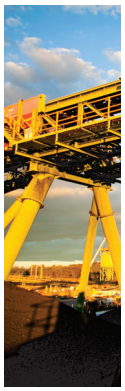


MOOLARBEN COAL COMPLEX
OC3 EXTENSION PROJECT

AMENDMENT REPORT

APPENDIX A

UPDATED PROJECT DESCRIPTION

YANCOAL
兖煤澳大利亚有限公司
MOOLARBEN COAL

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

3 PROJECT DESCRIPTION

This section describes the Project, **incorporating amendments as described in the *Moolarben OC3 Amendment Report* (refer red text).** The approved Moolarben Coal Complex (Project Approvals 05_0117 and 08_0135) and its interaction with the Project is described in Section 1.4.

3.1 PROJECT OVERVIEW

The Project would include the following activities:

- extension of open cut mining operations within ML 1691, EL 6288, and EL 7073 to allow mining of additional coal resources;
- extraction of up to **8.5 Mtpa** of ROM coal, with a total of approximately **30 Mt** over the life of the Project;
- mining operations between approximately 2025 to 2034 (within the approved life of the Moolarben Coal Complex ending on 31 December 2038);
- extension of employment of existing open cut workforce;
- construction and operation of ancillary infrastructure, services, plant and equipment in support of mining operations;
- construction and operation of water management and water storage infrastructure in support of mining operations;
- development of an integrated final landform with the approved OC3 mining area;
- ongoing exploration activities in the Project area;
- construction of haul road creek crossings;
- quarrying and/or excavation of borrow pits within approved disturbance areas to retrieve construction materials;
- conventional open cut mining related activities such as drilling and blasting, and other associated activities; and
- rehabilitation, decommissioning and closure.

Table 3-1 provides a summary of the key characteristics of the Project.

An indicative Project general arrangement is provided on Figure 3-1 **(i.e. the Project area)**.

Indicative timing and interaction of the Project with the approved Moolarben Coal Complex is shown in Figures 3-2 and 3-3, respectively. Production limits for the Moolarben Coal Complex and the Project are detailed in Figure 3-4.

Further detail on the Project description is provided below.

3.2 COAL RESOURCE, GEOLOGICAL FEATURES AND EXPLORATION

Exploration in the general area of the Moolarben Coal Complex (including within the Project area) has been conducted since 1950, with over 1,500 exploration boreholes completed to date.

Geological exploration activities would continue to be undertaken over the life of the Project to provide input to detailed mine planning and engineering studies to refine the understanding of coal quality and geological features.

A description of the local geological features (including faulting) in the vicinity of the Project is provided in the Groundwater Assessment (Appendix A).

Similar to the existing Moolarben Coal Complex, the Project targets the Ulan Seam of the Illawarra Coal Measures (Figure 3-5). Other shallower coal seams may also be recovered, if present.

The Ulan Seam is divided into five key working sections (i.e. A1, WS1, WS2, ELWR and G) that are separated by recognised partings. The Illawarra Coal Measures are overlain by the Triassic Narrabeen Group (locally known as the Wollar Sandstone) and comprise mainly conglomerate and sandstone.

The Ulan Seam typically ranges from 2.5 to 7.5 m thick in the Project area. Typical thickness of recovered coal plies mined by the existing Moolarben Coal Complex is 5.5 m in total, with various interburden thicknesses between plies. The Ulan Coal Seam plies have an average raw ash content of 13% to 50%.

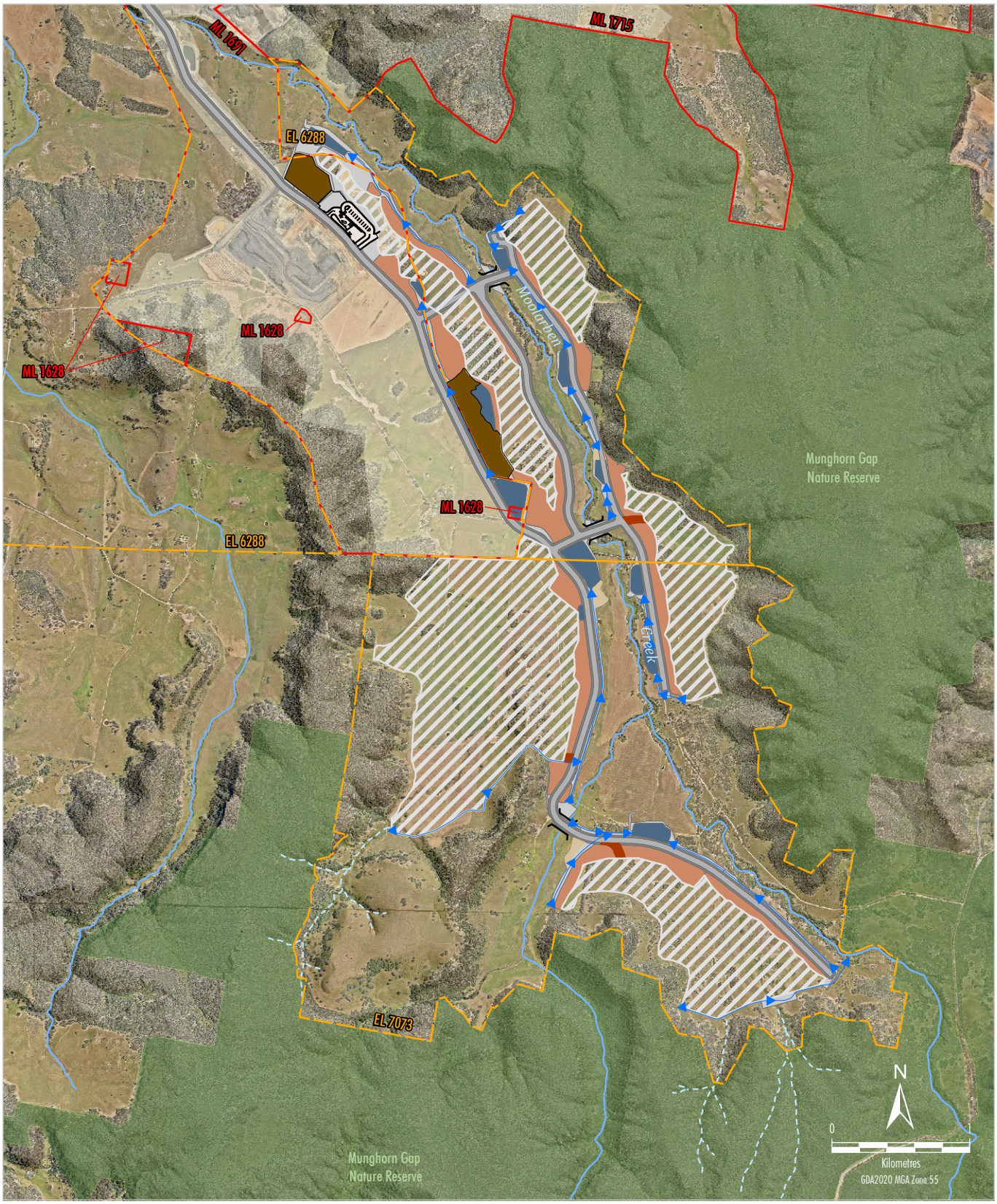
The thickness of overburden over the Project area typically ranges from less than 5 m thick (along eroded sections of Moolarben Creek) up to approximately 120 m along the valley edges at the boundary of the Munghorn Gap Nature Reserve. On this basis, the proposed open cut extensions for the Project would be relatively shallow with low strip ratios.

Table 3-1
Summary of the Approved Moolarben Coal Complex and the Project

Project Component	Approved Moolarben Coal Complex		Project (OC3 Extension)
	Stage 1 (Project Approval 05_0117)	Stage 2 (Project Approval 08_0135)	
Mine Life	Mining operations can be carried out until 31 December 2038.		Unchanged. Mining activities for the Project would be carried out until approximately 2034. Landform profiling and rehabilitation activities would continue following cessation of mining activities.
Open Cut Mining Areas	Conventional open cut mining within OC1, OC2 and OC3 areas.	Conventional open cut mining within OC4 area.	Mining within existing mining and exploration tenements and on Moolarben-owned freehold land, via conventional open cut mining methods (as per Stages 1 and 2) within an extension to the approved OC3 open cut pit, as well as four new open cut pits.
Open Cut Coal Extraction Limits	Up to 10 Mt of ROM coal extracted from the open cut mining operations in any calendar year.	Up to 16 Mt of ROM coal extracted from the open cut mining operations in any calendar year.	Up to **8.5 Mt** of ROM coal would be extracted from the Project in any calendar year.
	Up to 16 Mt (total) of ROM coal extracted cumulatively from the open cut operations at the Moolarben Coal Complex in any calendar year.		Unchanged (i.e. Project extraction of **8.5 Mtpa** can be accommodated within existing Moolarben Coal Complex cumulative open cut ROM coal extraction limits).
Coal Processing and Offsite Transport	Up to 16 Mtpa of ROM coal from the Moolarben Coal Complex can be processed (washed) in any calendar year. Total coal production of 22 Mtpa. Average of 8 trains per day and peak of 11 trains per day.	The Proponent shall ensure that all coal extracted from the site is sent to the Moolarben Stage 1 mine surface infrastructure area for processing (washing) and/or transport to market via rail.	All ROM coal extracted from the Project would be hauled to the existing Stage 1 infrastructure for processing and transport to market via rail. No change (cumulatively) to Stage 1 production and transport limits (22 Mtpa of total coal produced, average of 8 trains per day and peak of 11 trains per day) as a consequence of the Project.
Coal Rejects	Co-disposal of coal rejects with waste rock in the open cut voids.		Unchanged[1].
Workforce	Peak workforce expected to be up to approximately 1,000 personnel.		No increase cumulatively in peak workforce at the Moolarben Coal Complex. Extension of peak cumulative employment at the Moolarben Coal Complex for a longer period. Up to approximately 400 personnel from the Moolarben Coal Complex would be required to implement Project mining operations.
Hours of Operations	Mining operations and associated activities can be carried out 24 hours per day, 7 days per week.		Unchanged.
Site Access	Main site access via Ulan-Wollar Road and CHPP access via Ulan Road.		Unchanged[2].

[1] The Project would not directly create coal rejects as these are produced at the Stage 1 CHPP. The Project would not increase the rate of reject production. While the Project would indirectly increase the cumulative amount of mine rejects, these would continue to be managed as per the existing practices.

[2] The Project does not involve any direct interaction with the public road network. Employees, contractors and deliveries would access the Project area via the existing Moolarben Coal Complex site access and internal Moolarben Coal Complex roads.



MCM-20-18 OC3 Ext AR UPD AppA_201E

LEGEND

- National Park/Nature Reserve
- Exploration Licence Boundary
- Mining Lease Boundary
- Moolarben Coal Complex Disturbance Footprint
- OC3 Extension Project
- Indicative Open Pit Extent
- Indicative ROM Pad
- Culvert
- Indicative Haul Roads and Infrastructure Corridor
- Indicative Infrastructure Area
- Indicative Construction/Rehabilitation Material Stockpiles
- Conceptual Flood Levee Embankment
- Conceptual Water Management Infrastructure
- Indicative Vehicle Access
- Conceptual Surface Water Drain

Source: MCO (2023); NSW Spatial Services (2021)
Orthophoto: MCO (2021)

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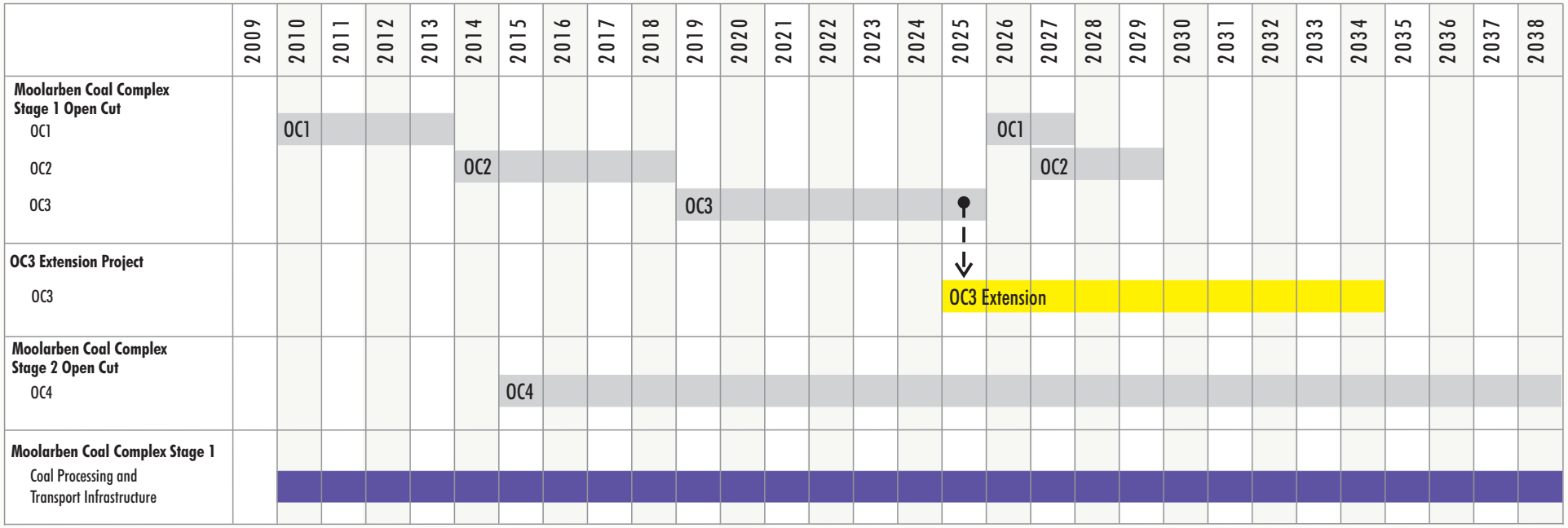
General Arrangement of the Project

Figure 3-1



Note: Indicative timing only includes mining operations and does not take into consideration decommissioning, closure and rehabilitation activities.

MCM-20-18 OC3 Ext AR UPD Appx_001B

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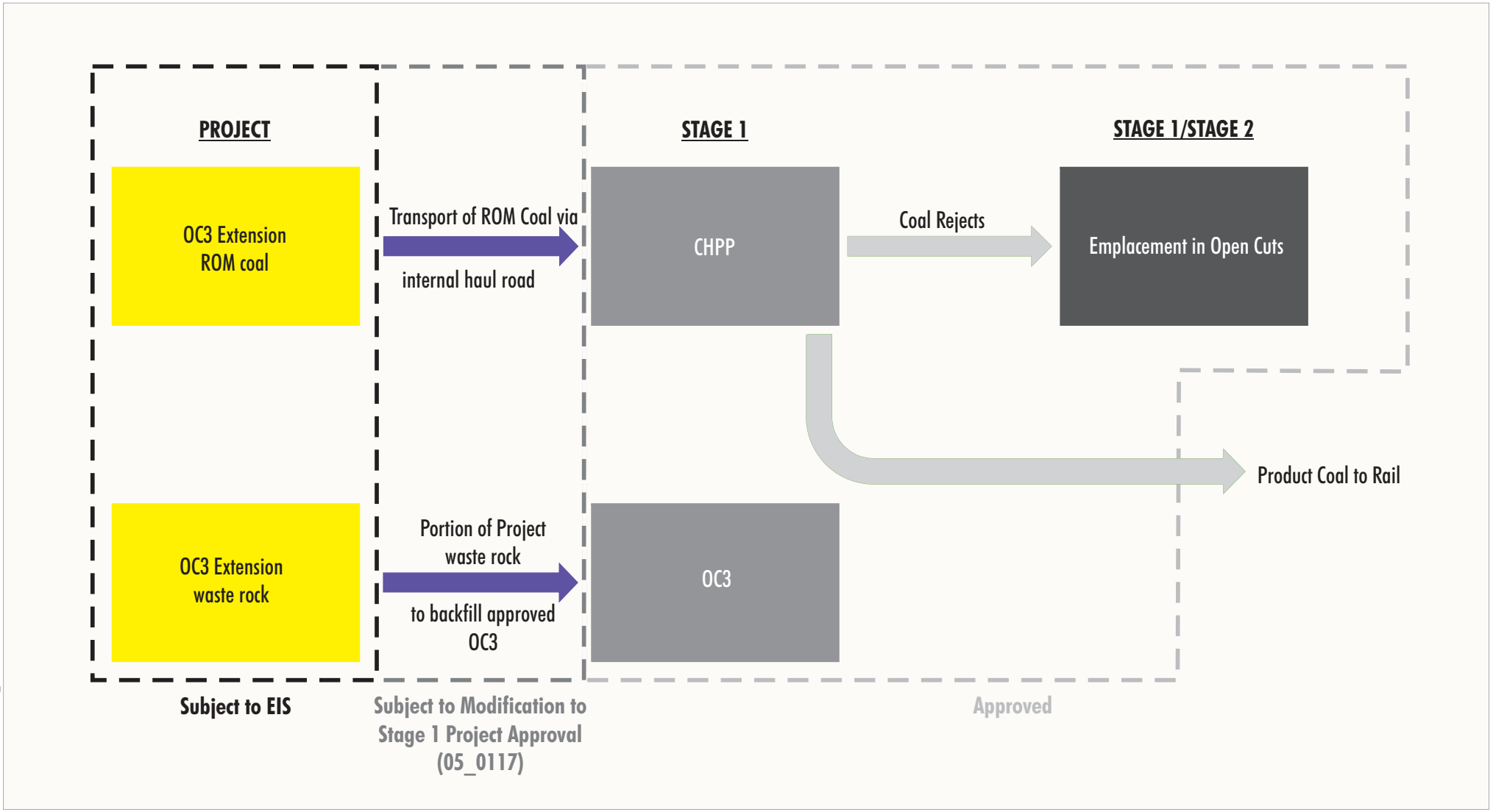
Moolarben Coal Complex
and OC3 Extension Project -
Indicative Open Cut Operations Timing

Figure 3-2



MCM-20-18 OC3 Ext AR UPD AppA_002A

LEGEND

- Project Components
- Modification to Stage 1 Project Approval (05_0117)
- Approved Moolarben Coal Complex Components

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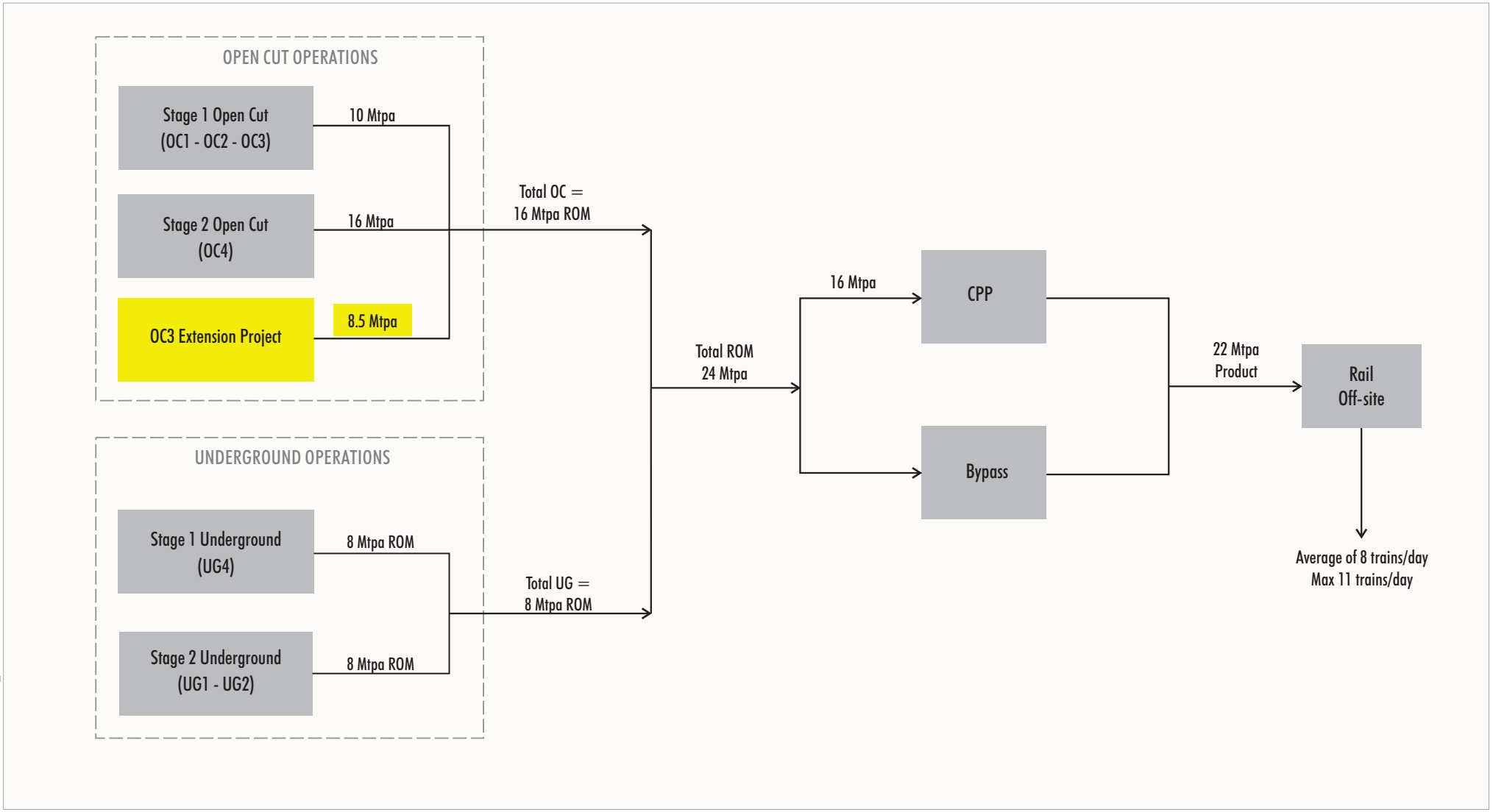
Project Interaction with Approved Moolarben Coal Complex

Figure 3-3



MCM-20-18 OC3 Extension EIS Sect3_003A

LEGEND
Project Components
Approved Moolarben Coal Complex Components

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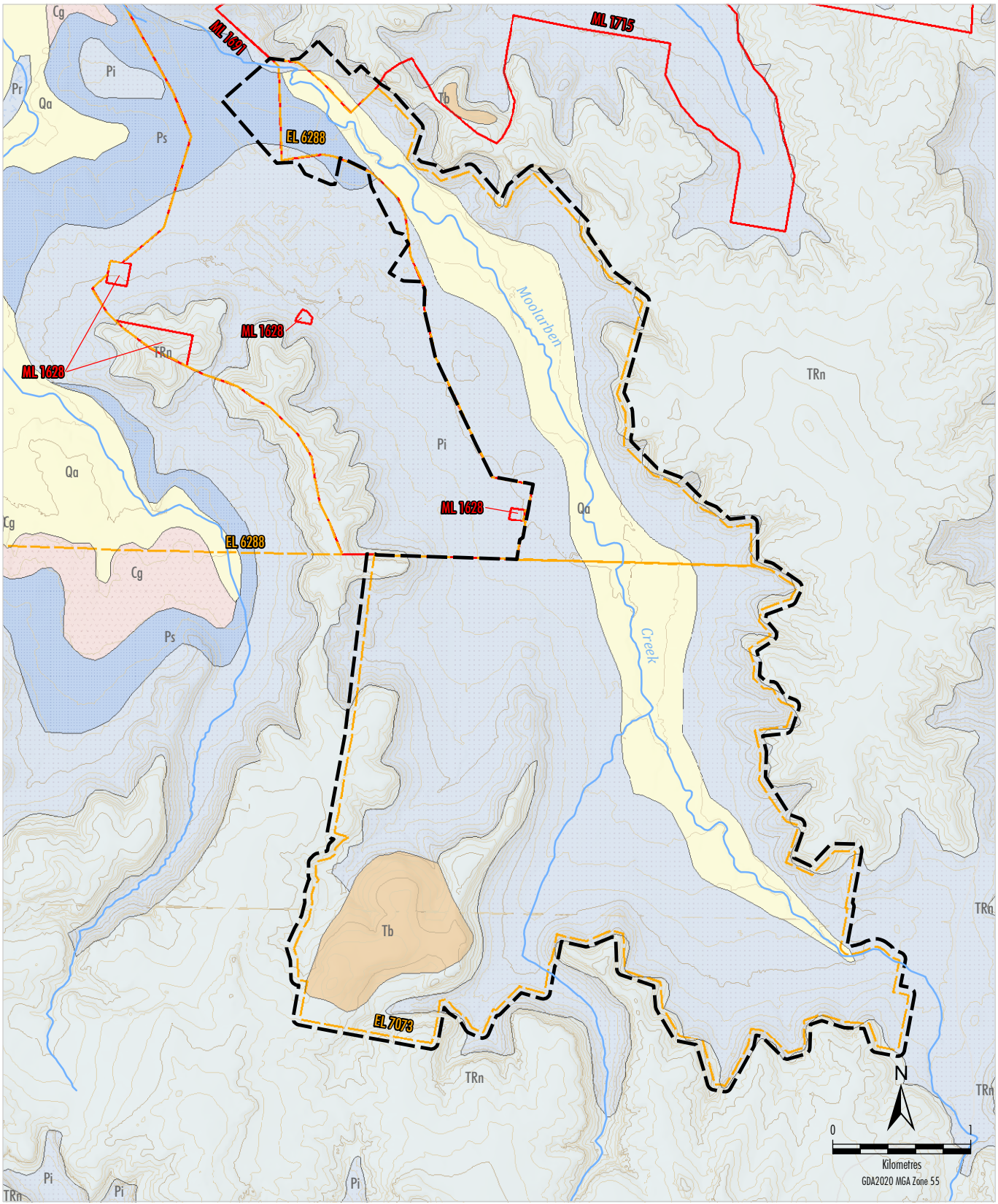
Moolarben Coal Complex
and OC3 Extension Project -
Coal Production Limits

Figure 3-4



MCM-20-18 OC3 Ext AR UPD AppA_202B

LEGEND

- Exploration Licence Boundary
- Mining Lease Boundary
- Watercourse
- Project Study Area

Regional Surface Geology

- Alluvium (Qa)
- Tertiary Basalt (Tb)
- Jura-Tertiary Volcanics (J-Tc)
- Pilliga Sandstone (Jp)
- Purlawaugh Formation (Ju)
- Mesozoic Igneous Rocks (Ma)
- Narrabeen Group (TRn)
- Illawarra Coal Measures (Pi)
- Shoalhaven Group (Nile Subgroup) (Ps)
- Rhylstone Volcanics (Pr)
- Carboniferous Granite (Cg)
- Palaeozoic Rock (Pz)

Source: MCO (2022); NSW Spatial Services (2021); Western Coalfield Geology Map 1:100, 000 (1998)

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Surface Geology of the Project Area and Surrounds

Figure 3-5

Figure 3-6 is a conceptual stratigraphic section of the Illawarra Coal Measures in the vicinity of the Project and shows the seams and plies of the stratigraphic section, and the target seams and partings of the typical working section.

3.3 PROJECT AREA

The Project proposes extraction of additional coal resources within existing mining and exploration tenements (Table 3-2), on Moolarben-owned freehold land (with minor areas of Council/Crown land).

Table 3-2
Mining and Exploration Tenements Related to the Project

Tenement Reference	Tenement Holders	Expiry
ML 1691	Moolarben Coal Mines Pty Ltd.	23/09/2034
EL 6288[1]	Moolarben Coal Mines Pty Ltd; Kores Australia Moolarben Coal Pty Ltd; Yancoal Moolarben Pty Ltd.	23/08/2023
EL 7073		12/02/2026

[1] EL 6288 is in the process of getting renewed

The Project has largely been constrained to previously cleared land which has historically been used for low intensity agriculture (i.e. grazing and dryland cropping).

The surrounding land uses include existing open cut mining for the approved OC3 immediately north of the Project area, as well as the Munghorn Gap Nature Reserve.

The Project has been designed to avoid:

- **disturbance within 100 m of the Munghorn Gap Nature Reserve;**
- disturbance **within 100 m** of mapped rocky habitat associated with threatened bat species **(specifically Large-eared Pied Bat and Eastern Cave Bat)** and the Broad-headed Snake; **and**
- open cut mining within 200 m of Moolarben Creek and Murdering Creek.

3.4 PROJECT GENERAL ARRANGEMENT

Key components of the Project layout include open cut pits, internal haul roads and associated creek crossings, internal access roads, mine infrastructure area, water management infrastructure (e.g. clean water diversions, mine water dams and sediment dams), ROM pads, waste rock emplacement areas and temporary rehabilitation and construction material stockpiles.

Indicative Project general arrangements for **Years 3** (nominally **2027**), 5 (nominally 2029), 7 (nominally 2031) and 10 (nominally 2034) are shown on Figures 3-7,3-8, 3-9 and 3-10, respectively.

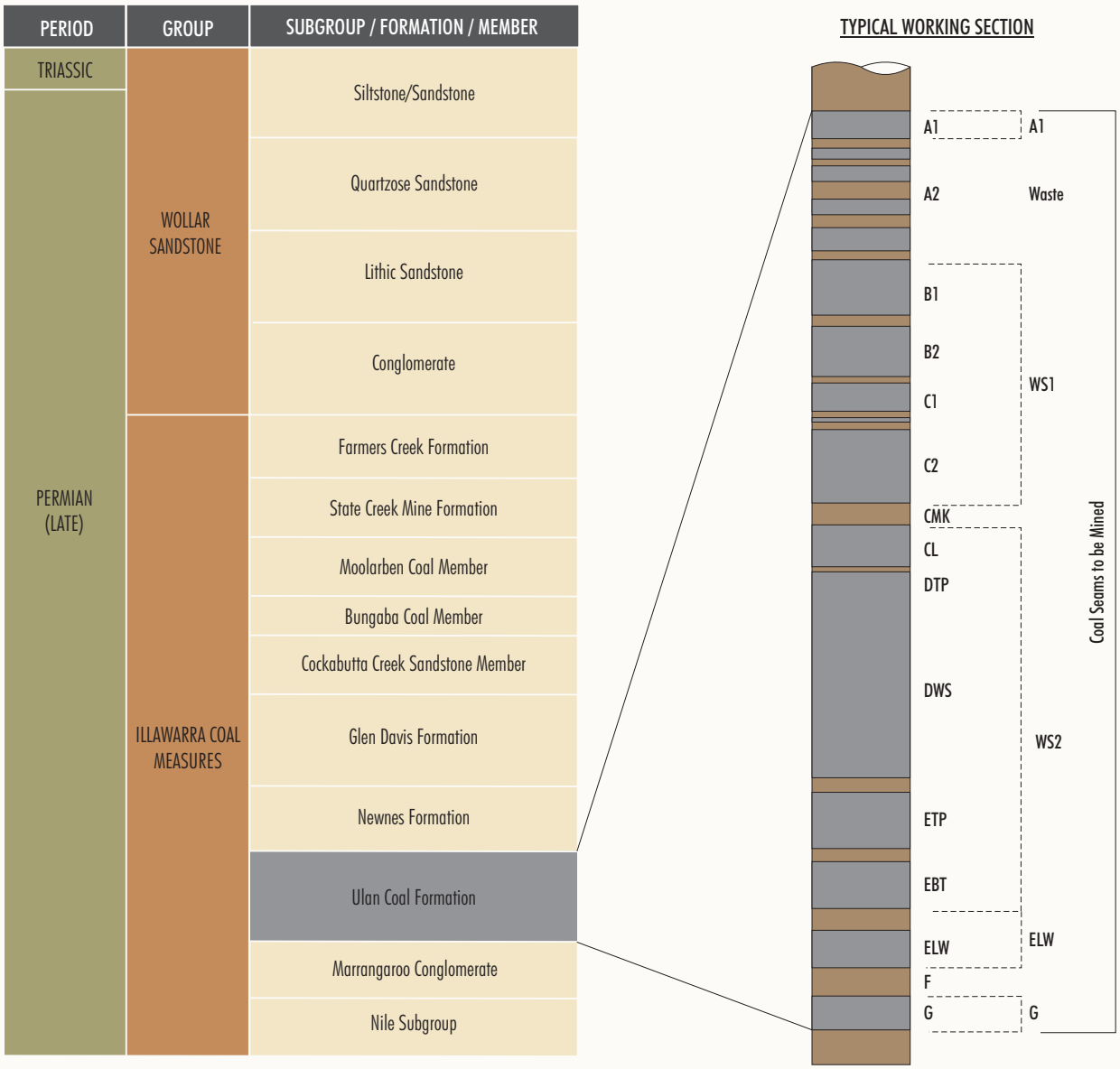
These indicative general arrangements are based on the indicative mine schedule in Table 3-3. The mining sequence and rate of mining shown may vary to take into account localised geological features, coal market quality and volume requirements, mining economics and Project detailed engineering design.

The sequence of mining and/or the general arrangement may also be modified throughout the life of the operation to maintain compliance with the applicable amenity criteria specified in the Project Development Consent for surrounding private residences.

The detailed mining sequence for any given period would be documented in the relevant Forward Program **in accordance with the requirements of the NSW *Mining Amendment (Standard Conditions of Mining Leases – Rehabilitation) Regulation 2021.***

Waste rock would be progressively placed in the open cut pits and landform profiling and rehabilitation of the emplaced waste rock would be undertaken over the life of the Project.

At the completion of Project mining activities, infrastructure would be decommissioned and final landform profiling and rehabilitation would be undertaken. The provisional final landform and rehabilitation strategy for the Project is presented in Section 3.16 and Attachment 8.



MCOA-20-18 OC3 Ext AR UPD AppA_004A

Source: MCO (2022)

LEGEND
Working Section
Coal
Waste

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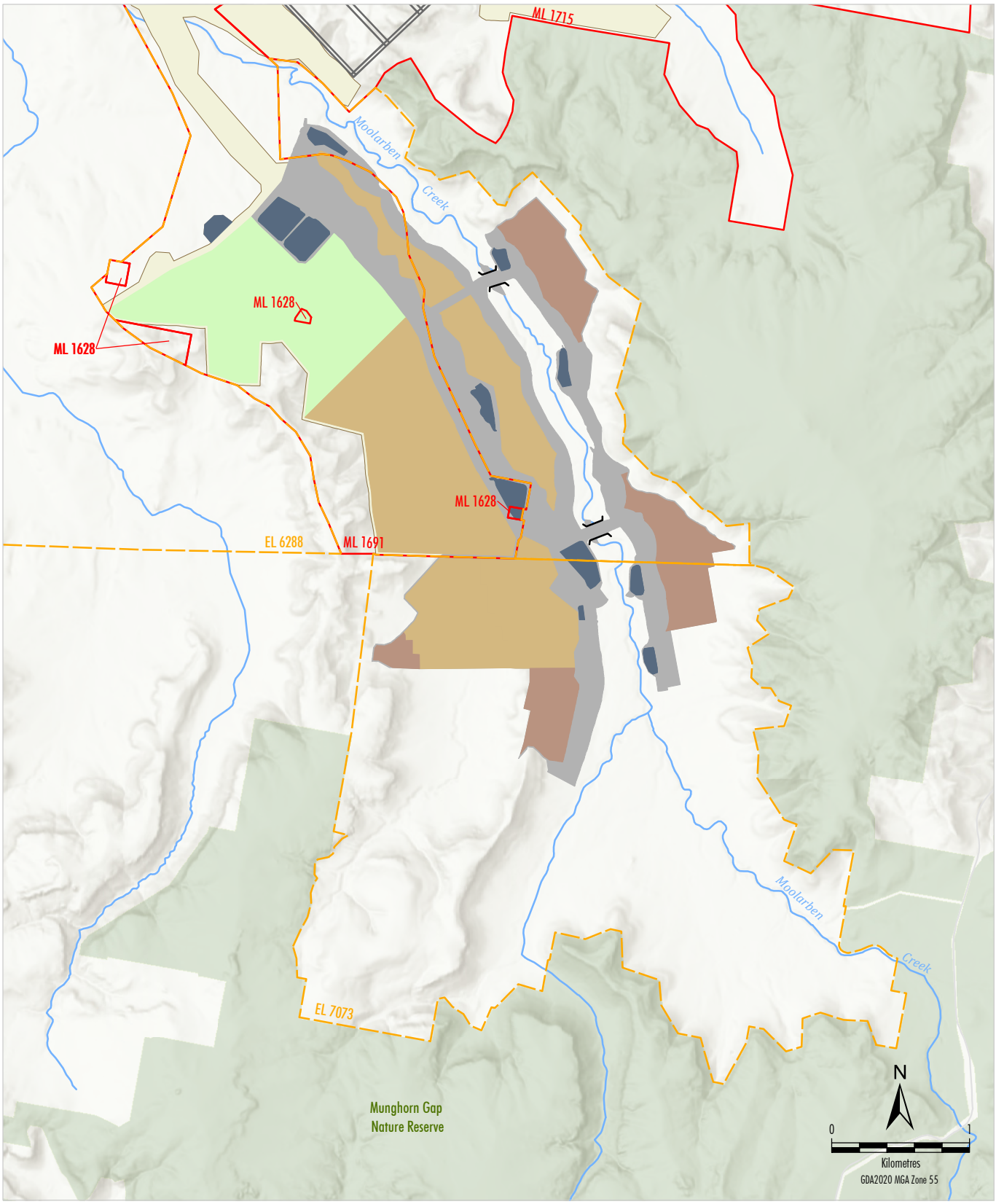
Indicative Stratigraphy of the Project Area

Figure 3-6



MCM-20-18 OC3 Ext AR UPD AppA_203B

LEGEND

- National Park/Nature Reserve
- Exploration Licence Boundary
- Mining Lease Boundary
- Moolarben Coal Complex Disturbance Footprint
- Underground Longwall Layout

OC3 Extension Project

- Indicative Active Mining
- Indicative Overburden Emplacement
- Indicative Rehabilitation
- Indicative Infrastructure Area
- Indicative Water Management
- Culvert

Source: MCO (2023); NSW Spatial Services (2021)

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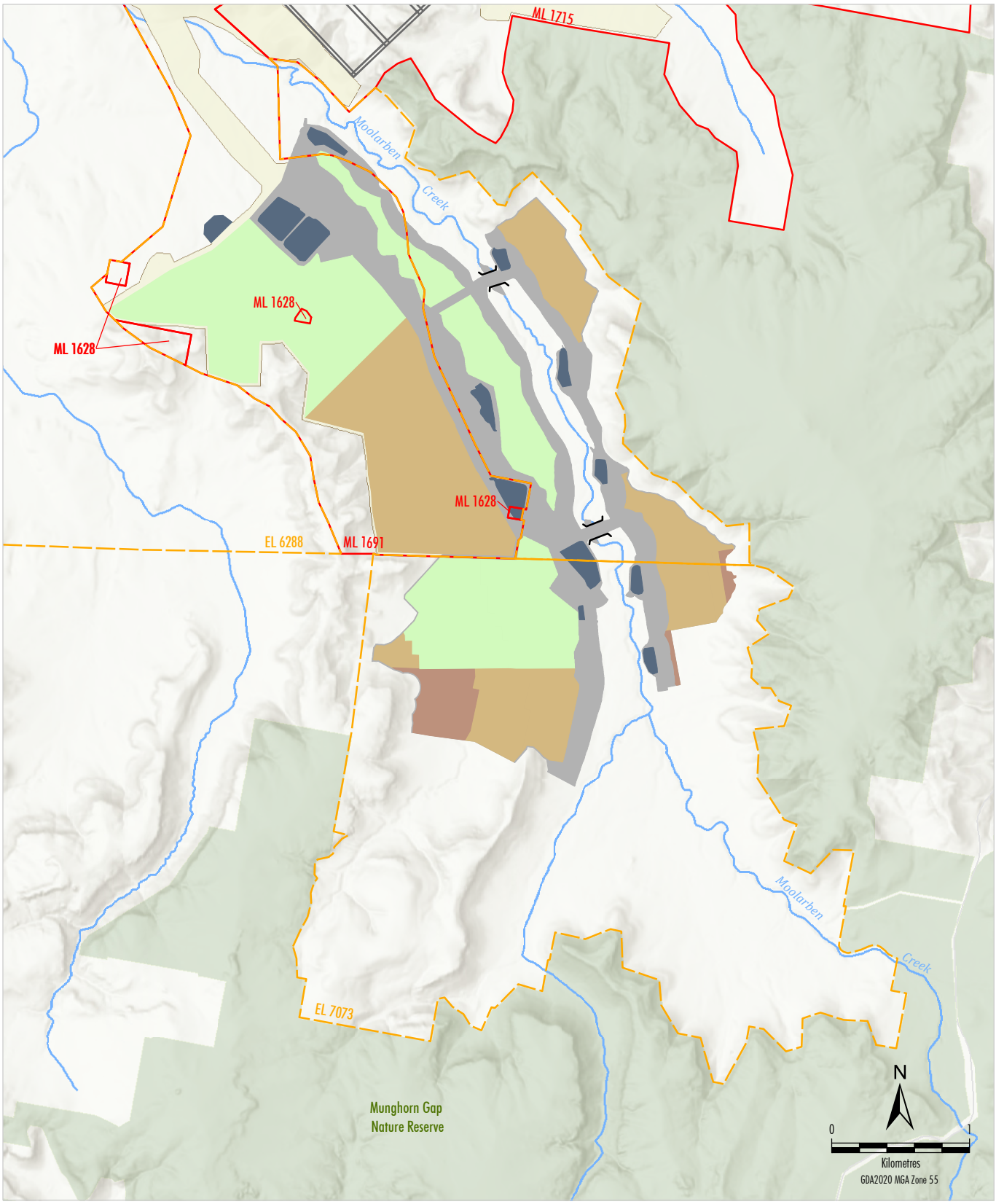
Indicative General Arrangement 2027

Figure 3-7



MCM-20-18 OC3 Ext AR UPD Appx_204B

LEGEND

- National Park/Nature Reserve
- Exploration Licence Boundary
- Mining Lease Boundary
- Moolarben Coal Complex Disturbance Footprint
- Underground Longwall Layout

OC3 Extension Project

- Indicative Active Mining
- Indicative Overburden Emplacement
- Indicative Rehabilitation
- Indicative Infrastructure Area
- Indicative Water Management
- Culvert

Source: MCO (2023); NSW Spatial Services (2021)

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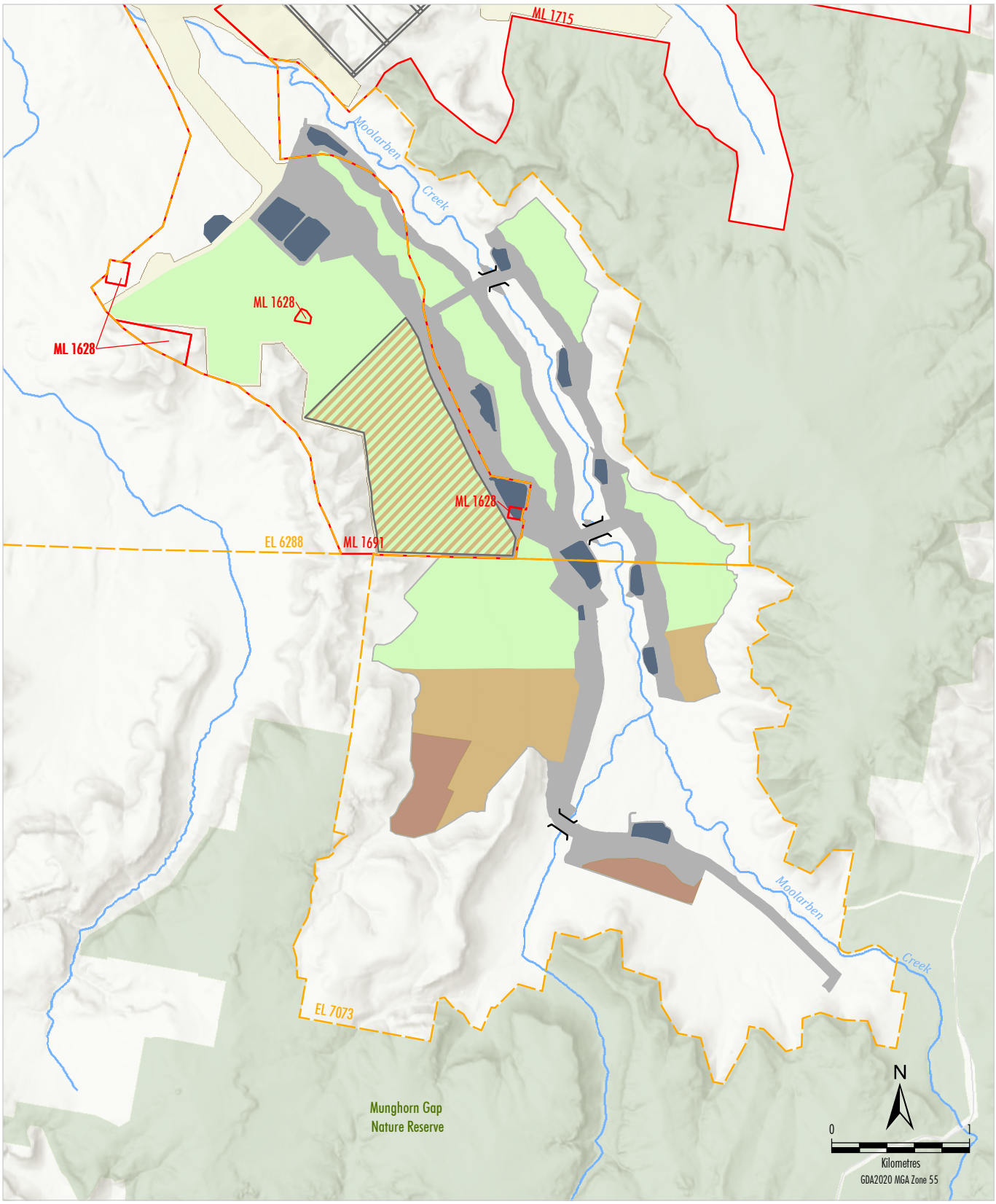
Indicative General Arrangement 2029

Figure 3-8



MCM-20-18 OC3 Ext AR UPD AppA_207B

LEGEND

- National Park/Nature Reserve
- Exploration Licence Boundary
- Mining Lease Boundary
- Moolarben Coal Complex Disturbance Footprint
- Underground Longwall Layout

OC3 Extension Project

- Indicative Active Mining
- Indicative Overburden Emplacement
- Indicative Temporary Rehabilitation/Landform Stabilisation
- Indicative Rehabilitation
- Indicative Infrastructure Area
- Indicative Water Management
- Culvert

Source: MCO (2023); NSW Spatial Services (2021)

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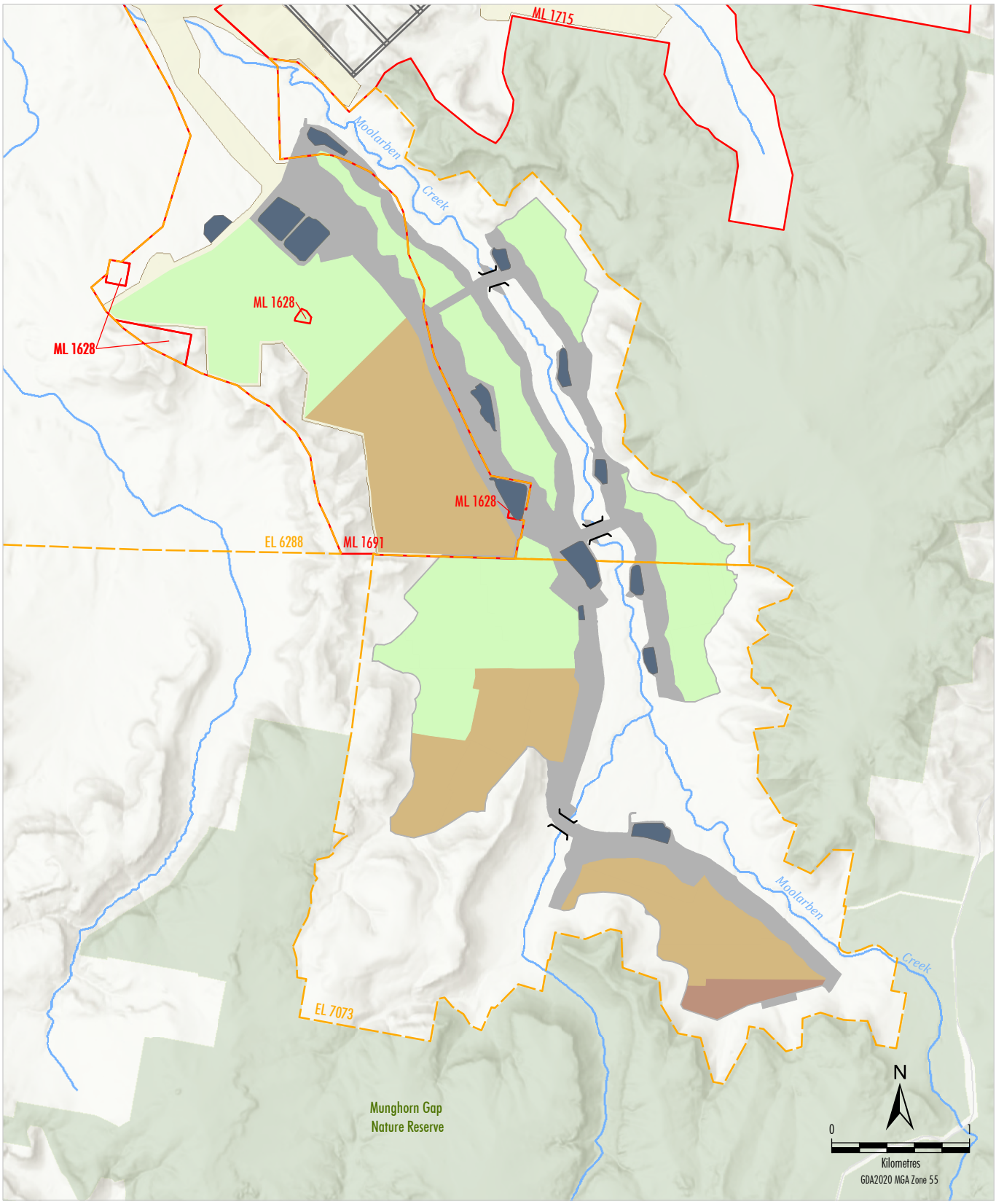
MOOLARBEN COAL COMPLEX

Indicative General Arrangement 2031

Figure 3-9



MCM-20-18 OC3 Ext AR UPD AppA_208B

LEGEND

- National Park/Nature Reserve
- Exploration Licence Boundary
- Mining Lease Boundary
- Moolarben Coal Complex Disturbance Footprint
- Underground Longwall Layout

OC3 Extension Project

- Indicative Active Mining
- Indicative Overburden Emplacement
- Indicative Rehabilitation
- Indicative Infrastructure Area
- Indicative Water Management
- Culvert

Source: MCO (2023); NSW Spatial Services (2021)

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Indicative General Arrangement 2034

Figure 3-10

3.5 PROJECT CONSTRUCTION ACTIVITIES

The Project would largely comprise open cut mining and the development of general facilities and infrastructure to support the extension of open cut operations.

The level of construction activity for the Project is significantly reduced through the proposed use of the existing coal handling, processing and transport infrastructure at the approved Moolarben Coal Complex (i.e. Stage 1 CHPP).

While there would be minor construction activities throughout the life of the Project in parallel with mine progression in the Project area, there is no distinct construction period required prior to continuation of mining operations in the extended OC3 pit.

If approved, Project mining activities would commence as soon as practicable after all relevant consents, approvals and licences have been obtained to ensure continuity of operations from the approved OC3 mining area.

Initial construction activities for the Project would be focused on the development of the following key infrastructure components:

- mine infrastructure area;
- main section of haul road which would integrate with the existing Stage 1 haul road;
- initial creek crossings;
- water management infrastructure; and
- water and electricity supply infrastructure.

Other construction activities undertaken progressively over the life of the Project would include:

- progressive development of dams, pumps, water diversions, pipelines, drains, storages and other water management equipment and structures;
- progressive development of internal haul roads and associated creek crossings, light vehicle access roads and services; and
- construction of ancillary infrastructure (e.g. electricity generation and/or distribution infrastructure, internal access roads, potable water supply and site communications).

Project construction activities would be undertaken up to 24 hours per day, seven days per week, on the basis that noise from these activities would be indistinguishable from mining operations.

Other activities that would be conducted as a component of the Project include environmental monitoring and the development of minor associated infrastructure (such as, but not limited to, temporary crib and equipment maintenance facilities).

Construction materials would be sourced from the Project disturbance area, within the Moolarben Coal Complex or imported, as required.

3.6 OPEN CUT MINING OPERATIONS

3.6.1 Hours of Operation

Project mining operations, including open cut mining activities and associated mobile equipment movements, would be conducted up to 24 hours per day, seven days per week consistent with the currently approved operations for the Moolarben Coal Complex.

3.6.2 Open Cut Mining Areas

The Project would comprise an extension of open cut mining operations immediately south of the approved OC3 mining area, as well as four new open cut pits to the east and south-east of the approved OC3 mining area (Figure 3-1).

The Project open cut pits would target the Ulan Seam within the Illawarra Coal Measures and provide a total of approximately **30 Mt** of ROM coal in addition to approved Moolarben Coal Complex operations.

The indicative extents of the open cut pits have been designed in consideration of detailed exploration works undertaken to define the coal resource as well as identified geological features and other environmental constraints.

Minor adjustments to pit extents within approved disturbance areas may be made in consideration of detailed design and mine planning throughout the life of the Project.

Open cut pit limits would extend into haul roads and other infrastructure areas immediately adjacent to the pits where resource is identified (i.e. within approved disturbance areas, but outside 200 m from Moolarben Creek, and conservatively applies the same criteria to Murdering Creek.

3.6.3 Mining Equipment

The mobile equipment used for the Project would vary according to the requirements of the advancing open cut mining operations.

Existing mobile equipment used at the Moolarben Coal Complex would be used for the Project, largely equipment currently used for Stage 1 open cut operations.

An indicative list of major mobile equipment used for impact assessment purposes for the Project is provided in the Noise and Blasting Impact Assessment (Appendix H **of the EIS**).

3.6.4 Indicative Mining Schedule

An indicative mine schedule for the Project is provided in Table 3-3 and indicative open cut mining progression is shown on Figure 3-11.

Table 3-3
Indicative Mine Schedule

Project Year	Nominal Calendar Year	Waste Rock (Mbcm)	ROM Coal (Mt)
1[1]	2025	**11.6**	**2.9**
2	2026	**17.7**	**5.0**
3	2027	**27.2**	**8.5**
4	2028	**10.8**	**1.5**
5	2029	**11.2**	**1.9**
6	2030	**10.8**	**1.8**
7	2031	**4.6**	**2.2**
8	2032	**9.9**	**2.2**
9	2033	**6.8**	**2.2**
10	2034	**1.0**	**1.6**
Total[2]		**111.5**	**29.8**

Mbcm = Million bank cubic metres.

[1] Assumed Project Year 1 is 2025.

[2] Totals do not equal the sum of each row due to rounding.

Staging of the development of the Project open cut mining areas would also be determined by coal market volume and blending requirements, mine economics and localised geological features.

As these requirements are likely to vary over the life of the Project, the development sequence of the different open cut mining areas and ROM coal extraction rates may also vary.

The mining schedule would continue to be reviewed and documented in the relevant Forward Program **in accordance with the requirements of the NSW *Mining Amendment (Standard Conditions of Mining Leases – Rehabilitation) Regulation 2021.***

Consistent with the existing Moolarben Coal Complex, product coal from the Project would be export quality thermal coal.

3.6.5 Open Cut Mining Activities

The Project would mine up to **8.5 Mtpa** of ROM coal (average of approximately **3 Mtpa** over the life of the Project) using conventional open cut mining methods (such as drilling and blasting), consistent with the existing Moolarben Coal Complex operations.

The ~~mining areas~~ **Project area** would include supporting infrastructure such as haul roads, hardstands, ROM pads, **temporary** rehabilitation and construction material stockpiles**,** water management **equipment and** structures **and other ancillary infrastructure (e.g. electricity generation and/or distribution infrastructure, internal access roads, potable water supply and site communications)** that would be designed to integrate with the existing Moolarben Coal Complex and minimise the amount of additional infrastructure required.

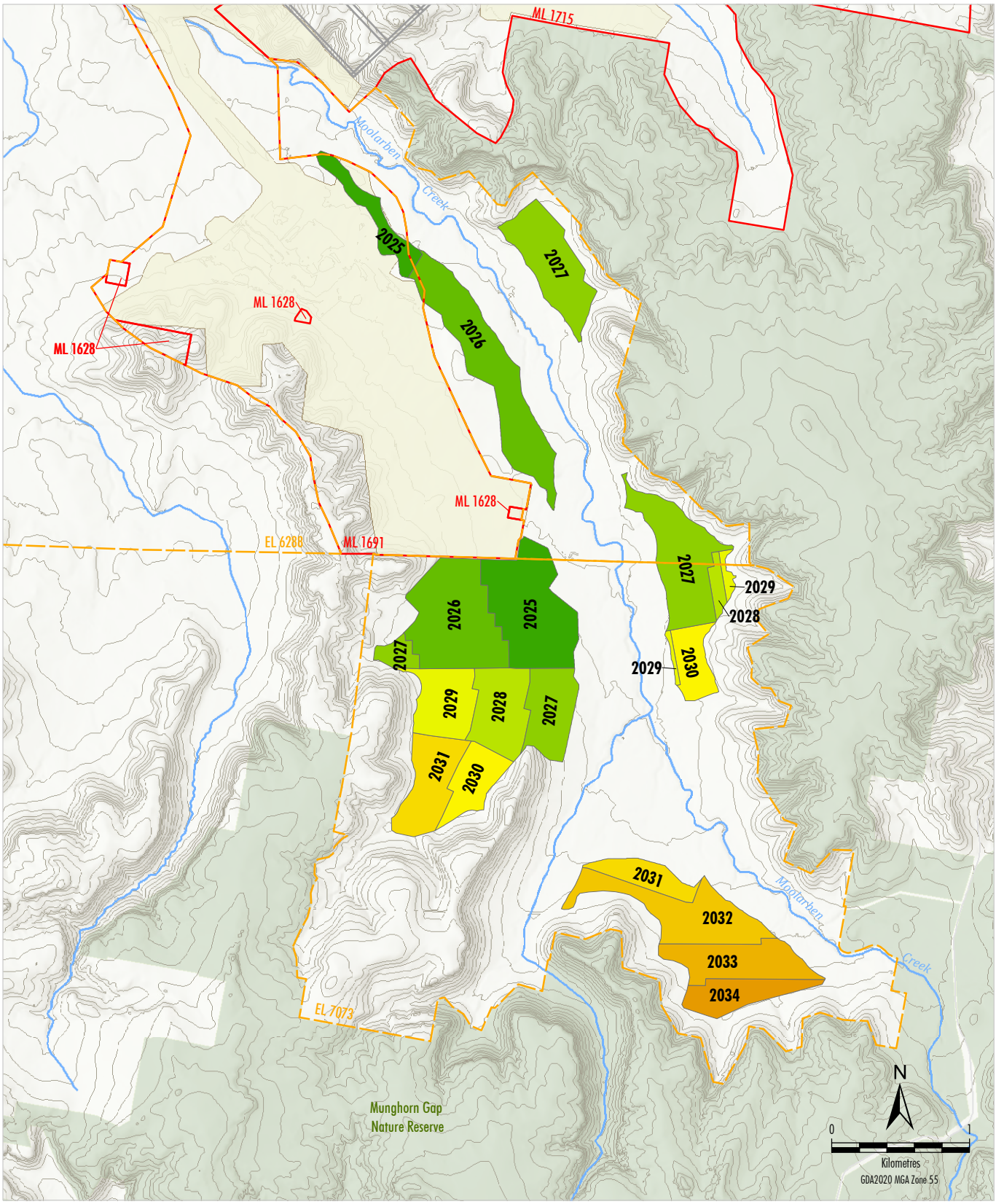
The indicative surface disturbance extent for the Project (outside of the existing approved disturbance) is shown on Figure 3-12 as well as proposed offsetting of disturbance in three key stages.~~Development of the Project would occur in three key stages in line with mine progression (Figure 3-12).~~

A summary of the Project general mining activities and sequence is provided below.

1. Vegetation Clearance and Topsoil Stripping

Progressive vegetation clearing would be undertaken ahead of the advancing open cut mining operation. Specific vegetation clearance procedures for the Project would be consistent with existing procedures at the Moolarben Coal Complex and are described in Attachment 8.

Soil stripping would be undertaken progressively by scrapers or dozers and stripped soil would either be used directly in progressive rehabilitation, or placed in stockpiles for later re-use. Stockpiles would be managed to reduce the potential for soil degradation.



MCM-20-18 OC3 Ext AR UPD AppA_211B

LEGEND

- National Park/Nature Reserve
- Exploration Licence Boundary
- Mining Lease Boundary
- Moolarben Coal Complex Disturbance Footprint
- Underground Longwall Layout

OC3 Mine Progression

- 2025
- 2026
- 2027
- 2028
- 2029
- 2030
- 2031
- 2032
- 2033
- 2034

Source: MCO (2023); NSW Spatial Services (2021)

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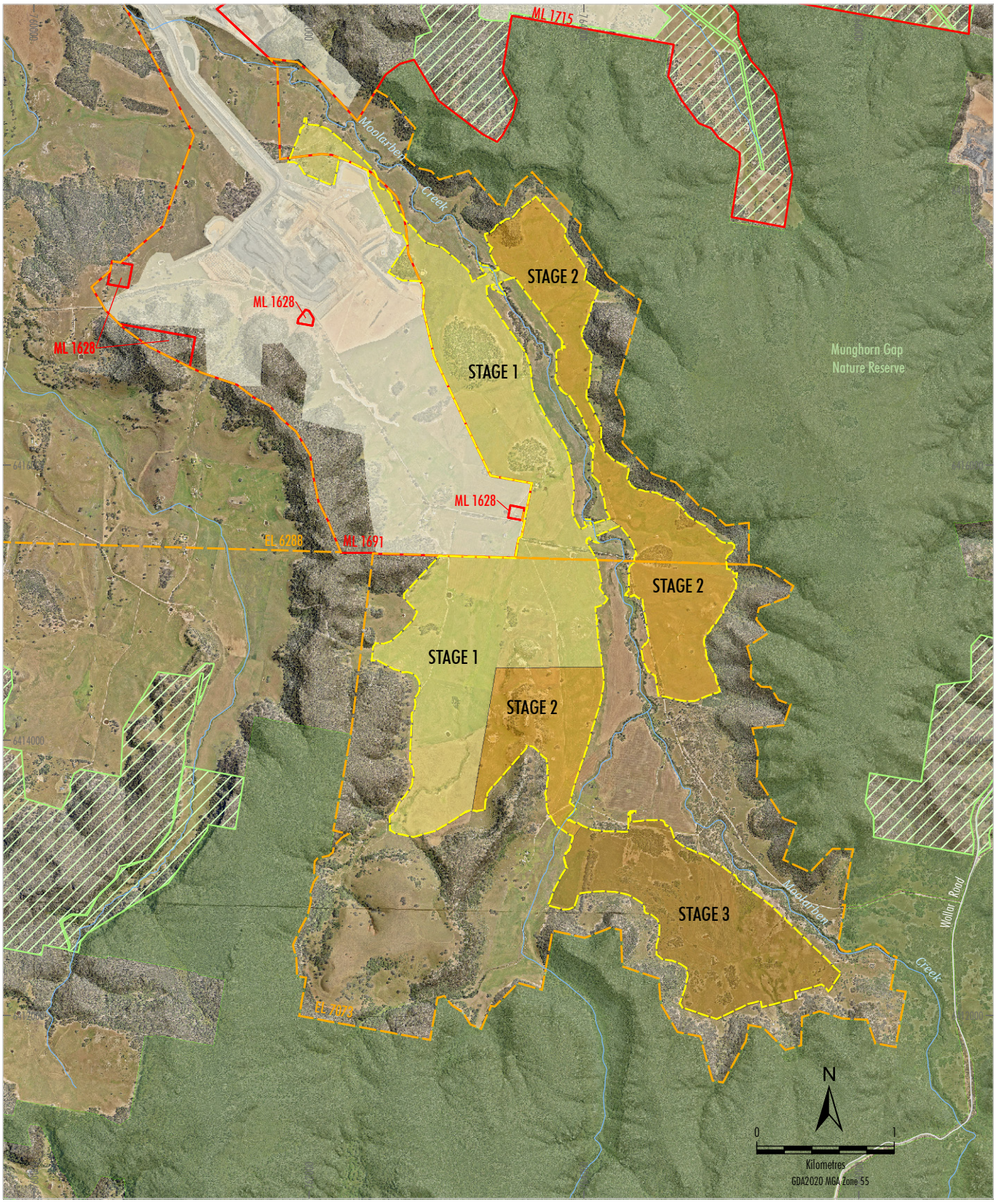
MOOLARBEN COAL COMPLEX

Indicative Mine Progression

Figure 3-11



MCM-20-18 OCG Ext AR UPD AppA_212C

LEGEND

- National Park/Nature Reserve
- Existing Biodiversity Offset Area
- Exploration Licence Boundary
- Mining Lease Boundary
- Moolarben Coal Complex Disturbance Footprint
- Indicative Project Surface Disturbance Extent

Indicative Project Stages

- Stage 1
- Stage 2
- Stage 3

Source: MCO (2023); NSW Spatial Services (2021); Orthophoto Mosaic: MCO (Dec 2021)

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MOOLARBEN COAL COMPLEX

Project Offset Staging

Figure 3-12

Soil stockpile locations and volumes would vary over the life of the Project. Temporary soil stockpiles would be located within approved disturbance areas during the life of the Project. Specific locations of stockpiles would vary over the life of the Project as mining and rehabilitation progresses and soil stockpiles are developed and depleted.

Additional temporary soil stockpiles may be constructed within the approved disturbance footprint for the Project and/or on backfilled waste rock emplacement areas, as required.

Soil management, stockpiling and re-application procedures undertaken for the Project would be consistent with existing procedures at the Moolarben Coal Complex. These procedures are detailed in Attachment 8.

2. Drilling and Blasting

Overburden and interburden material that cannot be efficiently ripped and excavated by mobile equipment would be drilled and blasted.

A mixture of ammonium nitrate and fuel oil (ANFO) and emulsion blend explosives, or similar, would be used for the Project, consistent with the existing Moolarben Coal Complex operations.

Blasting for the Project would only occur between the hours of 9.00 am to 5.00 pm from Monday to Saturday, inclusive, consistent with the Moolarben Coal Complex Project Approvals. Up to two blasts per day and up to nine blasts per week, averaged over any calendar year, would occur cumulatively at the Moolarben Coal Complex and the Project (unless additional blasts are required following misfires or for mine safety).

3. Overburden and Interburden Material Removal and Handling

Overburden and interburden material would be removed with excavators, front-end loaders and dozers. Haul trucks would be used to haul the material to waste rock emplacement areas.

There would also be quarrying and/or excavation of borrow pits within approved disturbance areas to provide construction materials. Where required, material would be processed using in-pit mobile crushers.

Waste rock management is described further in Section 3.8.

4. Coal Mining

Mining of exposed coal seams for the Project would typically involve dozers or front-end loaders ripping and pushing coal and parting material, and loading ROM coal into haul trucks.

Consistent with the existing configuration between Stage 1 and 2, ROM coal extracted for the Project would be trucked via existing Moolarben Coal Complex haul roads to be handled, processed and loaded onto trains via the existing Stage 1 infrastructure (Figure 3-3). This interaction would be subject to a separate modification to the Stage 1 Project Approval (05_0117).

The location of the key haul roads would be extended or relocated as required over the life of the Project. Open cut pit limits would also extend into haul roads and other infrastructure areas immediately adjacent to the pits where resource is identified.

5. Landform Profiling and Rehabilitation

Landform profiling and rehabilitation of backfilled open cut pits would be undertaken progressively over the life of the Project. Some temporary rehabilitation may be required to stabilise landforms until completion of mining operations and to minimise the potential for dust generation.

Where practicable, temporary emplacement areas **and rehabilitation material stockpiles** would be strategically placed near other large disturbance areas to expedite backfilling and rehabilitation and minimise rehandling.

Residual coal may also be extracted from underneath haul roads and other infrastructure areas prior to completion of mining, final landform profiling and rehabilitation.

A detailed description of the rehabilitation strategy, final landform and post-mining land use for the Project is provided in Attachment 8.

3.7 COAL PROCESSING AND PRODUCT COAL TRANSPORT

ROM coal from the Project would be hauled to the Stage 1 ROM coal facility (ROM coal stockpile and transfer bin), where it would be sized (as required) and conveyed to the CHPP (along with ROM coal from the rest of the Moolarben Coal Complex) for further processing or bypass the CHPP and transferred directly to the product stockpile. Product coal would continue to be stockpiled (as necessary) and loaded to trains for despatch to market.

There is no change proposed to the approved coal production and rail transport limits for the existing Moolarben Coal Complex as a consequence of the Project (Table 3-1).

ROM coal would be temporarily placed in stockpiles **as ROM pads** within the Project area (Figure 3-1) and directly hauled to the Stage 1 ROM coal facility. Mobile processing of ROM coal may also occur in the Project area prior to haulage to the Stage 1 infrastructure.

3.8 WASTE ROCK MANAGEMENT

3.8.1 Waste Rock Quantities

Approximately **112** million bank cubic metres (Mbcm) of waste rock would be extracted over the life of the Project (Table 3-3) (i.e. a ratio of approximately **3.7** [Mbcm] to 1 [Mt ROM coal]).

3.8.2 Waste Rock Emplacement Strategy

Waste rock management for the Project would be integrated with the existing Moolarben Coal Complex. Waste rock (including overburden and interburden) mined during development of the Project would be progressively placed in the mine voids (i.e. in-pit) once the coal has been mined.

A portion of the waste rock would be hauled to**/from** the approved OC3 mining area to assist with landform integration.

Temporary out-of-pit emplacement areas would be located adjacent to the open cut mining operations (within approved disturbance areas) to assist in managing waste rock throughout the life of the Project in preparation for establishing the final landform.

Where required, temporary emplacement areas would also be strategically placed near other large disturbance areas, such as dams and infrastructure areas, to expedite backfilling and rehabilitation and to minimise rehandling of overburden material.

A surge emplacement area would also be located in the approved OC3 area and temporarily rehabilitated as required over the life of the Project (Figure 3-9). Waste rock from the surge emplacement area would be used to backfill the final void at the end of mining.

Some temporary overburden emplacement areas, including the surge emplacement area, would be higher in elevation than the final landform (but would remain lower than surrounding ridgelines) to minimise disturbance areas and material rehandling prior to final emplacement.

Further discussion of the management of landform development activities is provided in Attachment 8.

3.8.3 Waste Rock Geochemistry

An assessment of the geochemical characteristics of the waste rock material associated with the development of the Project is provided in the Geochemistry Assessment (Appendix P) prepared by RGS (2022). A summary of the assessment is provided below.

Results of geochemical testing of overburden materials from the approved OC3 mining area (which are indicative of the Project area) were reviewed by RGS to identify any geochemical implications for waste rock management.

The Geochemistry Assessment (Appendix P) concluded the waste rock materials generated from the Project have a very low sulfur content and would be classified as non-acid forming (NAF), with a negligible risk of acid mine drainage and excess Acid Neutralising Capacity.

The concentration of dissolved trace metals/metalloids in leachate from representative overburden samples were low and generally below applied water quality guideline limits for livestock drinking water (Appendix P).

Consideration of the potential for mobilisation of metals is provided in Appendices A and B.

3.9 COAL REJECT MANAGEMENT

3.9.1 Coal Reject Geochemistry

An assessment of the geochemical characteristics of the coal within the Project area as well as coal reject material from the approved OC3 operations was undertaken for the Project Geochemistry Assessment (Appendix P) prepared by RGS (2022). A summary of the assessment is provided below.

Eight coal samples from the Project area and four coal reject samples from the approved OC3 operations underwent geochemical test work including acidity, electrical conductivity (EC), sulfur content, acid base accounting, and element enrichment and solubility.

Acidity and Salinity

The Geochemistry Assessment (Appendix P) concluded that the reject material is expected to be neutral to slightly alkaline and have a low level of salinity.

Acid Base Accounting

The Geochemistry Assessment (Appendix P) concluded that the CHPP rejects would typically be classified as Potentially Acid Forming-Low Capacity (PAF-LC) or Potentially Acid Forming (PAF). There is likely to be some variability in the geochemical characteristics of the coal seam plies (used to produce coal rejects) in a lateral and vertical direction.

Metal Enrichment and Solubility

Multi-element analyses were conducted on five composite samples and compared to average crustal abundance values. Results of this test work indicated all samples were not significantly enriched with metals or metalloids (Appendix P).

Metals/metalloids are sparingly soluble at the current pH of the reject materials. If PAF reject materials are not managed appropriately and allowed to freely oxidise, they have the potential to become acidic which can increase the solubility and mobility of some metals/metalloids over time (Appendix P).

Potential impacts of the Project on downstream water quality have been assessed in Appendices A and B.

3.9.2 Coal Reject Disposal Strategy

The existing Moolarben Coal Complex generates coarse and fine rejects, and ultrafine (tailings) rejects, in the coal preparation process (up to approximately 3.5 Mtpa). The Project would not directly create coal rejects as these are produced at the Stage 1 CHPP.

Rejects are conveyed from the CHPP to the rejects bin adjacent to the Stage 1 ROM coal facility and then back-hauled or conveyed to open cut pits for disposal/emplacement.

There is no change proposed to the approved coal reject disposal methods and production limits for the existing Moolarben Coal Complex as a consequence of the Project.

3.10 WATER MANAGEMENT

The water management strategy for the Project would be based on maximising the diversion of clean water runoff around disturbance areas, containing and re-using mine water (to prevent downstream contamination) as well as controlling sediment runoff from disturbed areas such as waste rock emplacements or areas cleared in advance of mining.

A detailed description of the Project water management system is provided in the Surface Water and Flood Impact Assessment (Appendix B) prepared by WRM.

3.10.1 Project Water Management System

The objectives of the Project water management system would be to:

- protect the integrity of regional and local water resources, including Moolarben Creek and Murdering Creek;
- separate runoff from areas undisturbed by mining and water generated from active mining areas, where reasonable and feasible;
- design and manage the water management system to operate reliably in all seasonal conditions, including both extended wet and dry periods, throughout the life of the mine; and
- provide sufficient water supply for Project requirements (e.g. dust suppression).

To meet these objectives, the Project water management system would comprise the following:

- sediment dams to collect and treat runoff from overburden emplacement areas;
- clean water diversion drains and dams to divert runoff from undisturbed catchments around areas disturbed by mining where reasonable and feasible;
- surface water drains to divert sediment-laden runoff from overburden emplacement areas to sediment dams;
- a mine-affected water system to store water from active mining areas and infrastructure areas; and
- other ancillary water management infrastructure (including pumps, piping and drains) **within the infrastructure corridor and adjacent to water storages**, as required.

Culverts would be used to construct the haul road crossings of Moolarben and Murdering Creeks. Temporary flood bunds would be constructed along haul roads adjacent to Moolarben Creek to protect infrastructure from flood events up to the 1% annual exceedance probability (AEP).

The progressive development of water storages for the Project is described in **Appendix G of the Amendment Report** and provisionally shown on Figures 3-7, 3-8, 3-9 and 3-10.

The main water sources for the Project would be:

- catchment runoff (from disturbed areas) and infiltration;
- incidental rainfall over water storages; and
- the Moolarben Coal Complex water management system, including inflows to underground mine workings.

A predictive assessment of the performance of the Project water management system for a range of different climatic scenarios is presented in Appendix B, which indicates there would be sufficient water supply for the Project.

Up-Catchment Runoff Control

Temporary and permanent up-catchment diversion structures would be constructed where reasonable and feasible over the life of the Project to divert runoff from undisturbed areas around the open cut pits and waste rock emplacement areas.

Diversion structures would also be developed to minimise the catchment reporting to the additional Project mine water dams.

A clean water diversion ~~dam~~ **system** would be constructed **to enable the diversion of** ~~on~~ Spring Creek upstream of mining operations ~~to divert runoff~~ around the advancing open cut for the life of the Project. Up-catchment diversion structures would also be constructed upstream of the southernmost pit and may include either clean water dams or diversions (or a combination of both). Captured clean water would be pumped via pipe and released into Moolarben Creek.

Any up-catchment diversion infrastructure would be maintained until rehabilitation has progressed to allow for passive water management via reinstated drainage features and watercourses in the final landform (Attachment 8).

Mine Water Dams

Mine water dams for the Project would be developed progressively, as shown conceptually on Figures 3-7, 3-8, 3-9 and 3-10. Water captured in the open cut pits would also be transferred to the mine water dams.

Periodic reviews of the site water balance would be conducted, which would enable the Project water management system to be adjusted as necessary.

The mine water dams would be managed and operated to avoid uncontrolled release to downstream watercourses.

Sedimentation Control

Sedimentation control for the Project would be implemented through the use of sediment dams. Sediment dams would contain runoff from disturbed areas that have been stripped of topsoil, waste rock emplacement areas, infrastructure areas or partially rehabilitated areas. The sediment dams would allow for gravity settling of sediment prior to release off-site.

Sediment dams would be sized to capture runoff from a 95th percentile rainfall event with a duration of five days (Landcom, 2004).

Sediment dams would be maintained until vegetation successfully establishes on topsoiled areas and runoff has similar water quality characteristics to areas that are undisturbed by mining activities.

Erosion and sediment control structures would be designed, constructed and maintained in consideration of the series *Managing Urban Stormwater: Soils and Construction - Volume 2E Mines and Quarries* (Department of Environment and Climate Change, 2008) or *Best Practice Erosion and Sediment Control* (International Erosion Control Association, 2008).

Water Consumption

The main water requirement for the Project would be for dust suppression on haul roads, waste emplacement areas and ROM coal stockpiles. Some water would also continue to be used for washdown of mobile equipment and other minor non-potable water uses in the Project mine infrastructure area. Water would also be transferred back to the Moolarben Coal Complex water management system for use in the CHPP, or treatment and discharge, as required.

The water consumption requirements and water balance of the system would fluctuate based on varying climatic conditions and as the extent of the mining operation changes over time.

Dust Suppression

The haul road dust suppression demand for the Project was calculated based on estimated future haul road lengths and widths, and in consideration of daily varying rates of evaporation and rainfall within the climatic sequences modelled for the site water balance (Appendix B).

The estimated haul road dust suppression demand for the Project is highly seasonal (Appendix B).

3.10.2 Open Cut Dewatering

It is predicted that groundwater inflows to Project open cut pits would evaporate and would not contribute material inflows to the Project water management system (Appendix B).

Sumps would be excavated in the floor of the open cut pits to manage potential inflows. Water that accumulates in the open cut sumps would be used for dust suppression and/or transferred to mine water storages for use onsite or transferred to the Moolarben Coal Complex water management system.

Licensing of the predicted groundwater inflows for the Project has been assessed and is described in Appendix A.

3.11 FINAL LANDFORM

The Project final landform has been designed based on the following key design principles (Attachment 8):

- The final landform is safe, stable and non-polluting.
- The emplacement landform incorporates macro-relief to avoid simple blocky forms.
- Surface water drainage from the final landform would incorporate micro-relief to increase drainage stability, avoid major engineered drop structures and limit erosion.
- Steep sections of the Project area would not be mined to enable integration of the rehabilitated landform with surrounding topography to create long-term stable slopes.
- Surface water drainage paths would be reinstated in the free-draining final landform to return flows to the natural environment.
- Open cut voids within the Project area would be progressively backfilled so as to be free-draining.

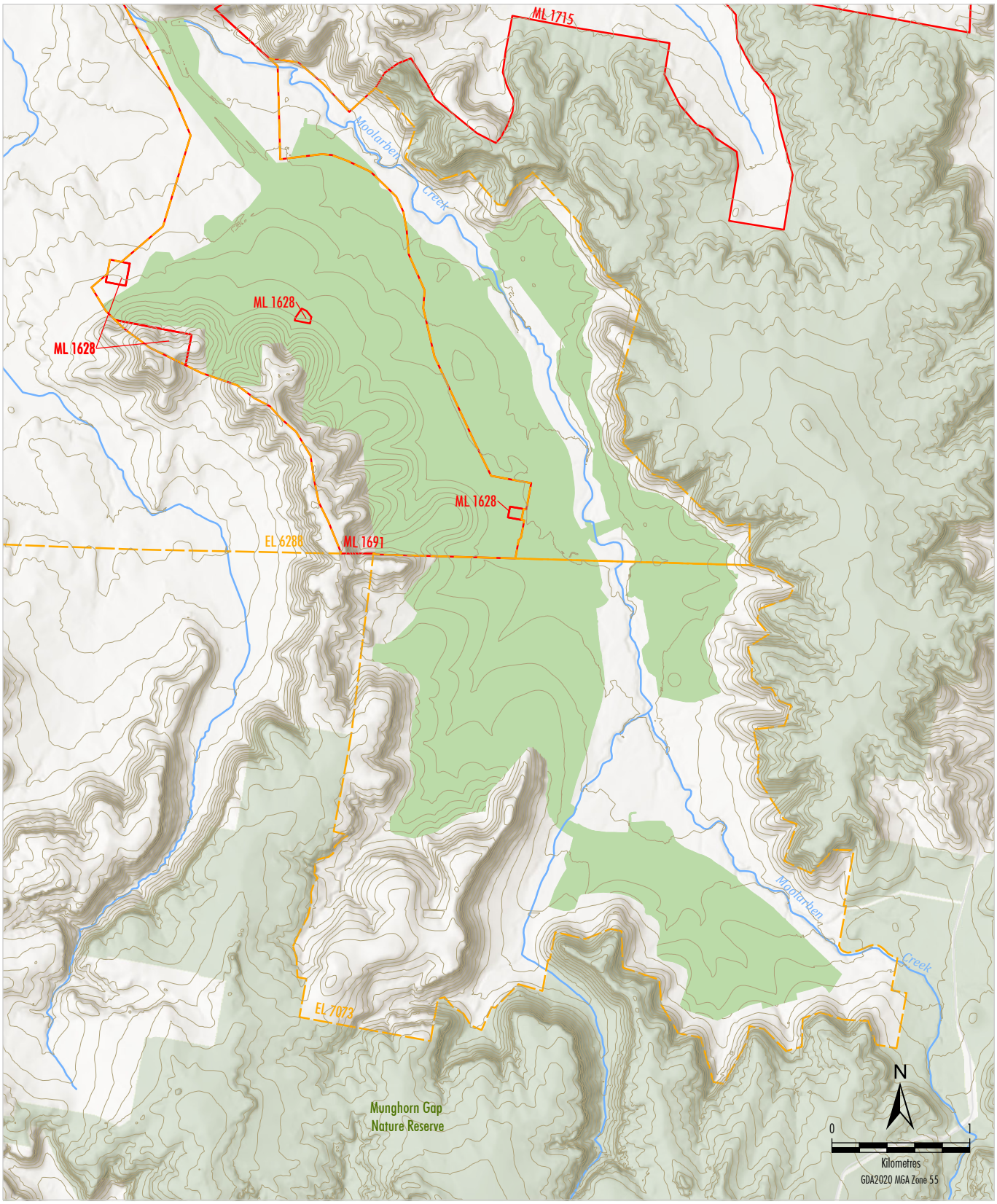
The Project final landform design principles are generally consistent with the approved OC3 mining area due to similar pre-mining landforms.

The conceptual final landform (Figure 3-13) has been developed using geomorphic design principles to address these key design principles (Attachment 8).

The landform has been designed using the GeoFluv™ methodology, which uses characteristics of relevant stable natural landforms in the local environment (referred to as analogues) and applies these characteristics to the design of new landforms of similar materials. More detailed erosion based assessment and design methods are then used to refine parts of the landform that are steeper than alluvial analogues (Attachment 8).

The Project open cut voids would be progressively backfilled as mining progresses to reinstate the landform to approximate the gently undulating pre-mining topography.

As a result, there would be no final voids remaining in the rehabilitated landform as mine voids within the Project area would be backfilled so that they are free-draining. **A small section of remnant highwall may remain at the southern end of the final landform, designed in consideration of geotechnical stability (Attachment 8).**



MCM-20-18 OC3 Ext AR UPD AppA_209B

LEGEND
- National Park/Nature Reserve
- Exploration Licence Boundary
- Mining Lease Boundary
- Indicative Extent of Established Rehabilitation

Source: MCO (2023); NSW Spatial Services (2021)

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Conceptual Final Landform

Figure 3-13

The Project would also result in no final void in the approved OC3 mining area, as the approved final void would be backfilled using waste rock from the Project.

A portion of the waste rock would be hauled to**/from** the approved OC3 mining area to assist with landform integration. The Project Development Application area therefore overlaps the Stage 1 Project Approval boundary in the approved OC3 mining area to facilitate landform integration as it forms part of the Project. The proposed general arrangements presented in this EIS for the approved OC3 mining area should take precedence over the Stage 1 Project Approval, in the event of any inconsistency.

A conceptual final landform of the Project (inclusive of the approved OC3 mining area) is shown on Figure 3-13.

The Project rehabilitation strategy and mine closure activities are described in Section 3.16 and Attachment 8.

3.12 INFRASTRUCTURE AND SERVICES

3.12.1 Mine Infrastructure Areas

A mine infrastructure area would be constructed during the first year of the Project to the east of the approved OC3 mining area (Figure 3-1).

The mine infrastructure area would include administration offices, workshops, stores, buildings, washdown facilities, laydown and hardstand areas, ablution facilities and other related ancillary infrastructure.

ROM pads would be constructed for the Project for use when direct haulage to the Stage 1 ROM coal facility is not possible due to operational constraints (Figure 3-1).

3.12.2 Site Access and Internal Roads

All employees, contractors and deliveries would access the Project area from the existing main site access for Stage 1 via Ulan-Wollar Road. Workers and delivered materials would then be transported to the Project area via internal roads.

Moolarben Road is closed for public access across the approved OC3 mining area and Project area.

There may be continued use of ancillary site accesses from local roads for environmental monitoring, general land management, exploration activities and other associated activities.
The Project would involve the progressive development of unsealed internal haul roads between the **mine infrastructure area,** open cut pits, waste emplacement **and stockpile** areas and ROM pad**s within approved disturbance areas**. Active haul roads would be regularly watered to minimise dust generation potential.

Internal access roads for light vehicles would also be constructed progressively within the Project mining area as required **(e.g. within the infrastructure corridor, adjacent to other ancillary infrastructure or in advance of open cut mining)**.

Internal haul roads and access roads would be integrated with the existing Moolarben Coal Complex.

3.12.3 Electricity Supply and Distribution

Power is supplied to the Moolarben Coal Complex at 66 kilovolt (kV) from the existing Essential Energy Ulan Switchyard. The 66 kV powerline runs adjacent to the road and rail corridor to the Stage 1 CHPP area where a 66/11 kV substation is located. Power is distributed around the site by overhead cable or underground cable where necessary.

Power supply to the Project area would be via extension of the existing on-site power distribution infrastructure for the Moolarben Coal Complex and/or via on-site electricity generation (e.g. diesel generators and solar panels). Standard electrical safety practices and laws (including considerations of vehicle clearance) would continue to apply.

3.12.4 Lighting

Lighting at the Project would be sourced from stationary work lights, fixed/permanent lights and vehicle mounted lights consistent with the approved lighting infrastructure at the Moolarben Coal Complex.

3.12.5 Potable Water

The potable water supply for the Project would be sourced from a combination of rainwater captured from roofs of facilities, suitably treated bore water or imported water from external sources.

A water supply truck would be used to distribute potable water for the Project to service areas around the site.

3.13 WASTE MANAGEMENT

Key waste streams for the Project would comprise:

- waste rock (as described in Section 3.8);
- sewage and effluent;
- recyclable and non-recyclable wastes; and
- other wastes from mining and workshop activities (e.g. used tyres, scrap metal, oil filters and waste hydrocarbons).

In addition, heavy mobile equipment tyres and/or inert building waste (e.g. demolished buildings and other construction waste) would be disposed of in the Project or Moolarben Coal Complex open cut pits, in accordance with an Environment Protection Licence (EPL) and the existing Moolarben Coal Complex Waste Management Plan.

The following actions/strategies would be implemented to maximise efficient waste management for the Project:

- general waste minimisation principles (reduce, re-use and recycle), including during purchase of products and materials;
- separation of waste streams at the source to minimise contamination of waste streams; and
- education of personnel (both during inductions and regular refreshers) regarding waste management principles and procedures, and locations of bins for various waste streams.

All waste would be classified in accordance with *Waste Classification Guidelines Part 1: Classifying Waste* (Environment Protection Authority [EPA], 2014), and either disposed of on-site or collected by an appropriately licensed contractor and disposed of at appropriately licensed disposal facilities. MCO would maintain a register of waste collected by appropriately qualified waste contractors.

Recyclable waste would be deposited in designated containers (e.g. scrap metal bins), which would be periodically removed from site for recycling.

Sewage and effluent from on-site ablution facilities would be collected and treated in the existing Moolarben Coal Complex sewage treatment plant, in accordance with relevant approvals (including an EPL). The sewage treatment plant would continue to be serviced by a licensed waste disposal contractor.

Once treated, sewage and effluent may also be applied to selected rehabilitation or landscaped areas at licensed discharge points as irrigation water, in accordance with an EPL.

3.14 MANAGEMENT OF DANGEROUS GOODS

The transportation, handling and storage of all dangerous goods for the Project would be conducted in accordance with the requirements of the *Storage and Handling of Dangerous Goods – Code of Practice 2005* (WorkCover NSW, 2005).

3.14.1 Hydrocarbon Storage

Hydrocarbons that would be used at the Project would include fuels (diesel and petrol), greases, oils, paints and degreasers.

Fuel and lubrication storage facilities for the Project would include above-ground bunded diesel-storage tanks in accordance with the requirements of Australian Standard (AS) 1940 The *Storage and Handling of Flammable and Combustible Liquids*. Hydrocarbon storage facilities would be operated in accordance with the *Work Health and Safety Regulation 2011*, *Work Health and Safety (Mines and Petroleum Sites) Act 2013* and associated regulations.

Runoff water from workshops and machine washdown bays would be directed to an interceptor trap to extract hydrocarbons, prior to it being discharged into the mine water management system. The trap would be routinely emptied of hydrocarbons by an appropriately licensed contractor.

3.14.2 Explosives Storage

Explosives required for the Project include initiating products and detonators, ammonium nitrate fuel oil and emulsion explosives.

Explosives would be stored, transported and used in accordance with the requirements of AS 2187.2 *Explosives – Storage and Use – Use of Explosives*.

3.14.3 Chemicals Storage and Safety Data Sheets

The management and storage of chemicals at the Project would be conducted in accordance with the existing management procedures at the Moolarben Coal Complex, as well as Australian Standards and codes. All chemicals used on-site for the Project would be recorded on the 'ChemAlert' register.

No chemical or hazardous material would be permitted on-site unless a copy of the appropriate Safety Data Sheet (SDS) is available, or in the case of a new product, the product is accompanied by an SDS.

3.15 WORKFORCE

The Moolarben Coal Complex has a peak workforce of up to approximately 1,000 personnel.

There would be no cumulative increase in the peak workforce at the Moolarben Coal Complex as a result of the Project, however the Project would result in an extension of peak cumulative employment for a longer period.

Up to approximately 400 personnel from the Moolarben Coal Complex would be required to implement Project mining operations. Given the scale of construction activities for the Project (Section 3.5), all employees for the Project have been considered as part of the operational workforce.

The operational hours of the Project would generally be 24 hours a day, seven days a week. Construction and development activities for the Project would also be undertaken 24 hours a day, seven days a week.

Shift start and finish times during mining operations would be scheduled outside the hours of 8.15 am to 9.00 am and 3.15 pm to 4.00 pm Monday to Friday to reduce potential overlap with school-related transport.

Shift times would be adjusted as necessary outside of the above hours over the life of the Project, based on operational efficiencies and production demands.

3.16 REHABILITATION AND MINE CLOSURE ACTIVITIES

3.16.1 Project Rehabilitation Strategy

A Rehabilitation and Mine Closure Strategy has been developed for the Project in consideration of relevant guidelines and the existing Moolarben Coal Complex Rehabilitation Management Plan and is presented in Attachment 8.

MCO has undertaken a preliminary assessment of potential post-mining land uses (e.g. nature conservation, agriculture) taking into account relevant strategic land use objectives of the area in the vicinity of the Project, current land use within and adjacent to the Project area and the potential benefits of the post-mining land use to the environment, future landholders and the community (Attachment 8).

Proposed post-mining land uses for the Project area include agricultural land, permanent water infrastructure and native and open woodland areas (Figure 3-14).

Post-mining land uses for the Project would continue to be developed and refined in consultation with the relevant stakeholders over the course of the Project life.

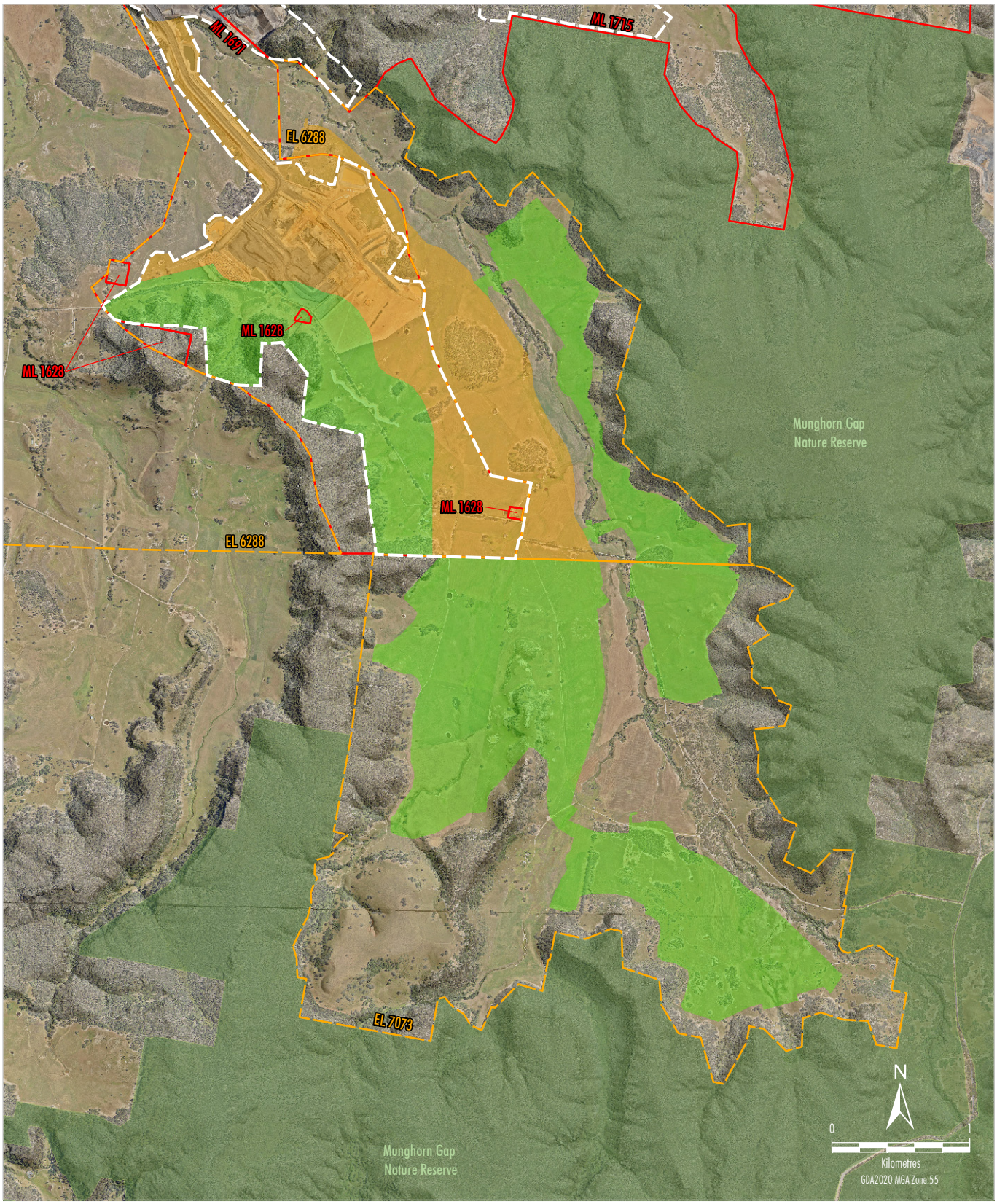
The conceptual Project final landform is detailed in Section 3.11.

3.16.2 Project Mine Closure and Decommissioning

A Mine Closure Plan would be developed for the Project in consultation with relevant regulatory authorities and community stakeholders. The Mine Closure Plan may be combined with the remainder of the Moolarben Coal Complex.

It is anticipated that the Mine Closure Plan would be integrated with mine closure measures for the existing Moolarben Coal Complex.

MCO would decommission and remove all Project infrastructure unless a suitable post-mining use is identified for the infrastructure in consultation with the NSW Resources Regulator, Mid-Western Regional Council and any other relevant stakeholders.



MCM-20-18 OC3 Ext AR UPD AppA_210A

LEGEND

- National Park/Nature Reserve
- Exploration Licence Boundary
- Mining Lease Boundary
- Moolarben Coal Complex Disturbance Footprint

Conceptual Post-mining Land Use Areas

- Agricultural Pasture
- Native Woodland

Source: MCO (2022); NSW Spatial Services (2021)
Orthophoto: MCO (Jan 2021)

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Conceptual Post-mining Land Use Areas

Figure 3-14

3.16.3 Project Rehabilitation Practices and Measures

Final rehabilitation activities for the Project would be undertaken progressively according to the following phases:

- Phase 1 – Decommissioning – removal of mining-related infrastructure such as hardstand areas, buildings and connected services, contaminated materials, hazardous materials and other infrastructure.
- Phase 2 – Landform Establishment – construction of the approved final landform which incorporates gradient, slope, aspect, drainage, substrate material testing and characterisation geotechnical testing and morphology.
- Phase 3 – Growth Medium Development – activities required to establish the physical, chemical and biological components of the growing media and ameliorants that are used to optimise the potential of the media in terms of the preferred vegetative cover.
- Phase 4 – Ecosystem and Land Use Establishment – establishment of the approved final landform which incorporates revegetated lands and habitat enhancement areas; species selection, species presence and growth together with weed and pest animal control/management; and establishment of flora.
- Phase 5 – Ecosystem and Land Use Sustainability – management of rehabilitation areas that incorporates components of floristic structure, species reproduction, nutrient cycling recruitment and recovery, community structure and function, which are the key elements of a sustainable landscape.
- Phase 6 – Relinquished Lands – land use and landscape is deemed suitable to be relinquished from the mining lease(s).

Rehabilitation materials would either be sourced from the Project disturbance area, within the Moolarben Coal Complex or imported as required.

A description of the progressive rehabilitation methods that would be implemented for the Project in relation to these phases is provided in Attachment 8.

Attachment 8 also includes:

- a detailed description of the methodology used to develop geomorphic landforms;
- a summary of proposed rehabilitation monitoring; and
- an overview of the current trials and research projects underway at the existing Moolarben Coal Complex.

3.17 OTHER ACTIVITIES

3.17.1 Exploration Activities

Exploration activities (including geotechnical investigations) would continue over the life of the Project to progressively refine the understanding of geological features, seam structure and coal/overburden characteristics, providing input to detailed mine planning and engineering and inform mine closure planning.

Exploration activities would also include investigation of potential construction material borrow pits within the indicative surface disturbance extent.

Exploration activities would comprise drilling, test pits, surface mapping and airborne and ground-based geophysical surveys.

Drilling activities would require only small surface areas and would involve the use of typical surface drilling rigs and supporting equipment.

Geochemical assessments would continue over the life of the Project to refine waste rock and coal reject management strategies and inform mine closure planning.

3.17.2 Monitoring Activities

Collection of environmental baseline data and monitoring of impacts would occur throughout the life of the Project in accordance with relevant management plans.

Monitoring for the Project is described in Attachment 9. The location, extent and methods adopted for monitoring would be adjusted throughout the life of the Project based on results and stakeholder feedback.