DARTBROOK MINE

SOIL STRIPPING MANAGEMENT PLAN

for Dartbrook Operations Pty Ltd

22 February 2024

DOCUMENT CONTROL

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1. INTRODUCTION

1.1 BACKGROUND

Dartbrook Mine is owned by an unincorporated Joint Venture (Dartbrook Joint Venture) between Australian Pacific Coal (AQC) and Tetra Resources Pty Ltd. Dartbrook Operations Pty Ltd (Dartbrook Operations) is the appointed operating management company and the Mine Operator under Section 5 of the *Work Health and Safety (Mines and Petroleum Sites) Regulation 2022*. The Dartbrook Joint Venture will acquire AQC Dartbrook Management Pty Ltd (ABN 62 007 377 577) which is the holder of the Development Consent and Environment Protection Licence), and AQC Dartbrook Pty Ltd (ABN 46 000 012 813) which is the holder of the relevant mining and coal authorities.

Dartbrook Mine is located approximately 10 km north-west of Muswellbrook and 4.5 km south-west of the village of Aberdeen in New South Wales. Dartbrook Mine operated as an underground longwall coal mine from 1993 until December 2006, when it was placed in care and maintenance by the previous owner, Anglo Coal (Dartbrook Management) Pty Ltd. The mine was acquired by AQC in 2017 and remained in care and maintenance throughout AQC's period of ownership.

Dartbrook Mine is authorised by Development Consent DA 231-07-2000 granted under the *Environmental Planning and Assessment Act 1979*. DA 231-07-2000 was granted on 28 August 2001 and has been modified on seven occasions (as summarised in **Table 1**). DA 231-07-2000 enables mining operations to be carried out until 5 December 2027.

Dartbrook Operations is preparing to recommence mining activities in 2024, thereby transitioning Dartbrook Mine from care and maintenance back to an operational phase.

Table 1 Modifications to DA 231-07-2000

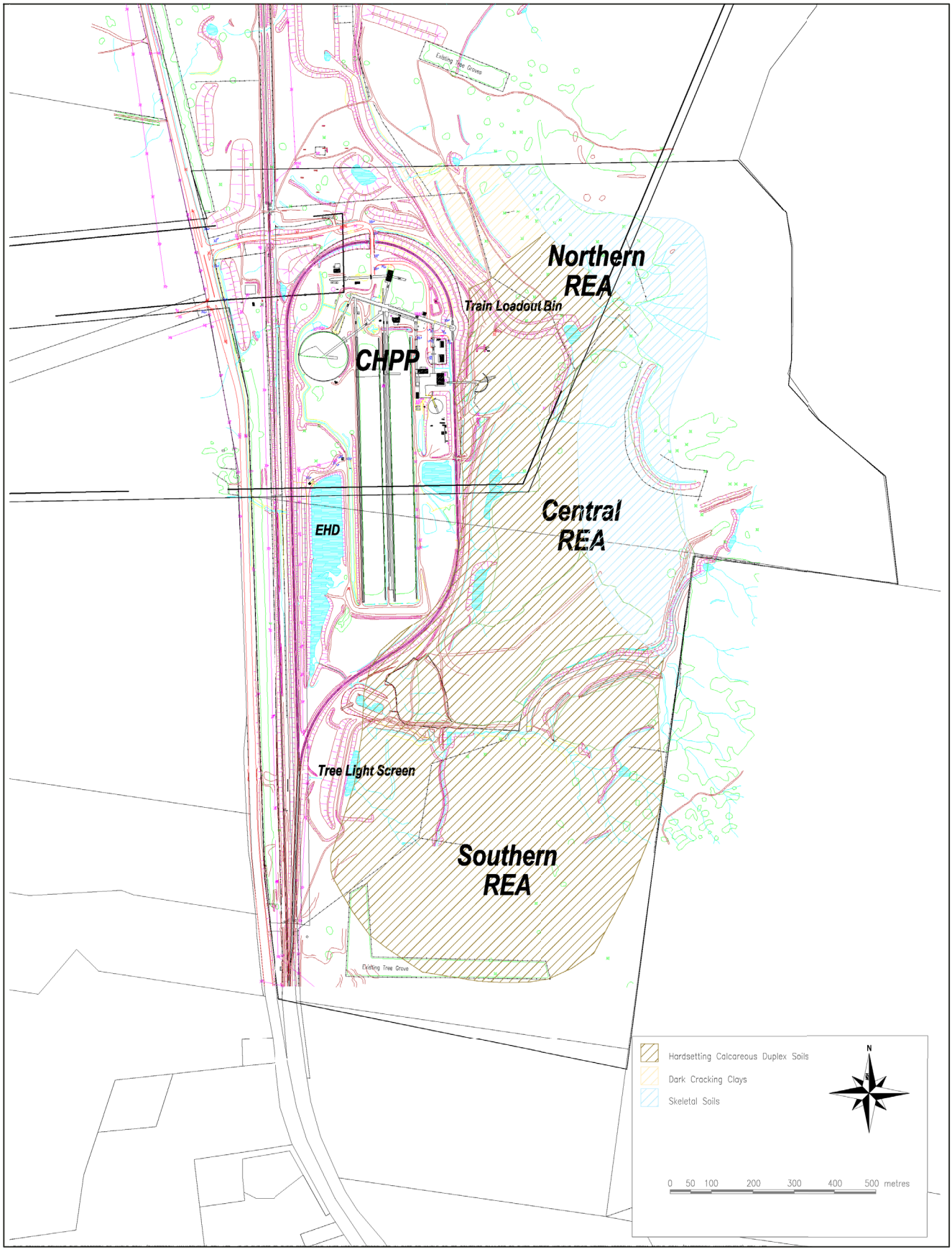
Modification	Approval Date	Activities
MOD 1	19 June 2002	MOD1 was an administrative modification to DA 231-07-2000 that altered the conditions regarding blasting notifications and structural inspections.
MOD 2	16 June 2003	MOD2 approved the construction and operation of an additional emergency tailings storage cell at the Coal Handling and Processing Plant (CHPP).
MOD 3	4 November 2003	MOD3 proposed the following changes to the site access arrangements: • Continued use of Dartbrook Road to provide access to the West Site; and • Use of local public roads by traffic associated with Dartbrook Mine. Prior to construction of the Kayuga Mine Access Road, access to the West Site was via Dartbrook Road. It was envisaged that Kayuga Mine Access Road would replace Dartbrook Mine as the primary access to the West Site. However, the Kayuga Mine Access Road was being used by trucks to haul coal to the CHPP. To avoid interactions between haul trucks and private vehicles, MOD3 proposed that Dartbrook Road should continue to be used as the primary access road for mine personnel. MOD3 also sought approval for locally based employees to access the West Site via local roads (Kayuga Road, Dartbrook Road and Blairmore Lane). For employees residing in the surrounding areas, these local roads provide more convenient access than the Western Access Road.
MOD 4	30 March 2004	DA 231-07-2000 allowed for truck haulage of coal to the CHPP over an 18-month period. Truck haulage was to be discontinued upon

Modification	Approval Date	Activities
		completion of the conveyor system for the Kayuga Seam, which would enable coal to be transferred to the CHPP via the Hunter Tunnel. MOD 4 extended the duration of truck haulage by 3 months to allow for haulage to continue until the completion of the Kayuga Seam conveyor system.
MOD 5	4 May 2005	MOD 5 facilitated changes to the rejects disposal system at Dartbrook Mine. The approved rejects disposal system involved the commissioning of a pipeline and pumping system for the transportation and disposal of reject materials. Engineering studies indicated that this method would pose significant technical risks due to the variability in relative quantities of coarse and fine rejects produced by the CHPP. MOD5 obtained approval for rejects to be transported to the Rejects Emplacement Area (REA) using trucks.
MOD 6	16 November 2005	MOD 6 provided approval for the following activities: • Establishment of four new Run of Mine (ROM) coal stockpiles and expansion of the existing emergency ROM coal stockpile at the CHPP; • Disposal of tailings within the Wynn Seam goaf; and • Operation of a Nitrogen Injection Plant to prevent the oxidation of coal.
MOD 7	11 March 2022	MOD 7 was determined by the NSW Independent Planning Commission (IPCN) on 9 August 2019. The IPCN approved the alternate mining method (bord and pillar mining) but not the proposed five-year extension to the duration of mining operations. Without the extension to operate under DA 231-07-2000 for a further five years, it was impractical to recommence mining at Dartbrook. In November 2019, an appeal was lodged against the IPCN's determination in the NSW Land and Environment Court. The court proceedings were resolved on 11 March 2022, with the proposed five-year extension of mining being approved. As a result, DA 231-07-2000 currently enables mining operations to be undertaken until 5 December 2027.

1.2 SOIL MANAGEMENT PLAN

This Soil Stripping Management Plan was developed in accordance with the conditions of the current Dartbrook Development Consent. The original plan included soil stripping and handling management measures for all components of the Dartbrook operations, including:

- Operation of the West Site Surface Facilities including Mine surface facilities, Kayuga Seam Access Slot and Kayuga Seam Access Road;
- Historic underground development and longwall mining operations in the Kayuga, Piercefield and Mt Arthur seams;
- Operation of CHPP at the East Site, construction and operation of existing and new ROM coal stockpiles, and construction and operation of a tailings filter press plant at the CHPP;
- Disposal of tailings underground in the Wynn Seam goaf;
- Construction, operation, and progressive rehabilitation of the current and the expanded REA at the East Site;
- The Nitrogen Injection Plant over the Kayuga Seam mine workings; and



JBA 2339 DBK - SM F 01 East Site Soil Types (21/02/2024)

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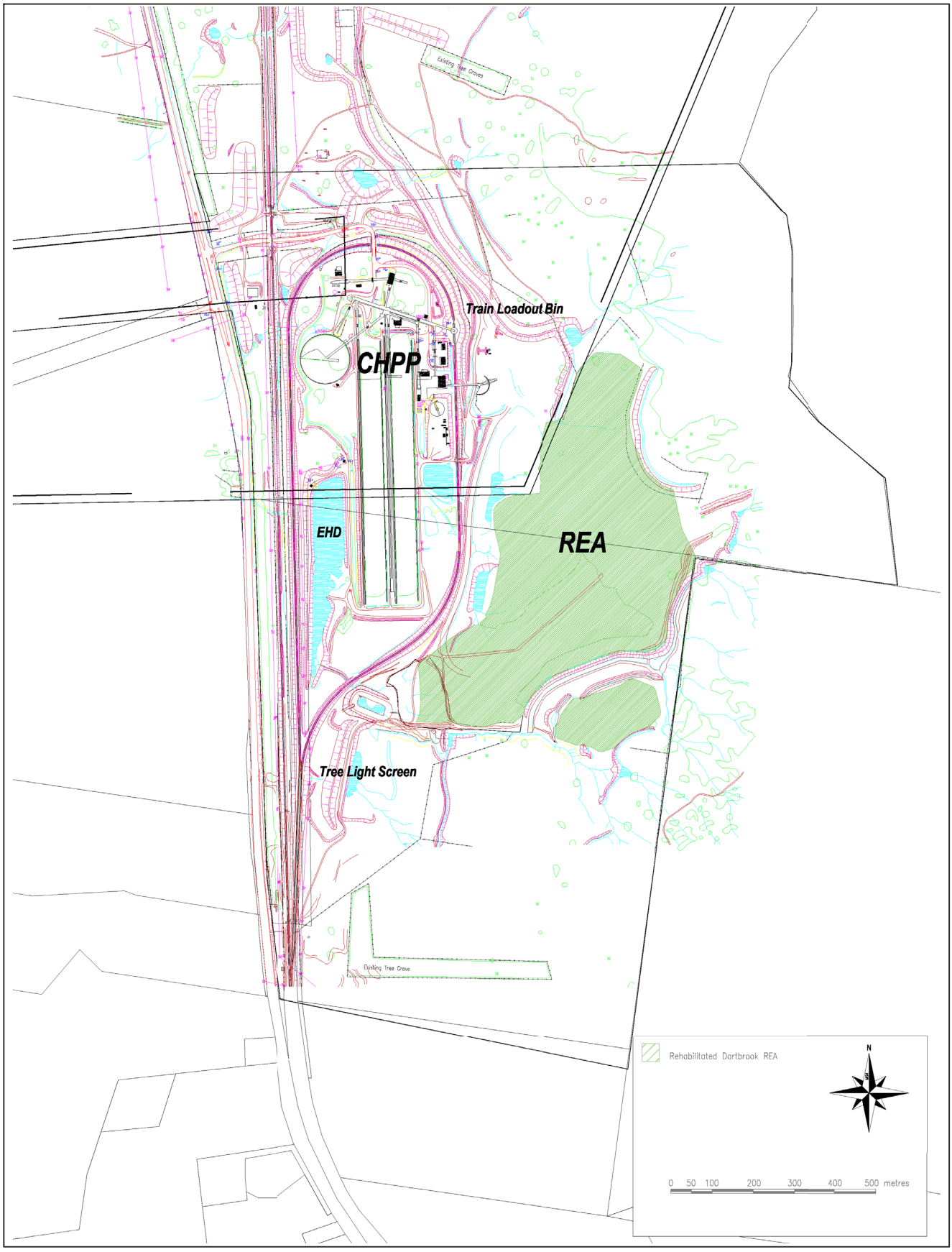
East Site Soil Types

FIGURE 1



JBA 2339 DBK - SM F 02 REA Rehabilitation Layout (22/02/2024)

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REA Rehabilitation Layout

FIGURE 2

1.3 MANAGEMENT PLAN REQUIREMENTS

The Soil Stripping Management Plan documents the management strategies designed to ensure the appropriate management of topsoil for use in all areas of rehabilitation including the REA. The primary objectives of the plan are to ensure the maximum retrieval of topsoil, use of appropriate stripping techniques and appropriate management of topdressing stockpiles. These objectives will be met through the implementation of the management strategies specified in **Section 3** and **Section 4**.

The specific requirements of the Soil Stripping Management Plan are contained in Development Consent condition 3.6 (c). These requirements are listed in **Table 2** with a reference to where each specific requirement is addressed in the management plan.

Table 2 Management Plan Requirements

Development Consent Condition			Reference
3.6 (c)	The Applicant must also prepare a Soil Stripping Management Plan for the expansion of the rejects emplacement area, prior to the commencement of construction of the reject emplacement area, to the requirements of Resources Regulator and DPIE Water that must include, but not be limited to:		This document is the Soil Stripping Management Plan which was originally prepared in consultation with the Department of Primary Industries – Mineral Resources and the Department of Natural Resources (now the Resources Regulator).
	(i)	details to ensure the maximum retrieval of suitable topsoil and appropriate management of topsoil stockpiles including immediate revegetation to protect from soil erosion and to control potential weed problems;	**Section 3**
	(ii)	details of the management of soil stockpiles, soil stripping techniques and scheduling;	**Section 3**
	(iii)	control of weed infestation on topsoil stockpile material;	**Section 3.2**
	(iv)	details of estimated quantities of suitable topsoil required for subsequent re-spreading on rehabilitated land; and	**Section 2.3**
	(v)	a program for reporting on the effectiveness of the soil stripping methods and performance against objectives contained in the soil stripping management plan, and the documents referred to in Condition 1.1(a).	**Section 4**

2. EXISTING ENVIRONMENT

2.1 INTRODUCTION

A number of soil surveys of the Dartbrook East Site have been undertaken and the entire footprint of the REA has been surveyed (see **Figure 1**). Studies undertaken include a detailed soil survey as part of the Dartbrook Extended Environmental Impact Statement (EIS) and a soils assessment undertaken for the original Dartbrook Underground Mine EIS. **Section 8** provides full references to these studies.

A summary of the findings of the studies in relation to the management of topsoil is presented in **Section 2.2**.

2.2 SOIL TYPES

Three soil types have been identified and mapped in the study area (**Figure 1**). **Table 3** characterises the soil types in terms of the depth of available topsoil and any special handling requirements. A full description of the soil types is provided in the Dartbrook Extended EIS and the Dartbrook EIS.

Table 3 Topsoil Suitability Assessment

Soil Type	Description	Suitability for Topdressing	Depth of Topsoil (mm)	Special Handling Requirements
Dark Cracking Clays	Uniform, dark brownish/black clays with strong structure throughout. Well-structured topsoil with some surface cracking, alkaline (pH 8), medium clay texture to 20 cm depth.	Suitable	200	None
Hard Setting Calcareous Duplex Soils	The A horizon has a sandy loam to fine sandy loam texture. A2 horizon is bleached sandy clay loam. The B horizon is reddish brown light medium to medium clay with strong structure alkaline subsoils. Total depth of A and B horizons range from 0.3 m to over 1 m. Some rocky outcrops occur throughout this soil unit, which will locally prevent topsoil stripping.	Suitable	100 – 120	A2-horizon material should not be included in the topsoil, as it is dispersible and highly erodible.
Skeletal Soil	Shallow, mostly sandy soils occurring on slopes generally greater than 15%. Rock size is commonly 20 – 30 cm, with larger rocks and rock outcrop areas frequent. Patches of coarse textured 'soil' occur at the base of steeper slopes, but commonly has large gravel inclusions.	Not suitable	0	Not Applicable

2.3 QUANTITIES OF TOPSOIL

In the original Plan all topsoil resources were to be stripped, stockpiled and used in rehabilitation of the REA. An assessment of the volume of available topsoil has been made for the area that was to be disturbed by the construction of the Dartbrook REA with a topsoil balance provided in **Table 4**. The Staged Layout Plans of the REA provided the basis for the assessment. **Figure 2** shows the current location of the REA is 29.6 ha. Topsoil was spread to a minimum depth of 100 mm. The available topsoil was determined by considering the mapped soil types (**Figure 1**) and the depth of topsoil available for each soil type **(Table 3**). The topsoil balance indicated that there was to be ample topsoil available for rehabilitation of the REA.

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Figure 2 Dartbrook's REA Rehabilitation Layout

Table 4 Topsoil Balance

Year	Total Area Disturbed (ha)	Total Topsoil Stripped (m3)	Total Area Rehabilitated (ha)	Topsoil Used in Rehabilitation (m3)	Topsoil Stockpile Inventory (m3)
5	17	20,400	8	8,000	12,400
10	25	30,000	22	22,000	8,000
15	27	32,400	24	24,000	8,400
20	49	50,000	49	49,000	1,000

When Care and Maintenance commenced, in late 2006, only the Central REA had been disturbed and this has since been rehabilitated. . A grazing trial was undertaken in 2015 which successfully demonstrated sustainable cattle grazing can occur on the rehabilitated REA.

The current site topsoil inventory is approximately 14,780 t (source : Dartbrook's 2022 Annual Review).

3. MANAGEMENT MEASURES

3.1 TOPSOIL STRIPPING

All additional areas are to be cleared of vegetation in accordance with the Flora & Fauna Management Plan prior to the commencement of topsoil stripping. Earthmoving plant operators will be trained and/or supervised to ensure that stripping operations are conducted in accordance with stripping plans and in situ soil conditions. This will ensure that all suitable topsoil resources are salvaged and that the quality of the stripped topsoil is not reduced through contamination with unsuitable soils.

Care is to be taken during stripping, stockpiling, and re-spreading to ensure that structural degradation of the soil is avoided and that excessive compaction does not occur during stockpiling.

3.2 STOCKPILING

Where possible, topsoil will be re-spread directly from stripped areas onto areas being rehabilitated. Where this is not possible, topsoil will be stored in stockpiles.

Topsoil stockpiles will be located in areas which are outside the area to be disturbed and away from drainage lines. Drainage from higher areas will be diverted around stockpiles to prevent erosion. Sediment controls will be installed downstream of the stockpiles to collect any washed sediment.

Stockpiles will be formed in low and free draining mounds of (approximately 3 m maximum height) with maximum surface area consistent with the storage area available. If the stockpile is to be retained for a period of more than six months, the stockpile will be deep ripped and sown with local grass seed stock and legumes in order to keep the soil healthy and maintain biological activity. Topsoil stockpiles will be clearly signposted and surveyed for easy identification and to avoid any inadvertent losses. Establishment of weeds on the stockpiles will also be monitored and controlled.

Stockpiles will be inspected periodically to monitor weeds and sediment and erosion control works.

3.3 RE-SPREADING

All disturbed areas (including REA rehabilitation) will include topsoil re-spreading management considerations:

- Balancing required rehabilitation topdressing quantities against stored stockpile inventories;

- Planning the source of topsoil to maximise direct re-spreading from stripping areas and to minimise the length of time that material is stored in stockpiles; and
- Selective placement of more erodible topsoil on flatter areas and not on steeper slopes, to minimise erosion.

During the removal of soils from the stockpiles, care will be taken to minimise structural degradation of the soils. The upper and lower sections of the stockpiles will be mixed to spread seed stock and micro-fauna through the lower sections of the stockpile.

The rehabilitation strategy will include the following measures which are designed to minimise the loss of topsoil re-spread on rehabilitated areas:

- Scarifying along the contour to encourage rainfall infiltration and minimise runoff;
- Reseeding soon after re-spreading to establish re-vegetation cover as early as possible;
- Installation of contour drains to limit slope lengths and runoff velocities; and
- Installation of collection drains and sediment dams in accordance with the Erosion and Sediment Control Plan to collect runoff and remove suspended sediment.

4. MONITORING

Soil stockpiles will be inspected at least quarterly to:

- Ensure erosion and sediment controls are in place and effective; and
- Identify the presence of weeds and the need for any weed controls.

5. REPORTING

5.1 ANNUAL REVIEW

Details of any topsoil management conducted during the construction and operation of the REA will be reported in the Annual Review. This will include details of REA rehabilitation and associated topsoil stripping, stockpiling and re-spreading. In accordance with Development Consent Condition 9.2 (b), Annual Reviews will be submitted to the Department of Planning, Housing and Infrastructure (DPHI), , Muswellbrook Shire Council (MSC), Upper Hunter Shire Council and the Dartbrook Community Consultative Committee. The Annual Review will also be made available to the public on the Dartbrook website.

5.2 INCIDENT REPORTING

Generally topsoil management incidents are:

- The contamination or loss of topsoil from the stockpiles,
- Uncontrolled unwanted vegetation and weed growth on the topsoil, and
- Significant sediment movement from the stockpile.

These incidents are reported internally. All significant incidents are reported to the appropriate and relevant Statutory Authority such as the DPHI, Resources Regulator, NSW Environmental Protection Authority and the Department of Climate Change, Energy, the Environment and Water – Water Division when appropriate.

6. RESPONSIBILITIES

The Dartbrook Environment Officer is the key person with responsibility for environmental management on the mine site during operations.

Specific responsibilities of the Environment Officer will include:

- Ensuring that all personnel are given adequate training in environmental awareness, legal responsibilities and topsoil management;
- Providing appropriate training/supervision of staff and contractors responsible for topsoil handling including stripping, stockpiling and re-spreading;
- Maintaining topsoil inventories and planning topsoil management;
- Monitoring erosion and sediment control works on topsoil stockpiles; and
- Monitoring and control of weeds on topsoil stockpiles.

7. REVIEW REQUIREMENTS

In accordance with Condition 3.2(f) of the Dartbrook Development Consent, this Plan will be reviewed every five years.

8. REFERENCES

- Enviros ciences Pty Ltd (1990). Dartbrook Underground Coal Mine Project Environmental Impact Statement.
- Enviros ciences Pty Ltd (1990) Characteristics of Soil Types. Appendix 1 – Enviros ciences Pty Ltd (1990) Dartbrook Underground Coal Mine Project Environmental Impact Statement.
- HLA-Enviros ciences (2000). *Dartbrook Extended Environmental Impact Statement.*
- R.J. Connolly Environment Management Consulting Pty Limited (2000) Soil and Land Capability Assessment at Dartbrook Mine Site. Appendix M – HLA-Enviros ciences Pty Limited (2000) Dartbrook Extended Environmental Impact Statement.

ABBREVIATIONS

Term	Definition
AQC	Australian Pacific Coal Limited
CCC	Community Consultative Committee
CHPP	Coal Handling and Preparation Plant
DA	Development Consent
Dartbrook Operations	Dartbrook Operations Pty Ltd
DPHI	Department of Planning, Housing and Infrastructure
EIS	Environmental Impact Statement
Ha	Hectares
IPCN	Independent Planning Commission
m	Metre
mm	Millimetre
m^3	Metres cubed
MSC	Muswellbrook Shire Council
REA	Rejects Emplacement Area
ROM	Run of Mine
t	Tonne