



Site	Russell Vale Colliery	DOC ID	RVC EC PLN 035
Type	Management Plan	Date Published	31/05/2022
Doc Title	Extraction Plan - Land Management Plan		

RUSSELL VALE COLLIERY RUSSELL VALE REVISED UNDERGROUND EXPANSION PROJECT

LAND MANAGEMENT PLAN *STAGES ONE and TWO -- PC21 to PC25 & PC07, PC08, and PC27 to PC34*

RVC EC PLN 035

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Control and Revision History

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Revisions

VERSION	DATE REVIEWED	REVIEW TEAM (CONSULTATION)	NATURE OF THE AMENDMENT
D1 (Version 1)	03/08/2021	Luke Bettridge/WCL	Draft document
D2 (Version 1)	06/10/2021	Luke Bettridge/WCL	Final draft document following consult
D3 (Version 1)	07/10/2021	Luke Bettridge/WCL	Final document following consult
D4 (Version 1)	17/11/2021	Luke Bettridge/WCL	Final document
0 (Final, Version 1)	06/12/2021	WCL document controls	Final document saved as controlled document.
1 (Version 2)	04/04/2022	Luke Bettridge (Umwelt)/WCL	EP 1 LMP as approved updated to include "Stage 2" workings, PC27 to PC34.
2 (Version 2)	31/05/2022	David Holmes (Umwelt) / WCL	Updated post stakeholder feedback
F1	31/05/2022	David Holmes (Umwelt) / WCL	Finalisation for submission to DPE

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1 INTRODUCTION

1.1 Overview

Wollongong Coal Limited (WCL) operates the Russell Vale Colliery (RVC) (formerly the NRE No.1 Colliery) located in the Southern Coalfield of New South Wales (NSW). The mine is located at Russell Vale, approximately 9 km north-northwest of Wollongong and 70 km south of Sydney, within the local government areas (LGAs) of Wollongong and Wollondilly in the Illawarra region of NSW (refer to **Figure 1**).

This Land Management Plan (LMP) has been prepared in support of an Extraction Plan (EP), as required by Condition C10 (g)(vi) of the Development Consent (MP09_0013) (the Development Consent).

As per the approved author appointment by the Department of Planning, Industry and Environment (DPIE) on 20/01/2022, this plan has been prepared by Luke Bettridge, Principal Environmental Scientist of Umwelt.

1.2 Project Background

RVC operates under the current Development Consent granted by the NSW Independent Planning Commission (IPC) on 8 December 2020. The Development Consent, known as the Underground Expansion Project (UEP), is based on the Revised Preferred Project Report (RPPR) and Response to Second PAC Review by Umwelt Environmental and Social Consultants Pty Ltd (Umwelt) dated July 2019. Under the Development Consent WCL may:

- extract 1.2 Mt of Run of Mine (ROM) coal per annum, with a maximum of 1 Mt of ROM coal being processed from site in a calendar year
- undertake mining operations for a period of five years from the date of commencement of mining operations.

The approved workings are contained within Consolidated Coal Lease 745 (CCL 745) and Mining Lease 1575 (ML 1575). In accordance with Condition C10(g)(ii), Part C of the Development Consent, this Land Management Plan (LMP) has been prepared as a component of the Russell Vale Colliery Extraction Plan (RVC EP) to manage the potential impacts to natural land features located in proximity to the proposed bord and pillar workings defined as being 'second workings' under MP09_0013. This PSMP covers the area relating to Pillars PC7, PC8 and PC 21 to PC25. PC7, PC8 and PC 21 to PC25 are situated to the west (PC21 to PC25), and south-east (PC7 and PC8) of the previously mined Longwall 6 (refer to **Figure 1**).

The secondary workings for the remaining panels approved under Development Consent MP_09_0013 will be mined in a staged approach and will therefore be subject to future Extraction Plans (EP).

1.3 Extraction Plan Areas

The LMP applies to the EP Areas indicated in **Figure 1** and incorporates features above panels PC07, PC08, PC 21 to PC25 and PC27 to PC34.

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1.4 Mine Design and Mining Method

Full details on the EP Area mine design and mining method are outlined within the main EP. This LMP covers the mining plan layout found in **Figure 1** and includes:

- one panel (PC21) and 4 sub-panels (PC22, PC23, PC24 and PC25) to the west of Mount Ousley Road adjacent to the Cataract Storage Reservoir
- two panels (PC07 and PC08) to the east of Mount Ousley Road
- eight panels (PC27 to PC34) west of the PC21-25 adjacent to the Cataract Creek Storage Reservoir.

Section 2 of the main extraction plan, 'Project Description', provides a full summary of the project, including details on the:

- mine planning and design
- mining methodologies
- phasing of the surface infrastructure relating to the project
- staging of second workings:
 - stage 1 – PC07, PC08 and PC21 to PC25
 - stage 2 – PC27 to PC34.

1.5 Natural Features Covered by This Plan

The surface land overlying the proposed extraction area for this EP lies wholly within crown land, declared as a 'Special Area' controlled and managed by WaterNSW. Managing the ecological integrity of the Special Areas is a key consideration of WaterNSW. The surface topography comprises of undulating land and dense bush, streams and waterways (addressed in the Water Management Plan (WMP) (RVC EC PLN 010)) and upland swamps (addressed within the Upland Swamp Monitoring Program (USMP) (RVC EC PLN 008)). All streams and drainage are directed towards Cataract Dam reservoir, via Cataract Creek, Cataract River and their tributaries (see EP Water Management Plan). Surface elevations range from 31 m to 390 m AHD.

One major natural feature within proximity to EP Area 1 is the Illawarra Escarpment which is located approximately 1.2 km east of the nearest Stage 1 panel of proposed workings covered by the EP and this LMP. As the escarpment is located over 1 km from the nearest proposed workings, it will not experience any mining related impacts and it is not discussed further within the EP for the current EP stages 1 and 2 and this LMP.

The nearest cliff to the EP Areas is 'Brokers Nose' on the Illawarra Escarpment, more than 1.3 km from PC07. No impacts from the planned mining are expected at Brokers Nose. Road cuttings for Mount Ousley Road located on the northern side of the Cataract Creek are outside the EP Areas and more than 500 m from PC07. No perceptible impacts to these features are expected from the planned mining with this further discussed in the RVC Built Features Management Plan (BFMP) (RVC EC PLN 002)).

There are no definitions for cliffs and steep slopes included in the Development Consent conditions. Sandstone formations and steep slopes have been assessed within the Subsidence Assessments (SCT, 2021; SCT, 2022) in the context of previous standards applied to RVC and the

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definitions found in contemporary mining approval conditions for other NSW sites with significant cliffs and areas of steeper ground.

There are numerous cliff formations located within the approved broader UEP Area, most of which are less than 5 m high. There are no cliffs or minor cliffs in the EP Areas. No waterfalls or gorges are found within the current EP Areas and are therefore not discussed further within this LMP.

The land features identified within the vicinity of the EP Areas, which are subject to this LMP include:

- steep slopes
- rocky outcrops.

The location of the natural features within the EP Areas is described in **Table 1** and shown on **Figure 2**.

Table 1 Natural Features Description and EP Areas

Natural Feature	Description (SCT, 2021, 2022)	General Location of land features in Relation to EP Area (SCT, 2021)
Cliffs/minor cliffs	Sandstone formations or rock faces greater than 10 m high.	There are no cliffs or minor cliffs in the EP Areas.
Steep slopes	Extended slopes, that are not sandstone formations, with an average slope of greater than 1 in 1.	There are no significant areas above the EP Areas considered to be steep slopes.
Rocky outcrops	Largely sandstone outcrops. Refer to section 5.1.3 of Appendix D of the main EP.	Rocky outcrops (Bald Hill Claystone) can be found on the northern ends of PC07 and PC08 and the eastern end of PC21 and PC25. Rocky outcrops (Bald Hill Claystone and Gosford Formation) can be found on the southern ends of PC27 and PC28.
Gorges	A narrow valley between hills or mountains, typically with steep rocky walls and a stream running through it.	There are no gorges in the EP Areas.

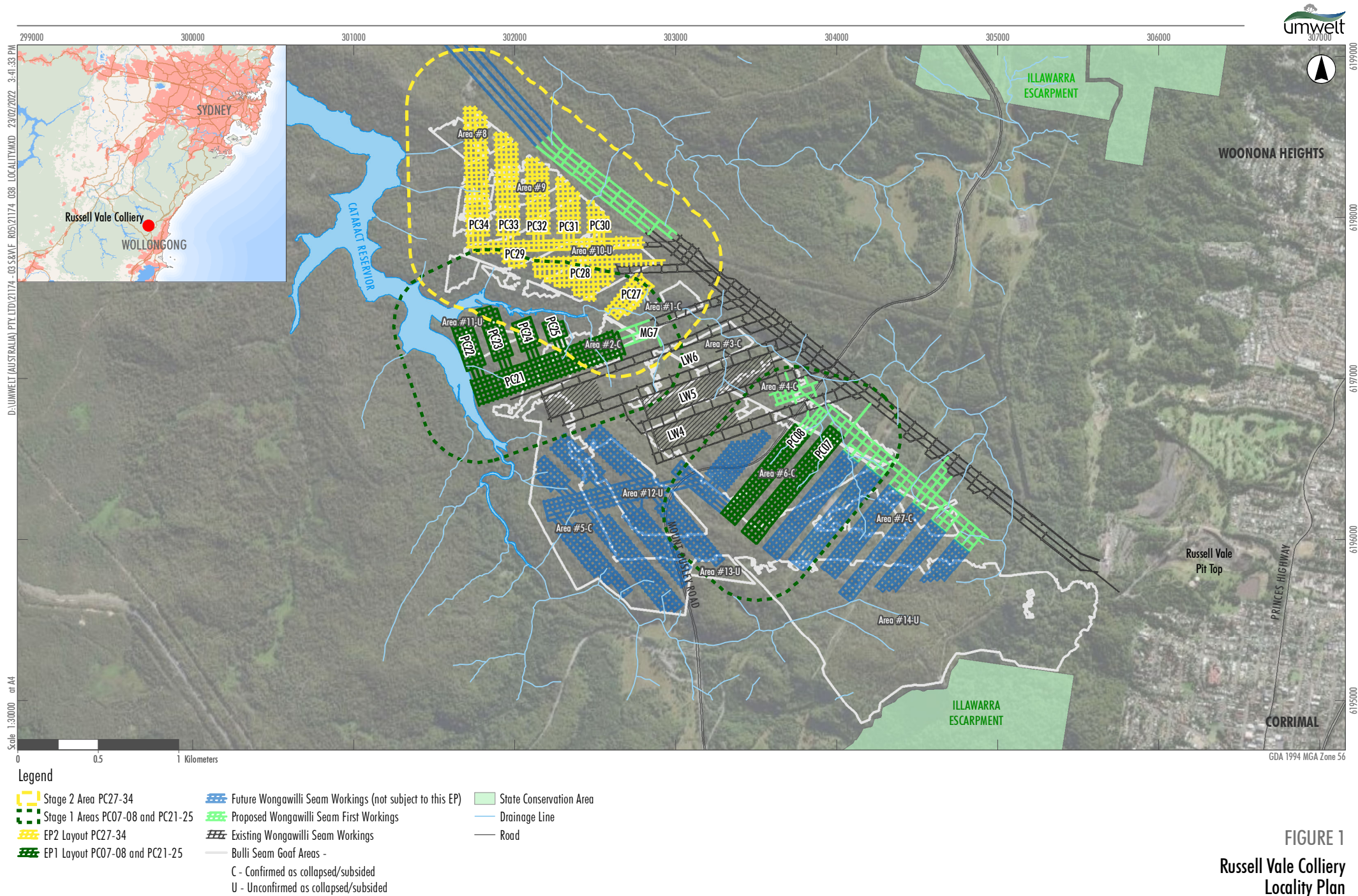
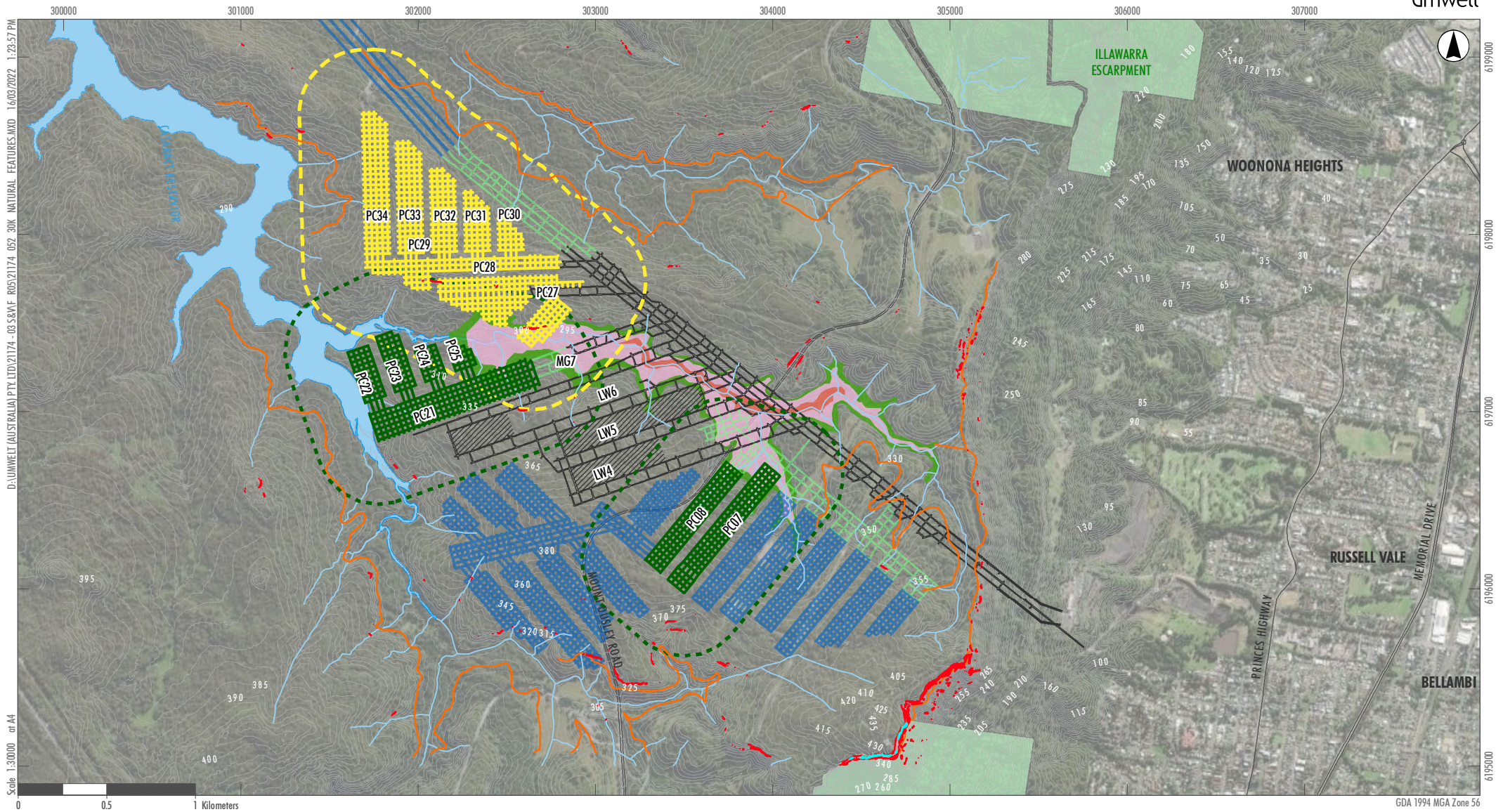


FIGURE 1
Russell Vale Colliery
Locality Plan



Legend

- | | | | |
|-----------------------------------|--|--|-------------------------|
| Stage 2 Area PC27-34 | Future Wongawilli Seam Workings (not subject to this EP) | Hawkesbury Sandstone Outcrop | State Conservation Area |
| Stage 1 Areas PC07-08 and PC21-25 | Proposed Wongawilli Seam 1st Workings | Bald Hill Claystone Outcrop | Contour (5m) |
| EP2 Layout PC27-34 | Existing Wongawilli Seam Workings | Bulgo Sandstone Outcrop | Drainage Line |
| EP1 Layout PC07-08 and PC21-25 | | Gosford Formation Outcrop | Road |
| | | Cliffs (rock faces > 10 m high) | |
| | | Steep slopes (extended slopes > 1V:1H) | |

Image Source: ESRI (2021) Data source: DFSI (2020)

FIGURE 2
Russell Vale Colliery
Natural Features

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2 STATUTORY REQUIREMENTS

2.1 Development Consent

Condition C10(g)(vi) of the Development Consent outlines the requirement to prepare an LMP for the EP Areas for all second workings.

Table 2 below summarises the Development Consent conditions and LMP requirements.

In accordance with Condition C10 of the Development Consent, WCL will ensure implementation of this management plan upon approval by the Secretary.

Table 2 RVC UEP Development Consent conditions (MP 09_0013)

Condition	Condition Requirement	Section Addressed
Condition A1	Obligation to Minimise Harm to the Environment In addition to meeting the specific performance measures and criteria, the Applicant must implement all reasonable and feasible measures to prevent, and if prevention is not reasonable and feasible, minimise, any material harm to the environment that may result from the construction and operation of the development, and any rehabilitation required under this consent.	Section 7 and Appendix A
Condition C1	Performance Measures - Natural and Heritage Features etc The Applicant must ensure that the development does not cause any exceedances of the performance measures in Table 6 (refer to table in Development Consent), to the satisfaction of the Secretary. Note: <ul style="list-style-type: none"> The Applicant will be required to define more detailed performance indicators (including impact assessment criteria) for each of these performance measures in the various management plans that are required under this consent. 	Section 5
Condition C2	Performance Measures - Natural and Heritage Measurement and monitoring of compliance with performance measures and performance indicators in this consent is to be undertaken using generally accepted methods that are appropriate to the environment and circumstances in which the feature or characteristic is located. These methods are to be fully described in the relevant management plans and monitoring programs. In the event of a dispute over the appropriateness of proposed methods, the Planning Secretary will be the final arbiter."	Section 5
Condition C10	Extraction Plan The Applicant must prepare an Extraction Plan for all second workings on site to the satisfaction of the Secretary. The Extraction Plan must: (a) Be prepared in consultation with RR, DPIE Water and WaterNSW and by suitably qualified and experienced	The Extraction Plan

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Condition	Condition Requirement	Section Addressed
	person/s whose appointment has been endorsed by the Secretary;	
	(b) Be approved by the Secretary before the Applicant carries out any second workings covered by the plan;	The Extraction Plan
	(g) describe in detail the performance indicators that would be implemented to ensure compliance with the performance measures in Tables 5 and 6, and manage or remediate any impacts and/or environmental consequences to meet the rehabilitation objectives in Table 4;	Section 5
	(g) (vi) Prepare a Land Management Plan which has been prepared in consultation with NSW RR and WaterNSW, which ensures public safety and manages access on the site;	This PSMP Appendix B Section 2
Condition F4	<p>Adaptive Management</p> <p>The Applicant must assess and manage development-related risks to ensure that there are no exceedances of the criteria and/or performance measures in this consent. Any exceedance of these criteria and/or performance measures constitutes a breach of this consent and may be subject to penalty or offence provisions under the EP&A Act or EP&A Regulation, notwithstanding offsetting actions taken.</p> <p>Where any exceedance of these criteria and/or performance measures has occurred, the Applicant must, at the earliest opportunity:</p> <ul style="list-style-type: none"> (a) Take all reasonable and feasible steps to ensure that the exceedance ceases and does not re-occur. (b) Consider all reasonable and feasible options for remediation (where relevant) and submit a report to the Department describing those options and any preferred remediation measures or other course of action. (c) Within 14 days of the exceedance occurring, submit a report to the Secretary describing these remediation options and any preferred remediation measures or other course of action: and (d) Implement remediation measures as directed by the Planning Secretary. <p>to the satisfaction of the Secretary.</p>	Section 5.2
Condition F5	<p>Management Plan Requirements</p> <p>Management plans required under this consent must be prepared in accordance with relevant guidelines, and include:</p> <ul style="list-style-type: none"> (a) A summary of relevant background or baseline data. 	

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Condition	Condition Requirement	Section Addressed
	<p>(b) Details of:</p> <ul style="list-style-type: none"> (i) The relevant statutory requirements (including any relevant consent, licence or lease conditions); (ii) Any relevant limits or performance measures and criteria; and (iii) The specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the development or any management measures. <p>(c) Any relevant commitments or recommendations identified in the document/s listed in condition A2;</p> <p>(d) A description of the measures to be implemented to comply with the relevant statutory requirements, limits, or performance measures and criteria.</p> <p>(e) A program to monitor and report on the:</p> <ul style="list-style-type: none"> (i) Impacts and environmental performance of the development; and (ii) Effectiveness of the management measures set out pursuant to condition F5(c). <p>(f) A contingency plan to manage any unpredicted impacts and their consequences and to ensure that ongoing impacts reduce to levels below relevant impact assessment criteria as quickly as possible.</p> <p>(g) A program to investigate and implement ways to improve the environmental performance of the development over time.</p> <p>(h) A protocol for managing and reporting any:</p> <ul style="list-style-type: none"> (i) Incident, non-compliance or exceedance of any impact assessment criterion or performance criterion. (ii) Complaint; or (iii) Failure to comply with other statutory requirements. <p>(i) Public sources of information and data to assist stakeholders in understanding environmental impacts of the development; and</p> <p>(j) A protocol for periodic review of the plan.</p>	<p>Section 3</p> <p>Section 5</p> <p>Section 5</p> <p>This plan</p> <p>Section 7</p> <p>Section 6</p> <p>Section 6</p> <p>Section 11</p> <p>Section 7.3</p> <p>Section 9</p> <p>Section 11</p>
Condition F7	<p>Management Plan Requirements</p> <p>Within three months of:</p> <ul style="list-style-type: none"> (a) the submission of an incident report under condition F9; (b) the submission of an Annual Review under condition F11; 	Section 11

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Condition	Condition Requirement	Section Addressed
	<p>(c) the submission of an Independent Environmental Audit under condition F13; or</p> <p>(d) the approval of any modification of the conditions of this consent (unless the conditions require otherwise);</p> <p>the suitability of existing strategies, plans and programs required under this consent must be reviewed by the Applicant.</p>	
Condition F8	<p>If necessary, to either improve the environmental performance of the development, cater for a modification or comply with a direction, the strategies, plans and programs required under this consent must be revised, to the satisfaction of the Planning Secretary. Where revisions are required, the revised document must be submitted to the Planning Secretary for approval within 6 weeks of the review.</p> <p>Note: This is to ensure strategies, plans and programs are updated on a regular basis and to incorporate any recommended measures to improve the environmental performance of the development.</p>	Refer to the Extraction Plan
Condition F9	<p>Incident Notification</p> <p>The Applicant must immediately notify the Department and any other relevant agencies immediately after it becomes aware of an incident. The notification must identify the development (including the development application number and name) and set out the location and nature of the incident.</p>	<p>Section 7.4</p> <p>Section 8</p>
Condition F10	<p>Non-Compliance Notification</p> <p>Within seven days of becoming aware of a non-compliance, the Applicant must notify the Department of the non-compliance. The notification must set out the condition of this consent that the development is non-compliant with, why it does not comply and the reasons for the non-compliance (if known) and what actions have been, or will be, undertaken to address the non-compliance</p>	Section 8
Condition F11 and F12	<p>Annual Review</p> <p>By the end of March each year after the commencement of the development under this consent, or other timeframe agreed by the Planning Secretary, a report must be submitted to the Department reviewing the environmental performance of the development, to the satisfaction of the Planning Secretary.</p>	Section 11

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2.2 Leases, Licences and Permits

In addition to the requirements of the Development Consent, all activities at or in association with the Russell Vale Colliery are undertaken in accordance with the relevant conditions outlined in the licences, permits and leases in **Table 3**.

Table 3 Licences, Permits and Leases

Licence and/or Approval	Document No.	Issue Date	Expiry Date
Consolidated Coal Lease (CCL)	745	27/12/1990	30/12/2023
Mining Purposes Lease (MPL)	271	09/05/1991	09/05/2033
Mining Lease (ML)	1575	22/03/2012	22/03/2029
Special Area Consent	F2020/3092	04 March 2021	03 March 2026

2.3 Consultation

2.3.1 Consultation During the Environmental Assessment Process

Extensive community and government consultation has been undertaken prior to and during the preparation of the original environmental assessment, the RPPR, the Submissions Report and other project-related assessment documentation. The primary objective of consultation was to keep the community, government agencies and other stakeholders informed and involved during project development process.

Community engagement was carried out in two phases and is summarised in Section 4.1.2 and Section 4.1.3 of the RPPR.

A complete summary of previous and ongoing government agency and stakeholder consultation is provided in Table 4.5 of the RPPR.

2.3.2 Consultation During the Preparation of the Management Plan

This LMP has been prepared in consultation with:

- the Department of Planning and Environment (DPE) formerly Department of Planning, Industry and Environment (DPIE) (Stage 1 and Stage 2 EP)
- NSW Resources Regulator (NSW RR)
- WaterNSW.

Details of the consultation are provided in **Table 4** below. The information contained in **Table 4** refers to consultation undertaken for both the Stage 1 and Stage 2 mining areas covered by the EP.

Table 4 Consultation Undertaken as Part of the Preparation of this Management Plan

Agency name and timing of consultation	Issue	Where issue is addressed in Management Plan
Stage 1 EP		
DPIE (Planning)	Letter to the department advising on the proposed team for the development of the Extraction Plan including its subplans.	See DPIE response to this letter in Appendix B of the main Extraction Plan.
WaterNSW (August 2021)	<p>i. Majority of the surface land overlying the proposed extraction area lies within WaterNSW land declared as a Special Area owned and managed by WaterNSW and provisions of the WaterNSW Act 2013 and WaterNSW Regulation 2020 apply. Maintaining the ecological integrity of the Special Areas is important and a key consideration of WaterNSW Mining Principles. Section 1.5 Natural Features must acknowledge this.</p> <p>ii. Section 2.2 Leases, Licences and Permits must list the Special Area Consent (Consent No. - F2020/3092; commenced on 4th March 2021 and valid until 3rd March 2026) – Issued by WaterNSW under Division 1 of Part 3 of the Water NSW Regulation 2020.</p>	<p>i. Section 1.5</p> <p>ii. Section 2.2</p>
NSW Resources Regulator (2021)	No specific comments re the LMP. Comments relating to the main EP are located in Appendix E of the EP document.	N/A
Stage 2 EP		
DPE	Regular engagement throughout process. No specific comments provided in relation to Land Management in relation to Stage 2. Plan reviewed by DPE as part of approval process	N/A
WaterNSW	A response was received by WaterNSW on 27 April 2022. No specific comments relating to extraction of Stage 2 area.	N/A
NSW RR	A response was received by NSW RR on 13 May 2022. No specific comments provided in response to Stage 2 bord and pillar workings.	Refer to response provided to NSW RR on 31 May 2022 outlined in Appendix B.

Consultation is included in **Appendix A**.

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2.4 Report Structure

The remainder of this Plan is structured as follows:

Section 2: Outlines the statutory requirements applicable to the Plan.

Section 3: Outlines the land features baseline data and impact assessments undertaken which support this.

Section 4: Details the predicted subsidence within the EP Areas applicable to the land features in Table 1.

Section 5: Describes performance measures and indicators that will be used to assess the Project.

Section 6: Describes the monitoring program.

Section 7: Describes the management, remediation and mitigation measures that will be implemented to reduce potential impacts. This section also details the contingency plan to manage any unpredicted impacts and their consequences.

Section 8: Outlines processes for management of incidents, complaints and non-compliances.

Section 9: Describes the required reporting processes.

Section 10: Outlines the plan administration requirements.

Section 11: Describes how the Plan will be implemented, managed, reviewed and updated.

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3 BASELINE DATA

Previous longwall mining extraction within the Bulli and Balgownie seams has resulted in various subsidence impacts within the EP Areas. These impacts occur mostly as rock falls and surface cracking on hard rock surfaces (SCT, 2019, SCT 2022). Changes in the character of stream channels such as cracking, iron staining, and sediment infilling in areas where the stream bed has been subsided have also occurred due to previous mining.

3.1 Site Description

The Stage 1 and Stage 2 EP Areas are located entirely within the 'Metropolitan Special Area' managed by WaterNSW. The Metropolitan Special Area is a restricted area and cannot be accessed by the public, except with the consent of WaterNSW. This area is accessed by WCL personnel and contractors for monitoring activities and access to its facilities in the catchment. The Metropolitan Special Area is also accessed by WaterNSW personnel. Access to the area to the west of the M1 is primarily via Fire Road 7D, and 7M, whilst to the East primarily via the Brokers nose Access track. Mount Ousley Road is a public road that passes through the Metropolitan Special Area.

Known natural surface features in the EP Areas are managed within this LMP.

3.2 Rock Falls

The subsidence assessment completed for the UEP as included in the RPPR (SCT, 2019) notes that previous inspections of cliff formations have identified several rock falls consistent with previous mining activity within the Bulli and Balgownie seams. Note there are no identified cliffs (defined as greater than 10 m in height) within the EP Areas. These rock falls are generally small in volume and are hard to distinguish from natural rock falls that have occurred in the general area over the period since mining first commenced.

There are numerous examples of much older natural rock falls along the slopes below most of the cliff formations. These isolated boulders are consistent with the natural processes of erosion, with similar boulders observed in areas where there has been no mining.

3.3 Surface Cracking

The subsidence assessment (SCT, 2019) noted that surface cracking has previously been documented on subsidence plans prepared during and after mining of the Balgownie Seam longwall panels. Most of the cracks can be found within proximity to the start of the previously mined Longwall 3 on a topographic ridge. Similar cracks are likely to have occurred at other locations but most of these would be in bushland locations where they would be difficult to detect.

Inspections conducted in association with cracking previously identified on Mount Ousley Road during previous longwall mining show that there are a series of tension cracks and minor sinkholes evident along the northern side of the ridgeline between Cataract River and Cataract Creek. These cracks are locally aligned with the direction of one of the principal joint directions in the Hawkesbury Sandstone.

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3.4 Iron Staining

Water rich in iron has previously been observed to be flowing into watercourses from the base of the sandstone cliff formations at several locations on the slopes above the southern side of Cataract Creek, a phenomenon consistent with horizontal shear movement at the base of the Hawkesbury Sandstone outcrop caused by mining subsidence (SCT, 2019).

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4 PREDICTED SUBSIDENCE IMPACTS

SCT have completed the Russell Vale Colliery: Subsidence Assessments for PC07-08 and PC21-25, and PC27 - 34 (SCT, 2021; SCT, 2022a). The Subsidence Assessments determined that the mine design is not considered to have any potential to perceptibly impact to natural land features.

The mine design is not considered to have significant, additional impacts to sandstone formations or instability of steeper ground. As outlined within the Subsidence Assessments (SCT 2021; SCT, 2022a), subsidence movements are expected to be negligible in the context of previous impacts. However monitoring of the upland swamps, and built features would be undertaken as presented in the USMP and BFMP.

The Illawarra Escarpment, in particular the section of Hawkesbury Sandstone outcrop at Brokers Nose, is not expected to be impacted by the proposed mining. It should be recognised that there is always potential for rock falls to occur naturally as part of the ongoing erosion processes, but the proposed mining is not expected to increase this potential.

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5 PERFORMANCE MEASURES AND OBJECTIVES

5.1 Performance Measures

The subsidence impact performance measures are specified in Table 7 of Development Consent **Condition C1**. The conditions of relevance to this LMP are outlined in **Table 5** below.

Table 5 Subsidence Impact Performance Measures – Land Features

Feature	Performance Measure	Performance Indicator	Monitoring
Land			
Cliffs, steep slopes and rock face features	Negligible environmental consequence (including subsidence induced rockfalls, displacement or dislodgement of boulders or slabs, or fracturing)	Rock falls Fracturing of rock slabs Instability of steep slopes	Visual monitoring LiDAR

The proposed workings are not considered to have any potential to perceptibly impact on natural surface features including cliffs (including the Illawarra Escarpment), steep slopes and rocky outcrops. As previously noted, there is always potential for rock falls to occur naturally as part of the ongoing erosion processes, but the proposed mining is not expected to increase this potential.

Wollongong Coal's primary objective is to prevent subsidence impacts through ensuring the long-term stability of the workings during and post extraction in accordance with the bord and pillar mine design.

Land feature management will be undertaken in accordance with the process described in **Figure 3**.

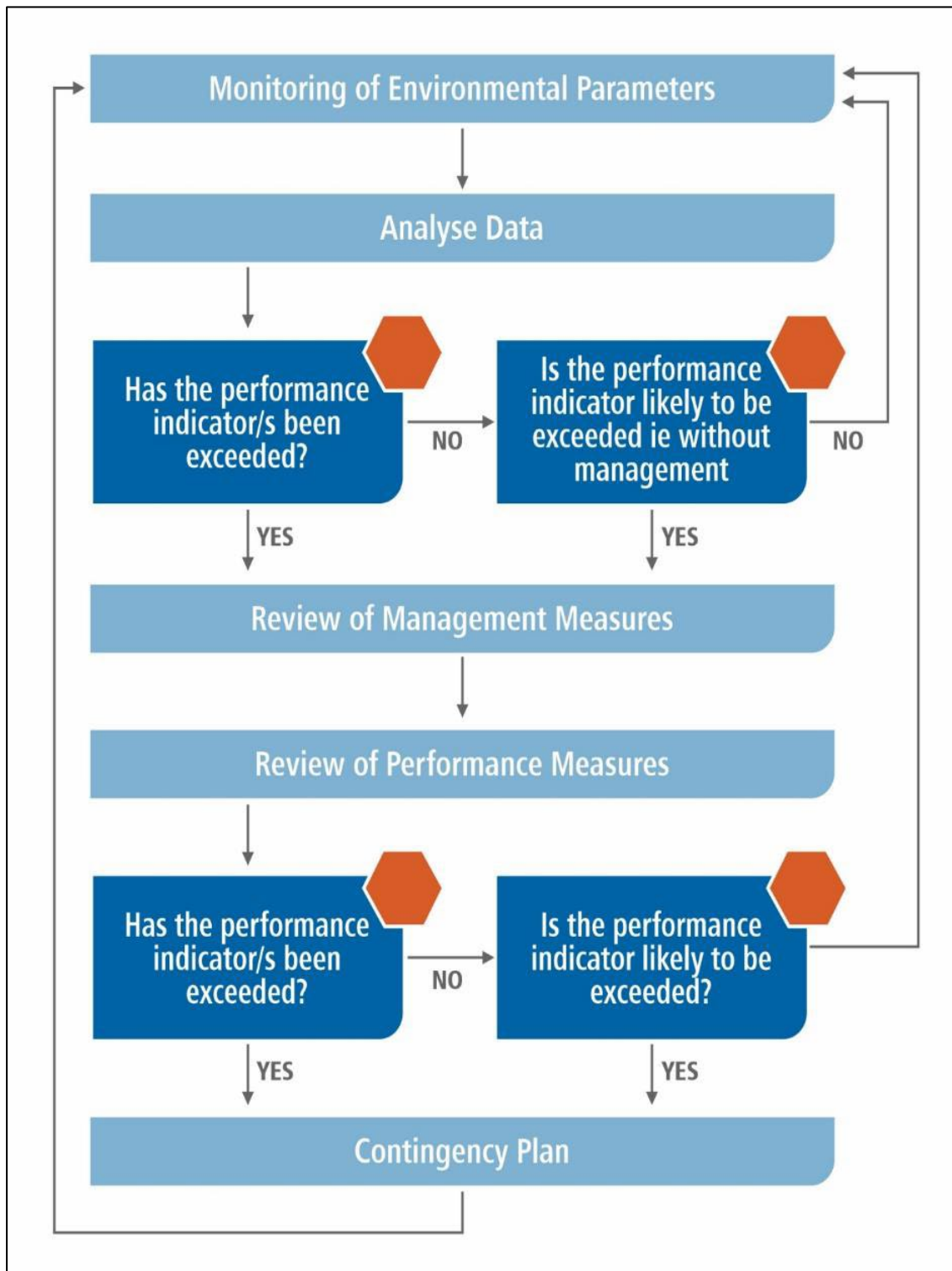


Figure 3 Adaptive Management Process

5.2 Adaptive Management

Where investigations triggered by the TARPS indicate that the changed conditions of sites have been, or are likely to have been, caused by mining operations, the response to these impacts include adaptive management measures to ensure further impacts to the site will not occur or

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be mitigated or that impacts to future sites do not occur in the future. Due to the nature of the proposed mining and low likelihood of underground mining resulting in any impacts to the site provided subsidence impacts remain within predictions, these adaptive management measures that will be implemented, will be considered in the investigation process. Adaptive management measures to be implemented in the event of a clear linkage between the mining authorised under the Development Consent and Land Management items will include a review of the design and layout of future mining within areas that may potentially impact on such items to avoid a recurrence of any such impacts.

These adaptive management measures may include:

- stop mining in the area and investigate causes of the potential exceedance of subsidence predictions
- undertake a review of the panel design parameters in consultation with the NSW RR and affected stakeholders as required.

The Contingency Planning process set out in **Section 7.4** also covers this process.

The purpose of this adaptive management measures are to implement additional measures where necessary to:

- enable potential impacts associated with higher than predicted subsidence impacts to be monitored; and/or
- the implementation of changes in mining operations to prevent performance criteria from being exceeded.

WCL will assess and manage development-related risks to ensure that there are no exceedances of the criteria and/or performance measures in the Development Consent in accordance with Development Consent **Condition F4**. Any exceedance of the Subsidence criteria and/or performance measures constitutes a breach of the Development Consent and may be subject to penalty or offence provisions under the EP&A Act or EP&A Regulation, notwithstanding offsetting actions taken. i

Where any exceedance of these criteria and/or performance measures has occurred, WCL will at the earliest opportunity:

- take all reasonable and feasible steps to ensure the exceedance ceases and does not re-occur;
- consider all reasonable and feasible options for remediation (where relevant) and submit a report to the Department describing those options and any preferred remediation measures or other course of action;
- within 14 days of the exceedance occurring, submit a report to the Secretary describing these remediation options and any preferred remediation measures or other course of action; and
- implement remediation measures as directed by the Planning Secretary,

to the satisfaction of the Secretary.

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6 MONITORING PROGRAM

The subsidence monitoring program will be conducted in the EP Areas during the second workings of

- Stage 1(a) PC21, PC22 to PC25
- Stage 1(b) PC07 and PC 08
- Stage 2 PC27 to PC34.

The subsidence monitoring program outlined below in **Table 6** will be implemented to monitor the development of possible subsidence related environmental impacts (refer to **Section 4**) for the identified features detailed in **Table 5**.

Table 6 Subsidence Monitoring Program PC21 to PC25, PC07 and PC08 and PC27 to PC34 (Land Surface Features)

Timing	Monitoring Component	Parameter	Timing/ Frequency	Responsibility
Pre-mining	Visual inspection of rock face features, steep slopes, rock falls and land in general.	Observations (e.g. baseline photography, existing rockfalls, cliff instabilities, surface cracking).	Prior to the commencement of second workings	Russell Vale Colliery (Environment Superintendent)
	Subsidence monitoring	As per subsidence monitoring program <ul style="list-style-type: none"> • LIDAR 	Prior to the commencement of second workings	Russell Vale Colliery (Environment Superintendent)
During mining	Visual inspection of rock face features, steep slopes, rock falls and land in general.	Visual Observation checklist (e.g. photography, existing rockfalls, cliff instabilities, surface cracking).	Fortnightly	Russell Vale Colliery (Environment Superintendent)
	Subsidence monitoring	As per subsidence monitoring program <ul style="list-style-type: none"> • LIDAR 	As per subsidence monitoring program	Russell Vale Colliery (Environment Superintendent)
Post mining	Visual inspection of rock face features, steep slopes, rock falls and land in general.	Observations (e.g. photography, existing rockfalls, cliff instabilities, surface cracking).	Within one month of the completion of second workings	Russell Vale Colliery (Environment Superintendent)
	Subsidence monitoring	As per subsidence monitoring program post mining <ul style="list-style-type: none"> • LIDAR 	Prior to the commencement of second workings	Russell Vale Colliery (Environment Superintendent)

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7 MITIGATION AND MANAGEMENT STRATEGIES

7.1 General

Wollongong Coal's key management measure for the EP Areas is impact avoidance through the implementation of the revised UEP mine design using the bord and pillar mining method. Monitoring to ensure the mine design is implemented in accordance with the Development Consent will be completed through the suite of underground mining controls and permits.

The monitoring program outlined in Table 6 will be undertaken focusing of identified key landscape features prior to, during and post mining for any potential impacts to confirm that the mine design measures to prevent such impacts are adequate and in accordance with the Development Consent.

In the unlikely event that impacts occur, potential management measures that will be considered to mitigate environmental consequences include:

- Monitoring of key landscape features prior to, during and post mining for any potential impacts to confirm that the mine design measures to prevent such impacts are adequate and in accordance with the Development Consent.

The implementation of these management measures will be considered with regard to the specific circumstances of the subsidence impact (e.g. the location, nature and extent of the impact) and the assessment of environmental consequences. The implementation of management measures will be related to the scale of impact and the ability to, and value in, undertaking mitigation measures on a case-by-case basis. This means that management measures will be considered and may be implemented prior to the land performance measure being exceeded. Management measures will be implemented, as appropriate, to comply with the relevant statutory requirements and the subsidence impact performance measure.

In the unlikely event that impacts occur, potential management measures that will be considered to mitigate/remediate environmental consequences include:

- Any identified potentially unstable rock structures within the EP Areas will be assessed and secured (if safe and practicable to do so). Methods used to secure unstable rock structures will be determined on a case-by-case basis and may include rock bolting or grouting of rock fractures. If required, measures to stabilise rock formations will be developed in consultation with the relevant regulatory agencies.
- Signs shall be prominently displayed where possible at any rock formation that has been identified as potentially being susceptible to failure. Signposts will warn specifically of the danger. Signposts will be installed in agreement with the relevant authority.
- The location of all signs, fences, and other remedial or warning provisions established will be marked on a Plan. This Plan will be maintained as a record of any remedial measures instituted during mining. The plan would be provided to WaterNSW for information.
- Follow-up inspections will be conducted to assess the effectiveness of implemented management measures and the requirement for any additional management measures. Management measures will be reported annually in accordance with the EP.

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In the event the subsidence impacts are deemed to present a safety hazard (i.e. regardless of the nature or extent of the subsidence impact), actions will be implemented in accordance with relevant management plans such as the RVC EP Public Safety Management Plan (PSMP) and or BFMP.

7.2 RVC Environmental Management System

RVC operate under the RVC Environmental Management Strategy (EMS) (RVC EC STD 001) which provides a framework to ensure activities at WCL are undertaken in an environmentally responsible manner and in general accordance with the following:

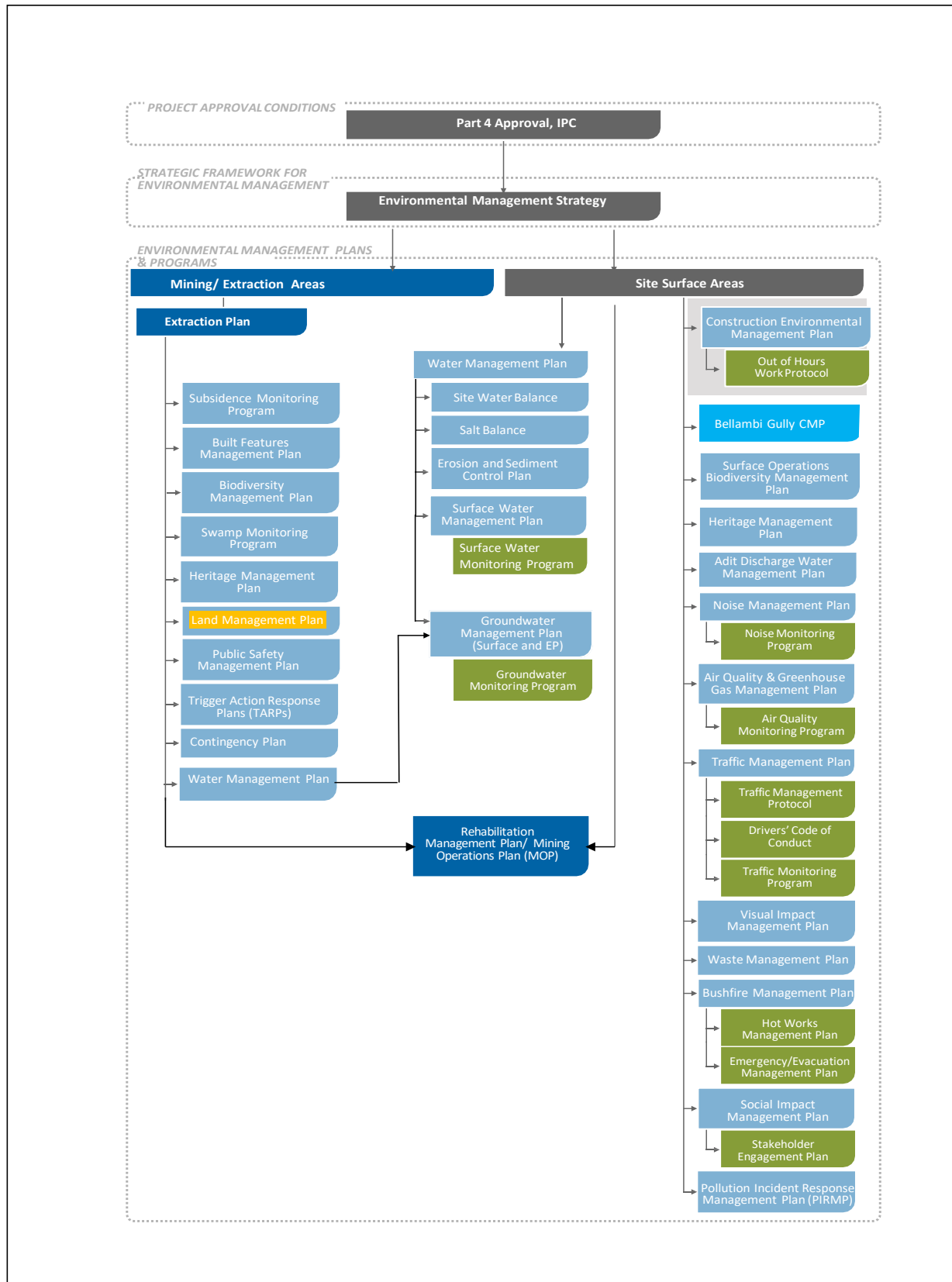
- Russell Vale Revised Preferred Underground Expansion Project Development Consent MP09_0013
- ISO14001 Environmental Management Standard
- legislative and other requirements.

While the EMS includes general requirements for the reporting and management of incidents, the EP provides specific requirements in relation to the management of subsidence related impacts associated with the mining covered by the EP and the EP requirements (including the requirements set out in this management plan) prevail to the extent of any inconsistency between documents.

The relationship between this plan, the EP, and the other sub plans as relevant to the EP is as shown in **Figure 4**.

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Figure 4 Environmental Management Framework



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7.3 Trigger Action Response Plan (TARP)

In accordance with **Condition C10(g)(viii)** of the Development Consent, the Extraction Plan and associated sub plans will identify TARPs to be implemented to manage potential impacts associated with underground mining.

These TARPs include the following:

- monitoring requirements (may include different locations);
- trigger levels that indicate a potential non-compliance or flag implementation of contingency measures;
- management and contingency actions (i.e. corrective and preventative actions) and reporting requirements;
- responsibilities; and
- timing.

These TARPs detail how the various predicted subsidence impacts, monitoring components, performance measures, and responsibilities are structured to achieve compliance with the relevant statutory requirements. They also form the framework for and contingency actions.

The Trigger Action Response Plan (TARP), as presented in Table 7 in **Appendix A**, has been designed specifically for this LMP to illustrate how the various predicted subsidence impacts, monitoring components, performance measures, and responsibilities are structured to achieve compliance with the relevant statutory requirements, and the framework for adaptive management and contingency actions.

The TARP system provides a simple, transparent and useable record of the monitoring of environmental performance and the implementation of management and/or contingency measures. Due to the nature of predicted impacts associated with the proposed second workings, Performance Measure TARPs have been established.

If monitoring indicates a Level 2 or 3 trigger has been reached, an investigation will occur in all circumstances. The nature of the investigation will depend on the feature being monitored, the location of the trigger exceedance and trigger level exceeded among other matters. Different investigation options are discussed in detail in the management plans specific to the feature being monitored.

Note: Level 3 Performance Measure TARP triggers do not, of themselves, constitute an incident or non-compliance under the Development Consent. Investigations following a Level 3 trigger will determine whether an exceedance or non-compliance of the performance measures or Development Consent conditions is likely or has occurred.

In the unlikely event that investigations of Level 3 Performance Measure TARP trigger exceedances determine that material harm has occurred *and* is attributable to the development approved under the Development Consent, the contingency plan and adaptive management measures outlined within **Section 5.2** will be implemented. In certain cases, management measures may be implemented in the absence of any clear link between the approved development and the observed impact to mitigate adverse environmental outcomes. Response to matters which are identified as Incidents or Non-Compliances will be implemented in consultation with DPE.



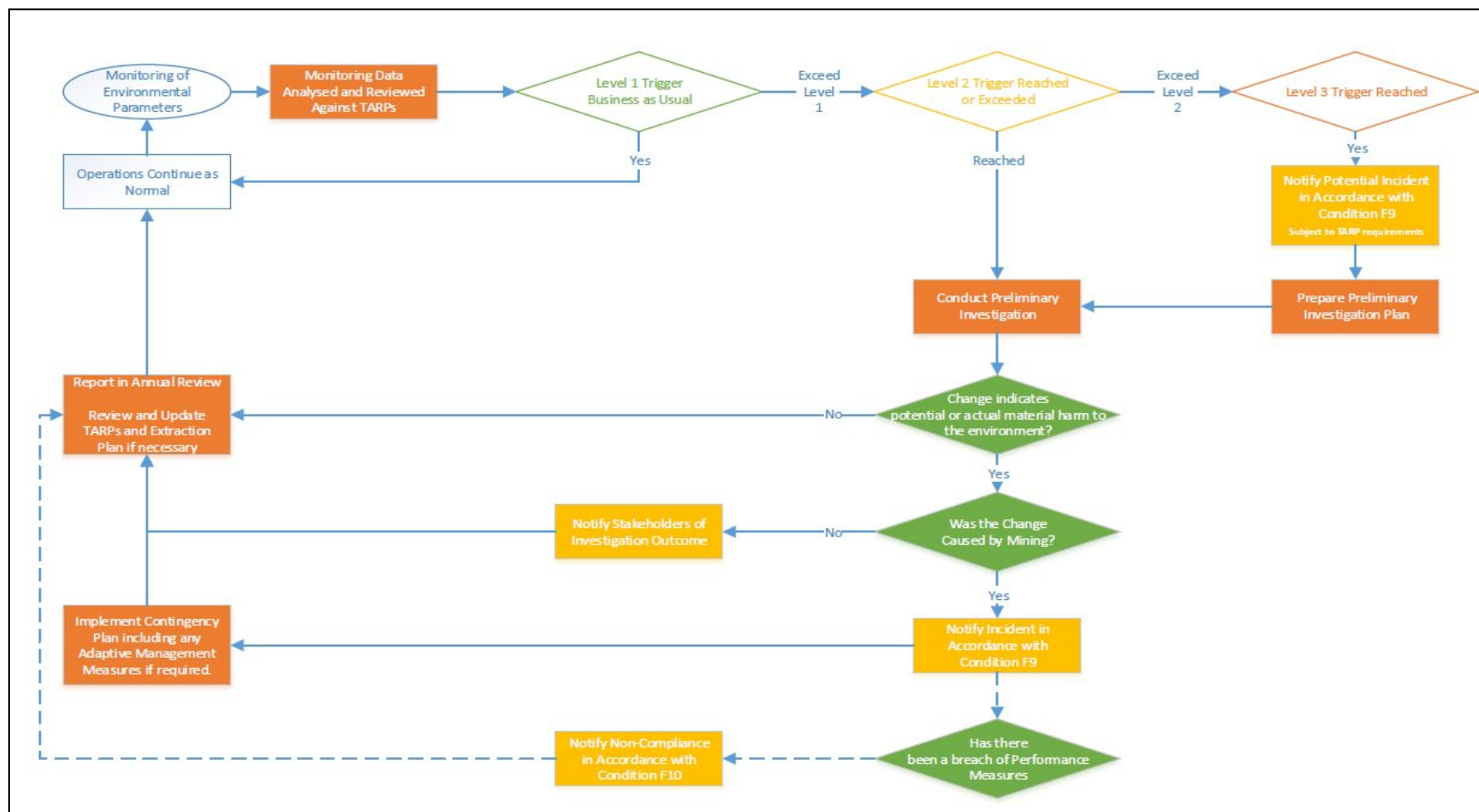
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The TARP applies only to the EP Areas shown in **Figure 1**.

Figure 5 provides a flow chart covering the TARP Process.

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Figure 5 TARP Process



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7.4 Contingency Plan

In the event that the observed parameters or impacts exceed or are considered likely to exceed the performance measures detailed in **Section 5** of this LMP, WCL will implement the following contingency plan:

- The observation will be reported to the Group Environment Manager as soon as possible.
- The observation will be recorded.
- An investigation will be undertaken to identify the cause of the observed impacts (noting that the proposed Development is not anticipated to have any more than negligible impacts on land values).
- WCL will report any exceedances of the performance measure to DPE and other relevant stakeholders as soon as practicable after WCL becomes aware of the exceedances.
- WCL will assess the exceedances referred to in the TARP (outlined in **Section 7.3**) and where appropriate, implement safety measures in accordance with the appropriate Management Plans.
- The Group Environment Manager will investigate any potential contributing factors and identify an appropriate action plan to manage the identified impacts, in consultation with specialists and/or relevant agencies if necessary.
- WCL will identify an appropriate action plan to manage the identified impacts, in consultation with other specialists and/or key stakeholders.
- WCL will submit the proposed course of action to DPE for approval.
- WCL will implement the approved course of action to the satisfaction of DPE.
- WCL will continue to monitor performance with the new action plan in place and, if successful will formalise these actions as part of this Plan.

Contingency measures will be developed in consideration of the specific circumstances of the issue and the assessment of consequences.

7.4.1 Steep slopes

The steep slopes that may be impacted by subsidence are located within the Metropolitan Special Area and are therefore not accessible to the public. As outlined in the PSMP, to ensure the safety of personnel that have authority to access the area, the following safety measures will be implemented as required at any area that has been identified as potentially being susceptible to failure.

- Signs shall be prominently displayed at any area that has been identified as potentially being susceptible to failure. Signposts will warn specifically of the danger. Signposts that are to be installed on private or public property will be installed in agreement with the relevant authority.
- The location of all signs, fences, and other remedial or warning provisions established will be marked on a Plan. This Plan will be maintained as a record of any remedial measures instituted during mining.

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- Any potentially unstable rock structures will be assessed and secured (if safe and practicable to do so). Methods used to secure unstable rock structures will be determined on a case-by-case basis and may include rock bolting or grouting of rock fractures. If required, measures to stabilise rock formations will be developed in consultation with the relevant regulatory agencies.

7.5 Potential Incident Notifications

Level 3 TARPs are set at a level that may indicate more than trivial environmental harm. Where monitoring indicates a Level 3 TARP trigger has been exceeded but the cause of the trigger being exceeded is unclear, DPE (and other relevant stakeholders) will be notified of a *potential* Incident. The notification will include the same matters required to be included in an incident notification as required by Condition F9 including the development (development application number and name) and set out the location and nature of the potential incident.

Unless the cause of the exceedance is clearly identifiable at the time the exceedance, the first step will be to investigate the likely cause or causes of the exceedance. A preliminary investigation plan will be developed to guide this investigation process and a copy provided to DPE and other relevant stakeholders.

The investigation process will also consider any remedial action that may be required.

8 INCIDENTS, COMPLAINTS AND NON-COMPLIANCES

8.1 Incidents and Non-Compliances

According to the Development Consent:

- An 'incident' is defined as "an occurrence or a set of circumstances that causes or threatens to cause material harm and which may or not be or cause a non-compliance". Examples may include a breach of specific Development Consent criteria or performance measure.
- An 'exceedance' or 'non-compliance' is defined as "an occurrence, set of circumstances or development that is a breach of this consent".

In both circumstances, an Incident or Non-Compliance must be attributable to the development approved under the Development Consent.

Material harm is defined in the Development Consent as:

"harm to the environment that:

- *involves actual or potential harm to the health or safety of human beings or to the environment that is not trivial, or*
- *results in actual or potential loss or property damage of an amount, or amounts in aggregate, exceeding \$10,000 (such loss includes the reasonable costs and expenses that would be incurred in taking all reasonable costs and expenses that would be incurred in taking all reasonable and practical measures to prevent, mitigate or make good harm to the environmental)."*

This definition excludes "harm" that is authorised under either this Development Consent or any other consent.

The proposed 'second workings' which trigger the requirement for this extraction plan are long term stable bord and pillar workings which are predicted to have only negligible subsidence effects.

Incidents and associated reporting requirements will be managed through established procedures set out in Section 7.2 of the EP. All incident notification related to land features will be sent to DPE and WaterNSW, immediately.

8.2 Complaints Handling

Complaints will be managed through established WCL procedures developed in accordance with **Condition F5(h)** of the Development Consent, whereby a copy of a complaints register (updated on a monthly basis) will be kept on the WCL website. A summary of complaints will be available to regulatory authorities, community consultative committee (CCC), and interested persons upon request and provided in the Annual Reviews completed in accordance with **Condition F11**.

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9 REPORTING

The Reporting Framework set out in Section 7 of the EP will apply to the implementation of this plan. This reporting framework includes:

- incident reporting
- quarterly monitoring data reporting
- six monthly reporting
- impact reporting (in the event of an observed impact associated with the development covered by the EP)
- Annual Review reporting requirements.

10 PLAN ADMINISTRATION

10.1 Roles and Responsibilities

Environment and community management is regarded as part of the responsibilities of all colliery personnel. The roles and function of the main personnel responsible for the implementation of environmental and community management including the plans, procedures and action plans contained in this LMP are outlined in WCL's Management Operating System.

10.2 Resources Required

In accordance with the WCL SYS POL 003 Environmental Policy, Management shall ensure that the appropriate resources are made available to achieve the implementation of this Plan.

It is the role of the Group Environment Manager to ensure that these requirements are communicated to WCL Management.

10.3 Training

Staff training will consist of three levels applicable to different types of staff:

- Level 1 – High level training on environmental legislative requirements (management staff)
- Level 2 – Operational level training (project managers, supervisors, surface personnel, control room operators)
- Level 3 – Basic awareness of environmental management (underground staff, all personnel).

Targeted training will be provided as required for all workers relevant to their activities to provide them with the knowledge, skills and awareness to minimise environmental impacts where they are undertaking an activity with a high risk of potential environmental impact in accordance with **Condition A28** of the Development Consent.

The Group Environment Manager/Site Environment Representative will review the training program and monitor its implementation.

10.4 Inductions

All personnel, including contractors, sub-contractors and staff, are required to attend a compulsory site induction that includes an environmental component prior to commencement on site.

The environmental component will include an overview of:

- Relevant details of this LMP, including purpose and objectives.
- Key environmental issues (e.g. activities with potential to result in environmental impacts).
- Consent Conditions, relevant licences, and permits
- Specific management requirements and responsibilities, and mitigation measures
- Incident response and reporting requirements.



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A record of all environmental training and inductions will be maintained and kept on site. The Group Environment Manager or delegate may authorise amendments to the induction where required to address project modifications, legislative changes or amendments to this LMP or related documentation.

The Group Environment Manager or authorised delegate will review and endorse the induction program and monitor its implementation.

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11 AUDIT AND REVIEW

11.1 Annual Review

In accordance with Condition F11 of the Development Consent, an Annual Review (AR) of the environmental performance of the project is to be prepared.

The AR will:

- describe the development (including rehabilitation) that was carried out in the previous calendar year and the development that is proposed to be carried out over the current year
- include a comprehensive review of the monitoring results and complaints records of the development over the previous calendar year, including a comparison of these results against the:
 - relevant statutory requirements, limits or performance measures/criteria
 - requirements of any plan or program required under the Development Consent
 - monitoring results of previous years
 - relevant predictions in the EA documents listed in the Development Consent condition A2(c)
- identify any non-compliance or incident which occurred in the previous calendar year, and describe what actions were (or are being) taken to ensure compliance and avoid recurrence
- evaluate and report on compliance with the performance measures, criteria, and operating conditions of the development
- identify any trends in the monitoring data over the life of the development
- identify any discrepancies between the predicted and actual impacts of the development and analyse the potential cause of any significant discrepancies
- describe what measures will be implemented over the next calendar year to improve the environmental performance of the development.

11.2 Auditing

In accordance with Condition F13 of the Development Consent, an Independent Environmental Audit will be undertaken by a suitably qualified auditor and include experts in any field specified by the Secretary within 12 months of the Development Consent and every three years after that.

This audit must:

- be prepared in accordance with the *Independent Audit Post Approval Requirements* (DPIE 2020 or as updated)
- be led and conducted by a suitably qualified, experienced and independent auditor whose appointment has been endorsed by the Planning Secretary
- be conducted by a suitably qualified, experienced and independent team of experts (including any expert in field/s specified by the Planning Secretary) whose appointment has been endorsed by the Planning Secretary

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- include consultation with the relevant agencies and the CCC
- assess the environmental performance of the development and whether it is complying with the relevant requirements in the Development Consent, water licences and mining leases for the development (including any assessment, strategy, plan or program required under these approvals)
- review the adequacy of any approved strategy, plan or program required under the abovementioned approvals
- recommend appropriate measures or actions to improve the environmental performance of the development, and/or any assessment strategy, plan or program required under these approvals
- be conducted and reported to the satisfaction of the Planning Secretary.

In accordance with Condition F14 of the Development Consent, WCL will submit a copy of the audit report, along with responses to any recommendations contained within the report to the Planning Secretary. The audit and response to recommendations would be submitted within three months of the completion of the audit unless otherwise agreed by the Planning Secretary.

11.3 Plan Revision

In accordance with Condition F7 of the Development Consent, this LMP will be reviewed within three months of:

- the submission of an incident report as per **Condition F9**
- the submission of an annual review under **Condition F11**
- the submission of an Independent Environmental Audit under **Condition F13**
- any modification to the conditions of the Development Consent (unless the conditions require otherwise or as otherwise agreed with DPE).

The revision status of this plan is indicated in the footer of each copy. Revisions to any documents listed within this Plan will not necessarily constitute a revision of this document.

Where revisions are required, the document would be submitted to DPE within six weeks of the review.

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12 REFERENCES

Russell Vale Colliery – Underground Expansion Project: Upland Swamp Ecological Monitoring Plan

Biosis 2012. NRE No. 1 Colliery Major Expansion: Upland Swamp Impact Assessment, Report prepared for Gujarat NRE Coking Coal Ltd. Authors: Garvey. N, Biosis Research Pty Ltd, Wollongong, NSW. Project no. 10594

DPIE 2020. Independent Audit Post Approval Requirements.

SCT, 2019. Russell Vale Colliery: Subsidence Assessment for Proposed Workings in Wongawilli Seam at Russell Vale East. SCT report number: UMW4609.

SCT 2021. Russell Vale Colliery: Subsidence Assessment for PC07-08 and PC21-25 Extraction Plan.

SCT, 2022. Russell Vale Colliery: Subsidence Assessment for PC27-34 (Stage 2) Extraction Plan

13 GLOSSARY OF TERMS AND ABBREVIATIONS

Abbreviations	
CCC	Community consultative committee
DPIE	Department of Planning, Industry and Environment
DPE	Department of Planning and Environment
EP	Extraction Plan
LGA	Local Government Area
LMP	Land Management Plan
MSB	Mine Subsidence Board
IPC	Independent Planning Commission
RMS	Roads and Maritime Services
ROM	Run of Mine
RPPR	Revised Preferred Project Report
NSW RR	NSW Resource Regulator
TARP	Trigger Action Response Plan
UEP	Underground Expansion Project
WNSW	Water NSW
WCL	Wollongong Coal Limited

Terms	
Baseline data	Monitoring conducted over time to collect a body of information to define specific characteristics of an area (e.g. species occurrence or noise levels) prior to commencement of a specific activity.
Bord and pillar	Mining method comprising of a series of self-supporting roadways (or bords) within the coal seam leaving a grid of pillars of unmined coal which are designed to be stable in the long term.
Development Consent	Russell Vale Revised Underground Expansion Project MP09-0013
First Workings	Involves the development headings or roadways which will provide access to the coal resource. They are developed using continuous miners with integrated roof and rib bolting rigs. First workings leave the coal pillars intact and the overlying strata fully supported
Incident	An occurrence or set of circumstances that cause or threaten to cause material harm and which may or may not be or cause a non-compliance
Land	Has the same meaning as the definition of the term in section 1.4 the EP&A Act, except for where the term is used in the noise and air quality conditions in PART B of this consent where it is defined to mean a whole of a lot, or contiguous lots owned by the same landowner, in a current plan registered at the Land Titles Office at the date of the development consent.

Terms	
Longwall	A secondary extraction method of mining coal that continuously removes the coal from the working face onto a series of conveyors that transfer the coal to the surface. As the coal is cut away (a 'shear'), both the longwall machine (known as a 'shearer') and the hydraulic roof supports advance forward ready for the next shear.
Material Harm	Is harm to the environment that: <ul style="list-style-type: none"> Involves actual or potential harm to the health or safety of human beings or to the environment that is not trivial, or Results in actual or potential loss or property damage of an amount, or amounts in aggregate, exceeding \$10,000 (such loss includes the reasonable cost and expenses that would be incurred in taking all reasonable and practicable measures to prevent, mitigate or make good harm to the environment)
Mine Operations	The carrying out of mining, including the extraction, processing, stockpiling and transportation of coal on the site and the associated removal, storage and/or emplacement of vegetation, topsoil, overburden and reject material.
Non-compliance	An occurrence, set of circumstances or development that is a breach of the development consent.
Pillar Extraction	A continuous miner system of mining whereby coal pillars are systematically extracted.
Pillar Run	A large scale progressive collapse of coal pillars in a short period of time.
Privately-owned Land	Land that is not owned by a public agency or a mining, petroleum or extractive industry company (or its subsidiary or related party).
Public infrastructure	Linear and related infrastructure and the like that provides services to the general public, such as roads, railways, water supply, drainage, sewage, gas supply, electricity, telephone, telecommunications etc.
Rehabilitation	The restoration of a landscape and especially the vegetation following its disturbance.
Second Workings	Extraction of coal from bord and pillar workings
Strain	The change in the horizontal distance between two points divided by the original horizontal distance between the points.
Subsidence	The totality of subsidence effects, subsidence impacts and environmental consequences of subsidence impacts
Subsidence effects	Deformation of the ground mass due to mining, including all mining-induced ground movements, such as vertical and horizontal displacement, tilt, strain and curvature.
Subsidence impacts	Physical changes to the ground and its surface caused by subsidence effects, including tensile and shear cracking of the rock mass, localised buckling of strata caused by valley closure and upsidence and surface depressions or troughs.
Tilt	The difference in subsidence between two points divided by the horizontal distance between the points.
Upsidence	Relative upward movement, or uplift, created by the horizontal compression and buckling behaviour of the rock strata in the vicinity of a valley floor
Valley closure	A phenomenon whereby one or both sides of a valley move horizontally towards the valley centreline, due to changed stress conditions beneath the valley and its confining land masses

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APPENDIX A TRIGGER ACTION RESPONSE PLAN

Table 7 Land Features TARP

Aspect	Monitoring				Trigger			
	Location	Parameters	Frequency/timing	Purpose	Level	Action/Reporting	Report Timing	Responsibility
Cliffs, Steep Slopes, Rocky Outcrops	All land features present within EP Area as outlined within the LMP.	Visual Monitoring of EP Areas - Stage 1a Stage 1b Stage 2	Monitoring of key landscape features: <ul style="list-style-type: none">prior to,during andpost mining for any potential impacts will be undertaken	To determine if subsidence effects resulting from bord and pillar mining system result in impacts to land features.	Level 1:			
					No exceedance of Level 2 or Level 3 triggers	<ul style="list-style-type: none"> Continue monitoring Report negligible impact in six monthly reports. 	Six monthly reporting in accordance with Extraction Plan approval.	Russell Vale Colliery (Group Environment Manager)
					Level 2:			
					Change in land features condition is observed LiDAR	Continue monitoring, and check results Inform DPE and WaterNSW of potential impact. Undertake targeted site inspection to document and photograph any observed changes/ impacts. Report potential impacts in six monthly reports.	DPE and WaterNSW informed within one week. Six monthly reporting in accordance with Extraction Plan approval.	Russell Vale Colliery (Group Environment Manager)

Site	Russell Vale Colliery	DOC ID	RVC EC PLN 035
Type	Management Plan	Date Published	31/05/2022
Doc Title	Extraction Plan - Land Management Plan		

Aspect	Monitoring				Trigger			
	Location	Parameters	Frequency/timing	Purpose	Level	Action/Reporting	Report Timing	Responsibility
					Level 3:			
					<p>Change in land features condition is observed, and impact greater than predicted occurs.</p> <p>LIDAR</p>	<p>Continue monitoring.</p> <p>Submit an incident report to DAWE, DPE and WaterNSW of potential impact.</p> <p>Undertake site inspection to document and photograph any observed changes/impacts.</p> <p>Discussion of potential remediation/ mitigation. Consultation with relevant stakeholders will be required if remediation or mitigation measures are required.</p> <p>Use appropriate specialists to undertake physical remediation activities.</p> <p>Report potential impacts in six monthly reports.</p>	<p>DPE and WaterNSW are informed immediately. DAWE to be notified within 48 hours.</p> <p>Commence preparation of mitigation/action and monitoring plan within one week (if required).</p> <p>Six monthly reporting in accordance with Extraction Plan approval.</p>	<p>Russell Vale Colliery (Group Environment Manager)</p>



Site	Russell Vale Colliery	DOC ID	RVC EC PLN 035
Type	Management Plan	Date Published	31/05/2022
Doc Title	Extraction Plan - Land Management Plan		

APPENDIX B CONSULTATION

Richard Sheehan

From: Ravi Sundaram <ravi.sundaram@waterNSW.com.au> on behalf of Ravi Sundaram
Sent: Tuesday, 24 August 2021 3:02 PM
To: Richard Sheehan; Jessie Evans
Cc: Devendra Vyas
Subject: RE: RE: Submission of RVC Extraction Plan_Land Management Plan and Public Safety Plan for WNSW review

Hi Richard

Thank you for providing WaterNSW to review draft versions of the above plans. WaterNSW has reviewed the plans and has the following comments/suggestions for your consideration.

Public Safety Management Plan (PSMP)

Special Area Access Consent

Majority of the surface land overlying the proposed extraction area lies within WaterNSW land declared as a Special Area (specifically the Metropolitan Special Area) owned and managed by WaterNSW and provisions of the *WaterNSW Act 2013* and *WaterNSW Regulation 2020* apply. Maintaining the ecological integrity of the Special Areas is important and a key consideration of WaterNSW Mining Principles.

Section 2.3 Table 3 must list the Special Area Consent (Consent No. F2020/3092; commenced on 4th March 2021 and valid until 3rd March 2026) – Issued by WaterNSW under Division 1 of Part 3 of the *Water NSW Regulation 2020*.

Unsealed access roads and Fire trails (Section 6.1.3)

Fire trails within the Metropolitan Special Area and overlying the mining area have a low potential to be impacted by subsidence due to the mining method adopted. However, they can be directly impacted on the surface by WCL activities in relation to exploration and environmental monitoring. A list of Water NSW roads and fire trails which may be utilised by WCL are listed in Schedule 4 of the Consent. WCL is responsible for any damage caused to fire trails due to its surface activities and must have mitigation and contingency measures in place to ensure all WaterNSW fire trails are safe, serviceable and repaired as soon as practical.

Schedules in the WCL Special Area Consent detail necessary aspects in relation to maintenance of fire trails including:

- Schedule 5 – Guidelines
 - Managing Urban Stormwater – Soils and Construction – Volume 2C – Unsealed Roads, and
 - NSW Rural Fire Service Fire Trail Design, Construction and Maintenance Manual
- Schedule 7 - WaterNSW Road and Fire Trail Rules
- Schedule 8 – Special Area Wet Weather Management Plan and Trigger Action Response Plan

Section 7.1 Para 4 – reference to WaterNSW Standard Conditions must be deleted. Applicable conditions and requirements are listed in WCL's Special Areas Consent (F2020/3092) and in any approvals including specific activity approvals issued by WaterNSW under Part 5 of the EP&A Act. Section 7.3.1 – WaterNSW Special Areas: Reference to WaterNSW track maintenance guidelines (including the Track Stabilisation and Control Manual) needs to be deleted as it is no longer used by WaterNSW. Recommended guidelines are specified in Schedule 5 of WCL's Special Areas Access Consent. Schedule 7 of WCL's Access Consent also specifies WaterNSW's road and fire trail rules and Schedule 4 specifies roads and fire trails WCL can access within the Metropolitan Special Areas. A list of the most relevant ones overlying the Russell Vale Colliery proposed extraction area must be listed here that will be utilized, monitored and maintained.

Land Management Plan

Majority of the surface land overlying the proposed extraction area lies within WaterNSW land declared as a Special Area owned and managed by WaterNSW and provisions of the WaterNSW Act 2013 and WaterNSW Regulation 2020 apply. Maintaining the ecological integrity of the Special Areas is important and a key consideration of WaterNSW Mining Principles. Section 1.5 Natural Features must acknowledge this.

Section 2.3 Leases, Licences and Permits must list the Special Area Consent (Consent No. - F2020/3092; commenced on 4th March 2021 and valid until 3rd March 2026) – Issued by WaterNSW under Division 1 of Part 3 of the Water NSW Regulation 2020.

Please feel free to contact me if you need to clarify any information regarding the above.

Regards

Ravi

Ravi Sundaram
Mining Catchment Specialist



PO Box 398, Parramatta NSW 2124
Level 14, 169 Macquarie Street
Parramatta NSW 2150

T: 02 9865 2507

M.: 0428 226 152/ 0451 510 194

ravi.sundaram@waterNSW.com.au

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Note: Please contact me by email or on my mobile until further notice as I may be working remotely.

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From: Richard Sheehan <richard.sheehan@wcl.net.au>

Sent: Tuesday, 3 August 2021 9:21 PM

To: Jessie Evans <Jessie.Evans@waterNSW.com.au>

Cc: Ravi Sundaram <ravi.sundaram@waterNSW.com.au>; Devendra Vyas <DVyas2@wcl.net.au>

Subject: ARK: RE: Submission of RVC Extraction Plan_Land Management Plan and Public Safety Plan for WNSW review

Good evening Jessie and Ravi,

Further to our correspondence as attached please see for your information and review the WCL Extraction Plan Land Management Plan and Public Safety Plan in draft form.

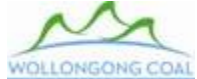
To support the review of the Land Management Plan please also see the Figure 4 showing the identified natural features.

If you have any questions or comments on the attached please contact me at your convenience.

Regards

Richard Sheehan

Group Environmental & Approvals Manager



Wollongong Coal Limited

Russell Vale Colliery

7 Princes Highway, Corrimal NSW 2518

PO Box 281, Fairy Meadow NSW 2519

☎ Mob: 0404 972 746

✉ Email: Richard.sheehan@wcl.net.au

Trescinda Brown

From: Richard Sheehan <richard.sheehan@wcl.net.au>
Sent: Tuesday, 10 August 2021 2:21 PM
To: Trescinda Brown
Cc: Luke Bettridge
Subject: FW: Submission of RVC Extraction Plan_Land Management Plan and Public Safety Plan for WNSW review
Attachments: fig2_21174_003_30K_Natural_Features_rev1.pdf; RVC EC PLN 009_Public Safety Management Plan _Rev 3_Draft.docx; 21174_Russell Vale UEP Land Management Plan_V2_Draft.docx

From: Richard Sheehan <richard.sheehan@wcl.net.au>
Sent: Tuesday, 3 August 2021 9:21 PM
To: 'Jessie Evans' <Jessie.Evans@waternsw.com.au>
Cc: 'Ravi Sundaram' <ravi.sundaram@waternsw.com.au>; 'Devendra Vyas' <DVyas2@wcl.net.au>
Subject: RE: Submission of RVC Extraction Plan_Land Management Plan and Public Safety Plan for WNSW review

Good evening Jessie and Ravi,

Further to our correspondence as attached please see for your information and review the WCL Extraction Plan Land Management Plan and Public Safety Plan in draft form.

To support the review of the Land Management Plan please also see the Figure 4 showing the identified natural features.

If you have any questions or comments on the attached please contact me at your convenience.

Regards

Richard Sheehan
Group Environmental & Approvals Manager



Wollongong Coal Limited
Russell Vale Colliery
7 Princes Highway, Corrimal NSW 2518
PO Box 281, Fairy Meadow NSW 2519
☎ Mob: 0404 972 746
✉ Email: Richard.sheehan@wcl.net.au

From: Richard Sheehan <richard.sheehan@wcl.net.au>
Sent: Thursday, 17 June 2021 10:28 PM
To: 'Jessie Evans' <Jessie.Evans@waternsw.com.au>
Cc: 'Ravi Sundaram' <ravi.sundaram@waternsw.com.au>
Subject: RE: Management plans

Thanks Jessie

Apologies as we had suggested we might have been able to meet to discuss last Friday as there are overlapping requirements with regard to the Land Management Plan, Public Safety Plan, and the Built Features Plan if we consider the high water line of the dam as that defining line for the asset being the dam catchment. I will take the points raised and get back to you on the specifics of a response including which document will address this requirement.

In addition we have consult with WNSW for comment via the DPIE portal, specifically reference PAE-20016268 and (MP09_0013-PA-19) being the UEP Extraction Plan Water Management Plan.

We are looking to complete the consultation phase of this management plan in the coming days so we can move towards finalisation and submission to DPIE next week in association with the Draft Extraction Plan. As such it would be greatly appreciated if you were able to provide comment early in the new week.

Regards

Richard Sheehan
Group Environmental & Approvals Manager



Wollongong Coal Limited
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✉ Email: Richard.sheehan@wcl.net.au

From: Jessie Evans <Jessie.Evans@waternsw.com.au>
Sent: Monday, 7 June 2021 9:53 AM
To: Richard Sheehan <richard.sheehan@wcl.net.au>
Cc: Ravi Sundaram <ravi.sundaram@waternsw.com.au>
Subject: Management plans

Hi Richard,

At the TWG we discussed getting together to work out what it include in the management plans Wollongong Coal is required to prepare. Having reviewed the conditions, I don't think we necessarily need to meet but Kel and I have put together some points for you to consider below. I strongly recommend having a look at Metropolitan Coal's management plans (available on their website) as they have similar requirements.

Management plans should look at the following, in particular,

- Roads - damage to roads from mining subsidence and overuse is a water quality and management issue. Long term use of roads and tracks and who pays for ongoing maintenance including cleaning out culverts and drains and repairs after heavy rain. What tracks are WCL going to manage?
- Infrastructure – Any WNSW assets needs to have a dilapidation survey to note current condition and recognise any damage from mining.
- Swamps – Access to piezometers in the middle of swamps needs to be minimised so that broad access ways are not made, minimal disturbance.
- Gates and fences need to be maintained in their current condition, no additional locks to maintain security.

I hope that helps.

Thanks

Jessie Evans

Mining Manager, Catchment Protection

For noting: *I am currently working remotely.
Please reach me via email or on my mobile*



Level 14, 169 Macquarie Street

PO Box 398

Parramatta NSW 2150

M: 0436 861 165

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27 April 2022

Contact: Ravi Sundaram
Telephone: 0428226152
Our ref: D2022/31435

Jessie Evans, Director Resource Assessments, DPE
Email: Jessie.Evans@DPIE.nsw.gov.au

Dear Jessie

Russell Vale Colliery Underground Expansion Project – Stage 2 (PC27-PC34) Extraction Plan

WaterNSW appreciates the opportunity to review the updated extraction plan (EP) which now include Stage 2 (PC27-34) of underground mining expansion project. WaterNSW has previously provided feedback on the Stage 1 (PC07-08 and 21 -25) (our reference - D2021/116712). Both Stage 1 and Stage 2 mining areas are located within the Metropolitan Special Area and the Upper Nepean Catchment (specifically within the upper catchment of the Cataract Reservoir).

WaterNSW has an important statutory role "*to protect and enhance the quality and quantity of water in declared catchment areas*". It also has a set of 'Mining Principles' which underpin WaterNSW decision making in relation to managing mining impacts in the declared Sydney catchment area and on catchment infrastructure.

Wollongong Coal Limited (WCL) has consulted with WaterNSW in preparing several key management plans required under the approval including Water Management Plan, Land Management Plan, Swamp Monitoring Program, and the Public Safety Management Plan. The EP has addressed feedback provided by WaterNSW to these plans.

Proposed mining in the Wongawilli seam in the Stage 2 area underlie parts of the previously mined Bulli and Balgownie seam workings area. The subsidence assessment has comprehensively addressed the pillar stability and pillar failure issues, and the potential risk of 'pillar run' for proposed extraction in a multi-seam area where overlying seams have been extracted previously.

Subsidence assessment predicts:

- vertical subsidence to be less than 100mm and generally imperceptible over most of the area, and
- the impacts, and consequences to natural, surface, and sub-surface features to be negligible and imperceptible in the undeveloped bushland setting over most of the Stage 2 extraction area.

WaterNSW considers that:

- The mining method and mine design adopted by WCL to the proposed mining in Stage 2 is likely to result in negligible impacts on water resources, biodiversity, and catchment environmental values.
- The proposed monitoring and management measures are appropriate for the planned mining method and subsidence predictions.
- The underground mine water balance monitoring system is expected to be effective as a guide to any unexpected inflows and inrush events from previously mined overlying seams and from Cataract Reservoir.
- The Trigger Action Response Plans (TARPs) for water and swamp monitoring including stream and swamp triggers developed based on baseline monitoring of performance indicators and anticipated subsidence effects are reasonable and appropriate.

WaterNSW does not have any concerns to the approval of the updated EP as:

- It has taken into consideration WaterNSW Mining Principles;
- Poses low risk to overlying catchment values and water resources; and
- Is likely to meet the performance measures set in the development consent.

Please contact Dr. Ravi Sundaram if you would like to discuss any of the above matters further.

Yours sincerely

A handwritten signature in blue ink, reading "Daryl Gilchrist". The signature is written in a cursive, flowing style.

Daryl Gilchrist
Manager, Catchment Protection

RVF22/403#40
MAAG0013970

Mr Simon Pigozzo

Via: Major Project Portal / Email

Dear Mr Pigozzo

**Re. Extraction Plan - Russell Vale Underground Expansion - RVC Revised UEP
Extraction Plan**

I refer to your request of 20 April 2022 for advice regarding the Russell Vale Underground Expansion - RVC Revised UEP Extraction Plan. The Resources Regulator has reviewed the request.

Limitations

The Extraction Plan is assessed and determined by DPIE under the conditions of the development consent. The Resources Regulator provides advice to DPIE to assist in the determination. In view of the high-level uncertainties in relation to the magnitude, nature, location, timing and duration of subsidence development due to the highly complicated conditions at the subject site as well as the existence of the Key Public Infrastructure located above the proposed extraction panels PC07 and PC08, we suggest that the Approving Authority consider and enforce relevant Conditions of Approval to ensure that the proposed mining of PC07 and PC08 be subject to:

1. The Proponent's undertaking of a specific review of the subsidence monitoring and any other relevant data collected during the mining of extraction panels PC21 to PC25 and PC27 to PC34. The objectives of the review are to up-date the Proponent's understanding of risks to the Key Public Infrastructure located above the proposed extraction panels PC07 and PC08 and, if warranted as a result of the review, to up-date the Proponent's risk management plans for the Key Public Infrastructure. The aforementioned review must include the representatives of the infrastructure operators, and
2. The infrastructure operators' endorsement of the Proponent's proposed risk management plans for the Key Public Infrastructure following the above-mentioned review.

Please note:

- The Key Public Infrastructure mentioned above is identified in Condition C7 of the Development Consent (i.e. MP09_0013, dated 8 December 2020);
- The aforementioned review may take place towards the end or after the completion of mining of extraction panels PC21 to PC25 and PC27 to PC34, and
- In discussing the Sequencing of Mining, the Proponent states that "Stage 2 second workings (PC27-PC34) may be undertaken concurrently with Stage 1a (PC21- PC25) and Stage 1b (PC07-PC08) second workings." In this case, it is critical to mine extraction panels PC21 to PC25 and PC27 to PC34 prior to the review as recommended above, considering the potentially severe consequences and any resulting community outrages if the Key Public Infrastructure is adversely affected by subsidence.

In addition, the holder of relevant mining leases is required to ensure that the rehabilitation commitments outlined in any approved Extraction Plan are included in the Mining Operations Plan / Rehabilitation Management Plan regulated by the Resources Regulator pursuant to the conditions of the mining leases under the Mining Act 1992. The holder of the mining leases must ensure the Mining Operations Plan / Rehabilitation Management Plan for the area covered by this 'RUSSELL VALE COLLIERY REVISED UNDERGROUND EXPANSION PROJECT, EXTRACTION PLAN, STAGES ONE and TWO - PC07, PC08 & PC21 to PC25 and PC27 to PC34 , RVE EC PLN 010 (dated 30 November 2021) ' is updated where necessary.

Regulatory requirements if approved

The authorisation holder is required to ensure that the rehabilitation commitments outlined in any approved Extraction Plan are included in the Mining Operations Plan / Rehabilitation Management Plan regulated by the Resources Regulator under the conditions of the mining lease and the *Mining Act 1992*. The authorisation holder must ensure the Mining Operations Plan / Rehabilitation Management Plan for the area covered by this Extraction Plan is updated where necessary.

The Resources Regulator may undertake assessments of the mine operators' proposed mining activities under the *Work Health and Safety (Mines and Petroleum Sites) Act 2013* and Regulation as well as other WHS regulatory obligations.

Subsidence associated with the proposed Extraction Plan will be regulated by under relevant provisions of WHS laws in particular Clause 33 and Clause 67 of the *Work Health and Safety (Mines and Petroleum Sites) Regulation 2014* relating to High Risk Activities and Subsidence.

Background

The NSW Resources Regulator is responsible for compliance and enforcement of the Extraction Plan is so far as it relates to requirements under the Mining Act 1992 and Work Health and Safety legislation. This role principally relates to rehabilitation, workplace safety and public safety.

The Mining Act Inspectorate within the Resources Regulator undertake risk-based compliance and enforcement activities in relation to obligations under the *Mining Act 1992*. This includes undertaking assessment and compliance activities in relation to mine rehabilitation activities and determination of security deposits.

The Mine Safety Inspectorate within the Resources Regulator is responsible for ensuring the mine operators' compliance with the Work Health and Safety (WHS) legislation, in particular the effective management of risks associated with the principal hazards as specified in the *Work Health and Safety (Mines and Petroleum Sites) Regulation 2014*.

Contact

Should you require any further information or clarification, please contact the Office of the Executive Director (ED.ResourcesRegulator@planning.nsw.gov.au)

Yours sincerely,



Peter Day
Executive Director
Resources Regulator
13 May 2022



Our Ref: 21174_Peter Day re NSWRR submission_V1.0

31 May 2022

Peter Day
Executive Director
NSW Resources Regulator

E| ED.ResourcesRegulator@planning.nsw.gov.au

Dear Peter

RE: NSW Resources Regulator Comments on Russell Vale Colliery Revised UEP Extraction Plan (RVF22/403#40, MAAG0013970)

I refer to your letter to Simon Pigozzo dated 13 May 2022 regarding the Russell Vale Colliery (RVC) revised Extraction Plan for the approved Russell Vale East mining area.

Thank you for providing a response, as requested by Wollongong Coal Limited (WCL) on 20 April 2022, for the revised Extraction Plan.

The extraction plan was revised to include extraction of the 'Stage 2' area, panels PC27–34. Based on the comments in the letter, we have assumed that the Resources Regulator has no specific concerns regarding the draft Extraction Plan insofar as it relates to the 'Stage 2' mining area (panels PC27–34).

As detailed in the current conditional approval of the 'Stage 1' Extraction Plan, mining is currently only approved in panel PC21 with further mining in PC22–25 and in PC07 and PC08 being subject to a review of subsidence monitoring in PC21 to confirm impact predictions. A minimum of 12 months groundwater monitoring within CCUS1 and the endorsement of the extraction plan by relevant infrastructure owners in the vicinity of PC07–08 is also required before mining can commence in PC07 and PC08.

A detailed submission to the Department of Planning and Environment is currently being prepared regarding the proposed approach to satisfying the subsidence monitoring requirements of this conditional approval.

Please do not hesitate to contact the undersigned on 1300 793 267 should you require clarification or further information.

Yours sincerely

David Holmes
Principal Environmental Consultant

E| dholmes@umwelt.com.au

cc Department of Planning and Environment

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Quality Outcomes.

**Umwelt (Australia)
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