and targets and will be undertaken by the Environmental Manager or delegate:

- In response to new or revised Boral Project approvals; and
- In response to major changes in site conditions or work methods.

Environmental performance is measured through compliance with the various environmental management plans.

Should an environmental non-conformance be identified as a result of a monitoring result, a non-conformance report will be completed and archived by the Environmental Manager or delegate and remedial action implemented in accordance with the Trigger Action Response Plan (Table 9).

6.2 REPORTING

Reporting on the implementation of this Plan would include the following:

- The results of all environmental monitoring and inspections, including adequacy of site-specific environmental safeguards and management measures;
- Any community/stakeholder complaints or non-conformances with licences/criteria, including any responses provided or actions undertaken in response to the complaint or non-conformance; and
- Any remediation actions or changes to management and mitigation measures.

6.2.1 Annual Environmental Management Report

The results of the rehabilitation management monitoring program will be presented in the Annual Review. This will include detailed assessment of monitoring results collected over the course of the annual monitoring program, an evaluation of any trends occurring across the site, and recommendations for management action. Through the Annual Review management actions may include:

- Refinement of rehabilitation management objectives and initiation of remedial action; and
- Alteration to monitoring frequency, parameters, or locations.

6.3 REVIEW

6.3.1 Review of Monitoring Actions

Any non-compliance identified during monitoring actions, of management and mitigation measures, will be highlighted and an environmental incident report will be completed. The non-conformance will be considered unresolved until:

- The non-compliance issue has been resolved;
- A new or revised procedure has been established and implemented;
- Training has been provided to relevant personnel/ sub-contractors; or
- Additional specific environmental management inspections are detailed in this rehabilitation management plan.

6.3.2 Review of Management Plan

This Plan will be reviewed as per Schedule 5 Condition 3 on the following basis:

- The submission of an incident report
- The submission of an Annual Review
- The submission of an audit report
- The approval of any modifications (unless the conditions require otherwise).

A review of the adequacy of site-specific environmental safeguards and management measures will be carried out by the Environmental Manager or delegate as required. This review will encompass site inspection and auditing reports as well as root cause assessments undertaken for any incidents reported.

6.4 TRIGGERS FOR REMEDIAL ACTIONS

A Trigger Action Response Plan (TARP) has been developed that describes triggers for when remedial rehabilitation actions would be implemented to achieve the rehabilitation measures and completion criteria described in this Plan (Table 9).

Table 9 Trigger, action, response plan

Aspect/ Category	Item	Risk Element	Trigger	Response
Landform Stability	1	Water management structures	Water management structures (pond banks, diversion channels) erosion &/or scouring	Undertake remedial actions such as amelioration, revegetation or alternative scour protection as required. For significant failures or repeat minor failures conduct review of design criteria and construction standards.
Growth Medium Suitability	2	Chemical and nutritional properties	Soil properties atypical for the surrounding landscape or alternative growth media atypical of intended specification	Undertake appropriate soil/spoil amelioration and revegetate as required.
	3	Growth medium depth	Growth medium depth (topsoil or other growth medium is less than 100mm in areas in the Growth Medium Development phase.	Top dress with additional suitable topsoil resource and /or medium if required. For repeat growth medium thickness issues conduct review of placement procedures and operational practices.
Vegetation Establishment	4	Uncontrolled entry of livestock or vehicles	Damage to vegetation caused by uncontrolled access by livestock or vehicles.	Conduct an inspection of the site. Undertake remedial actions such as fence installation or repairs, maintaining access tracks and sign posting.
	5	Planting success	Low survival rates (<80%)	Replant to achieve 80% native coverage
	6	Understorey species diversity	Understorey species diversity atypical compared to target vegetation community.	Undertake site assessment. Undertake remedial actions such as controlled burning, soil amelioration, reseeding and fertilising as required. For widespread low understorey diversity review seed/planting mix understorey species composition and seeding/planting rates. Review monitoring results to determine rates of successful establishment for various understorey species in seed/planting mixes.
	7	Tree and shrub species diversity	Tree and shrub species diversity atypical compared to target vegetation community.	Undertake site assessment. Undertake remedial actions such as controlled burning, soil amelioration, reseeding and fertilising as required. For widespread low tree and shrub diversity review seed/planting mix for tree and shrub species composition and seeding/planting rates. Review monitoring results to determine rates of successful establishment for various tree and shrub species in seed/planting mixes.

Aspect/ Category	Item	Risk Element	Trigger	Response
	8	Ground Cover	Total ground cover < 70% during Vegetation Establishment phase.	Undertake site assessment. Undertake remedial actions such as soil amelioration, soil aeration, reseeding and fertilising as required. For widespread low results for total ground cover review seasonal mixes and seeding rates.
	9	Weed levels	>50% cover of problematic weed species present.	Review if >50% cover will limit rehabilitation objectives. If needed, control problematic weed using methods such as removal, biological control, herbicide application and slashing. Treatment of infestations as appropriate to the species. Conduct follow up inspections to assess the effectiveness of weed management measures.
Ecosystem Development	10	Tree Density	Tree density is outside typical range for target vegetation community.	An inspection of the site will be undertaken by a suitably trained person. Undertake remedial actions such as cultivation or spraying to reduce grass competition, reseeding (for low density) and thinning (for high density) as required. For widespread tree density outside target ranges review seed mix tree species composition and seeding/planting rates. Review monitoring results to determine rates of successful establishment for various tree species in seed/planting mixes. Review seed bed preparation, weed/grass control and sowing/planting procedures.
	11	Ecosystem health	Composition, structure, function and vegetation integrity scores less than 50% of PCT benchmark	Undertake site assessment to determine deficiencies in ecosystem health based on BAM scores and field data. Undertake remedial actions such as controlled burning, soil amelioration, reseeding, fertilizing, spraying to reduce grass competition and pest control as required.
	12	Bushfire Resilience	Rehabilitation areas not able to recover in a reasonable time from effects of bushfire.	Conduct a rehabilitation assessment. Undertake remedial actions such as re-seeding affected area as required. Review bushfire management procedures particularly with a view to protecting young rehabilitation areas.
Fauna recolonisation	13	Vertebrate pest levels	Vertebrate pest species density causing significant damage to rehabilitation.	Consult with relevant government agencies to develop and implement appropriate vertebrate pest control program. Consider actions from relevant Threat abatement plans.

7 TRAINING

7.1 ENVIRONMENTAL INDUCTION

Environmental induction training will be delivered to all staff and subcontractors involved in the Project. This will be delivered by the relevant Boral personnel (e.g. Environmental Manager or delegate). This will include a component on environmental/what this Plan is for management and the associated controls and mitigation measures that will be implemented for the Project. All personnel will be required to sign an induction sheet, a copy of which will be maintained on site and appropriate records maintained.

Appropriate training and induction should include, but not be limited to:

- Raising awareness of on-site environmental management issues;
- Instruction and detail on how to report matters relating to ecology and rehabilitation to the site environmental representative or site manager.
- Providing information on the location and importance of EECs, threatened fauna species (and habitat) known to occur within the site (refer to Figure 3 in the FFMP);
- Providing information on the boundaries for any proposed vegetation clearing; and
- Training on procedures on encountering fauna (e.g. snakes)

7.2 SITE-SPECIFIC ENVIRONMENTAL TRAINING

Where identified by the Environmental Manager or delegate, additional site-specific training may be developed and implemented by the Project manager, delivered to relevant personnel/contractors as required regarding sensitive environmental issues. Specific training may include:

- Training in the use and location of spill kits; and
- Management and environmental incident response training.

8 CONTINGENCY PLANNING

8.1 EMERGENCY INCIDENT PLAN

Emergency incident planning will be as per the site Pollution Incident Response Management Plan (PIRMP) which has been developed to respond to uncontrolled discharges of fuels, oils and chemicals/unforeseen events as per EPL 11147 licence conditions.

Response procedures for protection of the water environment will aim to:

- Contain and control emergency incidents;
- Safeguard people on-site and offsite;
- Protect drainage paths and waterways;
- Minimise damage to the environment and property;
- Identify appropriate disposal techniques for contaminated soils and water; and
- Facilitate remediation of the environment.

Suitable containment and clean up materials will be maintained within easy and quick access.
All reporting will be in accordance with Boral's incident reporting management system. Similar complaints will be addressed through the site complaints register. Compliance with statutory requirements will be assessed through implementation of Boral's site audit program that is aligned to ISO 19011:2003. Results of the above-mentioned aspects will be used to ensure appropriate corrective actions are in place and to verify appropriate close out actions, follow up and reporting has occurred.

9 REFERENCES

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Appendix A ENDORSEMENT OF EXPERTS

Mr Ben Williams
Environmental Coordinator – Dunmore Lakes
Boral Resources (NSW) Pty Ltd

Via email: Ben.Williams@boral.com.au

20/05/2021

Dear Mr Williams

Dunmore Lakes Sand Extraction Project (DA 195-8-2004)
Endorsement of Experts

I refer to your request (DA-195-8-2004-PA-17) for the Planning Secretary's approval of suitably qualified persons to prepare the Flora and Fauna Management Plan and the Rehabilitation Management Plan for the Dunmore Lakes Sand Extraction Project (DA 195-8-2004).

The Department has reviewed the nominations and information you have provided and is satisfied that these experts are suitably qualified and experienced. Consequently, I can advise that the Planning Secretary approves the appointment of Mr Mark Nolan and Dr Emilie Mascarenhas of Cambium Group to prepare the Flora and Fauna Management Plan and the Rehabilitation Management Plan.

If you wish to discuss the matter further, please contact Joel Herbert on (02) 8289 6614 or joel.herbert@planning.nsw.gov.au

Yours sincerely

Matthew Sprott
Director
Resource Assessments (Coal & Quarries)

As nominee of the Planning Secretary

Appendix B RIPARIAN AREA MANAGEMENT PLAN

B.1 PURPOSE

In accordance with CoA (45), Boral must prepare a Riparian Area Management Plan (RAMP) in consultation with BCD to describe and detail the methods concerning work involving construction/rehabilitation of riparian areas and within 3m of an existing riparian area.

B.2 SITE RIPARIAN AREAS

There are numerous riparian areas located within the project area including Freshwater Wetlands on Coastal Floodplains as well as creek tributaries and drainage lines. These include:

- Eastern Tributary and riparian zone;
- Western Tributary and riparian zone;
- Northern Tributary and riparian zone;
- Rocklow Creek and riparian zone;
- North Western wetland;
- North Eastern wetland; and
- Southern wetland.

The existing riparian areas are shown in Figure 1 and the post-rehabilitation areas in Figure 3. The riparian areas most impacted by Stages 2, 3 and 4, and covered in this plan, are the Western Tributary and Rocklow Creek, including their riparian zones. The remaining riparian areas have previously been rehabilitated and only require ongoing monitoring and maintenance.

B.3 SITE WATER MANAGEMENT PLAN

The project conditions of approval require the preparation and implementation of a Site Water Management Plan that must include the site water balance, an Erosion and Sediment Control Plan, Surface Water Management Plan and a Ground Water Management Plan. This has been prepared as a separate document entitled Soil and Water Management Plan.

B.4 RIPARIAN AREA MANAGEMENT PLANS

Riparian Area Management Plans (RAMPs) have been prepared for the Western Tributary and Rocklow Creek within the project area. The plans provide guidance for works involving disturbance within 3m of an existing riparian area and for works involving construction/rehabilitation of riparian areas in accordance with the Conditions of Approval and relevant authorities. This plan applies to riparian areas occurring within Dunmore Lakes Sand Project (DLSP). The RAMPs satisfy Schedule 3, Condition 45 of the Conditions of Approval.

B.4.1 Objectives of the Riparian Area Management Plans

The objectives of the Riparian Area Management Plans are to:

- Describe the current condition of the riparian areas within the project area
- Provide detailed designs of the proposed works and proposed staging of works; and

Outline the management measures to be implemented at the site level, including completion criteria for the rehabilitation of riparian areas disturbed by the operation of the Dunmore Lakes Sand Extraction Stages 2, 3 and 4.

B.4.2 Western Tributary

A *Mining and Realignment of Western Tributary* CAA was granted based on the Riparian Area Management Plan included in the FFRMP created by Cumberland Ecology (2010). The CAA permits sand dredging and stream relocation during Stage 2 and 3 operations. The following works are an updated reflection of the 2010 RAMP.

i. Channel/bed design

As dredging approached completion in Stage 2, entry and exit points were established. The entry point that will flow into Stage 2 area will not require specific engineered requirements however a permanent outlet structure is required to manage flows from both tributaries leaving Stage 2. A final dredge pond overflow exit point is proposed by Bewsher (2015) to manage and limit turbid waters from being discharged. Figure B1 outlines the design parameters suggested by Bewsher (2015) for the outlet structure. Further details can be found in the August 2015 Bewsher Hydrological report Appendix F.

The Western Tributary in Stage 3 has been realigned, in accordance with the Mining and Realignment of Western Tributary – Summary Letter (EES 2015), to direct runoff through culvert 4, beneath the Princes Highway.

ii. Sediment and erosion control

All sediment and erosion control works will be in accordance with the Project's Sediment and Erosion Plan, which forms part of the WMP.

iii. Hydraulic modelling

The realignment and outlet structure of the Western Tributary have been designed with special consideration given to highly turbid waters and large flood events. The overflow structure has been designed to accommodate a 100 year Average Recurrence Interval (ARI) (EES 2015).

The hydrological study conducted by Bewsher Consulting (2015) has indicated that a small pond will form upstream of Culvert No. 4 due to the relative levels (RL's) of the Tabbita Road culvert and the Princes Highway culvert. This pond will not, however, have any impact on the natural hydrological regimes and natural geomorphic processes in the area.

iv. Rehabilitation and revegetation

All disturbed areas associated with the Western Tributary will be stabilised and rehabilitated as soon as practically possible. Existing vegetation was salvaged and reused where possible. Tubestock was planted to supplement the transplanted vegetation to complete the revegetation process. DLSP staff will monitor and maintain the rehabilitation site and replace any failed plants. Further details of the Western Tributary revegetation procedures can be found in Section 5.

v. Management of adjacent TECs

The closest EECs to the Western Tributary include the North Western wetland, located in the north-western corner of Stage 2, and the Coastal SEPP wetland, located to the east of the Kiama Bypass. The North Western wetland is located upstream, thus no ecological impacts are anticipated. The Coastal SEPP wetland is located downstream of the Western Tributary and has the potential to be impacted by works on the Western Tributary. All potential impacts will be managed in accordance through the implementation of the Erosion and Sediment Control and Water Quality Management Plans.

vi. Extraction staging and justification

The Western Tributary drains from the west to the southeast of Stage 2 where it enters the north-eastern corner of Stage 3 and flows into Rocklow Creek through two drainage culverts under the Kiama Bypass.

Rehabilitation of the Western Tributary has been undertaken following the completion of dredging in Stage 2. Stage 3 has also completed the realignment of the Western Tributary channel between Tabbita Road and the Princes Highway.

vii. Extraction timing and methods

Stage 2

As dredging neared completion in Stage 2, the final operations focused on dredging the Western Tributary. The sand within the area beneath and adjoining the natural Western Tributary alignment was excavated and removed for processing.

Stage 3

Extraction processes for the section of the Western Tributary that crosses the North Eastern corner of Stage 3 was largely similar to those for Stage 2. Dredging took place through the channel and the channel was reconstructed and stabilised as quickly as practically possible using various stabilisation methods i.e. jute matting and revegetation of the banks.

Following the realignment of the Western Tributary, all remaining recoverable resources below the existing channel will be extracted. Extraction operations in Stage 3 required the relocation of the Western Tributary which crosses Stage 3 in the north-eastern corner of stage 3.

viii. Diversion channel

Previous studies of the Stage 2 and Stage 3 dredging works showed the intended relocated of the Western Tributary channel as it approached the two Princes Highway culverts south of Tabbitta Road. It is proposed that the channel will be realigned from its current drainage to Highway Culvert No. 3 to Highway Culvert No. 4. Figure B2 defines the proposed realignment on the Western Tributary between Tabbitta Road and the highway.

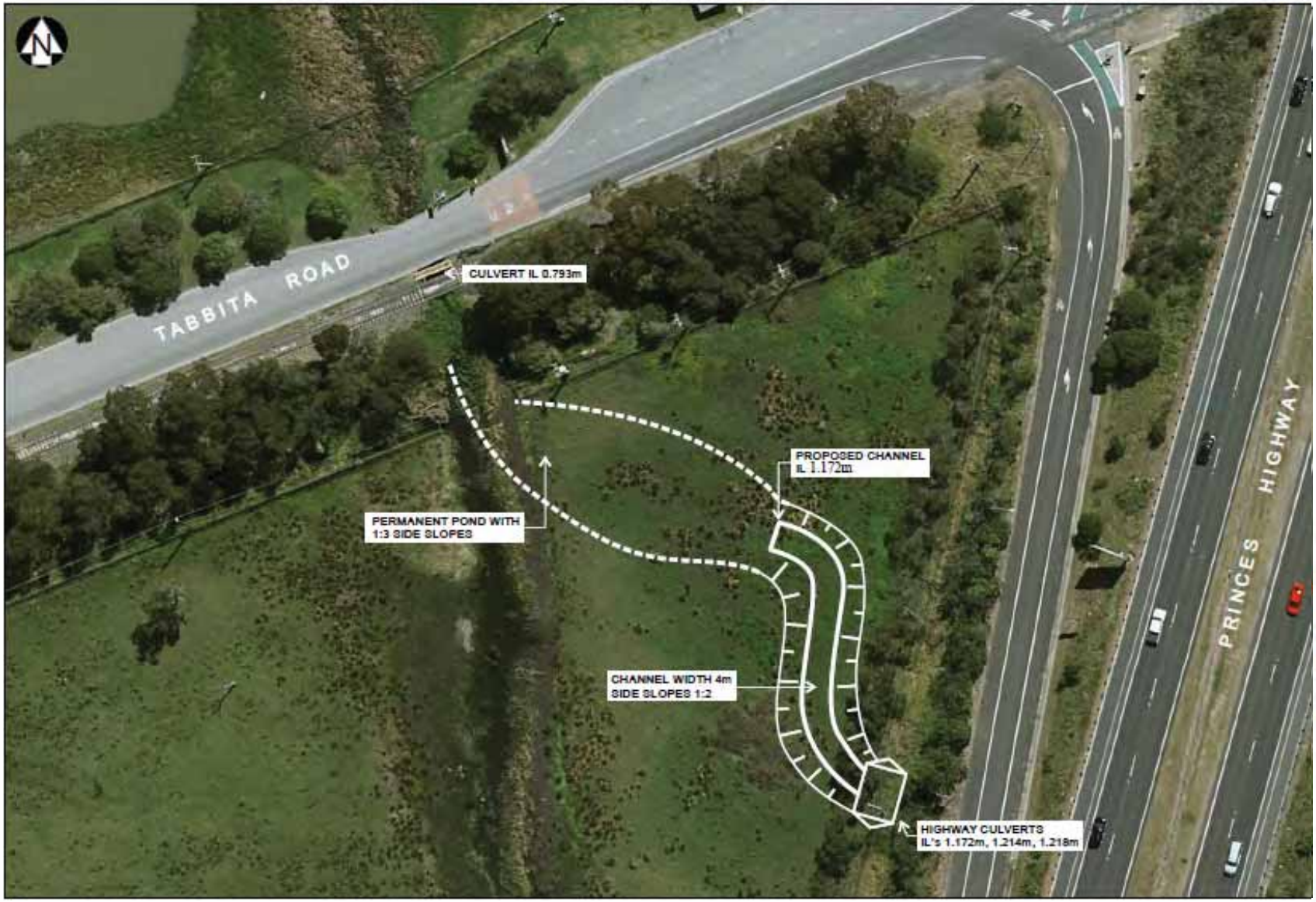

Figure B.1 - Dredge Pond Overflow Structure

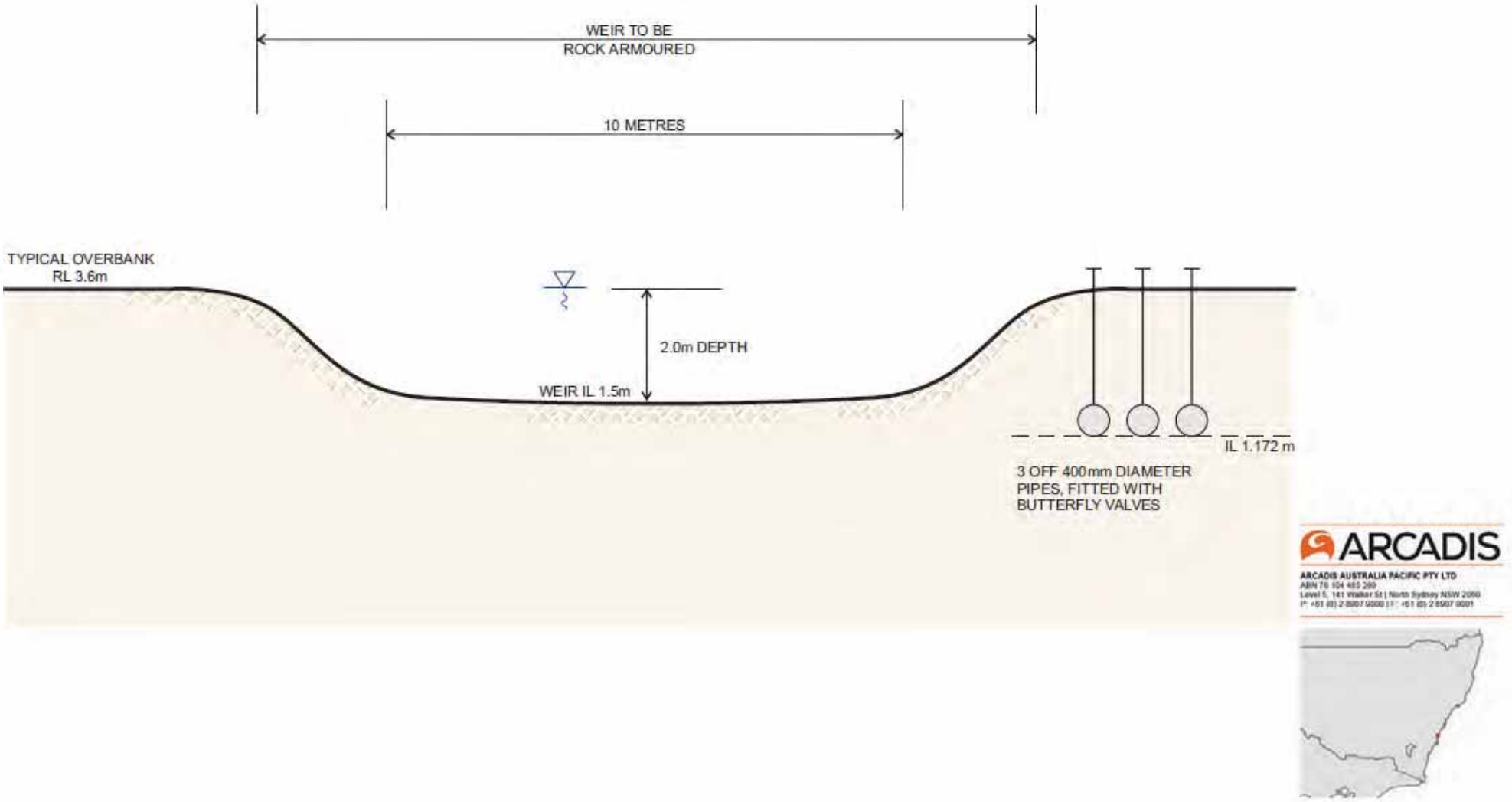

Figure B.2 - Western Tributary Realignment Works

B.4.3 Rocklow Creek

Rocklow Creek has previously been largely modified to for agricultural purposes. The original Rocklow Creek alignment is located within the southern boundary of Stage 3. The Development Approval requires Rocklow Creek to be realigned, generally to its former natural alignment, to flow into the lake in Stage 3.

i. Extraction staging and justification

As per the Conditions of Approval, realignment of Rocklow Creek must be completed prior to the commencement of extraction of Sub-Stage 3C1. Following the completion of realignment, extraction must not be undertaken within 3 metres of the bank of Rocklow Creek. Furthermore, batter slopes from this extraction limit shall be no steeper than 1:2 (H:V).

ii. Extraction timing and methods

Corkery and Co (2005) identify extraction methods which require the realigned Rocklow Creek to drain into the Stage 3 Lake. This varies from the method proposed by Corkery and Co. (2004), which would reinstate Rocklow Creek to its natural alignment around the hill into Culvert 1. Because of this alteration from the original design, a qualified hydrologist is required to re-design the precise methods for extraction and rehabilitation. This will be undertaken prior to extraction within Sub-Stage 3C1commences.

iii. Diversion channel

Schedule 3, Condition 12 requires the ultimate realignment of Rocklow Creek into the Stage 3 Lake. Figure 3 identifies the ultimate alignment which is both similar to the natural alignment of Rocklow Creek, and in accordance with Condition 12. The ultimate realignment will, however, need to be verified with future hydrological assessments.

iv. Rehabilitation and re-vegetation methods

As per the Conditions of Approval, rehabilitation of Rocklow Creek must be completed prior to the commencement of extraction of Sub-Stage 3C1. The re-aligned channel will be revegetated in accordance with the Landscape Plan and Section 5 of this RMP. Banks of the channel will be stabilised with jute matting and any other stabilisation measures identified following the required hydraulic assessment and channel designs.

v. Channel/bed designs (including scour protection measures)

The realigned channel shall be designed so as to safely convey, without bed or bank erosion, the 1 in 20-year ARI peak flow.

vi. Hydraulic modelling

Hydraulic modelling will be addressed prior to the realignment of Rocklow Creek.

vii. Sediment and erosion control

Sediment and erosion control will in accordance with the Sediment and Erosion Control

Management Plan included in the DLSP Water Management Plan

viii. Management of adjacent threatened ecological communities

The Southern wetland and the Coastal SEPP wetland to the east of the highway are the closet EECs to Rocklow Creek. Potential impacts on the Coastal SEPP wetland will be managed through the implementation of the Pest and Weed Management (Appendix D in FFMP), Water Quality and Erosion and Sediment Control Plans.

B.5 PROTECTION, ENHANCEMENT AND INTEGRATION WITH ADJACENT THREATENED COMMUNITIES

Three Endangered Ecological Communities (EECs) have been identified within the Stages 2 and 3 and 5; Swamp Oak Floodplain Forest EEC, Bangalay Sand Forest of the Sydney Basin and South East Corner Bioregions EEC and Freshwater Wetlands on Coastal Floodplains EEC. The remainder of vegetation within the site is characterised by exotic pasture and scattered weeds (Mills 2004).

B.5.1 Swamp and Oak Floodplain Forest

Areas identified as Swamp Oak Floodplain on the proposed Landscape Concept Plan (Hughes Landscape Architects 2006) will be established as the Swamp Oak Floodplain Forest EEC. The proposed areas for Swamp Oak Forest are illustrated in Figure 3 and include those areas adjacent to the constructed and existing freshwater wetlands, in addition to other areas of the site that are lowing lying and susceptible to periodic inundation. Details of the protection, integration and enhancement are described in the FFMP.

B.5.2 Bangalay Sand Forest

Bangalay Sand Forest has been identified in the location of Stage 5. Impacts to the forest will be offset as described in Schedule 3 COA 37A. No re-establishment of this EEC is proposed on the site. Details of the protection, integration and enhancement are described in the FFMP.

B.5.3 Freshwater Wetlands on Coastal Floodplains

Areas identified as wetlands on the proposed Landscape Concept Plan (Hughes Landscape Architects 2006) will be established as Freshwater Wetlands on Coastal Floodplains EEC. The three proposed areas for these wetlands are illustrated in Figure 3 and include in areas designed to be flat, low lying, and susceptible to periodic or semi- permanent freshwater inundation. Details of the protection, integration and enhancement are described in the FFMP.

Appendix C VEGETATION ESTABLISHMENT MONITORING PROFORMA

Vegetation Establishment Monitoring Proforma	
Date	
Quadrat (Unique Identifying Number)	
Quadrat Size (Dimensions)	
Assessed by	
Weather conditions	
Photo (taken looking north, east, south and west from star picket)	

To be completed for each 5m x 5m quadrat (native and exotic species)

Species	**Growth form** (seedling, groundcover, shrub, tree)	**Height (m)**	**Condition** (good= no evidence of disease or insect attack, moderate= some evidence of disease or insect attack, poor= much evidence of disease or insect attack)

General Condition of Quadrat

Attribute	% cover in Quadrat
Native plant species (living)	
Exotic plant species (living)	
Dead or dying plants	
Bare Ground	
Other (logs, rocks)	
TOTAL	100%

Other Observations

Other Comments (e.g. presence of litter, pest species, weed control required, additional watering required, presence of fauna species, replacement of seedling required)

Appendix D DOCUMENTATION AND COMPLETED CONTROLLED ACTIVITY APPROVAL RELATING TO THE REALIGNMENT OF THE WESTERN TRIBUTARY

ENVIRONMENTAL EARTH SCIENCES
THE KNOW AND THE HOW

24 September 2015

NSW Office of Water
Level 0
84 Crown Street
Wollongong NSW 2520

Attention: **Jeremy Morice**
Licensing Officer

Dear Jeremy

Application for Controlled Activity Approval for mining and redirection of the Western Tributary during Stage 2 and Stage 3 works at Dunmore Sand and Soil Tabbita Road Quarry

Environmental Earth Sciences is applying for a Controlled Activity Approval (CAA) on behalf of Dunmore Sand and Soil. The CAA is required to undertake sand dredging and stream relocation during Stage 2 and Stage 3 operations at the Tabbita Road quarry.

At present dredging is finishing in the Stage 2 area with final operations focused on dredging the Western Tributary. A finalised Stage 2 entry and exit point for the Western Tributary is required.

Future works will be undertaken in Stage 3 which requires the Western Tributary channel between Tabbita Road and the Princes Highway to be realigned.

This summary letter outlines the process involved in the finalised entry and exit points of the Western Tributary in the Stage 2 area and Western Tributary realignment south of Tabbita Road in reference to the previously submitted Flora, Fauna and Rehabilitation Management Plan (FFRMP) and Bewsher Consulting Hydrological Report.

Should you have any further queries, please contact us on (02) 9922 1777.

On behalf of
Environmental Earth Sciences NSW

Project Manager
Darren Fernandez
Environmental Scientist

Project Director / Internal Reviewer
Mark Stuckey
Principal Soil Scientist, Hydrogeologist & Risk Assessor
115040 CAA_Summary Letter

1.0 Western Tributary Stage 2 – Finalised entry and exit point lake Works

The following gives a brief outline of the proposed entry and exit locations and structure once the Western Tributary has been dredged. The previously submitted FFRMP provide detailed information to cover aspects of the channel rehabilitation and final designs.

1.1 Excavation and entry point

The entry of the Western Tributary will flow into the Stage 2 area without the need for any specific engineered requirements. Dredging will occur up to the western boundary road and Western Tributary entry culvert. This is as per provisions detailed in the Stages 2, 3 & 4 Flora and Fauna Rehabilitation Management Plan report (Figure 1).

1.2 Exit point and settling pond

Hydrological advice for the exit point identified two concerns for the Western Tributary specifically the impact of water quality and the final dredge pond overflow.

1.2.1 Water quality impact

The hydrological advice provided by Bewsher Consulting investigated sediment loads in the Dredge pond, Fines pond and Freshwater pond (Figure 1). A summary of sediment loads in the ponds are summarised below in Table 1.

TABLE 1 AVERAGE TSS VALUES RELATED TO THE STAGE 2 DREDGE POND

Calendar Period	Dredge Pond (DW-14) (av. TSS, in mg/L)	Fines Pond (DW15) (av. TSS, in mg/L)	Fresh Water Pond (av. TSS, in mg/L)
2011-2012	10.5	15.9	9.9
2012-2013	17.6	28.2	15.4
2013-2014	20.0	47.5	31.4
2014-2015	29.9	55.6	21.7

The Development Consent (DA-195-8-2004) for Dunmore Sand and Soil indicates a TSS discharge limit of 50mg/L. The findings of ongoing monitoring indicated the following.

- all of the Dredge Pond annual averages are less than the licence limit requirement;
- all of the Fresh Water Pond annual averages are less than the licence limit requirement; and
- the annual average values for both the Dredge Pond and the Fresh Water Pond are very similar.

Bewsher concluded that “there would be no water quality treatment benefit in diverting any (or potentially all) of the Dredge Pond future overflows into the Fresh Water Pond. Rather it would be best for the Dredge Pond overflows to be directed straight into the remnant Western tributary channel.”

1.2.2 Final dredge pond overflow exit point

The Northern and Western Tributary catchment inflows enter the Stage 2 dredge pond. A permanent outlet structure is required to manage flows from both tributaries leaving Stage 2. Figure 2 outlines the design parameters suggested by Bewsher for the outlet structure. This outlet structure has been designed with special consideration given to highly turbid waters and large flood events.

To manage and limit turbid waters from being discharged, the overflow structure is proposed to be installed with valves. In the event of turbid water discharging, the valves can be closed to limit water flow and reduce the risk of discharging turbid water offsite. Further details can be found in the August 2015 Bewsher Hydrological report and Figure 2.

To ensure the overflow structure can accommodate for a 100 year Average Recurrence Interval (ARI) both inflows for the Northern and Western Tributaries have been used to size the overflow weir capacity of the structure. The August 2015 Bewsher Hydrological report indicates that a "weir length of 10 metres with a weir invert level of RL 2.0m (and depth of flow of 1.5m) would be sufficient to cater for the local catchment 1 year ARI flood peak flow" (Figure 2).

1.3 Rehabilitation of the Western Tributary

Rehabilitation of the Western Tributary is required once dredging is complete. An outline of the Flora and Fauna Rehabilitation Management Plan is included below.

1. *Salvage and reuse existing vegetation where possible:*

Existing vegetation is to be removed in large 'tiles' by the excavator and placed to the side while work is taking place. This plant material is to be replanted into the realigned channel where possible.

2. *Supplementary plantings from tubestock:*

To supplement the transplanted vegetation tubestock is to be planted to complete the revegetation process. Tubestock is to be of the following species (Table 7.3) and be in a state that will allow for quick growth and bank stabilisation and be planted in the densities specified by the table. The rehabilitation area will include a buffer of 10m either side of the tributary that will be left to be restored to pasture land.

3. *Monitoring and maintenance of revegetation works:*

DSS staff will monitor the rehabilitation site and report back with any maintenance or replacement of failed plants that needs to be undertaken. Replacement of failed plants will need to occur until banks are stabilised and vegetation is re-established.

Table 7.3 PLANTING LIST FOR CREEKS AND RIPARIAN AREAS

Scientific Name	Common Name	Planting Location	Stock Size and Plant Densities
Alternanthera denticulata	Lesser Joyweed	Plant in well drained and drier areas.	Plant 2-6 tube stock per 1sqm.
Atriplex australasica	A Saltbush	Plant in better drained areas.	Plant 2-6 tube stock per 1sqm.
Bolboschoenus fluviatilis	March Club-rush	In or at margin of standing water to 15cm depth.	Plant 1 per 10sqm using plant fragments from local stocks.
Carex longebrachiata	Bergalia Tussock	Plant in better drained areas subject to periodic inundation.	Plant 2-6 tube stock per 1sqm.
Elaeocharis	Tall Spike Rush	In standing water 10-	Plant 2-6 tube stock

Table 7.3 PLANTING LIST FOR CREEKS AND RIPARIAN AREAS

Scientific Name	Common Name	Planting Location	Stock Size and Plant Densities
sphacelata		90cm depth.	per 1sqm.
Juncus krausii	Sea Rush	Plant in areas that are dry or subject to temporary water to 5cm depth.	Plant 2-6 tube stock per 1sqm.
Juncus usitatus	Forest Rush	Plant in standing water 2cm-20cm depth.	Plant 2-6 tube stock per 1sqm.
Ludwigia peploides ssp montevidensis	-	Standing water 2cm-20cm depth.	Plant 2-6 tube stock per 1sqm.
Paspalum distichum	Water Couch	At margin of standing water.	Plant 2-6 tube stock per 1sqm.
Persicaria decipiens	Slender Knotweed	At margin of standing water and in seepage zones.	Plant 1 specimen per 1sqm using 50ml tube stock where available.
Persicaria hydropiper	Water Pepper	At margin of standing water and in seepage zones.	Plant 2-6 tube stock per 1sqm.
Persicaria orientalis	Princes Feathers	Plant at the margin of standing water and in seepage zones.	Plant 2-6 tube stock per 1sqm.
Phragmites australis	Common Reed	Standing water ideally 2cm-20cm depth. Maximum water depth 0.5m.	Plant 2-6 specimens per 1sqm using 50ml tube stock where available.
Ranunculus inundatus	River Buttercup	At margin of standing water and in seepage zones.	Plant 2-6 tube stock per 1sqm.
Typha orientalis	Cumbungi	In standing water ideally 2cm-20cm depth. Maximum water depth 2m.	Plant 2-6 specimens per 1sqm using 50ml tube stock where available. Or broadcast seeds over fines area by direct seeding.

2.0 Western Tributary Stage 3 – Stream realignment works

2.1 Final design

The hydrological study conducted by Bewsher Consulting has indicated that due to the relative levels (RL's) of the Tabbita Road culvert and the Princes Highway culvert a small pond will form upstream of Culvert No.4. The final stream and lake design is outlined in Figure 3. This small pond will not inhibit natural hydrological regimes and natural geomorphic processes in the area.

Additional filling and revegetation will be required within this area once dredging is complete as specified in the Flora and Fauna Rehabilitation Management Plan. Revegetation of the northern portion of the realigned stream can occur with the initiation of dredge works. This will be in line with the final design outlined in the Flora and Fauna Rehabilitation Management Plan (Figure 7.1 FFRMP 2010).

The exit point of the Western Tributary into the RMA culvert will be installed as per the Controlled Activities Guidelines – Water Management Act 2000; Additional considerations for Design Of Culverts and In Stream Works.

Should you have any further queries, please contact us on (02) 9922 1777.

On behalf of
Environmental Earth Sciences NSW

Project Manager
Darren Fernandez
Environmental Scientist

Project Director / Internal Reviewer
Mark Stuckey
Principal Soil Scientist, Hydrogeologist & Risk Assessor

3.0 Attached Documents

- ATTACHMENT 1 – Figures
- ATTACHMENT 2 – Fauna and Flora and Rehabilitation Management Plan
- ATTACHMENT 3 – Hydrological Report

ENVIRONMENTAL EARTH SCIENCES GENERAL LIMITATIONS

Scope of services

The work presented in this report is Environmental Earth Sciences response to the specific scope of works requested by, planned with and approved by the client. It cannot be relied on by any other third party for any purpose except with our prior written consent. Client may distribute this report to other parties and in doing so warrants that the report is suitable for the purpose it was intended for. However, any party wishing to rely on this report should contact us to determine the suitability of this report for their specific purpose.

Data should not be separated from the report

A report is provided inclusive of all documentation sections, limitations, tables, figures and appendices and should not be provided or copied in part without all supporting documentation for any reason, because misinterpretation may occur.

Subsurface conditions change

Understanding an environmental study will reduce exposure to the risk of the presence of contaminated soil and or groundwater. However, contaminants may be present in areas that were not investigated, or may migrate to other areas. Analysis cannot cover every type of contaminant that could possibly be present. When combined with field observations, field measurements and professional judgement, this approach increases the probability of identifying contaminated soil and or groundwater. Under no circumstances can it be considered that these findings represent the actual condition of the site at all points.

Environmental studies identify actual sub-surface conditions only at those points where samples are taken, when they are taken. Actual conditions between sampling locations differ from those inferred because no professional, no matter how qualified, and no sub-surface exploration program, no matter how comprehensive, can reveal what is hidden below the ground surface. The actual interface between materials may be far more gradual or abrupt than an assessment indicates. Actual conditions in areas not sampled may differ from that predicted. Nothing can be done to prevent the unanticipated. However, steps can be taken to help minimize the impact. For this reason, site owners should retain our services.

Problems with interpretation by others

Advice and interpretation is provided on the basis that subsequent work will be undertaken by Environmental Earth Sciences NSW. This will identify variances, maintain consistency in how data is interpreted, conduct additional tests that may be necessary and recommend solutions to problems encountered on site. Other parties may misinterpret our work and we cannot be responsible for how the information in this report is used. If further data is collected or comes to light we reserve the right to alter their conclusions.

Obtain regulatory approval

The investigation and remediation of contaminated sites is a field in which legislation and interpretation of legislation is changing rapidly. Our interpretation of the investigation findings should not be taken to be that of any other party. When approval from a statutory authority is required for a project, that approval should be directly sought by the client.

Limit of liability

This study has been carried out to a particular scope of works at a specified site and should not be used for any other purpose. This report is provided on the condition that Environmental Earth Sciences NSW disclaims all liability to any person or entity other than the client in respect of anything done or omitted to be done and of the consequence of anything done or omitted to be done by any such person in reliance, whether in whole or in part, on the contents of this report. Furthermore, Environmental Earth Sciences NSW disclaims all liability in respect of anything done or omitted to be done and of the consequence of anything done or omitted to be done by the client, or any such person in reliance, whether in whole or any part of the contents of this report of all matters not stated in the brief outlined in Environmental Earth Sciences NSW's proposal number and according to Environmental Earth Sciences general terms and conditions and special terms and conditions for contaminated sites.

To the maximum extent permitted by law, we exclude all liability of whatever nature, whether in contract, tort or otherwise, for the acts, omissions or default, whether negligent or otherwise for any loss or damage whatsoever that may arise in any way in connection with the supply of services. Under circumstances where liability cannot be excluded, such liability is limited to the value of the purchased service.

Bewsher

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Epping NSW 2121
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Bewsher Consulting Pty Ltd
ABN 24 312 540 210

DUNMORE LAKES SAND EXTRACTION PROJECT STAGE 2

HYDROLOGICAL REPORT FOR WESTERN TRIBUTARY WORKS UPSTREAM AND DOWNSTREAM OF TABBITTA ROAD

AUGUST 2015

1. INTRODUCTION

This report looks at the hydrologic aspects of the following Stage 2 works:

(a) Mining of the Western Tributary channel such that all the tributary flows are then directly entering the working pond (and the 'final' lake form); and
(b) Relocation (as-required) of the Western Tributary channel between Tabbitta Road and the Princes Highway.

2. STAGE 2 LAKE WORKS

2.1 Current Status

The Stage 2 Lake is close to becoming its ultimate size. Given this situation and as per the provisions detailed in the *Stages 2, 3 & 4 Flora and Fauna and Rehabilitation Management Plan* report:

(i) the previously maintained Northern Tributary has not needed to be maintained and its inflows are now directly entering the Stage 2 Lake channel; and
(ii) the previously maintained Western Tributary now no longer needs to be retained. This means that this tributary channel can now be mined with any inflows also directly entering the Stage 2 Lake.

2.2 Hydrologic Works to Accompany the Mining of the Western Tributary Channel

Whereas previously – and is also the case currently – the Stage 2 working pond has been an "off-line" facility and therefore not received any inflows from the Western Tributary. With the Western tributary inflows now about to enter the working pond there are two main hydrologic considerations.

The first consideration is downstream water quality impacts. To gain a proper understanding of those potential impacts the recent history of total dissolved solids measurements has been reviewed. **Table 1** lists the annual average values for the Stage 2 Dredge Pond and also for the adjacent Fines Pond and Fresh Water Pond (where the outflows from the Fines Pond flow through the Fresh Water Pond before then entering the Western tributary channel downstream of the working pond).

Table 1: Average TSS Values Related to the Stage 2 Dredge Pond

Calendar Period	Dredge Pond (DW-14) (av. TSS, in mg/L)	Fines Pond (DW15) (av. TSS, in mg/L)	Fresh Water Pond (av. TSS, in mg/L)
2011-2012	10.5	15.9	9.9
2012-2013	17.6	28.2	15.4
2013-2014	20.0	47.5	31.4
2014-2015	29.9	55.6	21.7

With respect to the discharge licence limit of 50mg/L, **Table 1** shows the following:

- all of the Dredge Pond annual averages are less than the licence limit requirement;
- all of the Fresh Water Pond annual averages are less than the licence limit requirement; and
- the annual average values for both the Dredge Pond and the Fresh Water Pond are very similar.

Given the above findings, it is concluded that there would be no water quality treatment benefit in diverting any (or potentially all) of the Dredge Pond future overflows into the Fresh Water Pond. Rather it would be best for the Dredge Pond overflows to be directed straight into the remnant Western tributary channel.

This is shown diagrammatically in **Figure 1**.

The second consideration is the design parameters for the new Dredge Pond overflow structure (which will be needed since both Northern and Western tributary catchment inflows will be entering the Dredge Pond). It is suggested that this overflow structure operate for the whole period up until the 'final' Stage 2 Pond Lake (and its permanent outlet structure) is designed and constructed.

In order to control any unexpected increases in TSS readings, it is recommended that the overflow structure be constructed such that site staff will have the capacity to control the water level in the Dredge Pond. Hence **Figure 2** shows the inclusion of three 400mm diameter pipes with each fitted with a butterfly valve or its equivalent.

Consideration of 100 year ARI inflows from the combined Northern and western Tributaries has been used to size the overflow weir capacity of the structure.

Area	=	5.4 km2
t_c	=	1.44 hours
i(1y, 1.44h)	=	28 mm/h
C_{1y}	=	0.62
Q_{1y}	=	0.278 x 0.62 x 28 x 5.4 = 26.1 m3/s

A weir length of 10 metres with a weir invert level of RL 2.0m (and depth of flow of 1.5m) would be sufficient to cater for the local catchment 1 year ARI flood peak flow, as shown in **Figure 2**.

2.3 WESTERN TRIBUTARY WORKS DOWNSTREAM OF TABBITTA ROAD

Previous studies of the Stage 2 and Stage 3 dredging works showed the intended relocation of the Western Tributary channel between Tabbitta Road and the Princes Highway embankment culverts. This included a redirection of the channel as it approached the two highway culverts just south of Tabbitta Road. That is, whereas the channel currently drains to Highway Culvert No. 3 at highway upgrade chainage 10230m (which consists of a 5 cell 2700mm x 2400mm box culvert structure) the studies showed the channel being diverted to the entrance of Highway Culvert No. 4 at highway upgrade chainage 10120m (which consists of a 3 cell 2400mm x 900mm structure).

The results of detailed survey of the Western Tributary culverts at Tabbitta Road and at Highway Culvert No. 4 were provided to Bewsher Consulting. The surveyed levels show that the former culvert invert level is lower than at the latter location (as reproduced in **Figure 3**). This means that a pond or small lake will necessarily be formed upstream of Highway Culvert No. 4.

Figure 3 defines the works proposed between Tabbitta Road and the highway.

Don Still
17 August 2015

Department of Primary Industries
Water

Contact: Jeremy Morice
Phone: 02 4224 9736
Fax: 02 4224 9740
Email: jeremy.morice@dpi.nsw.gov.au

Dunmore Sand & Soil Pty Ltd
C/- Environmental Earth Sciences NSW
7-9 George Place
Artarmon NSW 2064

Our ref: 10 ERM2010/1116
File No: 9054222
Your Ref: 195-8-2004

Attention: Darren Fernandez

14 December 2015

Dear Sir

Re: Controlled activity approval – 10 ERM2010/1116
For activity described as: Mining and Realignment of Western Tributary,
To be carried out at: Lot 6 DP 611159, Lots 4 & 5 DP 1030504, 38 Tabbita Road, Dunmore
Date of Issue 14 December 2015 : Date of Expiry 14 December 2018.

I refer to your application for a controlled activity approval under the *Water Management Act 2000* which was received at this office on 30 October 2015. Receipt of your application fee of $1374 is also acknowledged.

1. Controlled activity approval

DPI Water (formerly the NSW Office of Water) has determined to grant you a controlled activity approval. Please find enclosed the **Notice of Determination** together with your **Statement of Approval**.

Please read carefully the conditions of the approval and seek clarification from DPI Water for any condition not fully understood.

A **copy** of this approval and any annotated documentation should be **provided to council**, your **certifier** and to all **contractors** engaged in the implementation of this controlled activity or the Vegetation Management Plan (VMP) to ensure they are also aware of the conditions.

The controlled activity approval must be kept **current until** the controlled activity has been **completed**. Applications for **extending the approval** should be made to DPI Water, in writing, at least **one month** prior to the expiry date on the approval.

2. Inspections and fees

As the approval holder, you are required to notify DPI Water on completion of the controlled activity. A site inspection may be needed to confirm that all of your obligations under the controlled activity approval have been carried out.

Costs associated with a single inspection may be covered by the application fee. However, if extra inspections or significant reassessment is required then additional fees will be incurred.

Fees will also apply to any amendments requested or any extension of this approval. The current fee schedule is available at: www.water.nsw.gov.au > Water licensing > Approvals > Controlled activities.

3. Other approvals may be required

Subject to the conditions of the attached Statement of Approval, the approval holder is only authorised to carry out the controlled activity described at the location specified.

The attached Statement of Approval does not relieve the approval holder of any obligation which may exist to also obtain permission / approval / consent from any other agency who may have some form of control over the site or the proposed development.

Any questions regarding this correspondence should be directed to **Jeremy Morice, jeremy.morice@dpi.nsw.gov.au.**

Yours sincerely

Jeremy Morice
Water Regulation Officer
Water Regulatory Operations, Water Regulatory Operations South
NSW Department of Primary Industries - Water

Enc:
Notice of Determination
Statement of Approval

Department of Primary Industries
Water

Notice of Determination

issued under the *Water Management Act 2000*

Application details

Approval Number	**10 ERM2010/1116**
First applicant	
Last Name	Dunmore Sand & Soil Pty Ltd
First Name	
Address	38 Tabbita Road
	DUNMORE NSW 2529
Contact	**Fax:**
Email	
Second applicant (if applicable)	
Last Name	
First Name	
Address	
	Town: **State:** **P/Code:**
Contact	**Ph:** **Fax:**
Email	

Determination

Application type	**Controlled Activity Approval** to be issued under Part 3, Chapter 3 of the *Water Management Act 2000* - for matters assessed as integrated development under Part 4 of the *Environmental Planning & Assessment Act 1979*
Determination	☒ Granted (subject to conditions) ☐ Refused
Date of Determination	14 December 2015
Reasons for Determination	see Attachment 1
Date of Expiry	14 December 2018
Location	Lot 6 DP 611159, Lots 4 & 5 DP 1030504, 38 Tabbita Road, Dunmore
Description of activity	Mining and Realignment of Western Tributary

Determining Officer

Signature

Name **Jeremy Morice**
by delegation from the Minister administering the
Water Management Act 2000

Right of Appeal: Section 368 of the *Water Management Act 2000* gives a right of appeal in certain circumstances. As this application has been assessed as integrated development it will not be subject to any third party rights of appeal under the *Water Management Act 2000*. This does not affect any right of appeal an objector may be entitled to under section 98 of the *Environmental Planning and Assessment Act, 1979*.

Notice of Determination

issued under the Water Management Act 2000

ATTACHMENT 1

Reason for determination

Approval Number: **10 ERM2010/1116**

Reason: This controlled activity approval is granted on the basis that DPI Water (formerly the NSW Office of Water) is satisfied the proposed development has adequate arrangements in place to ensure that no more than minimal harm will be done to waterfront land at this site as a consequence of carrying out the proposed controlled activity.

This controlled activity approval is subject to the attached conditions.

Department of Primary Industries
Water

Statement of Approval

Water Management Act 2000

Approval details

Approval No: **10 ERM2010/1116** **File No: 9054222**

Status: CURRENT *

Approval type: **Controlled Activity Approval**

Water sharing plan: not applicable

Period of Approval

Date of effect: 14 December 2015

Expiry date: 14 December 2018

Approval holder(s): Schedule 1

Description of activity: Schedule 2

Conditions: Schedule 3

Contact for service of documents

Name: Dunmore Sand & Soil Pty Ltd

Address: 38 Tabbita Road, DUNMORE, NSW, 2529

* NOTE: An approval has effect for such period as is specified in the approval, or if the period is extended under section 105 of the *Water Management Act 2000*, that extended period. If an application for extension of an approval is lodged before the approval expires, the term of the expiring approval is extended until either the date of the final decision on the application, or a date fixed by the Minister for the approval, whichever is the later date. An approval which has expired can be the subject of an application to extend it but it needs to be accompanied by a statutory declaration of the reasons for the delay in making the application. If the Minister accepts these reasons the term of the approval is taken to have been extended, and the application may be dealt with, as if the application had been made before the approval expired.

It is an offence under the *Water Management Act 2000* to breach a term or condition of the approval or to construct or carry out a controlled activity to which the approval does not relate, or if the approval has expired, been surrendered or cancelled.

Schedule 1 - Approval holder(s)

Holder's name(1):	Dunmore Sand & Soil Pty Ltd		
Postal Address:	38 Tabbita Road		
	Town/City DUNMORE	**State** NSW	**P/Code** 2529
Holder's name(2):			
Postal Address:			
	Town/City	**State**	**P/Code**
Company Name:			
ACN (if applicable):			
Office Address:			
	Town/City	**State**	**P/Code**

Property/land owner's details

Name of Owner/s (1)	Dunmore Sand & Soil Pty Ltd		
Postal Address:	Greystanes House		
	Town/City PROSPECT	**State** NSW	**P/Code** 2148
Name of Owner/s (2)			
Postal Address:			
	Town/City	**State**	**P/Code**

IMPORTANT NOTICE – Change of approval holder or landholder or contact person.

Please advise DPI Water (formerly the NSW Office of Water) in the event of any of the following as soon as practicable:

- If there is a change in the ownership or occupation of the land benefited by this approval (see Schedule 2). Under the *Water Management Act 2000*, an approval is typically held by the owner or lawful occupier of the benefited land. Consequently, a change in ownership may cause a change in your legal obligations as an approval holder. *
- If there is a change to the contact person or their contact details. You will be required to lodge a written statement signed by all the approval holders. *
- If there is a change in the mailing address for the nominated contact person. This should be done by the contact person in writing.

* *An updated Statement of Approval reflecting these changes will be issued free of charge.*

Schedule 2 – Controlled activity

Authorised Controlled Activity

Subject to the conditions of this approval, in relation to the controlled activity described, the holders of this approval are authorised to construct and carry out the controlled activity at the location specified:

Controlled activity:	Mining and Realignment of Western Tributary
Property Name:	
Site address:	Lot 6 DP 611159, Lots 4 & 5 DP 1030504, 38 Tabbita Road, Dunmore
Local Council:	Shellharbour City Council
Development Reference:	195-8-2004
Name of watercourse:	t/Rocklow Creek
Catchment name:	Minnamurra River

Application fees

Fee:	$ 1374	has been paid exclusive of GST
Receipt No:	WOP1091998	

Approval issued by

Officer's name	Jeremy Morice

Schedule 3 Conditions:

In relation to the controlled activity described in Schedule 2, the holders of this approval are authorised to construct and carry out the controlled activity at the location specified subject to the conditions listed:

Number	Condition
Plans, standards and guidelines	
1	This Controlled Activity Approval number 10 ERM2010/1116 only applies to the controlled activity carried out at the location marked on Mining and Realignment of Western Tributary - Summary Letter, prepared by Environmental Earth Sciences, dated 24/09/2015 as approved by DPI Water (formerly the NSW Office of Water) and stamped on 14 December 2015. This Controlled Activity Approval does not permit controlled activities at any other site.
2	The approval holder must not transfer this Controlled Activity Approval 10 ERM2010/1116 without the written approval of DPI Water.
3	The approval holder must keep a copy of the current Controlled Activity Approval 10 ERM2010/1116 on site at all times and make this approval available to officers from DPI Water on request.
4	If the controlled activities described in this Controlled Activity Approval 10 ERM2010/1116, have not commenced or been completed within the period of this approval, the approval holder must apply to DPI Water for a new approval or seek an extension prior to the lapsing of the consent.
5	The approval holder must notify DPI Water in writing within 14 calendar days of any change in (i) site management; (ii) land ownership; (iii) land occupation.
6	The approval holder must comply with the requirements of each of the plans approved by DPI Water and stamped on 14/12/2015 as follows: i. Mining and Realignment of Western Tributary - Summary Letter, prepared by Environmental Earth Sciences, dated 24/09/2015 ii. Flora and Fauna and Rehabilitation Management Plan, prepared by Cumberland Ecology, dated August 2010 iii. Hydrological Report for Western Tributary, prepared by Bewsher, dated August 2015
7	The approval holder must submit for approval, by DPI Water, any amendments to a plan listed in Condition 6 (six) prior to carrying out any works in relation to the approved controlled activity.
8	The approval holder must clearly mark on the ground, the boundaries of the areas where the controlled activity is to be carried out before commencement of the controlled activity, and maintain the markings until the works are completed.
9	At practical completion and/or at the end of the maintenance period, the approval holder must provide a final written report to DPI Water evidencing completion of the approved controlled activity.
10	The approval holder must notify DPI Water in writing within seven (7) days if the controlled activity (i) ceases for a period of more than 30 calendar days; or (ii) is terminated before its full completion, or (iii) is resumed.
Disposal	
11	The approval holder must not leave materials which could obstruct the flow of water or damage river banks on waterfront land at any time.
12	The approval holder must remove surplus material when operations cease and the controlled activity is completed.
Erosion control	
13	The approval holder must establish erosion and sediment control works in accordance with Mining and Realignment of Western Tributary - Summary Letter, prepared by Environmental Earth Sciences, dated 24/09/2015, approved by DPI Water and stamped on 14/12/2015, prior to the commencement of any other works on the site.

Number	Condition
14	The approval holder must decommission all erosion and sediment control works using a suitably qualified person when the site has stabilised.
15	The approval holder must (i) implement erosion and sediment control measures in accordance with the requirements of the Managing Urban Stormwater Manual, Volume 1, Soils and Construction (Landcom, 4th Edition, March 2004) prior to any works commencing at the site; and (ii) maintain the control measures for the duration of the approval to prevent sediment and dirty water entering the waterway.
Maintaining river	
16	The approval holder must not reduce river width, divert or realign the river from its existing alignment otherwise than in accordance with Mining and Realignment of Western Tributary - Summary Letter, prepared by Environmental Earth Sciences, dated 24/09/2015, approved by DPI Water and stamped on 14/12/2015.
17	The approval holder must only conduct works in the river during periods of low flow.
River bed and bank protection	
18	The approval holder must place geotextile material between the river bank and the rock work.
19	The approval holder must ensure that all rock rip-rap surfaces are rough and aligned with the adjoining bed, bank and floodplain profile.
Vegetation management and riparian corridor	
20	The approval holder must revegetate all areas identified in the approved Flora and Fauna and Rehabilitation Management Plan, prepared by Cumberland Ecology, dated August 2010 and Mining and Realignment of Western Tributary - Summary Letter, prepared by Environmental Earth Sciences, dated 24/09/2015, stamped by DPI Water on 14/12/2015. The approval holder must monitor and maintain revegetation works for a period of 2 years in accordance with the approved vegetation management plan.
21	The approval holder must not compromise the implementation of the Vegetation Management Plan (VMP) for any work and/or controlled activity at the site.
END OF CONDITIONS	

Appendix E CONTROLLED ACTIVITY APPROVALS RELATING TO STAGE 2 AND STAGE 3 EXTRACTION

Natural Resources Access Regulator

Contact: Natural Resources Access Regulator
Phone: 1800 633 362
Email: nrar.enquiries@nrar.nsw.gov.au

Our ref: 10CX122266 / A011621
Your ref: DA195/8/204

4 January 2021

BORAL RESOURCES (NSW) PTY LTD
C/- Benjamin Williams
Dunmore Sand & Soil
38 Tabbitta Road
Dunmore NSW 2529

Emailed: ben.williams@boral.com.au

Dear Sir/Madam

Re: Controlled activity approval extension - 10CX122266 / A011621
Dev Ref: DA195/8/204
Description: Extractive Industry
Location: 38 Tabbitta Road Dunmore NSW 2529
Date of Issue: 18/12/2017 Date of Expiry: 17/12/2023

I refer to your application for a controlled activity approval extension under the *Water Management Act 2000* which was received at this office on 18/11/2020. Receipt of your application fee of $484 is also acknowledged.

1. Controlled activity approval

Natural Resources Access Regulator (NRAR) has determined to grant you a controlled activity approval. Please find enclosed the **Notice of Decision** together with your **Statement of Approval**.

Please read carefully the conditions of the approval and seek clarification from NRAR for any condition not fully understood.

A **copy** of this approval and any annotated documentation should be **provided to council**, your **certifier** and to all **contractors** engaged in the implementation of this controlled activity to ensure they are also aware of the conditions.

The controlled activity approval must be kept **current until** the controlled activity has been **completed**. Applications for **extending the approval** should be made to NRAR, in writing, at least **one month** prior to the expiry date on the approval.

2. Other approvals may be required

Subject to the conditions of the attached Statement of Approval, the approval holder is only authorised to carry out the controlled activity described at the location specified.

The attached Statement of Approval does not relieve the approval holder of any obligation which may exist to also obtain permission / approval / consent from any other agency who may have some form of control over the site or the proposed development.

Any questions regarding this correspondence should be directed to **nrar.enquiries@nrar.nsw.gov.au.**

Yours sincerely

for
Alison Collaros
Manager Licensing & Approvals (East)
Natural Resources Access Regulator
NSW Department of Industry

Enc: Notice of Decision, Statement of Approval

Natural Resources Access Regulator

Notice of Decision

Water Management Act 2000

Application details

Reference number	10CX122266 / A011621
Application type	Controlled activity approval under section 92 of the *Water Management Act 2000* for integrated development
Description of activity	Extractive Industry
Applicant/s	BORAL RESOURCES (NSW) PTY LTD C/- Benjamin Williams Dunmore Sand & Soil Pty Ltd 38 Tabbitta Road DUNMORE NSW 2829

Decision

Decision	**Granted, subject to conditions** This decision was made under section 95 of the *Water Management Act 2000*.
Date of decision	19 November 2020
Determining officer	Jeremy Morice by delegation from the Minister administering the *Water Management Act 2000* under the *Instrument of Delegation (Water Management Act) 2011*

Reason/s for decision

This controlled activity approval was granted on the basis that the Natural Resources Access Regulator is satisfied adequate arrangements are in place to ensure that no more than minimal harm will be done to waterfront land as a consequence of the carrying out of the controlled activity.

Conditions were applied for the purpose of protecting the environment from the impacts associated with the approval, or to require security for the cost of performing the approval holder's obligations under the approval in case the approval holder fails to fulfil those obligations.

Right of appeal

Section 368 of the *Water Management Act 2000* provides a right of appeal to the Land and Environment Court against a decision **imposing certain conditions** on an approval or **fixing the term** of an approval.

An approval holder wishing to make an appeal must do so **within 28 days** after the date of decision.

As this application is for a controlled activity approval for **integrated development**, there is no third party right of appeal under the *Water Management Act 2000*. This does not affect any right of appeal an **objector** may be entitled to under section 98 of the *Environmental Planning and Assessment Act 1979*.

END OF STATEMENT

Natural Resources Access Regulator

Statement of Approval

Water Management Act 2000

Application details

Approval number	10CX122266 / A011621
Status	Current
Approval Kind	Controlled Activity
Date of effect	Should an appeal be made against the granting of this approval, this approval will not take effect until the appeal is finally disposed of.
Expiry date	17/12/2023
Approval holder(s)	**Schedule 1**
Activities	**Schedule 2**
Conditions	**Schedule 3**

Contact for service of documents

Name	Benjamin Williams
Address	38 Tabbitta Road DUNMORE NSW

* Note: An approval has effect for such period as is specified in the approval, or if the period is extended under section 105, that extended period. If an application for extension of an approval is lodged before the approval expires, the term of the expiring approval is extended until either the date of the final decision on the application, or a date fixed by the Minister for the approval, whichever is the later date. An approval which has expired can be the subject of an application to extend it but it needs to be accompanied by a statutory declaration of the reasons for the delay in making the application. If the Minister accepts these reasons the term of the approval is taken to have been extended, and the application may be dealt with, as if the application had been made before the approval expired.

It is an offence under the Water Management Act 2000 to breach a term or condition of the approval or to construct and use works to which the approval does not relate. It is also an offence to use works the subject of an approval if the approval has expired, been surrendered or cancelled.

Schedule 1 - Approval holders

The holders of this approval are:

Approval Holders	ACN (if applicable)
BORAL RESOURCES (NSW) PTY LTD	000 756 507

Important notice - change of landholder or contact

Please advise the Office in the event of any of the following, as soon as practicable:

- If there is a change in the ownership or occupation of the land benefited by this approval (see Schedule 2). Under the Water Management Act 2000, an approval is typically held by the owner or lawful occupier of the benefited land. Consequently, a change in occupation may cause a change in your legal obligations as an approval holder.*
- If there is a change to the contact person. You will be required to lodge a written statement signed by all the holders.*
- If there is a change to the mailing address for the nominated contact person. This should be done by the contact person in writing.

* An updated Statement of Approval will be issued free of charge

Schedule 2 - Activities

Part A: Authorised activities

Subject to the conditions of this approval, in relation to each numbered activity in the table, the holders of this approval are authorised to undertake the activity of the type shown at the location specified:

Activity

Specified Activity	Extractive Industry
Specified location	38 Tabbitta Road Dunmore NSW 2529
Waterfront Land	Rocklow Creek, Illawarra Rivers Water Source

Schedule 3 - Conditions

The approval is subject to the following conditions:

Conditions

DS4875-00001	A. Before commencing the controlled activity authorised by this approval, the boundary of the area where the activity is to be carried out must be clearly marked on the ground. B. The markings must remain in place until the controlled activity has been completed.
DS4860-00001	The approval holder must employ a suitably qualified person to directly supervise the controlled activity authorised by this approval to be carried out.
DS4862-00001	The controlled activity authorised by this approval must be maintained for a period of 2 years after completion of the controlled activity.
DS4861-00001	All erosion and sediment control works must be decommissioned using a suitably qualified person on completion of the controlled activity once the site has stabilised.
DS4865-00001	A. All materials must be stored away from the water source so that materials do not: i. obstruct water flow, or ii. wash into the water source, or iii. cause damage to river banks. B. When the controlled activity authorised by this approval has been completed, surplus materials must be removed from waterfront land.
DS4859-00029	Rehabilitation of the site after the controlled activity is completed must be implemented in accordance with the following plan(s)/document(s) held by The Natural Resources Access Regulator, Parramatta Office, and stamped on 16 December 2017: Plan/Document No. 1. Rehabilitation Management Plan, Ref. AA009002, prepared by Arcadis, dated 17/03/2017.
DS4858-00001	The controlled activity authorised by this approval must be carried out in accordance with Managing Urban Stormwater: Soils and Construction, Volume 1 (Landcom, 2004), as amended or replaced from time to time.
DS4852-00001	A copy of this approval must be kept at the site where the controlled activity is taking place. A copy of the approval must be provided to all personnel working on the controlled activity.
DS4891-00003	The Natural Resources Access Regulator, Parramatta Office, must be notified in writing within 30 days of any change to the personnel in charge of: A. the management of the site where the controlled activity authorised by this approval takes place, or B. the implementation of the controlled activity
DS4857-00007	The approval holder must notify the Natural Resources Access Regulator, Parramatta Office, in writing within 30 days of the controlled activity being completed.
DS4863-00006	At completion of the maintenance period for the controlled activity authorised by this approval, the approval holder must report in writing to the Natural Resources Access Regulator, Parramatta Office, that: A. the controlled activity has been completed, and B. the water source and waterfront land have been restored and rehabilitated in accordance with plans held by the Natural Resources Access Regulator.
DS4889-00088	The controlled activity authorised by this approval must be carried out in accordance with the following plan(s)/document(s) held by the Natural

	Resources Access Regulator, Parramatta Office, stamped on 16 December 2017: A. Plan/Document No.1. Stage 3 CAA Map, prepared by Dunmore Sand & Soil, dated 4/09/2017;: 2. Rehabilitation Management Plan, Ref. AA009002, prepared by Arcadis, dated 17/03/2017, B. Plan/Document No.3. Water Management Plan, Ref. AA009002-WMP-F-005, prepared by Arcadis, dated 13/02/2017.
DS4892-00016	The approval holder must provide a report to the Natural Resources Access Regulator, Parramatta Office, stamped on 16 December 2017: A. Plan/Document No. 1. Stage 3 CAA Map, prepared by Dunmore Sand & Soil, dated 4/9/2017;: 2. Rehabilitation Management Plan, Ref. AA009002, prepared by Arcadis, dated 17/3/2017, B. Each report must: i. address the requirements set out in each plan, and ii. be prepared by a suitably qualified person.
DS4857-00026	The approval holder must notify the Natural Resource Access Regulator, Parramatta Office, in writing to nrar.servicedesk@dpie.nsw.gov.au , within 30 days of the controlled activity being completed.
Glossary	***licensor*** - WaterNSW or the Natural Resources Access Regulator, depending on which organisation administers your licences and/or approvals
	waterfront land - Land and material in or within 40 m of the top of the bank or shore of a river, lake, estuary or coastal waters.
General Notes	All conditions on an approval require compliance. An appeal to the Land and Environment Court against a decision to impose certain conditions on an approval can be made within 28 days after the date the decision is made. Conditions identified with the first letter "**D**" are those that can be appealed during the appeal period.
	The words in this approval have the same meaning as in the *Water Management Act 2000*

Contact: Jeremy Morice
Phone: 02 4275 9320
Email: jeremy.morice@nrar.nsw.gov.au

Dunmore Sand & Soil Pty Ltd
38 Tabbitta Rd,
DUNMORE NSW 2529

Our ref: 10CX123242 (ERM2010/1116)
File No:
Your Ref: 195-8-2004

9 August 2019

Attention: Ben Williams

Emailed: ben.williams@boral.com.au

Dear Sir

Re: Controlled activity approval – 10CX123242 (ERM2010/1116)
For activity described as: Tabbita Road Stage 2 extraction
To be carried out at: Lot 4 & 5 DP1030504 and Lot 6 DP611159 38 Tabbitta Road, Dunmore 2529
Date of Issue: 5/08/2019 Date of Expiry: 4/08/2022

I refer to your application for a controlled activity approval under the *Water Management Act 2000* which was received at this office on 5/06/2019. Receipt of your application fee of $484 is also acknowledged.

1. Controlled activity approval

Natural Resources Access Regulator (NRAR) has determined to grant you a controlled activity approval. Please find enclosed the **Notice of Decision** together with your **Statement of Approval**.

Please read carefully the conditions of the approval and seek clarification from NRAR for any condition not fully understood.

A **copy** of this approval and any annotated documentation should be **provided to council**, your **certifier** and to all **contractors** engaged in the implementation of this controlled activity to ensure they are also aware of the conditions.

The controlled activity approval must be kept **current until** the controlled activity has been **completed**. Applications for **extending the approval** should be made to NRAR, in writing, at least **one month** prior to the expiry date on the approval.

2. Inspections and fees

As the approval holder, you are required to notify NRAR on completion of the controlled activity. A site inspection may be needed to confirm that all of your obligations under the controlled activity approval have been carried out.

Costs associated with a single inspection may be covered by the application fee. However, if extra inspections or significant reassessment is required then additional fees will be incurred.

Fees will also apply to any amendments requested or any extension of this approval. The current fee schedule is available at: www.water.nsw.gov.au > Water licensing > Approvals > Controlled activities.

3. Other approvals may be required

Subject to the conditions of the attached Statement of Approval, the approval holder is only authorised to carry out the controlled activity described at the location specified.

The attached Statement of Approval does not relieve the approval holder of any obligation which may exist to also obtain permission / approval / consent from any other agency who may have some form of control over the site or the proposed development.

Any questions regarding this correspondence should be directed to **Jeremy Morice, jeremy.morice@nrar.nsw.gov.au.**

Yours sincerely

For
Alison Collaros
Manager Licensing & Approvals (East)
Natural Resources Access Regulator
NSW Department of Industry

Enc:
Notice of Decision
Statement of Approval

Notice of Decision

Water Management Act 2000

Application details

Reference number	10CX123242
Application type	Controlled activity approval under section 92 of the *Water Management Act 2000* for integrated development
Description of activity	Tabbita Road Stage 2 extraction
Applicant/s	Dunmore Sand & Soil Pty Ltd 38 Tabbitta Rd, DUNMORE NSW 2529

Decision

Decision	**Granted, subject to conditions** This decision was made under section 95 of the *Water Management Act 2000*.
Date of decision	5 August 2019
Determining officer	David Zerafa by delegation from the Minister administering the *Water Management Act 2000* under the *Instrument of Delegation (Water Management Act) 2011*

Reason/s for decision

This controlled activity approval was granted on the basis that the Natural Resources Access Regulator is satisfied adequate arrangements are in place to ensure that no more than minimal harm will be done to waterfront land as a consequence of the carrying out of the controlled activity.

Conditions were applied for the purpose of protecting the environment from the impacts associated with the approval, or to require security for the cost of performing the approval holder's obligations under the approval in case the approval holder fails to fulfil those obligations.

Right of appeal

	Section 368 of the *Water Management Act 2000* provides a right of appeal to the Land and Environment Court against a decision **imposing certain conditions** on an approval or **fixing the term** of an approval. An approval holder wishing to make an appeal must do so **within 28 days** after the date of decision. As this application is for a controlled activity approval for **integrated development**, there is no third party right of appeal under the *Water Management Act 2000*. This does not affect any right of appeal an **objector** may be entitled to under section 98 of the *Environmental Planning and Assessment Act 1979*. **END OF STATEMENT**

NSW GOVERNMENT | Natural Resources Access Regulator

Statement of Approval

Water Management Act 2000

Approval details

Approval number	10CX123242
Status	CURRENT*
Approval kind	Controlled Activity
Water sharing plan	Greater Metropolitan Region Unregulated River Water Sources 2011
Date of effect	Should an appeal be made against the granting of this approval, this approval will not take effect until the appeal is finally disposed of.
Expiry date	04/08/2022
Approval holder(s)	Schedule 1
Activities	Schedule 2
Conditions	Schedule 3

Contact for service of documents

Name	Benjamins James Williams
Address	38 Tabbitta Rd DUNMORE NSW-2529

* **Note: An approval has effect for such period as is specified in the approval, or if the period is extended under section 105, that extended period. If an application for extension of an approval is lodged before the approval expires, the term of the expiring approval is extended until either the date of the final decision on the application, or a date fixed by the Minister for the approval, whichever is the later date. An approval which has expired can be the subject of an application to extend it but it needs to be accompanied by a statutory declaration of the reasons for the delay in making the application. If the Minister accepts these reasons the term of the approval is taken to have been extended, and the application may be dealt with, as if the application had been made before the approval expired.**

It is an offence under the Water Management Act 2000 to breach a term or condition of the approval or to construct and use works to which the approval does not relate. It is also an offence to use works the subject of an approval if the approval has expired, been surrendered or cancelled.

Schedule 1 - Approval holders

The holders of this approval are:

Approval holder(s)	ACN (if applicable)
Dunmore Sand & Soil Pty Ltd	

Important notice - change of landholder or contact

Please advise the Office in the event of any of the following, as soon as practicable:

- If there is a change in the ownership or occupation of the land benefited by this approval (see Schedule 2). Under the Water Management Act 2000, an approval is typically held by the owner or lawful occupier of the benefited land. Consequently, a change in occupation may cause a change in your legal obligations as an approval holder.*
- If there is a change to the contact person. You will be required to lodge a written statement signed by all the holders.*
- If there is a change to the mailing address for the nominated contact person. This should be done by the contact person in writing.

** An updated Statement of Approval will be issued free of charge*

Schedule 2 - Activities

Part A: Authorised activities

Subject to the conditions of this approval, in relation to each numbered activity in the table, the holders of this approval are authorised to undertake the activity of the type shown at the location specified:

Activity 1

Specified Activity

Extractive Industry

Specified location

6//611159	Whole Lot
4//1030504	Whole Lot
5//1030504	Whole Lot

Water source

Illawarra Rivers Water Source

Water sharing plan

Greater Metropolitan Region Unregulated River Water Sources 2011

Schedule 3 - Conditions

The approval is subject to the following conditions:

Conditions

Water management works

DS4875-00001 A. Before commencing the controlled activity authorised by this approval, the boundary of the area where the activity is to be carried out must be clearly marked on the ground.
B. The markings must remain in place until the controlled activity has been completed.

DS4860-00001 The approval holder must employ a suitably qualified person to directly supervise the controlled activity authorised by this approval to be carried out.

DS4862-00008 The controlled activity authorised by this approval must be maintained for a period of 5 years after completion of the controlled activity.

DS4856-00024 Before commencing the controlled activity authorised by this approval, a suitably qualified person must:
A. locate the benchmarks shown on Plan No. 1 Dunmore Lakes Sand Extraction Project Stages 2, 3 & 4 - Flora and Fauna and Rehabilitation Management Plan, dated August 2010 by Cumberland Ecology held by Natural Resources Access Regulator, Wollongong, and stamped on 3/11/2010, and
B. clearly mark the cross-sections with stakes, using a GPS with the datum GDA94.

Activities

DS5035-00533 The controlled activity authorised by this approval must be carried out in accordance with the following plan(s)/document(s) held by Natural Resources Access Regulator, Wollongong Office:
A. Dunmore Lakes Sand Extraction Project Stage 2 - Hydrological Report for Dredge Crossing of the Western Tributary, dated August 2010 by Bewsher Consulting Pty Ltd;
B. Surface Water Assessment for the Dunmore Lakes Sand Extraction Proposal Stages 2, 3 & 4, dated August 2004 by Bewsher Consulting Pty Ltd;
C. Dunmore Lakes Sand Extraction Project Stages 2, 3 & 4 - Flora and Fauna and Rehabilitation Management Plan, dated August 2010 by Cumberland Ecology.

Environmental matters

DS4861-00001 All erosion and sediment control works must be decommissioned using a suitably qualified person on completion of the controlled activity once the site has stabilised.

Monitoring and recording

DS4852-00001

A copy of this approval must be kept at the site where the controlled activity is taking place. A copy of the approval must be provided to all personnel working on the controlled activity.

DS4858-00001

The controlled activity authorised by this approval must be carried out in accordance with Managing Urban Stormwater: Soils and Construction, Volume 1 (Landcom, 2004), as amended or replaced from time to time.

Reporting

DS4863-00029

At completion of the maintenance period for the controlled activity authorised by this approval, the approval holder must report in writing to Natural Resources Access Regulator, Wollongong Office, that:
A. the controlled activity has been completed, and
B. the water source and waterfront land have been restored and rehabilitated in accordance with plans held by Natural Resources Access Regulator.

DS4892-00049

A. The approval holder must provide a report to Natural Resources Access Regulator, Wollongong Office, on the implementation of each of the following plan(s):
Vegetation Management plan every six (6) months up to the end of the maintenance period, and at the completion of the controlled activity authorised by this approval.
B. Each report must:
i. address the requirements set out in each plan, and
ii. be prepared by a suitably qualified person.

Glossary

licensor - WaterNSW or DPI Water, depending on which organisation administers your licences and/or approvals

waterfront land - Land and material in or within 40 m of the top of the bank or shore of a river, lake, estuary or coastal waters.

General Notes

All conditions on an approval require compliance. An appeal to the Land and Environment Court against a decision to impose certain conditions on an approval can be made within 28 days after the date the decision is made. Conditions identified with the first letter "**D**" are those that can be appealed during the appeal period.

The words in this approval have the same meaning as in the *Water Management Act 2000*

Note: The words in this approval have the same meaning as in the WMA

END OF STATEMENT

Appendix F CONSULTATION LETTERS

Re: Request for Consultation Dunmore Lakes Sand Project Rehabilitation Management Plan

Ben Williams <Ben.Williams@boral.com.au>

Fri 25/06/2021 12:13 PM

To: Byron Robinson <byronr@kiama.nsw.gov.au>
Cc: Paul Czulowski <paulc@kiama.nsw.gov.au>; Jessica Rippon <jessicar@kiama.nsw.gov.au>

Hi Byron,

Thank you very much for your feedback on the RMP. I note that you had no issue with the plan. I would like to provide you some answers to the general queries you had:

Why Bangalay Sand Forest vegetation community is not included in the 5B replanting/rehabilitation, only freshwater fringing wetland.

Freshwater wetland species were chosen as only the fringing edge of the Stage 5B pond is being revegetated. This replanting is done for stability and at the landowner request for amenity. Banagaly Sand Forest Vegetation will be offset via retiring the biodiversity credit (71) of PCT659 as detailed in Condition 37A of the consent prior to vegetation clearing in Stage 5B.

Whether Kiama Council had a position on the Consultative Committee?

Mark Miller (Manager of Compliance and Regulation) currently attends on behalf of SHCC. We would be happy to invite the KCC equivalent to the meeting. Do you have a contact (Jessica?). I will be sending out invites shortly as the meeting is in August.

Regards,

BEN WILLIAMS
Environmental Coordinator Dunmore

Telephone: 02 42378414
Mobile: 0401 895 478
Email: Ben.Williams@boral.com.au

Boral Dunmore Sand and Soil
38 Tabbita Road, Dunmore NSW 2529
www.boral.com.au

From: Byron Robinson <byronr@kiama.nsw.gov.au>
Sent: Monday, 21 June 2021 10:22 AM
To: Ben Williams <Ben.Williams@boral.com.au>
Cc: Paul Czulowski <paulc@kiama.nsw.gov.au>; Jessica Rippon <jessicar@kiama.nsw.gov.au>
Subject: RE: Request for Consultation Dunmore Lakes Sand Project Rehabilitation Management Plan

Hi Ben,

No real concerns with the RMP, main comment is related to why Bangalay Sand Forest vegetation community is not included in the 5B replanting /rehabilitation, only freshwater fringing wetland. There may be a reason for this, however given the vegetation community being removed for stage 5B is Bangalay Sand Forest and the adjacent vegetation community is Bangalay Sand Forest, I would have thought at least vegetation from this community would be represented in the replanting / rehabilitation plan.

The only other question we had, which came in through our Catchment and Flood Risk Management Committee, was whether Kiama Council had a position on the Consultative Committee? The new Council elected in September / October will need to consider putting forward a representative if there is a vacant position for KMC on the consultative committee.

Regards

Byron Robinson
Environmental/Sustainability Officer
Kiama Municipal Council
P: 02 4232 0444
PO Box 75, Kiama NSW 2533
www.kiama.nsw.gov.au

RESPECT • INNOVATION • INTEGRITY • TEAMWORK • EXCELLENCE

From: Ben Williams <Ben.Williams@boral.com.au>
Sent: Friday, 18 June 2021 12:06 PM
To: Jessica Rippon <jessicar@kiama.nsw.gov.au>
Cc: Paul Czulowski <paulc@kiama.nsw.gov.au>; Byron Robinson <byronr@kiama.nsw.gov.au>
Subject: Re: Request for Consultation Dunmore Lakes Sand Project Rehabilitation Management Plan

Thanks Jessica and team. If you have any queries, please feel free to contact me. Have a great day.

Regards,

BEN WILLIAMS
Environmental Coordinator Dunmore

Telephone: 02 42378414
Mobile: 0401 895 478
Email: Ben.Williams@boral.com.au

Boral Dunmore Sand and Soil
38 Tabbita Road, Dunmore NSW 2529
www.boral.com.au

From: Jessica Rippon <jessicar@kiama.nsw.gov.au>
Sent: Friday, 18 June 2021 11:48 AM
To: Ben Williams <Ben.Williams@boral.com.au>
Cc: Paul Czulowski <paulc@kiama.nsw.gov.au>; Byron Robinson <byronr@kiama.nsw.gov.au>
Subject: RE: Request for Consultation Dunmore Lakes Sand Project Rehabilitation Management Plan

Hi Ben,

I have received this plan and passed through to appropriate staff for comment.

They are working on this at the moment and will provide back to you once completed.

Kind Regards

Jessica

Jessica Rippon
Director Environmental Services
Kiama Municipal Council
P: 02 4232 0444
PO Box 75, Kiama NSW 2533
www.kiama.nsw.gov.au

From: Ben Williams <Ben.Williams@boral.com.au>
Sent: Friday, 18 June 2021 10:28 AM
To: Council <council@kiama.nsw.gov.au>; Jessica Rippon <jessicar@kiama.nsw.gov.au>
Cc: Adnan Voloder <adnan.voloder@boral.com.au>
Subject: Re: Request for Consultation Dunmore Lakes Sand Project Rehabilitation Management Plan

Hi Jessica,

I hope all is well,

Are you able to confirm that you have received the email requesting consultation of the Dunmore Lakes Sand Project Rehabilitation Management Plan (including a Riparian Area Management Plan) and that you are able to provide comment by 22/06/21?

If you have any issues, please feel free to contact me,

Regards,

BEN WILLIAMS
Environmental Coordinator Dunmore

Telephone: 02 42378414
Mobile: 0401 895 478
Email: Ben.Williams@boral.com.au

Boral Dunmore Sand and Soil
38 Tabbita Road, Dunmore NSW 2529
www.boral.com.au

From: Ben Williams
Sent: Tuesday, 8 June 2021 3:42 PM
To: council@kiama.nsw.gov.au <council@kiama.nsw.gov.au>; jessicar@kiama.nsw.gov.au <jessicar@kiama.nsw.gov.au>
Cc: Adnan Voloder <adnan.voloder@boral.com.au>
Subject: Request for Consultation Dunmore Lakes Sand Project Rehabilitation Management Plan

Hi Jessica,

I hope this email finds you well.

As part of the modification consent issued in November 2020, we are required to consult with Kiama Council, following Condition 43 of consent DA 195-8-2004 , for the preparation of the Rehabilitation Management Plan. A copy of the consent is attached for your reference.

Please find attached a copy of the Rehabilitation and Riparian Area Management Plan, prepared in accordance with the requirements of Condition 43 of the consent.

It would be most appreciated if you could send through any comments on the plans by COB 22 June 2021.

Any questions or concerns, please get in touch. I would appreciate if you would be able to reply confirming that you have received this email.

Regards,

BEN WILLIAMS
Environmental Coordinator Dunmore

Telephone: 02 42378414
Mobile: 0401 895 478
Email: Ben.Williams@boral.com.au

Boral Dunmore Sand and Soil
38 Tabbita Road, Dunmore NSW 2529
www.boral.com.au

Request for Consultation Dunmore Lakes Rehabilitation Management Plan

Andrew Lee <Andrew.Lee@shellharbour.nsw.gov.au>

Tue 22/06/2021 9:54 AM

To: Ben Williams <Ben.Williams@boral.com.au>
Cc: Grant Meredith <Grant.Meredith@shellharbour.nsw.gov.au>

Hi Ben,

Regarding the modification consent issued in November 2020, Condition 43 of consent DA 195-8-2004, the preparation of the Rehabilitation Management Plan and the required consultation with Shellharbour City Council.

Recommendations include:

Page 6- 2.4.2 Fisheries Permit Application, should include reference to ‘any impacts on a Saltmarsh vegetation community will require the Fisheries Permit Application’; and

Page 28- 5.6 Maintenance, replace the word phrase 'additional planting will be considered' to 'will be replanted to achieve 80% native coverage'

Regards

Andrew Lee

Shellharbour CITY COUNCIL

Andrew Lee | Senior Environment Officer - Biodiversity

76 Cygnet Avenue, Shellharbour City Centre
Locked Bag 155, Shellharbour City Centre, NSW 2529
p. 0406 383 047 **m.** 0406 383 047
www.shellharbour.nsw.gov.au

Our ref: DOC21/510978

Ben Williams
Environmental Coordinator
Boral Dunmore Sand and Soil
E-mail: Ben.Williams@boral.com.au

22/6/2021

Dear Ben

Subject: *Consultation for Dunmore Lakes Sand Project – Rehabilitation Management Plan and Riparian Management Plan*

Thank you for your e-mail dated 8th June 2021 regarding consultation with us to meet Condition 43 and 45 of consent DA 195-8-2004 for the preparation of a Rehabilitation Management Plan and a Riparian Area Management Plan.

We have reviewed the above document and support the proposed approach to rehabilitation overall.

Please do not hesitate to contact me on 42244186, or via email Vanessa.Allen@environment.nsw.gov.au should you have any further queries.

Yours sincerely

Vanessa Allen

Senior Conservation Planning Officer
Biodiversity & Conservation Division
Environment, Energy and Science

Dunmore Lakes Sand Extraction Project – Rehabilitation Management Plan
Post Approval Review

Document: Rehabilitation Management Plan
Revision: Version 7, dated June 2021
Reviewed: Nagindar Singh (July 2021)

Rehabilitation Management Plan* – DA195-8-2004, *Schedule 3, Conditions 43 and 44	**Satisfactory (Yes/No/Partial)**	**Comment**	**Action Required**
43 Prior to commencing extraction in Stage 5, the Applicant must update the Rehabilitation Management Plan for the development to the satisfaction of the Planning Secretary: This plan must:			
(a) be prepared: i. by suitably qualified consultants, including a specialist hydrologist, wetlands ecologist and landscape architect, whose appointments have been approved by the Planning Secretary; ii. in consultation with Shellharbour Council, Kiama Council, BCD and the Department; and iii. in accordance with extant guidelines including the *Constructed Wetlands Manual, Volumes 1 & 2 and the Shellharbour Visual Management Plan User Manual;*	Partial Partial Yes	• Section 1.1 and Appendix A. This section should state names of persons from Cambium who were endorsed by the Planning Secretary to prepare the Rehabilitation Management Plan (RMP) and the date of endorsement. It was not the entire Cambium Group that was endorsed. • Section 1.4 – update with recommended edits / comments included in the draft Rehabilitation MP pdf. • Section 2.2	Yes Yes No
(b) provide detailed plans of the final landform based on current backfill estimates;		• Section 4, Figures 3 and 4.	No
(c) set detailed performance indicators and completion criteria for the rehabilitation of all areas disturbed by the development;		• Section 5.9, Table 7	No
(d) describe the measures that would be implemented to achieve the criteria in paragraph (c) and triggers for remedial actions;		• Sections 4, 5, 7 and Section 6.4 and TARP Table 8.	No
(e) include detailed design plans and scheduling for progressive rehabilitation to be initiated, undertaken and/or completed in the next 5 years;		• Section 5	No
(f) include a program to monitor, independently audit and report on progress against the criteria in paragraph (c) and the effectiveness of the measures in paragraph (d); and		• Section 5.7, Section 5.8	No
(g) include any Riparian Area Management Plan/s prepared in accordance with condition 45 for those riparian areas to be disturbed/rehabilitated in the next 5 years.		• Appendix B – Riparian Area Management Plan	No

Document: Rehabilitation Management Plan
Revision: Version 7, dated June 2021
Reviewed: Nagindar Singh (July 2021)

44. The Applicant must implement the Rehabilitation Management Plan as approved by the Planning Secretary.	-		-
Riparian Area Management Plan* – DA195-8-2004, *Schedule 3, Conditions 45 and 46	**Satisfactory (Yes/No/Partial)**	**Comment**	**Action Required**
45. The Applicant must prepare a Riparian Area Management Plan in consultation with BCD and to the satisfaction of the Planning Secretary. For works involving:	Yes	• Section 1.4 of RMP	No
(a) disturbance within 3 m of an existing riparian area, the plan must: • describe the broader extraction staging and justify the need for extraction in the Riparian Area; • describe in detail the methods and timing for extraction within the Riparian Area; • provide for construction and stabilisation of appropriate diversion channels to divert the • waterbody around the disturbance area, unless otherwise approved by BCD and the Planning • Secretary; and • describe the methods for rehabilitation of the Riparian Area and diversion channels; and	Yes	• Appendix B – Riparian Area Management Plan	No
(b) construction/rehabilitation of Riparian Areas, the plan must: • detail proposed channel/bed designs, including scour protection measures; • include hydraulic modelling supporting the proposed design; • where applicable, include measures to replicate pre-existing tidal-estuarine conditions; • include detailed plans for rehabilitation and revegetation of the Riparian Area using locally • endemic species; • describe measures for the protection, enhancement and integration with adjacent threatened communities, including *Freshwater Wetlands on Coastal Floodplains, Swamp Oak Floodplain Forest* and *Bangalay Sand Forest of the*	Yes	• Appendix B – Riparian Area Management Plan	No

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Sydney Basin and South East Corner Bioregions. 46. The Applicant must implement the Riparian Area Management Plan as approved by the Planning Secretary.			
Other Comments			
• Address the minor edits / clarification included throughout the draft RMP pdf document.			Yes