



WATER MANAGEMENT PLAN

Version	Effective Date (Month/YYYY)	Revision Detail (Include the main areas reviewed, trigger / why the change)	Author (Name/s)	Review Team (Name/s)
1	Apr 2010	Original Water Management Plan	MCO	J Thomas, Aquaterra, Worley Parsons
2	June 2013	General Review and Update	MCO	Environmental Department
3	July 2015	Document developed in accordance with PA 05_0117 and PA 08_0135	MCO	MCO, WRM Water & Environment (SWB & SWMP), Dundon Consulting (GWMP)
4	Feb 2018	General Review and Update	MCO	MCO
5	Feb 2020	To Incorporate approved modifications to Stage 1 (Mod 14) and Stage 2 (Mod 3)	MCO	MCO, WRM Water and Environment (SWB), HydroSimulations (GWMP)
6	Sep 2020	To incorporate approval of Stage 1 (MOD 15)	MCO	MCO
7	Nov 2023	General Review and Update	MCO	MCO

Document	Version	Effective Date	Status	Author
MCO_ENV_PLN_0028	7	Nov 2023	Approval	MCO

TABLE OF CONTENTS

1.0 INTRODUCTION.....	1
1.1 OPERATIONAL STATUS	4
1.2 SCOPE AND PURPOSE.....	4
1.3 STRUCTURE OF THIS WATER MANAGEMENT PLAN	5
1.4 SUITABLY QUALIFIED EXPERTS	6
1.5 CONSULTATION.....	6
2.0 STATUTORY AND PROJECT APPROVAL REQUIREMENTS	8
2.1 PROJECT APPROVAL	8
2.1.1.. Water Management Performance Measures	8
2.2 EPBC ACT APPROVAL.....	9
2.3 LICENCES, APPROVALS AND LEASES.....	9
2.4 OTHER LEGISLATION AND REQUIREMENTS	10
2.4.1.. Water Management Act 2000 and Water Act 1912	10
2.4.2.. National Water Quality Management Strategy	10
2.4.3.. Regional Water Supply and Monitoring Investigation	10
2.4.4.. Hunter-Central Rivers Catchment Action Plan 2013-2023	12
3.0 WATER MANAGEMENT OVERVIEW	13
3.1 WATER MANAGEMENT SYSTEM AND SITE WATER BALANCE.....	13
3.2 SURFACE WATER OVERVIEW	13
3.3 GROUNDWATER OVERVIEW	14
3.4 ROLES AND RESPONSIBILITIES.....	14
4.0 REVIEW AND IMPROVEMENT OF ENVIRONMENTAL PERFORMANCE.....	17
4.1 ANNUAL REVIEW	17
4.2 PLAN REVISION.....	18
5.0 REPORTING SYSTEMS.....	19
5.1 INCIDENTS	19
5.2 COMPLAINTS	20
5.3 NON-COMPLIANCES	20
5.4 EXCEEDANCE OF PERFORMANCE CRITERIA	20
5.5 SUPPLY OF GROUNDWATER DATA.....	21

Document	Version	Effective Date	Status	Author
MCO_ENV_PLN_0028	7	Nov 2023	Approval	MCO

APPENDIX A - SITE WATER BALANCE

APPENDIX B - SURFACE WATER MANAGEMENT PLAN

APPENDIX C - GROUNDWATER MANAGEMENT PLAN

Document	Version	Effective Date	Status	Author
MCO_ENV_PLN_0028	7	Nov 2023	Approval	MCO

LIST OF TABLES

TABLE 1: OVERVIEW OF WAMP DOCUMENTS.....	5
TABLE 2: RELEVANT WATER LICENCES HELD BY MCO	10
TABLE 3: ROLES AND RESPONSIBILITIES	14

LIST OF FIGURES

FIGURE 1: REGIONAL LOCATION.....	2
FIGURE 2: APPROVED MOOLARBEN COAL PROJECT (STAGE 1 AND 2) GENERAL ARRANGEMENT	3
FIGURE 3: ENVIRONMENTAL MANAGEMENT SYSTEM STRUCTURE.....	7

LIST OF ATTACHMENTS

ATTACHMENT A - RELEVANT PROJECT APPROVALS (05_0117 AND 08_0135) CONDITIONS

Document	Version	Effective Date	Status	Author
MCO_ENV_PLN_0028	7	Nov 2023	Approval	MCO

1.0 INTRODUCTION

The Moolarben Coal Complex (MCC) is an open cut and underground coal mining operation located approximately 40 kilometres north of Mudgee in the Western Coalfield of New South Wales (NSW) (**Figure 1**).

Moolarben Coal Operations Pty Ltd (MCO) is the operator of the Moolarben Coal Complex on behalf of the Moolarben Joint Venture (Moolarben Coal Mines Pty Ltd [MCM], Yancoal Moolarben [YM] Pty Ltd and a consortium of Korean power companies). MCO, MCM and YM are wholly owned subsidiaries of Yancoal Australia Limited.

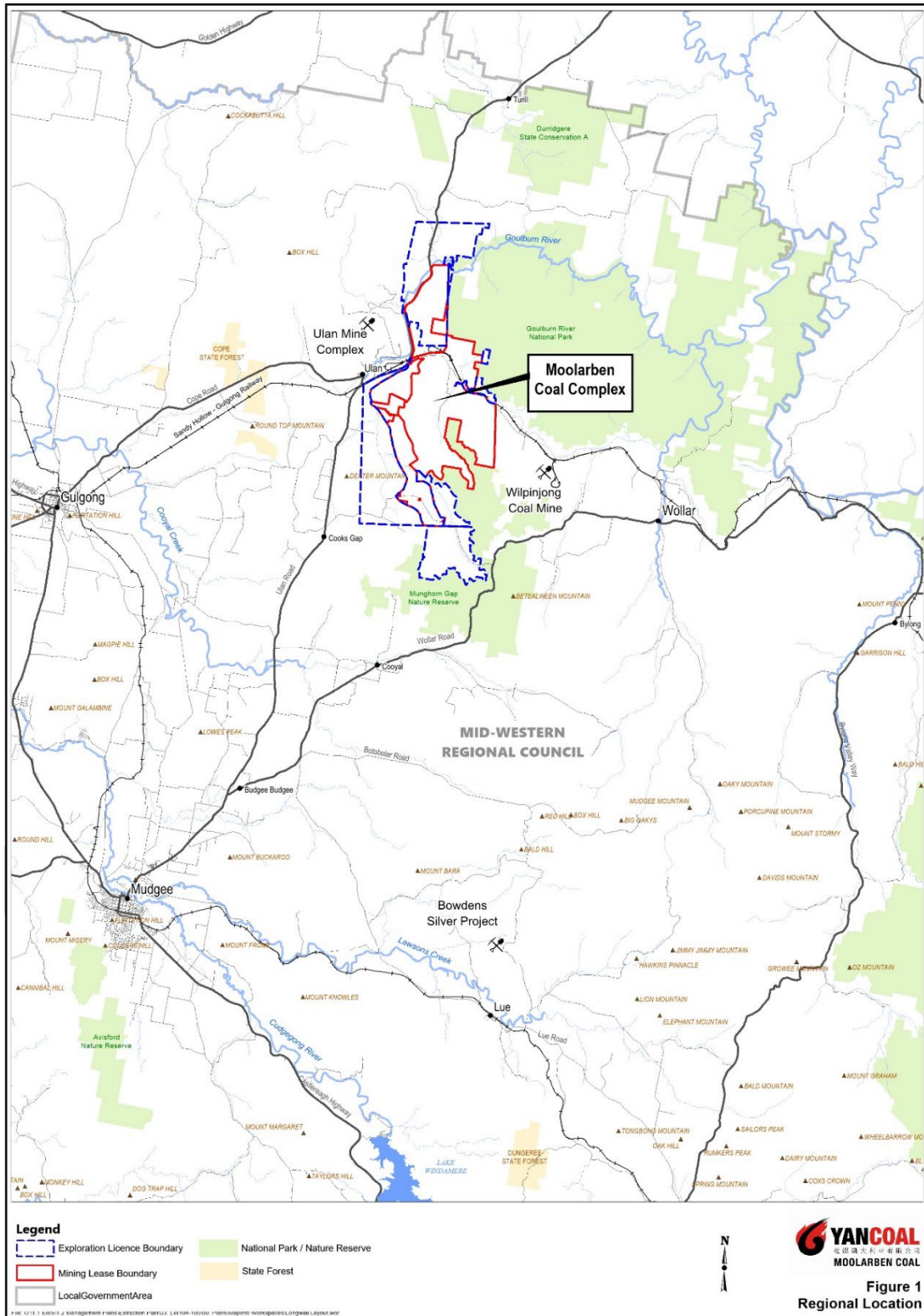
Mining operations at the MCC are currently approved until 31 December 2038 and would continue to be carried out in accordance with NSW Project Approval (05_0117) (Moolarben Coal Project Stage 1) as modified and NSW Project Approval (08_0135) (Moolarben Coal Project Stage 2) as modified.

Mining operations at the MCC are undertaken in accordance with the Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) approvals EPBC 2007/3297, EPBC 2008/4444, EPBC 2013/6926 and EPBC 2017/7974.

The current mining operations at the MCC are conducted in accordance with the requirements of the conditions of Mining Lease (ML) 1605, ML 1606, ML 1628, ML 1691 and ML 1715 granted under the *Mining Act 1992*.

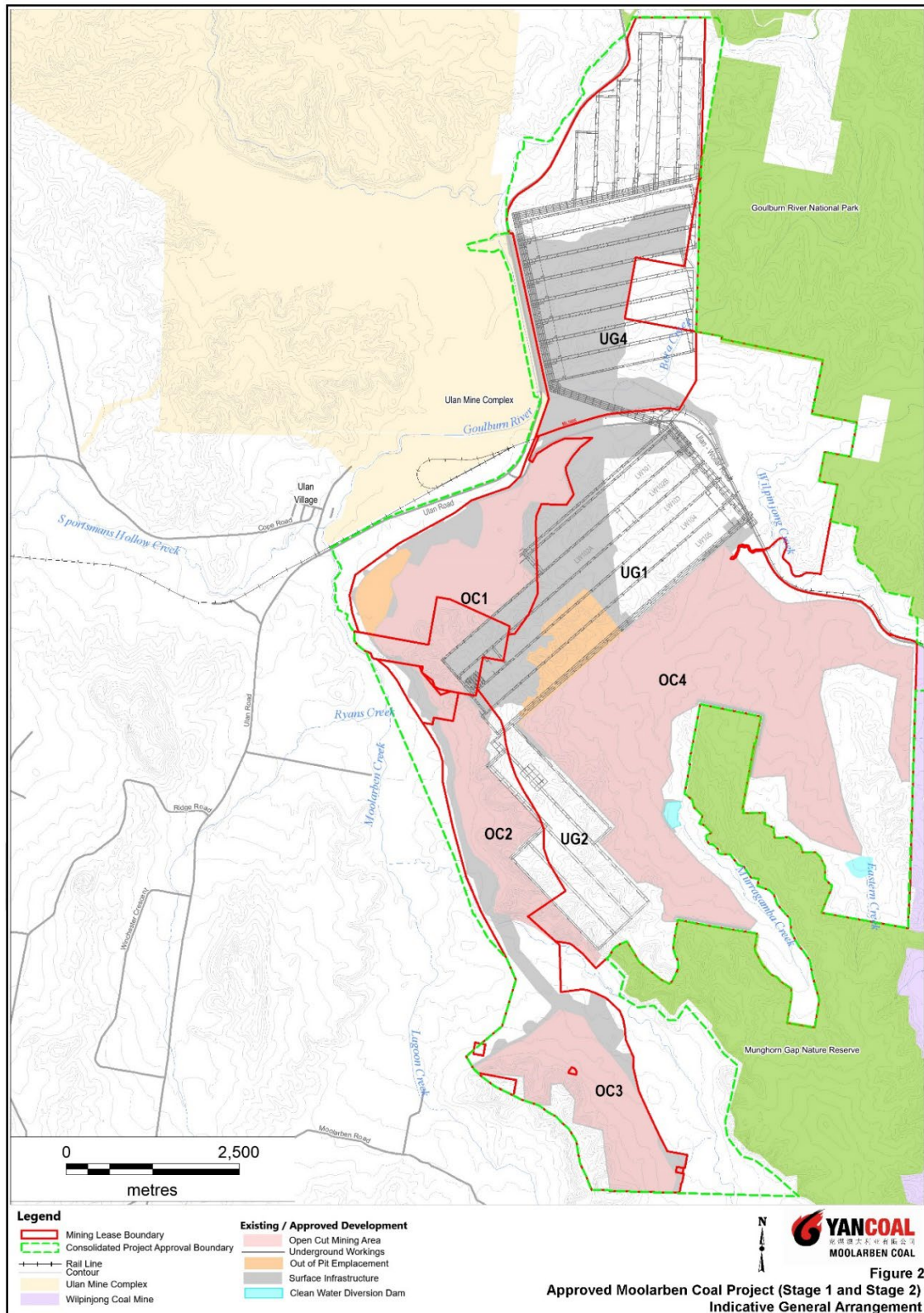
Document	Version	Effective Date	Status	Author
MCO_ENV_PLN_0028	7	Nov 2023	Approval	MCO

Figure 1: Regional Location



Document	Version	Effective Date	Status	Author
MCO_ENV_PLN_0028	7	Nov 2023	Approval	MCO

Figure 2: Approved Moolarben Coal Project (Stage 1 and 2) General Arrangement



Document	Version	Effective Date	Status	Author
MCO_ENV_PLN_0028	7	Nov 2023	Approval	MCO

1.1 OPERATIONAL STATUS

The Moolarben Coal Complex (MCC) comprises four approved open cut mining areas (OC1, OC2, OC3 and OC4), three approved underground mining areas (UG1, UG2 and UG4) and other mining related infrastructure (including coal processing and transport facilities) (**Figure 2**). Since the commencement of coal mining operations in 2010, mining activities have occurred within OC1, OC2, OC3, OC4, UG1 and UG4 with mining to progress to other approved mines in the future.

Construction/development and exploration activities are currently focused on works to facilitate open cut mining progression and development and progression of underground mining operations at the MCC.

Construction works in support of open cut mining progression include mine infrastructure areas, offices, water management works, coal handling, haul roads, diversions, water storages, and other ancillary works.

Construction works in support of underground mining progression include mine infrastructure areas, materials handling and processing, water management infrastructure and underground mining surface facilities.

1.2 SCOPE AND PURPOSE

This Water Management Plan (WAMP) has been prepared by MCO to satisfy the requirements under NSW Project Approval (05_0117) (as modified) and the NSW Project Approval (08_0135) (as modified).

This WAMP has been prepared to manage surface water and groundwater related impacts associated with open cut and underground mining, operation of the Coal Handling and Processing Plant (CHPP) and the supply of water to the operations.

Document	Version	Effective Date	Status	Author
MCO_ENV_PLN_0028	7	Nov 2023	Approval	MCO

1.3 STRUCTURE OF THIS WATER MANAGEMENT PLAN

This WAMP is a component of the overarching Environmental Management Strategy for the MCC (**Figure 3**).

In accordance with Condition 33, Schedule 3 and Condition 29, Schedule 3 of the NSW Project Approvals (05_0117 and 08_0135, respectively), the WAMP includes the following three documents:

- Site Water Balance (SWB) (MCO, 2020a) (**Appendix 1**).
- Surface Water Management Plan (SWMP) (MCO, 2022b) (**Appendix 2**).
- Groundwater Management Plan (GWMP) (MCO, 2020c) (**Appendix 3**).

A brief overview of the documents above is provided in **Table 1**.

Table 1: Overview of WAMP Documents

Document	Description
Site Water Balance	Overview of water management system, water balance modelling methodology, assumptions and results.
Surface Water Management Plan	Surface water baseline data, management measures, performance criteria, monitoring program and response plan.
Groundwater Management Plan	Groundwater baseline data, performance criteria, monitoring program, response plan and groundwater model validation.

The remainder of the WAMP is structured as follows:

- Section 2.0** Outlines the statutory requirements applicable to the WAMP.
- Section 3.0** Outlines water management systems at the MCC.
- Section 4.0** Provides details for the review and improvement of environmental performance process.
- Section 5.0** Describes the management and reporting of incidents, complaints and non-compliances.

Document	Version	Effective Date	Status	Author
MCO_ENV_PLN_0028	7	Nov 2023	Approval	MCO

1.4 SUITABLY QUALIFIED EXPERTS

The Secretary of the NSW Department of Planning & Environment (DPE) approved Dr David Newton (WRM Water & Environment), Dr Noel Merrick (HydroSimulations), Mr Andrew Durick (Australian Groundwater and Environment (AGE)) as suitably qualified and experienced experts for the preparation of the WAMP.

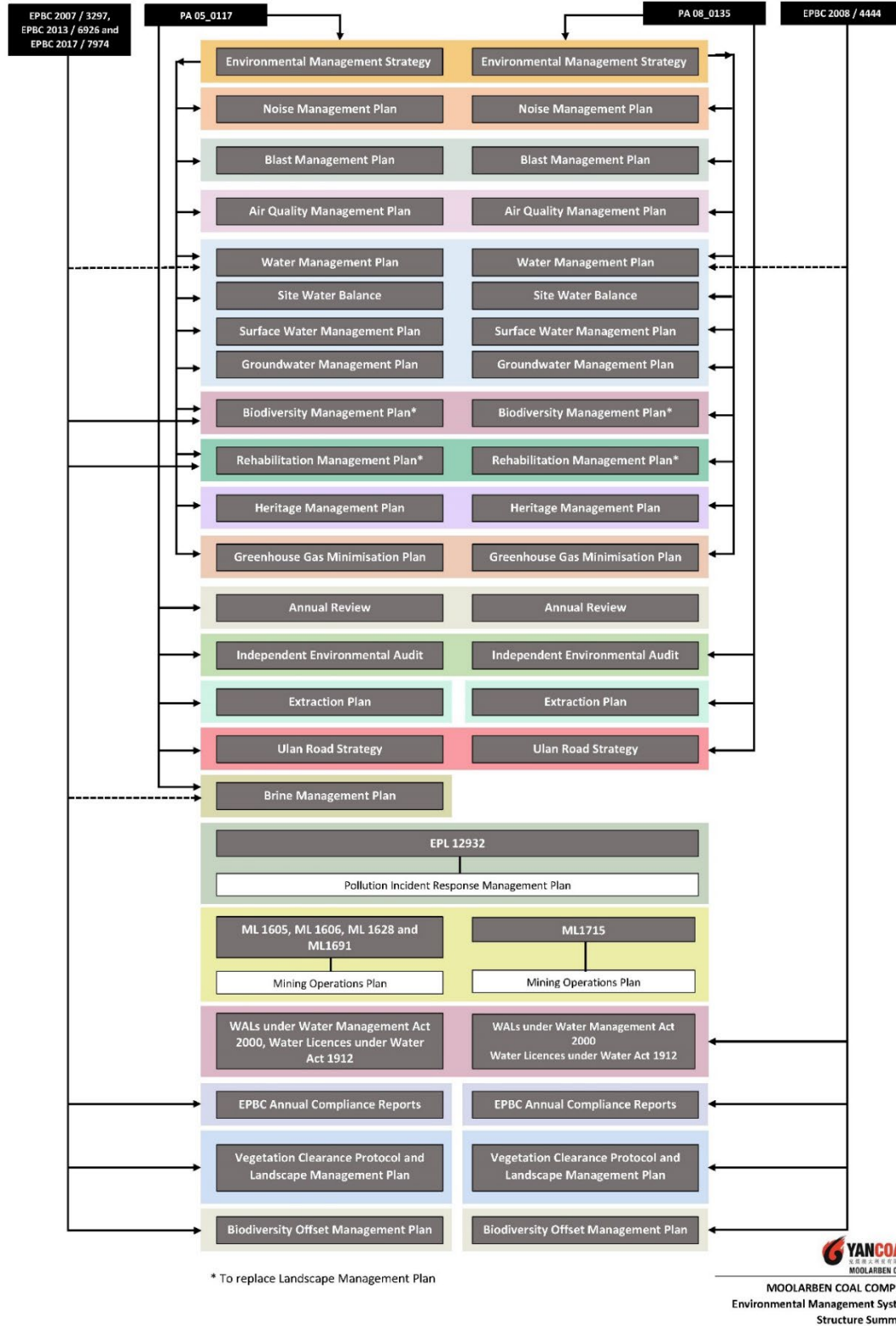
Relevant sections/appendices of the WAMP have been prepared/reviewed by Dr David Newton (SWB and SWMP), Dr Noel Merrick and Mr Andrew Durick (GWMP).

1.5 CONSULTATION

The WAMP was prepared in consultation with the Department of Planning & Environment - Water (DPE Water), the NSW Environment Protection Authority (EPA) and the NSW DPE. Feedback from these agencies has been incorporated into the WAMP.

Document	Version	Effective Date	Status	Author
MCO_ENV_PLN_0028	7	Nov 2023	Approval	MCO

Figure 3: Environmental Management System Structure



Document	Version	Effective Date	Status	Author
MCO_ENV_PLN_0028	7	Nov 2023	Approval	MCO

2.0 STATUTORY AND PROJECT APPROVAL REQUIREMENTS

MCO's statutory obligations are contained in:

- the conditions of the NSW Project Approval (05_0117) (as modified) and NSW Project Approval (08_0135) (as modified);
- the conditions of the Commonwealth Approvals (EPBC 2007/3297, EPBC 2013/6926, EPBC 2017/7974 and EPBC 2008/4444);
- relevant licences and permits, including conditions attached to Environment Protection Licence (EPL) 12932, mining leases and water licences; and
- other relevant legislation.

2.1 PROJECT APPROVAL

Condition 33, Schedule 3 and Condition 29, Schedule 3 of the NSW Project Approvals (05_0117 and 08_0135, respectively) require the preparation of a Water Management Plan. **Attachment A** presents a reconciliation of these requirements and indicates where they are addressed within this WAMP.

Condition 3, Schedule 5 of Project Approval (05_0117) and Condition 3, Schedule 6 of Project Approval (08_0135) outline general management plan requirements that are applicable to the preparation of the WAMP. **Attachment A** presents a reconciliation of these requirements and indicates where they are addressed within this WAMP.

2.1.1 Water Management Performance Measures

Condition 32, Schedule 3 and Condition 28, Schedule 3 of the NSW Project Approvals (05_0117 and 08_0135, respectively) provide specific water management performance measures for the following features:

- general water management;
- the Drip;
- construction and operation of linear infrastructure;
- sediment dams;
- clean water diversion and storage infrastructure;
- mine water storages;
- tailings, acid forming and potentially acid forming materials;
- in-pit emplacement of tailings, acid forming and potentially acid forming materials;
- chemical and hydrocarbon storage;
- Murrumbidgee and Eastern Creek Realignments;
- aquatic and riparian ecosystems;

Document	Version	Effective Date	Status	Author
MCO_ENV_PLN_0028	7	Nov 2023	Approval	MCO

- treated water discharge volume;
- treated water discharge quality; and
- storages constructed for the water treatment facility.

These specific water management performance measures and how they have been addressed by MCO are summarised in **Attachment A**.

2.2 EPBC ACT APPROVAL

Commonwealth approvals relevant to the MCC include EPBC 2007/3297, EPBC 2013/6926, EPBC 2008/4444 and 2017/7974. EPBC 2007/3297 and EPBC 2013/6926 do not have any specific water related conditions.

Relevant conditions for 2008/4444 and 2017/7974 have been included in this WAMP.

2.3 LICENCES, APPROVALS AND LEASES

In addition to the NSW Project Approvals (05_0117 and 08_0135) and Commonwealth Approvals (2007/3297, 2013/6936, 2017/7974 and 2008/4444) all activities at the MCC will be conducted in accordance with various other licences, permits and leases which have been issued or are pending issue.

Key licences, permits and leases pertaining to water at the MCC include:

- EPL 12932 issued under Part 3 of the NSW Protection of the Environment Operations Act 1997 by the EPA in August 2008 (as amended with project progression).
- Groundwater Monitoring Licences issued under the Water Act 1912 (refer **Table 2**).
- Water Access Licences issued under the Water Management Act 2000 (refer **Table 2**).
- Forward Program approved by the Resources Regulator (as amended with project progression).

MCO will obtain and hold volumetric licenses to account for maximum predicted groundwater inflows and surface water take associated with the development and operation of the MCC in accordance with the legislative requirements of the *Water Management Act 2000* and the *Water Act 1912* (**Section 2.4.1**). Relevant volumetric licences would remain to be held by MCO (or retired) to account for predicted post-mining MCC water take.

Document	Version	Effective Date	Status	Author
MCO_ENV_PLN_0028	7	Nov 2023	Approval	MCO

Table 2: Relevant Water Licences Held by MCO

Licence Number	Description
WAL36340, WAL37583 and WAL19424	Wollar Creek Water Source – Hunter Unregulated and Alluvial Water Sources
WAL37582 and WAL41888	Upper Goulburn River Water Source – Hunter Unregulated and Alluvial Water Sources
WAL39799	Sydney Basin - North Coast Fractured and Porous Rock Groundwater Source
20BL173935	Monitoring and Test Bores

2.4 OTHER LEGISLATION AND REQUIREMENTS

2.4.1 Water Management Act 2000 and Water Act 1912

The *Water Management Act 2000* incorporates the provisions of various prior Acts relating to the management of surface and groundwater in NSW. It provides a single statute for regulation of water access, use and works (e.g. pumps or bores) that affect the licensing of surface water and alluvial and non-alluvial groundwater in the vicinity of the MCC.

The *Water Act 1912* incorporates provisions that relate to groundwater monitoring and test bores.

2.4.2 National Water Quality Management Strategy

The National Water Quality Management Strategy is a joint national approach to improving water quality in Australian and New Zealand waterways.

The process for water quality management is based on national guidelines that are implemented at State, Regional and Local levels. The national water quality guidelines are the basis for development of the State and Local water management plans and objectives.

The Australian and New Zealand Environment and Conservation Council water quality guidelines have been considered where applicable in both the SWMP (Appendix 2) and the GWMP (Appendix 3) for the MCC.

2.4.3 Regional Water Supply and Monitoring Investigation

In accordance with the conditions of the original Stage 1 Project Approval (05_0117), MCO engaged a qualified and independent expert to undertake a Regional Water Supply and Monitoring Investigation in consultation with the EPA, NSW Office of Water (NOW) (now DPE - Water), the then Department of Trade and Investment, Regional Infrastructure and Services, Ulan Coal Mines Pty Ltd (UCML) and Wilpinjong Coal Pty Ltd (WCPL). The Regional Water Study was submitted to the Department of Planning and Infrastructure (now DPE) in November 2009.

Document	Version	Effective Date	Status	Author
MCO_ENV_PLN_0028	7	Nov 2023	Approval	MCO

The study considered:

- the feasibility and potential environmental benefits of increased water sharing between the three mining operations in the region;
- the potential for developing regional surface and groundwater monitoring programs to:
 - rationalise the surface and groundwater monitoring programs of the three mining operations in the region; and
 - improve the monitoring of the individual and cumulative surface and groundwater impacts of these mining operations.
- measures to reduce the surface and groundwater impacts of mining in the region; and
- any potential changes to existing licences and/or approvals that could facilitate the implementation of these measures.

Based on the results of this study and consultation with relevant government agencies, the following actions have been implemented:

- Review of the monitoring network and rationalisation of monitoring points identified several areas where monitoring could be reduced and/or data shared between three mines, without compromising the regional management of the groundwater and surface water resources. The recommended regional monitoring network is consistent with the three individual mines' surface water and groundwater monitoring plans. UCML, MCO and WCPL participate in ongoing sharing of monitoring data where appropriate.
- Water sharing between UCML and MCO is undertaken. Details on the water sharing agreement between UCML and MCO is described in the SWB (**Appendix 1**).
- Ongoing discussion and consultation between UCML, MCO and WCPL in order to integrate monitoring rationalisation, and that any changes in water inflows and/or water demand are factored into developing optimal water sharing arrangements throughout the life of all three mines.
- Contemporary groundwater modelling undertaken for the MCC has considered cumulative impacts associated with the Ulan Mine Complex and Wilpinjong Coal Mine.

Document	Version	Effective Date	Status	Author
MCO_ENV_PLN_0028	7	Nov 2023	Approval	MCO

2.4.4 Hunter-Central Rivers Catchment Action Plan 2013-2023

The *Hunter-Central Rivers Catchment Action Plan 2013-2023* has been developed by the Hunter-Central Rivers Catchment Management Authority (2013) to set strategic goals, targets and outcomes for maintaining and improving the health and productivity of the Hunter-Central Rivers Catchment. The 2013-2023 plan is a further development on the goals and targets of the previous (and first) catchment action plan. The plan provides direction for actions at all levels of government, industry and community to maintain or improve the long-term viability of healthy and productive natural systems within the catchment region.

The goals, targets and outcomes of the *Hunter-Central Rivers Catchment Action Plan 2013-2023* have been considered where relevant in the preparation of this WAMP.

Document	Version	Effective Date	Status	Author
MCO_ENV_PLN_0028	7	Nov 2023	Approval	MCO

3.0 WATER MANAGEMENT OVERVIEW

3.1 WATER MANAGEMENT SYSTEM AND SITE WATER BALANCE

Water demands at the MCC include:

- water used in the CHPP, including water retained in coal products and rejects and water for dust suppression (including stockpiles);
- haul road dust suppression;
- underground water use; and
- miscellaneous water usage such as potable water, vehicle wash down, irrigation, evaporation and mining infrastructure area water usage.

These water demands are met through a combination of the following water sources:

- runoff captured from the footprint of the mining disturbance area by the water management system;
- groundwater pit inflows (including underground mines);
- recycled water from the coal processing water circuit;
- water imported from the Ulan Mine Complex under agreement with UCML; and
- water supply from groundwater borefields/advanced dewatering.

The Water Management System also includes water disposal including effluent irrigation and licensed discharges. A detailed description of the MCC water management system and an overview of the supporting site water balance modelling is provided in the SWB (**Appendix 1**).

3.2 SURFACE WATER OVERVIEW

The MCC is located in the Upper Goulburn River and Wollar Creek catchments (both sub-catchments to the larger Goulburn River and Hunter River catchments), which have catchment areas of approximately 2,455 square kilometres (km²) and 532 km², respectively. Both catchments drain to the Goulburn River which flows in an easterly direction, eventually joining the Hunter River approximately 150 km downstream of the MCC.

Moolarben Creek is a tributary of the Upper Goulburn River sub-catchment and flows along the western boundary of the MCC.

Wilpinjong Creek is a tributary of Wollar Creek sub-catchment and flows along the east and north-east of the MCC into Wollar Creek, before joining the Goulburn River approximately 26 km downstream of the MCC. A detailed description of surface water management and monitoring at the MCC is provided in the SWMP (**Appendix 2**).

Document	Version	Effective Date	Status	Author
MCO_ENV_PLN_0028	7	Nov 2023	Approval	MCO

3.3 GROUNDWATER OVERVIEW

The MCC is located in the Western Coalfields on the north-western edge of the Sydney-Gunnedah Basin, which contains sedimentary rocks of Triassic and Permian age (including coal measures). The dominant outcropping lithologies over the MCC are the Triassic Narrabeen Group (Wollar Sandstone) and the Permian Illawarra Coal Measures. The siltstones and sandstones of the Triassic Narrabeen Group form elevated, mesa-like plateaus associated with the Goulburn River National Park and the Munghorn Gap Nature Reserve.

A detailed description of groundwater management and monitoring at the MCC is provided in the GWMP (**Appendix 3**).

3.4 ROLES AND RESPONSIBILITIES

Overall responsibilities for implementing the suite of environmental management plans across the MCC are described in Appendix E the Environmental Management Strategy (EMS). The roles and responsibilities of site employees and contractors relating to water management are summarised in **Table 3**.

Table 3: Roles and Responsibilities

Role	Responsibility
General Manager	Provide adequate resources to implement the requirements of the suite of Water Management Plans.
Environment and Community Manager	Preparation, implementation and maintenance of the WAMP.
	Communication of the WAMP to relevant personnel and contractors
	Conduct regulatory and stakeholder reporting, notifications and consultations in accordance with the WAMP, including non-compliances or exceedances.
	Manage the response to all water related complaints and incidents.
	Oversee investigations and response protocol implementation.
	Oversee discharges in accordance with EPL conditions.
	Coordinate review of the groundwater model and monitoring network.
Environment and Community Superintendent	Communication of the WAMP to relevant personnel and contractors
	Provide water management advice in accordance with the WAMP.
	Coordinate investigations and response protocol implementation.
	Approve area specific erosion and sediment control plans through the process.
	Oversee monitoring as outlined in the WAMP (surface, groundwater, stream health, channel stability, dams, water transfer, discharge etc.).
	Oversee the installation, maintenance and calibration of monitoring equipment (e.g. water quality and flow meters).

Document	Version	Effective Date	Status	Author
MCO_ENV_PLN_0028	7	Nov 2023	Approval	MCO

Role	Responsibility
Environment and Community Advisor	Provide water management advice in accordance with the WAMP.
	Coordinate the installation, maintenance and calibration of monitoring equipment (e.g. water quality and flow meters).
	Coordinate monitoring as outlined in the WAMP (surface, groundwater, stream health, channel stability, dams, water transfer, etc.).
	Review water monitoring data against trigger levels.
	Coordinate groundwater and surface water response protocols.
	Prepare data and reviews for internal/external reporting, including annual review.
	Conduct inspections of erosion and sediment controls and water infrastructure.
	Conduct 6 monthly potential acid mine drainage monitoring.
Technical Services Managers	Implementation of, and compliance with, the WAMP in mine designs, including budgeting and resources.
	Include water management in life of mine planning and mine designs.
	Design water management structures in accordance with WAMP requirements.
	Coordinate annual inspections of Mine Water storages.
	Collation and analysis of water movement and management information.
Open Cut Operations Manager	Implementation of, and compliance with, the WAMP in the Open-Cut operations, including budgeting and resources.
	Communicate Water Management Plan requirements to relevant personnel and contractors.
	Operate, maintain and calibrate (where relevant) water infrastructure in the Open-cut areas in accordance with the WAMP (pumps, pipes, dams, meters, transfers, etc.).
	Dispose rejects in accordance with the WAMP.
	Coordinate weekly water structure inspections and monitoring in open-cut areas.
CHPP Manager	Implementation of, and compliance with, the WAMP in the CHPP, including budgeting and resources.
	Communicate Water Management Plan to relevant personnel and contractors.
	Coordinate and oversee supply of water from the Ulan Mine Complex.
	Coordinate inspections and monitoring of water structures in the CHPP area.
	Operate, maintain and calibrate (where relevant) water structures in the CHPP area in accordance with the WAMP (water treatment, pumps, pipes, dams, meters, transfers, etc.).
	Perform monthly inspection of pipeline from the Ulan Mine Complex to the MCC CHPP.
Maintenance Manager	Implementation of, and compliance with the WAMP in maintenance operations, including budgeting and resources.

Document	Version	Effective Date	Status	Author
MCO_ENV_PLN_0028	7	Nov 2023	Approval	MCO

Role	Responsibility
	Operate and maintain washbays, chemical and fuel storages in accordance with the WAMP.
Underground Operations Manager	Implementation of, and compliance with the WAMP in the underground operations, including budgeting and resources.
	Coordinate and oversee supply of water from the dewatering/production borefield.
	Operate, maintain and calibrate (where relevant) water structures in the underground area in accordance with the WAMP (pumps, pipes, dams, meters, transfers, etc.).
	Monitoring groundwater usage and dewatering from underground operations.
Project Managers	Implementation of, and compliance with the WAMP in project areas, including budgeting and resources.
	Development, implementation and maintenance of project erosion and sediment control plans.
	Communicate the WAMP requirements to relevant personnel/ contractors.
	Design and construct water management structures in accordance with the WAMP.
	Operate and maintain water structures in project areas in accordance with the WAMP (e.g. pumps, pipes, dams, meters, transfers, etc.).
	Perform regular inspections and maintenance of erosion and sediment controls.
All Employees & Contractors	Report incidents and defective water management systems or water wastage (e.g. leaking pipes).

Document	Version	Effective Date	Status	Author
MCO_ENV_PLN_0028	7	Nov 2023	Approval	MCO

4.0 REVIEW AND IMPROVEMENT OF ENVIRONMENTAL PERFORMANCE

4.1 ANNUAL REVIEW

In accordance with Condition 4, Schedule 5 and Condition 4, Schedule 6 of the Project Approvals (05_0117 and 08_0135, respectively) MCO conducts an annual review of MCO operations prior to 31 March each year.

These annual reviews specifically address the following aspects of Condition 4, which directly relate to water management:

- include a comprehensive review of the monitoring results and complaints records of MCO operations over the previous calendar year, which includes a comparison of these results against the:
 - relevant statutory requirements, limits or performance measures/criteria;
 - monitoring results of previous years; and
 - relevant predictions in the Environmental Approval (EA);
- identify any non-compliance over the last year, and describe what actions were (or are being) taken to ensure compliance;
- identify any trends in the monitoring data over the life of the project;
- identify any discrepancies between the predicted and actual impacts of MCO operations, and analyse the potential cause of any significant discrepancies; and
- describe what measures will be implemented over the next year to improve the environmental performance of the project.

The annual review will also include relevant monitoring data, analysis of trends in consideration of natural fluctuations and possible mining induced changes and the volume of water extracted from groundwater production bores.

The annual reviews are made publicly available on the [Moolarben Coal website](#) in accordance with Condition 11, Schedule 5 and Condition 11, Schedule 6 of the Project Approvals (05_0117 and 08_0135, respectively).

Document	Version	Effective Date	Status	Author
MCO_ENV_PLN_0028	7	Nov 2023	Approval	MCO

4.2 PLAN REVISION

In accordance with Condition 5, Schedule 5 and Condition 5, Schedule 6 of the Project Approvals (05_0117 and 08_0135, respectively) the WAMP (including SWB, SWMP and GWMP) will be reviewed, and if necessary revised to the satisfaction of the Secretary, within 3 months of the submission of:

- (a) an Annual Review in accordance with Condition 4, Schedule 5 and Condition 4, Schedule 6 of the Project Approvals (05_0117 and 08_0135, respectively);
- (b) an incident report in accordance with Condition 7, Schedule 5 and Condition 7, Schedule 6 of the Project Approvals (05_0117 and 08_0135, respectively);
- (c) an audit in accordance with Condition 9, Schedule 5 and Condition 9, Schedule 6 of the Project Approvals (05_0117 and 08_0135, respectively);
- (d) any modification to the conditions of the Project Approvals.

The WAMP will be made publicly available on the [Moolarben Coal website](#), in accordance with Condition 11, Schedule 5 and Condition 11, Schedule 6 of the Project Approvals (05_0117 and 08_0135, respectively).

In addition to, or in conjunction with, the above review requirements the SWMP will be revised (as required) on an ongoing basis throughout the life of the MCC in consideration of:

- changes to legislation, regulation and guidance;
- changes to mine planning, supplies or discharge (that has a material effect on water management);
- adaptive management and continual improvement; or
- relevant agency feedback.

Document	Version	Effective Date	Status	Author
MCO_ENV_PLN_0028	7	Nov 2023	Approval	MCO

5.0 REPORTING SYSTEMS

In accordance with Condition 3, Schedule 5 and Condition 3, Schedule 6 of the NSW Project Approvals (0117 and 08_0135, respectively), MCO has developed protocols for managing and reporting the following:

- incidents;
- complaints;
- non-compliances with statutory requirements; and
- impact assessment criteria and/or performance criteria that result in a non-compliance as a result of the MCC.

These protocols are summarised below and are described in detail in the Environmental Management Strategy.

5.1 INCIDENTS

An incident is defined as a set of circumstances that causes or threatens to cause material harm to the environment and/or breaches or exceeds the limits or performance measures/criteria in the NSW Project Approvals.

In the event that an incident associated with the MCC occurs, which causes or threatens to cause material harm to the environment, the incident will be managed in accordance with relevant regulatory approvals and statutory obligations.

The reporting of incidents will be conducted in accordance with Condition 7, Schedule 5 and Condition 7, Schedule 6 of the NSW Project Approvals (05_0117 and 08_0135, respectively). MCO will notify the Secretary of the DPE, and any other relevant agencies immediately after MCO becomes aware of the incident which causes or threatens to cause material environmental harm. For any other incident associated with the project, MCO will notify the Secretary and any other relevant agencies as soon as practicable after becoming aware of the incident.

In the event of a pollution incident, a notification will also be conducted as per the processes outlined in the Pollution Incident Response Management Plan (prepared as part of MCO's holding EPL 12932), in accordance with the protocol for industry notification of pollution incidents under Part 5.7 of the *Protection of the Environment Operations Act 1997*.

Document	Version	Effective Date	Status	Author
MCO_ENV_PLN_0028	7	Nov 2023	Approval	MCO

Within seven days of the date of the incident, MCO will provide the Secretary of the DPE and any relevant agencies with a detailed report on the incident. The report will:

- describe the date, time and nature of the incident;
- identify the cause (or likely cause) of the incident;
- describe what action has been taken to date; and
- describe the proposed measures to address the incident.

5.2 COMPLAINTS

MCO will manage complaints in accordance with Section 5.4 of the MCC Environmental Management Strategy.

5.3 NON-COMPLIANCES

MCO will notify the Secretary of the DPE, and any other relevant agencies of any water related non-compliance associated with the MCC immediately after MCO becomes aware of the incident. Within seven days of the date of the incident, MCO will provide the Secretary of the DPE and any relevant agencies with a detailed report on the incident.

In addition, within two weeks of obtaining monitoring results showing an exceedance of the criteria detailed in the NSW Project Approvals (05_0117 and 08_0135) and completion of the protocol for determining an exceedance is a non-compliance (as outlined in each management plan), MCO shall, in accordance with Condition 3, Schedule 4 and Condition 3, Schedule 5 of the NSW Project Approvals (05_0117 and 08_0135, respectively) notify affected landowners in writing of the exceedance, and provide regular monitoring results to each affected landowner until the MCC is again complying with the relevant criteria.

A review of MCO's compliance with all conditions in the NSW Project Approvals, mining leases and all other approvals and licences will be undertaken prior to (and included within) each Annual Review. The Annual Review will be made publicly available on the [Moolarben Coal Website](#) in accordance with Condition 11, Schedule 5 and Condition 11, Schedule 6 of the NSW Project Approvals (05_0117 and 08_0135, respectively).

5.4 EXCEEDANCE OF PERFORMANCE CRITERIA

Details regarding the response protocol, including reporting procedures, for the exceedance of performance criteria (e.g. as determined by investigations following exceedance of investigation trigger levels or ranges) is described in Section 8 of the SWMP and Section 8 of the GWMP.

Document	Version	Effective Date	Status	Author
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5.5 SUPPLY OF GROUNDWATER DATA

In accordance with Condition 6 of EPBC 2008/4444, upon request, MCO will provide groundwater monitoring data to the (Commonwealth) Department of the Environment and Energy, NSW government agencies and the operators of Ulan and/or Wilpinjong mines (or other adjacent mining operations). The following protocol for provision of groundwater monitoring data will apply:

- A request for the provision of data is to be made in writing to MCO's Environment and Community Manager, including details of the specific data requested and proposed use of the data.
- MCO's Environment and Community Manager will review the request for compliance with Condition 6 of EPBC 2008/4444.
- Data to be provided may be in the form of Annual Review documentation or other format as agreed by MCO's Environment and Community Manager.

(Note, the above data provision protocol will not affect the existing data sharing agreement MCO has with UCML or WCPL).

Document	Version	Effective Date	Status	Author
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6.0 REFERENCES

Australian and New Zealand Environment Conservation Council, ANZECC (2000), *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*, Australian and New Zealand Environment and Conservation Council/Agriculture and Resource Management Council of Australia and New Zealand.

EMM (2013), *Moolarben Coal Project Stage 1 Optimisation Modification Environmental Assessment*, May 2013.

Hansen Bailey, HB (2012), *Moolarben Coal Project Stage 2 – Preferred Project Report*, January 2012.

Landcom (2004), *Managing Urban Stormwater – Soils and Construction – Fourth Edition*, March 2004, NSW Government.

Moolarben Coal Operations Pty Ltd (2020a) *Site Water Balance*.

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NOW (2009), *Water Sharing Plan for the Hunter Unregulated and Alluvial Water Sources*, 2009.

NSW (2004). *Approved Methods for the Sampling and Analysis of Water Pollutant in NSW*. Department of Environment and Conservation and Environmental Protection Agency. ISBN 1-74137-051-5. Document reference DEC 2004/35. March 2004.

NSW Department of Environment and Climate Change, DECC (2008), *Managing Urban Stormwater – Soils and Construction – Volume 2E Mines and Quarries*, June 2008.

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Attachment A - Relevant Project Approvals (05_0117 and 08_0135) Conditions

Table A-1: Water Management Plan Requirements in NSW Project Approval 05_0117

NSW Project Approval Condition	WAMP Section
<p>Water Management Plan</p> <p>33. The Proponent shall prepare and implement a Water Management Plan for the project to the satisfaction of the Secretary. This plan must:</p> <p>(a) be prepared in consultation with DPIE Water, NRAR and the EPA, by suitably qualified and experienced persons whose appointment has been approved by the Secretary and be revised and submitted to the Secretary for approval by 31 October 2016;</p> <p>(a1) include reference to the National Water Quality Management Strategy;</p> <p>(a2) include detailed performance criteria and describe measures to ensure that the Proponent complies with the Water Management Performance Measures (see Table 11);</p> <p>(b) in addition to the standard requirements for management plans (see Condition 3 of Schedule 5), this plan must include a:</p> <p>(i) <u>Site Water Balance</u> that:</p> <p>...</p> <p>(ii) <u>Surface Water Management Plan</u>, that includes:</p> <p>...</p> <p>(iii) <u>Groundwater Management Plan</u>, that includes:</p> <p>...</p> <p>(iv) a protocol that has been prepared in consultation with the owners of the Ulan and Wilpinjong mines to:</p> <ul style="list-style-type: none"> • minimise cumulative water quality impacts; • review opportunities of increased water sharing between these projects; • co-ordinate water quality and flow monitoring programs as far as practicable; • undertake joint investigations/studies in relation to complaints/exceedences of trigger levels where cumulative impacts are considered likely; and • co-ordinate modelling programs for validation, re-calibration and re-running of groundwater models. 	<p>1.5</p> <p>2.4.2</p> <p>2.1.1</p> <p>Appendix 1</p> <p>Appendix 2</p> <p>Appendix 3</p> <p>2.4.3</p>

Table A-2: Water Management Plan Requirements in NSW Project Approval 08_0135

NSW Project Approval Condition	WAMP Section
<p>Water Management Plan</p> <p>29. The Proponent shall prepare and implement a Water Management Plan for the project to the satisfaction of the Secretary. This plan must:</p> <p>(a) be prepared in consultation with DoI Lands and Water, NRAR and the EPA, by suitably qualified and experienced persons whose appointment has been approved by the Secretary;</p> <p>(b) be submitted to the Secretary for approval prior to the commencement of any development on site;</p> <p>(c) include reference to the National Water Quality Management Strategy;</p> <p>(d) include detailed performance criteria and describes measure to ensure that the Proponent complies with the Water Management Performance Measures (see Table 14);</p> <p>(e) in addition to the standard requirements for management plans (see condition 3 of Schedule 6), this plan must include a:</p> <p>(i) <u>Site Water Balance</u> that:</p> <p>...</p> <p>(ii) <u>Surface Water Management Plan</u>, that includes:</p> <p>...</p> <p>(iii) <u>Groundwater Management Plan</u>, that includes:</p> <p>...</p> <p>(iv) a protocol that has been prepared in consultation with the owners of the Ulan and Wilpinjong mines to:</p> <ul style="list-style-type: none"> • minimise cumulative water quality impacts; • review opportunities of increased water sharing between these projects; • co-ordinate water quality and flow monitoring programs as far as practicable; • undertake joint investigations/studies in relation to complaints/exceedences of trigger levels where cumulative impacts are considered likely; and • co-ordinate modelling programs for validation, re-calibration and re-running of groundwater models. 	<p>1.5</p> <p>1.5</p> <p>2.4.2</p> <p>2.1.1</p> <p>Appendix 1</p> <p>Appendix 2</p> <p>Appendix 3</p> <p>2.4.3</p>

Table A-4: Stage 1 Project Approval (05_0117) Water Management Performance Measures

NSW Project Approval Condition (Schedule 3 Condition 32)		Relevant Reference
Water Management – General	<ul style="list-style-type: none"> Minimise cumulative water impacts with the other mines in the region Maximise water sharing with the other mines in the region Minimise the use of clean water on site 	2.4.3 2.4.3 Appendix 1
The Drip	<ul style="list-style-type: none"> Nil impact on the water supply to the Drip. 	Appendix 3
Construction and operation of linear infrastructure	<ul style="list-style-type: none"> Design, install and maintain erosion and sediment controls generally in accordance with the series <i>Managing Urban Stormwater: Soils and Construction</i> including Volume 1, Volume 2A -Installation of Services and Volume 2C – Unsealed Roads Design, install and maintain the infrastructure within 40 m of watercourses generally in accordance with the <i>Guidelines for Controlled Activities on Waterfront Land</i> (DPI 2007), or its latest version Design, installation and maintenance of creek crossings generally in accordance with the <i>Policy and Guidelines for Fish Friendly Waterway Crossings</i> (NSW Fisheries, 2003) and <i>Why Do Fish Need To Cross The Road? Fish Passage Requirements for Waterway Crossings</i> (NSW Fisheries 2003), or their latest versions 	Appendix 2 Appendix 2 Appendix 2
Mine Sediment Dams	<ul style="list-style-type: none"> Design, install and maintain the dams generally in accordance with the series <i>Managing Urban Stormwater: Soils and Construction - Volume 1 and Volume 2E Mines and Quarries</i> 	Appendix 2
Clean water diversion & storage infrastructure	<ul style="list-style-type: none"> Use best endeavours to upgrade the existing clean water systems to capture and convey the 100 year ARI flood Maximise as far as reasonable and feasible the diversion of clean water around disturbed areas on site 	Appendix 2 Appendix 2
Mine water storages	<ul style="list-style-type: none"> Mine water storage infrastructure is designed to store a 50 year ARI 72 hour storm event On-site storages (including failings dams, mine infrastructure dams, groundwater storage and treatment dams) are suitably lined to comply with a permeability standard of $< 1 \times 10^{-9}$ m/s 	Appendix 2 Appendix 2
Tailings, acid forming and potentially acid forming materials	<ul style="list-style-type: none"> In-pit emplacement, encapsulation or capping to prevent the migration of pollutants beyond the pit shell 	Appendix 2
In-pit emplacement of tailings, acid forming and potentially acid forming materials	<ul style="list-style-type: none"> Emplacement, encapsulation and capping to prevent or minimise the migration of pollutants beyond the pit shell of seepage from out of pit emplacement areas Adequate freeboard within the pit void to minimise the risk of discharge to surface waters 	Appendix 2 Appendix 2

Table A-4: Stage 1 Project Approval (05_0117) Water Management Performance Measures (continued)

NSW Project Approval Condition		Relevant Reference
Chemical and hydrocarbon storage	<ul style="list-style-type: none"> Chemical and hydrocarbon products to be stored in bunded areas in accordance with the relevant Australian Standard 	Appendix 2
Aquatic and riparian ecosystem, including the relevant sections of Moolarben Creek, Bora Creek and Goulburn River	<ul style="list-style-type: none"> Maintain or improve baseline channel stability Develop site-specific in-stream water quality objectives in accordance with ANZECC 2000 and Using the ANZECC Guidelines and Water Quality Objectives in NSW procedures (DECC 2006), or its latest version 	Appendix 2 Appendix 2
Treated Water Discharge Volume	<ul style="list-style-type: none"> Up to 10 ML/day for the following periods (unless the Secretary agrees otherwise): <ul style="list-style-type: none"> until the commencement of mining operations in UG4; and following completion of mining operations in UG4 Up to 15 ML/day during mining operations in UG4 Greater than 15 ML/day during prolonged wet periods, with the approval of EPA. 	Appendix 2
Treated Water Discharge Quality	<ul style="list-style-type: none"> Electrical conductivity limit of 685 $\mu\text{S}/\text{cm}$ (100th percentile discharge limit) for up to 10ML/day until 30 June 2022 (unless the Secretary agrees otherwise) After 30 June 2022 (unless the Secretary agrees otherwise) an alternative electrical conductivity limit for treated water discharges as determined under condition 32A 	Appendix 2
Storages constructed for the Water Treatment Facility	<ul style="list-style-type: none"> Brine and feedwater storages designed to store a 100 year ARI 72 hour storm event Brine storages are suitably lined to comply with a permeability standard of $< 1 \times 10^{-9}$ m/s over 1000mm or equivalent standard 	Appendix 2

Table A-5: Stage 2 Project Approval (08_0135) Water Management Performance Measures

NSW Project Approval Condition		Relevant Reference
Water Management – General	<ul style="list-style-type: none"> Minimise cumulative water impacts with the other mines in the region Maximise water sharing with the other mines in the region Minimise the use of clean water on site 	2.4.3 2.4.3 Appendix 1
The Drip	<ul style="list-style-type: none"> Nil impact on the water supply to the Drip 	Appendix 3
Construction and operation of linear infrastructure	<ul style="list-style-type: none"> Design, install and maintain erosion and sediment controls generally in accordance with the series <i>Managing Urban Stormwater: Soils and Construction including Volume 1, Volume 2A -Installation of Services</i> and Volume 2C – <i>Unsealed Roads</i> Design, install and maintain the infrastructure within 40 m of watercourses generally in accordance with the <i>Guidelines for Controlled Activities on Waterfront Land</i> (DPI 2007), or its latest version Design, installation and maintain creek crossings generally in accordance with the <i>Policy and Guidelines for Fish Friendly Waterway Crossings</i> (NSW Fisheries, 2003) and <i>Why Do Fish Need To Cross The Road? Fish Passage Requirements for Waterway Crossings</i> (NSW Fisheries 2003), or their latest versions 	Appendix 2 Appendix 2 Appendix 2
Mine Sediment Dams	<ul style="list-style-type: none"> Design, install and maintain the dams generally in accordance with the series <i>Managing Urban Stormwater: Soils and Construction - Volume 1 and Volume 2E Mines and Quarries</i> 	Appendix 2
Clean water diversion & storage infrastructure	<ul style="list-style-type: none"> Design, install and maintain the clean water system to capture and convey the 100 year ARI flood Maximise as far as reasonable and feasible the diversion of clean water around disturbed areas on site 	Appendix 2 Appendix 2
Mine water storages	<ul style="list-style-type: none"> Mine water storage infrastructure is designed to store a 100 year ARI 72 hour storm event On-site storages (including failings dams, mine infrastructure dams, groundwater storage and treatment dams) are suitably lined to comply with a permeability standard of $< 1 \times 10^{-9}$ m/s 	Appendix 2 Appendix 2
Tailings, acid forming and potentially acid forming materials	<ul style="list-style-type: none"> In-pit emplacement, encapsulation or capping to prevent the migration of pollutants beyond the pit shell Adequate freeboard within the pit void to minimise the risk of discharge to surface waters 	Appendix 2 Appendix 2
Chemical and hydrocarbon storage	<ul style="list-style-type: none"> Chemical and hydrocarbon products to be stored in bunded areas in accordance with the relevant Australian Standards 	Appendix 2

**Table A-5: Stage 2 Project Approval (08_0135) Water Management Performance Measures
(continued)**

NSW Project Approval Condition		Relevant Reference
Murragamba and Eastern Creek realignments	<ul style="list-style-type: none"> • Increase the overall length of the creek diversions and reduce the overall average bed slope compared to the existing creek alignments • Mimic the existing meandering plan form of the low flow channel • Include creek corridors which are designed to contain flood flows up to the 1 in 100 year ARI • Include low flow channels which are designed to contain a rainfall event of a 1 in 1 year ARI • Include riffle/drop structures that are designed for a 1 in 20 year ARI peak flow • Incorporate erosion control measures based on vegetation and engineering revetments • Incorporate persistent/permanent pools for aquatic habitat • Incorporate seepage control/flow loss measures through sections of the creek lines to be constructed over mine waste backfill • Revegetate with suitable native riparian vegetation species to restore aquatic biodiversity throughout the realignments 	<p>Appendix 2</p> <p>Appendix 2</p> <p>Appendix 2</p> <p>Appendix 2</p> <p>Appendix 2</p> <p>Appendix 2</p> <p>Appendix 2</p> <p>Appendix 2</p> <p>Appendix 2</p>
Aquatic and riparian ecosystem. Including the relevant sections of Murragamba Creek, Eastern Creek and Wilpinjong Creek	<ul style="list-style-type: none"> • Maintain or Improve baseline channel stability • Develop site-specific in-stream water quality objectives in accordance with ANZECC 2000 and Using the <i>ANZECC Guidelines and Water Quality Objectives in NSW procedures</i> (DECC 2006), or its latest version 	<p>Appendix 2</p> <p>Appendix 2</p>

APPENDIX A - SITE WATER BALANCE

APPENDIX B - SURFACE WATER MANAGEMENT PLAN

APPENDIX C - GROUNDWATER MANAGEMENT PLAN