WAMBO COAL PTY LIMITED

SOUTH BATES EXTENSION UNDERGROUND MINE

EXTRACTION PLAN
LONGWALLS 21 TO 24

MAIN DOCUMENT

Peabody

WAMBO COAL PTY LIMITED
SOUTH BATES EXTENSION UNDERGROUND MINE

EXTRACTION PLAN
LONGWALLS 21 - 24

PREPARED BY
WAMBO COAL PTY LIMITED AND
RESOURCE STRATEGIES PTY LTD

JULY 2020
Project No. WAM-09-15
Document No. 1030860

DOCUMENT CONTROL

Applicant	Wambo Coal Pty Limited
Mine	Wambo Coal Mine – South Bates Extension Underground Mine
Document No.	EP 21-24
Title	Extraction Plan for South Bates Extension Underground Mine Longwalls 21 to 24
General Description	Management of potential subsidence effects, subsidence impacts and environmental consequences from mining of Longwalls 21 to 24 at the South Bates Extension Underground Mine
Key Support Documents	Wambo Coal Environmental Management System Wambo Coal Health and Safety Management System
Development Consent	DA 305-7-2003 (as modified)
Mining Leases	CL 397, ML 1594, ML 1572, MLA 557

Revisions

Rev No	Date	Description	By	Checked
A	July 2020	Final for Submission	WCPL and Resource Strategies	-

Approvals

	Name	Position	Signed	Date
Originator	P. Jaeger	Environment and Community Manager	P. [signature]	20/07/2020
Checked	M. Berry	Technical Services Manager	[signature]	22/07/2020
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The nominated Coordinator for this document is	Environment and Community Manager

OVERVIEW AND SUMMARY OF COMMITMENTS

This document is an Extraction Plan that outlines the proposed management, mitigation, monitoring and reporting of potential subsidence impacts and environmental consequences from the secondary extraction of Longwalls 21 to 24 at the South Bates Extension Underground Mine.

The table on page iii summarises the key monitoring, management and reporting commitments in this Extraction Plan.

Wambo Coal Pty Limited (WCPL) commits to updating the Inrush Management Plan (as part of the notification under clause 33 of the *Work Health and Safety (Mines and Petroleum Sites) Regulation, 2014*) to incorporate this revision of the Extraction Plan.

The Trigger Action Response Plans (TARPs) provided in the component management plans will be further developed as this Extraction Plan is reviewed and revised. **Table 21** of this Extraction Plan is designed to support both the TARPs in the component management plans and clearly outline actions and levels of responsibility within WCPL.

In accordance with the Development Consent, WCPL must ensure that underground mining complies with the subsidence impact performance measures outlined below. This Extraction Plan has been developed to meet these subsidence impact performance measures.

Subsidence Impact Performance Measures

Feature	Performance Measure
Wollombi Brook	Negligible subsidence impacts and environmental consequences. Release of water from the site only in accordance with Environment Protection Licence requirements.
Low level cliffs within the South Bates Extension Area	Minor environmental consequences (that is occasional rockfalls, displacement or dislodgement of boulders or slabs, or fracturing that in total do not impact more than 5% of the total face area of such features).
Wollemi National Park	Negligible subsidence impacts and environmental consequences.
Warkworth Sands Woodland Community	Minor cracking and ponding of the land surface or other subsidence impacts. Negligible environmental consequences.
White Box, Yellow Box, Blakely's Red Gum Woodland/Grassy White Box Woodland Community	Minor cracking and ponding of the land surface or other subsidence impacts. Negligible environmental consequences.
Central Hunter Valley Eucalypt Forest and Woodland Ecological Community	Minor cracking and ponding of the land surface or other subsidence impacts. Negligible environmental consequences
Conservation Areas (including the proposed Wambo offset area under SSD 7142)	Negligible reduction to previously identified biodiversity credits.
Wambo Homestead Complex (WHC)	Negligible impact on heritage values, unless approval has been granted by the Heritage Branch and/or the Minister.
All built features (including public infrastructure and all structures on privately-owned land)	Always safe. Serviceability should be maintained wherever practicable. Loss of serviceability must be fully compensated. Damage must be fully repairable, and must be fully repaired or else replaced or fully compensated.
Public Safety	Negligible additional risk.

Source: After Tables 1 and 2 of the Development Consent (DA 305-7-2003).

Summary of Monitoring, Management and Reporting Commitments

Component	Monitoring	Management	Reference
North Wambo Creek	• Monitoring of subsidence in accordance with the Subsidence Monitoring Program (**Appendix H**). • Monitoring in accordance with the Surface Water Monitoring Program, including the subsidence and diversion monitoring program. • Monitoring in accordance with the Groundwater Monitoring Program. • Weekly visual inspections when extraction is occurring within 100 metres (m) of North Wambo Creek. • Visual inspection of surface areas which required remediation in accordance with the Land Management Plan (**Appendix B**).	• Stockpile sufficient materials and make equipment and necessary resources available for sealing any surface cracks (particularly in areas that are predicted to be ponded) and installation of scour protection works. • Remediation of surface cracks along North Wambo Creek and in other areas where practicable using conventional earthmoving equipment. • Installation of scour protection works in areas that may be vulnerable to scour following completion of subsidence. • Stabilisation of any areas of surface cracking or erosion, using erosion protection measures (e.g. vegetation planting). • Review of remediation measures and implementation of additional measures if required. • Review of areas that may be vulnerable to instabilities along North Wambo Creek and North Wambo Creek Diversion and implementation of vegetation management and channel stabilisation measures if necessary. • Implementation of the Surface and Groundwater Response Plan.	**Section 3.1** and **Appendix A**
Ephemeral Drainage Lines	• Monitoring of subsidence in accordance with the Subsidence Monitoring Program (**Appendix H**). • Visual inspection of drainage line flow paths for evidence of erosion or channelisation following significant rainfall events. • Monitoring in accordance with the Surface Water Monitoring Program, including bed and bank stability monitoring and surface water quality and flow monitoring. • Monitoring in accordance with the Groundwater Monitoring Program.	• Implementation of the Surface and Groundwater Response Plan. • Post-subsidence assessment of impacts to Stony Creek and other ephemeral drainage lines and implementation of any minor remedial works.	
Permian Aquifers	• Monitoring in accordance with the Groundwater Monitoring Program.	• Implementation of the Surface and Groundwater Response Plan.	

Summary of Monitoring and Management Commitments (Continued)

Component	Monitoring	Management	Reference
Cliffs	• Monitoring of subsidence in accordance with the Subsidence Monitoring Program. • Visual observations of cliffs[1] for signs of recent rock fall and/or instability (high definition video/photos recorded via an unmanned aerial vehicle).	• Measures to stabilise/mitigate impacts to rock faces/cliffs if considered beneficial and practicable in consultation with relevant regulatory agencies (e.g. artificial rock support, standing supports, dislodgement of remaining loose rock, etc.).	**Section 3.2** and **Appendix B**
Land in General	• Monitoring of subsidence in accordance with the Subsidence Monitoring Program. • Visual observations of fences. • Visual observations of the ground surface.	• Notification to agistees of areas of longwall mining and active subsidence, and exclusion of agistment grazing from areas where surface cracking presents a reasonable risk to people and/or livestock. • Remediation of surface cracks[2] where practicable using conventional earthmoving equipment (e.g. a backhoe), including: – infilling of surface cracks with soil or other suitable materials; or – locally regrading and re-compacting the surface. • Repair of fences prior to allowing access for agistment grazing. • Stabilisation of any areas of surface cracking using erosion protection measures (e.g. vegetation planting). • Drainage works and rehabilitation of subsidence troughs (i.e. areas of induced ponding) as necessary. • Management measures in accordance with the Erosion and Sediment Control Plan.	**Section 3.2** and **Appendix B**
Biodiversity	• Monitoring of subsidence in accordance with the Subsidence Monitoring Program. • Monitoring in accordance with the Biodiversity Management Plan. • Visual observations to record Wollemi National Park escarpment cliff stability (including high definition video/photos recorded via an unmanned aerial vehicle).	• Vegetation Clearance Protocol, described in the Biodiversity Management Plan. • Threatened Species Management Protocol, described in the Biodiversity Management Plan. • Management measures for the Remnant Woodland Enhancement Program areas, described in the Biodiversity Management Plan. • Rehabilitation as described in the Mining Operations Plan.	**Section 3.3** and **Appendix C**

Summary of Monitoring and Management Commitments (Continued)

Component	Monitoring	Management	Reference
Aboriginal Cultural Heritage	• Monthly visual observations of artefact scatters and isolated finds to identify any significant surface cracks and/or erosion in the vicinity of a site during extraction of longwall panels in immediate proximity to a site. • Recording of the condition of Wambo Site 507 (rock shelter with potential archaeological deposit [PAD]) post-mining to identify instances of block/rock fall, cracking, opening of bedding planes, exfoliation and/or overhang collapse. • Recording of the condition of Wambo Site 499 (rock shelter with PAD) will occur after the extraction of Longwall 21.	• Based on the recommendations of Kuskie (2017), artefact scatters, isolated finds, open context PADs, scarred trees and rock shelters with PAD will be left *in situ*. • If subsidence monitoring identifies any adverse changes the appropriate stabilisation works and/or salvage will be considered in accordance with the protocols in the Heritage Management Plan. • WCPL will maintain a database of site locations and locate any surface activities to avoid impacts to Aboriginal sites where practicable. • If a site is to be impacted by surface remediation activities and it is located within an Aboriginal Heritage Impact Permit area, that site will be salvaged in accordance with the WCPL complex-wide Heritage Management Plan. • WCPL will lodge updated Aboriginal Site Recording Forms and/or Aboriginal Site Impact Recording Forms with the Office of Environment and Heritage when required.	**Section 3.4** and **Appendix D**
Whynot Homestead	• Structural assessment of the Whynot Homestead will be undertaken post-mining to assess if demolition is required.	• The Whynot Homestead and outbuildings have been archivally recorded in accordance with the Development Consent (DA 305-7-2003) (condition now repealed). • The Whynot Homestead will be fenced to prevent access prior to secondary extraction of Longwall 21. • Demolition to be considered in the future if the structure(s) present an ongoing safety concern.	**Section 3.4** and **Appendix D**

Summary of Monitoring and Management Commitments (Continued)

Component	Monitoring	Management	Reference
WCPL Assets	• Visual observations to record the general condition of WCPL assets (e.g. active service lines), including safety and serviceability. • Visual observations to record condition of roads and access tracks, including surface cracks, buckling and general safety. • Monitoring of pipeline integrity at fixed points. • Monitoring to detect abnormal changes in flow in pipelines. • Monitoring of ventilation shaft, fan surface infrastructure and underground workings at base of shaft.	• Assessment of WCPL assets to identify modifications potentially required prior to subsidence. • Assessment of bores and decommissioning and sealing prior to extraction if required (dependent on condition). • Decommissioning of the disused United gas extraction well near the Whynot Homestead prior to secondary extraction of Longwall 21. • Whynot Homestead will be fenced prior to secondary extraction of Longwall 21 to prevent access. • Maintenance of safe access to WCPL assets. • Implementation of communication protocols to ensure internal WCPL stakeholders are aware of the longwall progression. • Posting of warning signs at suitable locations on roads and site access tracks and updating warning signs if a change to the WCPL asset is identified during monitoring. • Provision of a 15 metre separation barrier around the Montrose West Open Cut pit walls. • Structural assessment of WCPL assets and subsidence assessment post-Longwalls 21 to 24 extraction. • Structural assessment of Whynot Homestead to assess if demolition is required post-subsidence. • Repair of WCPL assets in accordance with associated standards and procedures.	**Section 3.5** and **Appendix E**

Summary of Monitoring and Management Commitments (Continued)

Component	Monitoring	Management	Reference
Public Safety	• Monitoring of subsidence in accordance with the Subsidence Monitoring Program. • Visual observations of fences. • Visual observations of warning signs (e.g. legibility). • Visual observations of integrity of cliffs and steep slopes. • Visual inspections per standard measures in the Health and Safety Management System (e.g. security, site staff around site).	• Restricted access (i.e. the general public are not allowed on WCPL-owned land used for mining purposes). Permanent signage located at the entrance to WCPL-owned land will be maintained. • All personnel and visitors accessing the Wambo site are subject to Health and Safety Management System requirements. • Posting and maintenance of warning signs at suitable locations on property boundaries, fences and access tracks. The signs will indicate that underground mining (with surface subsidence) is being undertaken on WCPL-owned land and will prohibit entry by unauthorised persons. • Notification to agistees of areas of longwall mining and active subsidence, and exclusion of agistment grazing from areas where surface cracking presents a reasonable risk to people and/or livestock. • Whynot Homestead will be fenced prior to secondary extraction of Longwall 21 to prevent access. • Structural assessment of Whynot Homestead to assess if demolition is required post-subsidence. • Management of surface cracking, areas of subsidence troughs and potential cliff or steep slope instability in accordance with the Land Management Plan. • Repair of fences in accordance with the Land Management Plan. • All safety incidents will be handled in accordance with the Health and Safety Management System. • Following mining, review of warning sign placement and removal if no longer required.	**Section 3.6** and **Appendix F**

Summary of Monitoring and Management Commitments (Continued)

Component	Monitoring	Management	Reference
Reporting	The following mechanisms will report the outcomes of the monitoring and management measures: • Incident Reporting. • Subsidence Management Status Reports. • Six Monthly Report (for the period 1 January to 30 June). • Annual Reviews (for the period 1 January to 31 December).		**Section 4.2**

[1] Cliffs include: the low level cliffs, intermediate level cliffs and cliffs associated with the Wollemi National Park escarpment located within the vicinity of Longwalls 21 to 24.

[2] Minor cracks that develop are not expected to require remediation as geomorphologic process will result in natural filling of these cracks over time.

TABLE OF CONTENTS

Section			Page
1	OVERVIEW OF THE EXTRACTION PLAN		1
	1.1	PURPOSE AND SCOPE	1
	1.2	STRUCTURE OF THE EXTRACTION PLAN	8
	1.3	MINE PLAN AND SCHEDULE	9
	1.4	SUBSIDENCE PREDICTIONS	14
	1.5	SUBSIDENCE IMPACT PERFORMANCE MEASURES	17
	1.6	SUBSIDENCE MANAGEMENT APPROACH	20
2	DEVELOPMENT OF THE EXTRACTION PLAN		21
	2.1	REVIEW OF PREDICTIONS	21
	2.2	RISK ASSESSMENT	27
	2.3	CONSULTATION	29
3	SUBSIDENCE MANAGEMENT AND MONITORING		33
	3.1	WATER MANAGEMENT	37
	3.2	LAND MANAGEMENT	43
	3.3	BIODIVERSITY MANAGEMENT	46
	3.4	HERITAGE MANAGEMENT	52
	3.5	BUILT FEATURES MANAGEMENT	55
	3.6	PUBLIC SAFETY MANAGEMENT	57
	3.7	REHABILITATION MANAGEMENT	59
	3.8	MONITORING PROGRAM SUMMARY	60
4	IMPLEMENTATION		69
	4.1	ADAPTIVE MANAGEMENT AND CONTINGENCY RESPONSE	69
	4.2	REPORTING FRAMEWORK	72
	4.3	REVIEW OF THE EXTRACTION PLAN	75
	4.4	REVIEW OF OTHER MANAGEMENT PLANS	75
	4.5	KEY RESPONSIBILITIES	76
5	REFERENCES		78
6	ABBREVIATIONS, ACRONYMS AND GLOSSARY		79
	6.1	ABBREVIATIONS AND ACRONYMS	79
	6.2	GLOSSARY	80

LIST OF TABLES

Table 1	Extraction Plan Requirements
Table 2	Key Mining Parameters
Table 3	Proposed Mining Schedule (Secondary Extraction)
Table 4	Maximum Predicted Total Subsidence, Tilt and Curvatures for Longwalls 21 to 24
Table 5	Subsidence Impact Performance Measures
Table 6	Changes to Predictions and Assessed Levels of Potential Impact as a Result of the Updated Longwall Layout
Table 7	Key Potential Consequences/Hazards Identified by the Subsidence Risk Assessment
Table 8	Summary of Consultation with Government Agencies
Table 9	Management Plans Distributed for Comment

TABLE OF CONTENTS (Continued)

LIST OF TABLES (continued)

Table 10	Surface and Sub-surface Features
Table 11	Water Management Issues Associated with the Extraction of Longwalls 21 to 24
Table 12	Water Performance Measures, Performance Indicators and Contingency Measures for Longwalls 21 to 24
Table 13	Land Management Issues Associated with the Extraction of Longwalls 21 to 24
Table 14	Biodiversity Management Issues Associated with the Extraction of Longwalls 21 to 24
Table 15	Biodiversity Performance Measures, Performance Indicators and Contingency Measures for Longwalls 21 to 24
Table 16	Heritage Management Issues Associated with the Extraction of Longwalls 21 to 24
Table 17	Built Feature Management Issues Associated with the Extraction of Longwalls 21 to 24
Table 18	Built Feature Performance Measures, Performance Indicators and Contingency Measures for Longwalls 21 to 24
Table 19	Public Safety Management Issues Associated with the Extraction of Longwalls 21 to 24
Table 20	Longwalls 21 to 24 Monitoring Program Summary
Table 21	Contingency Plan Responsibilities
Table 22	Summary of Reporting Framework
Table 23	Key Extraction Plan Responsibilities

LIST OF FIGURES

Figure 1	Regional Location
Figure 2	Approved Wambo Coal Mine Layout
Figure 3	Aerial Photograph of Longwalls 21 to 24
Figure 4	Wambo Coal Mine Environmental Management System
Figure 5	Stratigraphy of the Wambo Coal Mine Area
Figure 6	Longwalls 21 to 24 Layout
Figure 7	Predicted Subsidence from the South Bates Extension Underground Mine
Figure 8a	Features with Subsidence Impact Performance Measures – Water, Cliffs and Heritage
Figure 8b	Features with Subsidence Impact Performance Measures – Biodiversity
Figure 9	Location of Built Features
Figure 10	Cliffs in the Vicinity of Longwalls 21 to 24
Figure 11	Monitoring of Environmental Consequences against Performance Indicators and Measures
Figure 12	Locations of Air Quality, Noise and Blast Monitoring Sites
Figure 13	Locations of Surface Water and Groundwater Monitoring Sites
Figure 14	Locations of Relevant Biodiversity Monitoring Sites
Figure 15	WCPL Organisation Structure

TABLE OF CONTENTS (Continued)

LIST OF ATTACHMENTS

Attachment 1 Statutory Requirements
Attachment 2 Relevant Consultation Records
Attachment 3 Program to Collect Baseline Data for Future Extraction Plans
Attachment 4 Key Contact Register

LIST OF APPENDICES

Appendix A Water Management Plan
Appendix B Land Management Plan
Appendix C Biodiversity Management Plan
Appendix D Heritage Management Plan
Appendix E Built Features Management Plan
Appendix F Public Safety Management Plan
Appendix G Coal Resource Recovery Plan (including Plans 1 to 7)
Appendix H Subsidence Monitoring Program
Appendix I Rehabilitation Management Plan

LIST OF TECHNICAL REPORTS

Report 1 Subsidence Predictions and Impact Assessments
Report 2 Groundwater Assessment Review
Report 3 Surface Water Assessment Review
Report 4 Subsidence Risk Assessment

1 OVERVIEW OF THE EXTRACTION PLAN

The Wambo Coal Mine is an open cut and underground coal mining operation located approximately 15 kilometres (km) west of Singleton, near the village of Warkworth, New South Wales (NSW) (**Figure 1**). The Wambo Coal Mine is owned and operated by Wambo Coal Pty Limited (WCPL), a subsidiary of Peabody Energy Australia Pty Limited.

The potential environmental impacts of the existing Wambo Coal Mine were assessed in the *Wambo Development Project Environmental Impact Statement* (the Wambo Development Project EIS) (WCPL, 2003). Development Consent (DA 305-7-2003) for the Wambo Coal Mine was granted on 4 February 2004 by the then NSW Minister for Urban Affairs and Planning under Part 4 of the NSW *Environmental Planning and Assessment Act, 1979* (EP&A Act).

The South Bates Extension Underground Mine is a component of the approved Wambo Coal Mine. An application to modify the Development Consent (DA 305-7-2003 MOD 17) to allow the development of the South Bates Extension Underground Mine (Longwalls 17 to 25) in the Whybrow Seam was approved in December 2017. The application was accompanied by the *South Bates Extension Modification Environmental Assessment* (South Bates Extension Modification EA) (WCPL, 2017).

The South Bates Extension Underground Mine commenced in Longwall 17 in December 2018 and involves extraction of coal by longwall mining methods from the Whybrow Seam within Coal Lease (CL) 397, Mining Lease (ML) 1594, ML 1572 and Mining Lease Application (MLA) 557 (**Figure 2**).

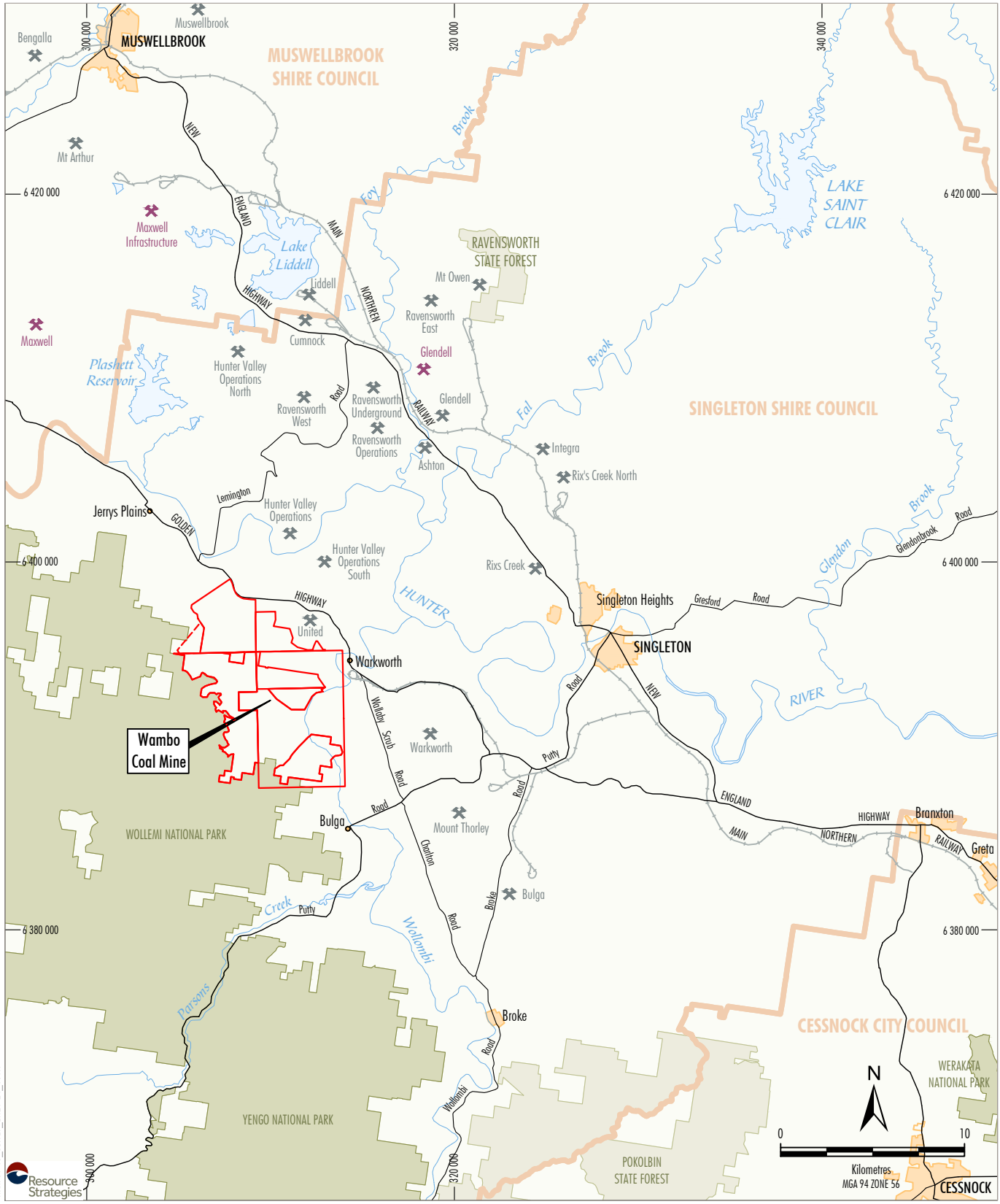
1.1 PURPOSE AND SCOPE

This document is an Extraction Plan that outlines the proposed management, mitigation, monitoring and reporting of potential subsidence impacts and environmental consequences from the secondary extraction of the second set of longwalls at the South Bates Extension Underground Mine (Longwalls 21 to 24).

This Extraction Plan has been prepared in consideration of the Draft *Guidelines for the Preparation of Extraction Plans Required under Conditions of Development Consents, Project Approvals and Mining Lease Conditions for Underground Coal Mining* (Version 5) (Draft Extraction Plan Guidelines) (NSW Department of Planning and Environment [DP&E] and NSW Trade & Investment – Division of Resources and Energy [DRE], 2015).

The objectives of this Extraction Plan are to:

- provide detailed plans of Longwalls 21 to 24;
- outline potential subsidence effects, subsidence impacts and environmental consequences of Longwalls 21 to 24;
- describe the measures that will be implemented to ensure compliance with the subsidence impact performance measures and mitigate, manage and remediate potential subsidence impacts and environmental consequences; and
- detail a monitoring and contingency plan for potential subsidence impacts and environmental consequences, including detailed performance indicators for subsidence impact performance measures.



LEGEND

- Mining and Coal Lease Boundary
- Mining Lease Application Boundary
- Local Government Boundary
- Mining Operation
- Proposed Mining Operation (Application lodged)

Source: NSW Department of Resources & Energy (2020); Geoscience Australia (2009)

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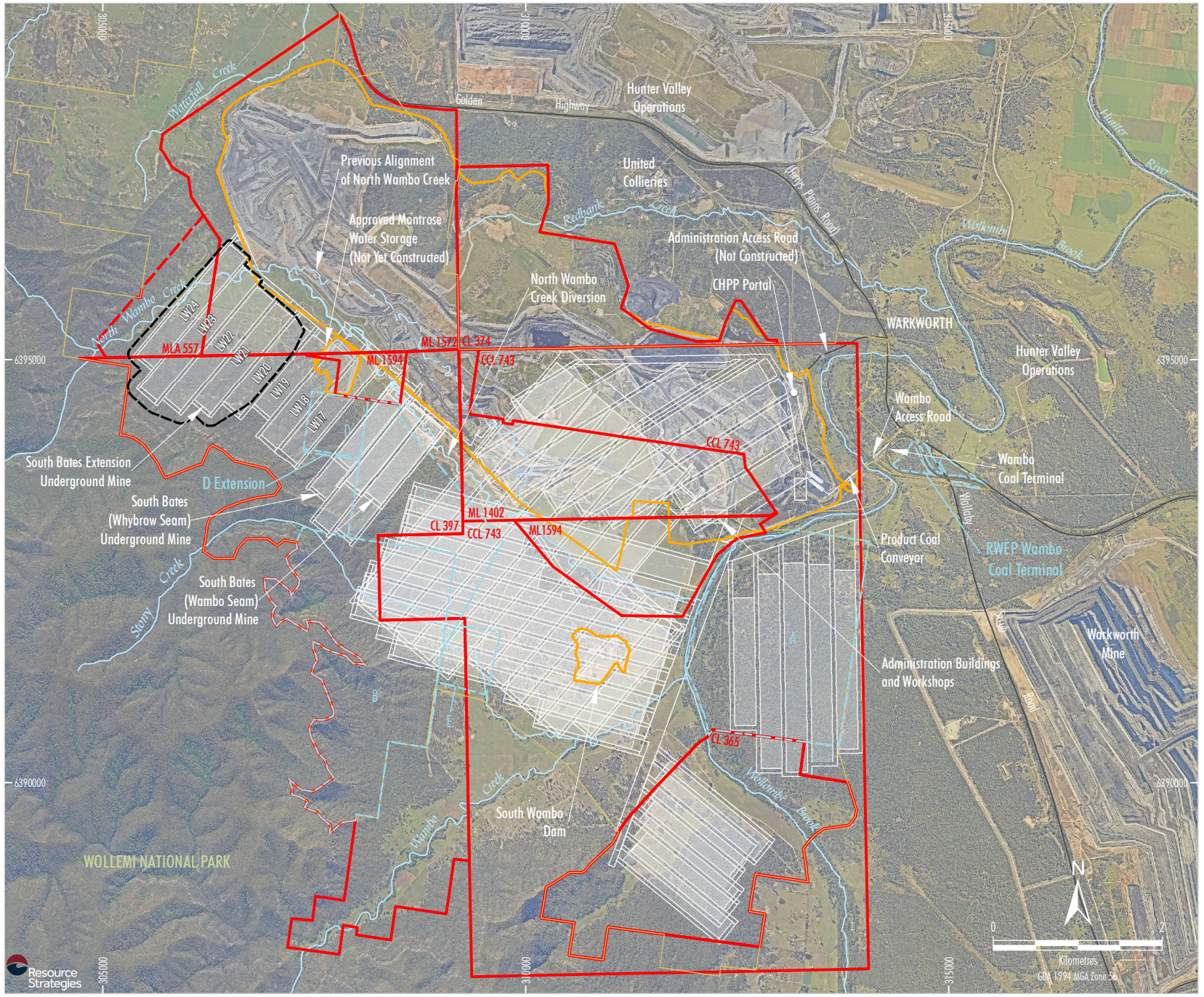
WAMBO COAL MINE

Regional Location

Figure 1



LEGEND

- WCPL Owned Land
- Mining and Coal Lease Boundary
- Mining Lease Application Boundary
- Existing/Approved Surface Development Area
- Approved Underground Development
- Remnant Woodland Enhancement Program (RWEP) Area
- Extraction Plan Application Area

Source: WCPL (2020); NSW Spatial Services (2019)
Orthophoto: WCPL (May 2019)

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WAMBO COAL MINE

Approved Wambo Coal Mine Layout

Figure 2

WAM-09-15_SBX EP_LW21-24_203f

The South Bates Extension Underground Mine includes nine longwalls in the Whybrow Seam (Longwalls 17 to 25). The Extraction Plan Application Area for Longwalls 21 to 24 (Longwalls 21 to 24 Application Area) is based on a 26.5 degree (°) angle of draw and is shown on **Figure 3**. Secondary extraction of Longwalls 21 to 24 is scheduled to commence in February 2021.

This Extraction Plan and its component plans have been prepared by WCPL, with assistance from Mine Subsidence Engineering Consultants (MSEC), SLR Consulting Pty Ltd (SLR), Alluvium, South East Archaeology and Resource Strategies. The appointment of the team of suitably qualified and experienced persons has been endorsed by the Secretary of the Department of Planning, Industry and Environment (DPIE).

This Extraction Plan forms part of WCPL's Environmental Management System for the Wambo Coal Mine. The relationship of this Extraction Plan to the Wambo Coal Mine Environmental Management System is shown on **Figure 4**.

1.1.1 Statutory Requirements

This Extraction Plan has been prepared in accordance with the conditions of the Development Consent (DA 305-7-2003), and in consideration of the Draft Extraction Plan Guidelines (DP&E and DRE, 2015).

The statutory requirements relevant to this Extraction Plan are summarised below.

Development Consent (DA 305-7-2003)

This Extraction Plan has been prepared in accordance with Condition B7 of Schedule 2 of the Development Consent (DA 305-7-2003). The requirements of Condition B7 of Schedule 2 are summarised in **Table 1**, along with the relevant section of this Extraction Plan in which the requirements are addressed.

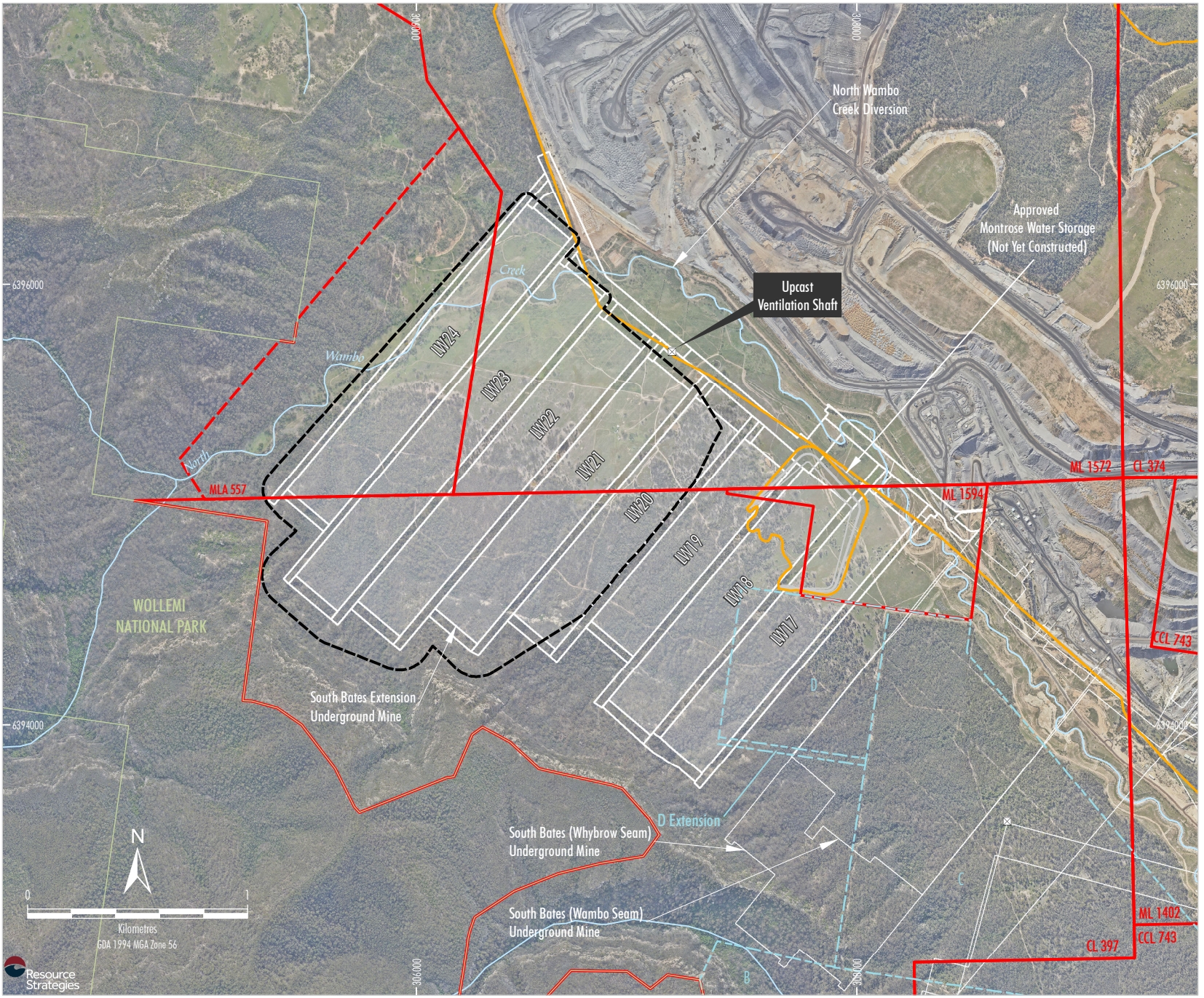
Further detail on the requirements of the Development Consent (DA 305-7-2003) is provided in **Attachment 1.**

Mining Lease Conditions

Longwalls 21 to 24 are located within CL 397, ML 1594, ML 1572 and MLA 557 (**Figure 3**). Under the conditions of the mining leases, WCPL must not undertake underground mining operations that may cause subsidence other than in accordance with an approved Extraction Plan. The approved Extraction Plan must provide for the effective management of risks associated with any subsidence resulting from mining operations.

MLA 557 is currently pending approval. Mining of Longwalls 22, 23 and 24 will not be undertaken until this ML has been granted.

The requirements of the conditions of the mining leases are summarised in **Attachment 1**, along with the relevant section of this Extraction Plan where the requirements are addressed.



LEGEND

- Mining and Coal Lease Boundary
- Mining Lease Application Boundary
- National Park Boundary
- Existing/Approved Surface Development Area
- Approved Underground Development
- Ventilation Shaft
- Remnant Woodland Enhancement Program (RWEP) Area
- Extraction Plan Application Area

Source: WCPL (2020); NSW Spatial Services (2019)
Orthophoto: WCPL (May 2019)

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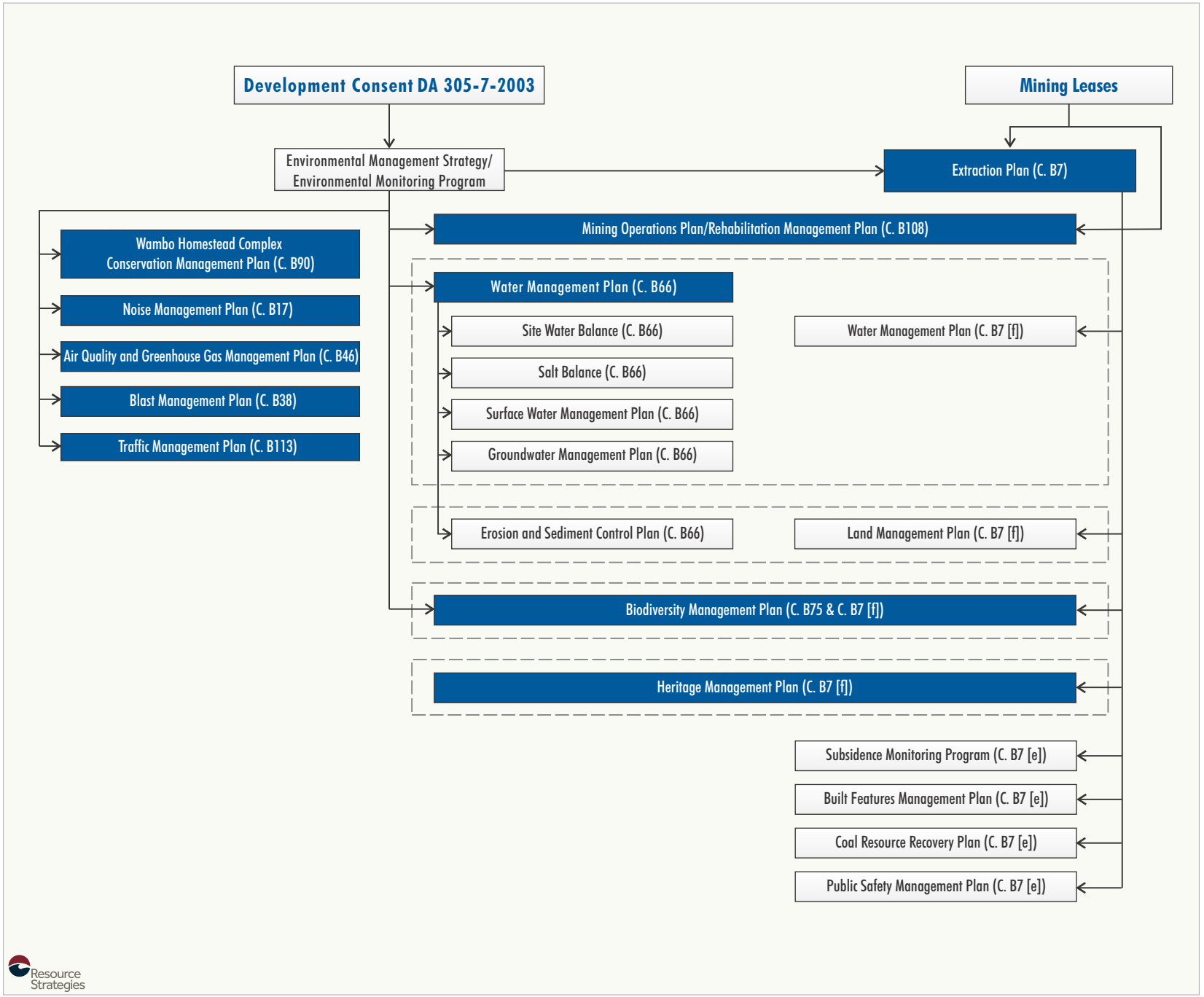
WAMBO COAL MINE

Aerial Photograph of Longwalls 21 to 24

Figure 3

WAM-09-15_SBX EP_LW21-24_201D



Resource Strategies

WAM-09-15_SBX EP_LW21-24_001B

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WAMBO COAL MINE

Wambo Coal Mine
Environmental Management System

Figure 4

Table 1
Extraction Plan Requirements

Development Consent (DA 305-7-2003) Condition	Extraction Plan Reference
Condition B7 of Schedule 2	
B7. The Applicant must prepare an Extraction Plan for all second workings on the site to the satisfaction of the Planning Secretary. Each Extraction Plan must:	This document
a) be prepared by a suitably qualified and experienced person/s whose appointment has been endorsed by the Planning Secretary;	**Section 1.1** and **Attachment 2**
b) include detailed plans of existing and proposed first and second workings and any associated surface development;	**Section 1.3** and **Appendix G**
c) provide updated predictions of the potential subsidence effects, subsidence impacts and environmental consequences of the proposed mining covered by the Extraction Plan, incorporating any relevant information obtained since this consent;	**Section 2.1** and **Technical Reports 1 to 4**
d) describe in detail the performance criteria to be implemented to ensure compliance with the performance measures in Table 1 and Table 2, and manage or remediate any impacts and/or environmental consequences to meet the rehabilitation objectives in condition B104, including: (i) a trigger action response plan to identify risks and specific follow up actions to avoid exceedances of the performance measures; and (ii) a contingency plan that expressly provides for adaptive management where monitoring indicates that there has been an exceedance of the performance measures, or where any such exceedance appears likely;	**Section 3** and **Appendices A, B, C, D, E, F, H and I**
e) include the following to the satisfaction of the Resources Regulator (or DRG, as the case may require):	
(i) a coal resource recovery plan…	**Appendix G**
(ii) a Subsidence Monitoring Program…	**Appendix H**
(iii) a Built Features Management Plan…	**Appendix E**
(iv) a Public Safety Management Plan…	**Appendix F**
(v) appropriate revisions to the Rehabilitation Management Plan…	**Section 3.7**
f) include a:	
(i) Water Management Plan…	**Appendix A**
(ii) Biodiversity Management Plan…	**Appendix C**
(iii) Land Management Plan…	**Appendix B**
(iv) Heritage Management Plan…	**Appendix D**
g) include a program to collect sufficient baseline data for future Extraction Plans.	**Attachment 3**

Other Statutory Requirements

In addition to the Development Consent (DA 305-7-2003) and mining leases, all activities at or in association with the South Bates Extension Underground Mine will be undertaken in accordance with the following licences, permits and leases:

- *Wambo Coal Mine Mining Operations Plan September 2019 – December 2020* (MOP) approved under the conditions of the mining leases, and any approved amendment or replacement MOP.
- Environment Protection Licence (EPL) 529 issued under the NSW *Protection of the Environment Operations Act, 1997*, and any subsequent variations.
- Consent #2222 and Aboriginal Heritage Impact Permits (AHIPs) #C0001474, #C0002000 and #C0003213 issued under section 90 of the NSW *National Parks and Wildlife Act, 1974* (NPW Act) and any additional AHIPs issued under section 90 of the NPW Act.
- Water access licences and approvals issued under the NSW *Water Management Act, 2000*.
- Mining and occupational health and safety related approvals granted by the NSW Resources Regulator and WorkCover NSW.

1.2 STRUCTURE OF THE EXTRACTION PLAN

This Extraction Plan comprises a main text component and supporting management plans and studies, which include Appendices A through I and Technical Reports 1 through 4. An overview of the main text sections of the Extraction Plan is presented below:

Section 1 Provides an introduction to the Extraction Plan, including the purpose and scope of the Extraction Plan and a summary of the mine plan and design, subsidence predictions, subsidence impact performance measures and subsidence management approach.

Section 2 Describes the process of development of the Extraction Plan, including: the process of reviewing and updating the predictions of subsidence effects, subsidence impacts and environmental consequences; the risk assessment process for identifying key subsidence management issues; and consultation undertaken by the mine with affected agencies and other key stakeholders.

Section 3 Describes the measures that will be implemented to mitigate, manage, remediate and monitor potential subsidence impacts and environmental consequences on natural and built features.

Section 4 Addresses key elements of how the plan is going to be implemented, including an adaptive management approach, reporting, regular review and key responsibilities.

Section 5 Lists the documents referred to in **Sections 1 to 4** of this Extraction Plan.

Section 6 Defines abbreviations, acronyms and terms used in **Sections 1 to 4** of this Extraction Plan.

Attachment 1 Outlines the relevant requirements under the Development Consent (DA 305-7-2003), Draft Extraction Plan Guidelines (DP&E and DRE, 2015) and mining leases, and provides the relevant section of this Extraction Plan where the requirements are addressed.

Attachment 2 Provides evidence of WCPL's consultation process for the Extraction Plan.

Attachment 3 Provides details of a program to collect sufficient baseline data for future Extraction Plans.

Attachment 4 Provides a consolidated list of key stakeholder contact information.

Appendices A to I contain component management and monitoring plans of the Extraction Plan:

Appendix A Water Management Plan for Longwalls 21 to 24 (WMP).

Appendix B Land Management Plan for Longwalls 21 to 24 (LMP).

Appendix C WCPL complex-wide Biodiversity Management Plan (BMP) (addressing the requirement for a Biodiversity Management Plan for Longwalls 21 to 24).

Appendix D WCPL complex-wide Heritage Management Plan (HMP) (addressing the requirement for a Heritage Management Plan for Longwalls 21 to 24).

Appendix E Built Features Management Plan for Longwalls 21 to 24 (BFMP).

Appendix F Public Safety Management Plan for Longwalls 21 to 24 (PSMP).

Appendix G Coal Resource Recovery Plan for Longwalls 21 to 24 (CRRP).

Appendix H Subsidence Monitoring Program.

Appendix I MOP (satisfying the requirements of a Rehabilitation Management Plan).

This Extraction Plan is also supported by a series of technical reports, prepared by relevant specialists, which contain a review of predictions of subsidence effects, subsidence impacts and environmental consequences. A facilitated risk assessment workshop, incorporating the relevant technical specialists, was also conducted. These technical reports are contained in **Technical Reports 1 to 4**:

Report 1 Subsidence Predictions and Impact Assessment.

Report 2 Groundwater Assessment Review.

Report 3 Surface Water Assessment Review.

Report 4 Subsidence Risk Assessment.

1.3 MINE PLAN AND SCHEDULE

The approved orientation and footprint of the South Bates Extension Underground Mine was assessed by the South Bates Extension Modification Environmental Assessment (EA) (WCPL, 2017). The following changes to the orientation and/or footprint of the South Bates Extension Underground Mine have been approved since the South Bates Extension Modification EA was approved:

- On 12 April 2018, DPIE approved the shortening of Longwall 16, part of the South Bates Underground Mine, by approximately 390 m due to potential health and safety risks associated with the gas content of the coal seam.
- On 4 September 2018, WCPL provided DPIE with correspondence explaining that geological structures had been encountered that may require changes to the main headings and finishing ends of Longwalls 18, 19 and 20. Accordingly, WCPL requested that DPIE approve the Extraction Plan for Longwalls 17 to 20 for extraction of Longwall 17 only. On 7 September 2018, DPIE approved the extraction of Longwall 17 only, on the basis that WCPL would prepare an amended Extraction Plan for Longwalls 18, 19 and 20.
- On 4 June 2019, DPIE approved the amended Longwalls 17-20 Extraction Plan, which included shortened finishing ends for all subsequent longwalls (i.e. including Longwalls 21 to 24).
- On 13 November 2019, DPIE approved the shortening of the commencing end of Longwall 19 as a result of a geological feature that was previously unidentified.
- On 15 April 2020, DPIE approved the shortening of the commencing end of Longwall 20 as a result of the same geological feature that required the shortening of Longwall 19.

Further detail on the mine plan and schedule is provided in the subsections below.

1.3.1 Mine Plan

Longwalls 21 to 24 will be extracted using retreating longwall mining methods for secondary extraction of panels with approximately 261 m void width (extraction face of approximately 250 m). Construction of development main headings, maingates and tailgates will be undertaken using continuous miners.

The Longwalls 21 to 24 Application Area and approved mine plan is shown in **Figure 3,** and key mining parameters are summarised in **Table 2**.

Table 2
Key Mining Parameters

Dimension	Longwall 21	Longwall 22	Longwall 23	Longwall 24
Gate Road Width (m)	5.4			
Gate Road Height (m)	2.5 to 2.8			
Maingate Chain Pillar Width (m)	37.2	36.2	26	27.7
Tailgate Chain Pillar Width (m)	26	30	29	21
Longwall Void Width (m)	261			
Longwall Void Length (m)	1,505	1,705	1,870	1,705
Extraction Height (m)	2.3 to 2.7	2.3 to 2.8	2.3 to 2.9	2.3 to 3.0
Depth of Cover (m)	60 to 280	60 to 290	70 to 290	65 to 220

ROM = run-of-mine. Mt = million tonnes. m = metres (m).

Detailed mine layout drawings are provided in **Appendix G** (Coal Resource Recovery Plan). **Appendix G** also provides justification of the mining layout, including a description of resource recovery and effects on future resource recovery.

Geology and Stratigraphy

The Wambo Coal Mine is situated within the Hunter Coalfield subdivision of the Sydney Basin, which forms the southern part of the Sydney-Gunnedah-Bowen Basin (WCPL, 2003). The coal-bearing rocks of the Sydney Basin are Permian in age and are typically associated with low-lying gentle topography (WCPL, 2003). The overlying rocks of Triassic age cover large parts of the Sydney Basin and tend to form prominent escarpments where they outcrop (WCPL, 2003).

Mining activities at the Wambo Coal Mine include both open cut and underground mining of several coal seams from the Wittingham Coal Measures, which combine with the Newcastle Coal Measures to form the Singleton Supergroup. A summary of the coal measure stratigraphy underlying the Wambo Coal Mine area is provided in **Figure 5**.

The Wittingham Coal Measures are divided into the Jerrys Plains Subgroup, Vane Subgroup, Denman Formation and Archerfield Sandstone (WCPL, 2003). The Jerrys Plains Subgroup contains eight formations with 15 named coal seams (WCPL, 2003). The Jerrys Plains Subgroup is up to 800 m thick and generally consists of relatively coarse clastic sediments (NSW Department of Mineral Resources [DMR], 1993). The sedimentary rock layers above and between coal seams are typically lithic sandstone, siltstone and conglomerate, while minor carbonaceous claystone and tuff occurs throughout the sequence (WCPL, 2003).

Coal seams previously, currently and approved to be mined at the Wambo Coal Mine include (**Figure 5**):

- Whybrow Seam;
- Redbank Creek Seam;
- Wambo Seam;
- Whynot Seam;
- Woodlands Hill Seam; and
- Arrowfield Seam.

SUPERGROUP	GROUP	SUBGROUP	FORMATION	SEAM
SINGLETON SUPERGROUP	NARRABEEN GROUP		WIDDEN BROOK CONGLOMERATE	
	NEWCASTLE COAL MEASURES [1]	GLEN GALLIC SUBGROUP	Greigs Creek Coal	
			Redmanvale Creek Formation	
			Dights Creek Coal	
		DOYLES CREEK SUBGROUP	Waterfall Gully Formation	
			Pinegrove Formation	
		HORSESHOE CREEK SUBGROUP	Lucernia Coal	
			Strathmore Formation	
			Alcheringa Coal	
			Clifford Formation	
		APPLETREE FLAT SUBGROUP	Charlton Formation	
			Abbey Green Coal	
		WATTS SANDSTONE		
	WITTINGHAM COAL MEASURES	DENMAN FORMATION		
		JERRYS PLAINS SUBGROUP	Mount Leonard Formation	***Whybrow Seam*** [2]
			Althorpe Formation	
			Malabar Formation	***Redbank Creek Seam*** [2]
				Wambo Seam [2]
				Whynot Seam [2]
				Blakefield Seam
			Mount Ogilvie Formation	*Glen Munro Seam*
				Woodlands Hill Seam [2]
			Milbrodale Formation	
			Mount Thorley Formation	***Arrowfield Seam*** [2]
				Bowfield Seam [3]
				Warkworth Seam [3]
			Fairford Formation	
			Burnamwood Formation	*Mount Arthur Seam* [3]
				Piercefield Seam [3]
				Vaux Seam [3]
				Broonie Seam
				Bayswater Seam
		ARCHERFIELD SANDSTONE		
		VANE SUBGROUP	Bulga Formation	
			Foybrook Formation	
			Saltwater Creek Formation	

[1] Previously known as the Wollombi Coal Measures.
[2] Coal reserves currently approved to be mined at the Wambo Coal Mine.
[3] Coal reserves proposed to be mined by the United Wambo Open Cut Coal Mine Project (SSD 7142).

WAM-09-15_SBX.EP_LW21-24_002A

Resource Strategies

After: DMR (1993)

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WAMBO COAL MINE

Stratigraphy of the Wambo Coal Mine Area

Figure 5

These seams dip gently to the south-west at approximately 2° to 3°, with minor local variations due to varying thicknesses of inter-seam sediments and fault zones (WCPL, 2003). Faulting usually trends north or north-east to south-west with normal throws of up to 10 m, with some low angle thrusts (i.e. reverse faults) of variable throw (MineConsult, 2001).

There is a series of north-northeast to south-southwest trending faults within and adjacent to the mining area with throws between 0.5 m and 1 m. Some larger faults have been identified to the north-west and to the south-east of the longwalls with throws between 3 m and 12 m (**Technical Report 1**).

The South Bates Extension Underground Mine mines the Whybrow Seam, which produces a low ash thermal coal. ROM coal is crushed and washed at the Wambo coal handling and preparation plant. Product coal from the South Bates Extension Underground Mine will be considered suitable for export and domestic markets.

The overburden of the Longwalls 21 to 24 Application Area consists predominately of interbedded sandstone and siltstone layers, with minor claystone, mudstone, shale, tuffaceous and coal layers (**Technical Report 1**).

Previous and Future Mining

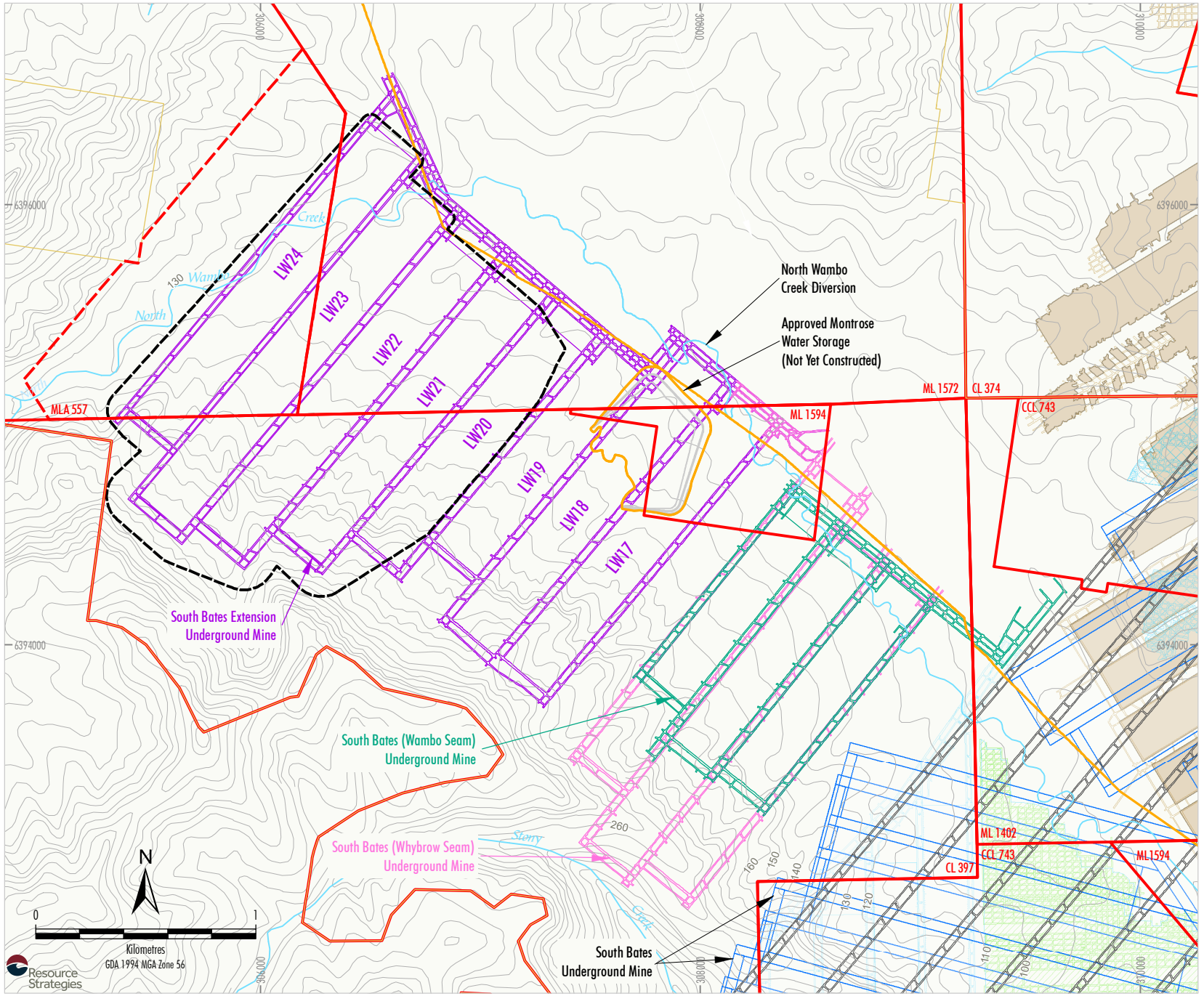
Previous and future workings in the vicinity of Longwalls 21 to 24 are shown on **Figure 6**.

Longwall 25 at the approved South Bates Extension Underground Mine will be the subject of a future Extraction Plan.

In addition to the approved South Bates Extension Underground Mine, the Development Consent (DA 305-7-2003) provides consent for underground mining by longwall methods in the Arrowfield and Woodlands Hill Seams (**Figure 6**). The future workings in the Arrowfield and Woodlands Hill Seams are located to the south-east of Longwalls 17 to 25 (**Figure 6**). The approved future underground longwall workings are described in the Wambo Development Project EIS (WCPL, 2003) and *South Wambo Underground Mine Modification Environmental Assessment* (WCPL, 2016) and will be the subject of a future Extraction Plan.

Further to underground mining activities, the Development Consent (DA 305-7-2003) provides consent for open cut mining. The seams approved for open cut mining include the Whybrow, Redbank Creek, Wambo and Whynot Seams.

An application to modify the Development Consent (DA 305-7-2003 MOD 16) was lodged in November 2016 to support the proposed United Wambo Open Cut Coal Mine Project. The Modification was approved on 28 August 2019 and allows integrated open cut mining at the United Coal Mine and Wambo Coal Mine.



LEGEND

- WCPL Owned Land
- Mining and Coal Lease Boundary
- Mining Lease Application Boundary
- Existing/Approved Surface Development Area
- South Bates Extension Underground Mine
- Extraction Plan Application Area
- Existing Homestead Mine Workings in Whybrow Seam
- Existing Wollemi and Ridge Workings in Whybrow Seam
- Existing United Mine Workings in Woodlands Hill/Arrowfield Seam
- Existing North Wambo Underground Workings in Wambo Seam
- Existing South Bates Underground Mine Workings in Whybrow Seam
- Existing/Approved South Bates Underground Mine Workings in Wambo Seam
- Approved Arrowfield and Woodlands Hill Seam Workings

Source: WCPL (2020); NSW Spatial Services (2019)

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WAMBO COAL MINE

Longwalls 21 to 24 Layout

Figure 6

WAM-09-15_SBX EP_LW21-24_2020

1.3.2 Mine Schedule

WCPL operates its mines seven days per week, 24 hours per day on a rotating shift basis. WCPL is currently mining Longwall 19 at the South Bates Extension Underground Mine.

The proposed sequence of mining for Longwalls 21 to 24 at the South Bates Extension Underground Mine under the Extraction Plan and anticipated/actual start and completion dates are summarised in **Table 3**.

Table 3
Proposed Mining Schedule (Secondary Extraction)

Longwall	Estimated Start Date	Estimated Duration	Estimated Completion Date
Longwall 21	February 2021	6 months	August 2021
Longwall 22	September 2021	6 months	March 2022
Longwall 23	March 2022	5 months	August 2022
Longwall 24	September 2022	7 months	April 2023

1.4 SUBSIDENCE PREDICTIONS

Predictions of subsidence effects for Longwalls 21 to 24 are provided by MSEC (**Technical Report 1**). The process for the development of these predictions is described in **Section 2.1.1**.

Predicted Conventional Subsidence Movements

The maximum subsidence, tilts and curvatures predicted by MSEC (2020) for Longwalls 21 to 24 are summarised in **Table 4**. **Figure 7** provides subsidence contours for Longwalls 21 to 24 at the South Bates Extension Underground Mine.

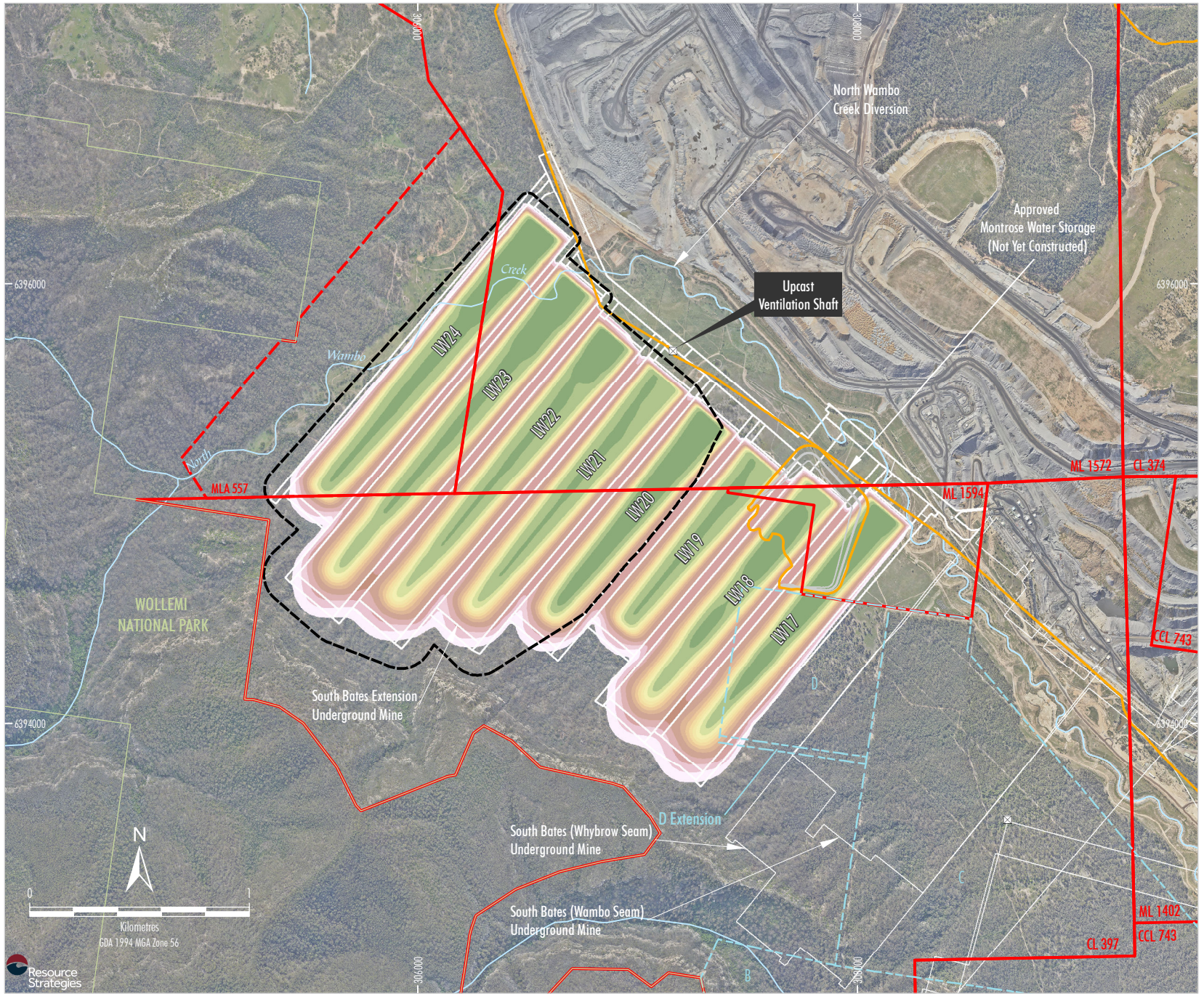
Table 4
Maximum Predicted Total Subsidence, Tilt and Curvatures for Longwalls 21 to 24

Longwalls[1]	Depth of Cover to the Whybrow Seam (m)	Subsidence (mm)	Tilt (mm/m)	Hogging Curvature (km^{-1})	Sagging Curvature (km^{-1})
Longwall 21	60 to 280	1,750	70	> 3.0	> 3.0
Longwall 22	60 to 290	1,850	80	> 3.0	> 3.0
Longwall 23	70 to 290	1,850	75	> 3.0	> 3.0
Longwall 24	65 to 220	1,850	80	> 3.0	> 3.0
Cumulative subsidence	60 to 290	1,950	85	> 3.0	> 3.0

After: MSEC (2020).

mm = millimetres. mm/m = millimetres per metre. km^{-1} = per kilometre.

[1] Predictions for individual longwalls are incremental and do not take into account additional subsidence caused by adjacent longwall panels.



Source: WCPL (2020); NSW Spatial Services (2019); MSEC (2020)
Orthophoto: WCPL (May 2017)

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WAMBO COAL MINE

Predicted Subsidence from the South Bates Extension Underground Mine

Figure 7

WAM-09-15_SBX EP_LW21-24_212A

Non-Conventional Ground Movements

MSEC (**Technical Report 1**) considers it is likely non-conventional ground movements (i.e. localised irregularities) will occur due to near surface geological features. The non-conventional movements are often accompanied by elevated tilts, curvatures and strains. The sections of drainage lines located directly above the longwalls have shallow incisions into the natural surface soils. The predicted valley related movements for the drainage lines, therefore, are not significant when compared with the predicted conventional movements (**Technical Report 1**).

In most cases, it is not possible to predict the exact locations or magnitudes of the non-conventional movements due to near surface geological conditions. For this reason, the strain predictions provided in **Technical Report 1** are based on a statistical analysis of measured strains, including both conventional and non-conventional anomalous strains.

For single-seam conditions, at the commencing ends of Longwalls 21 to 24 (i.e. south-western), the 95 percent (%) confidence levels for maximum strains above areas with similar mining geometry was 5 mm/m tensile and 4 mm/m compressive (**Technical Report 1**). At the finishing ends of Longwalls 21 to 24, the 95% confidence levels for maximum strains above areas with similar mining geometry was 12 mm/m tensile and 17 mm/m compressive (**Technical Report 1**).

Predicted Far-Field Displacement Movements

An empirical database of observed incremental far-field horizontal movements from monitoring data from the NSW Coalfields indicates that the 90% confidence level for measurable far-field movements (i.e. nominally greater than 25 mm) is within 1,500 m from the active longwall (**Technical Report 1**).

The Montrose West Open Cut Pit is located to the north-east of Longwalls 17 to 25 (**Figure 7**). The open cut pit has extracted the overburden material above the Whybrow Seam. The removal of this material would have relieved and redistributed much of the horizontal in-situ stress in the overburden strata adjacent to the pit. The potential for far-field horizontal movements in the vicinity of the Montrose West Open Cut Pit, therefore, is reduced (**Technical Report 1**).

MSEC (**Technical Report 1**) predicts the potential impacts of far-field horizontal movements on the natural and built features within the vicinity of the longwalls are not expected to be significant. Therefore, MSEC (**Technical Report 1**) considers it is not necessary to establish monitoring to measure the far-field horizontal movements resulting from Longwalls 21 to 24.

Timing and Duration of Subsidence Impacts

Surface cracking has been typically observed to close up as the longwall face retreats, and natural filling of minor remnant cracking usually occurs within 6 to 12 months. Conditions at the South Bates Extension Underground Mine in areas of high depth of cover are expected to be similar.

1.5 SUBSIDENCE IMPACT PERFORMANCE MEASURES

The statutory requirements relevant to this Extraction Plan are summarised in **Section 1.1.1**. In accordance with the Development Consent (DA 305-7-2003) (Conditions B1 and B4, Schedule 2), WCPL must ensure that the underground mining operations comply with the subsidence impact performance measures outlined in **Table 5**. This Extraction Plan has been developed to meet these performance measures. The locations of key features are provided on **Figures 8a and 8b**.

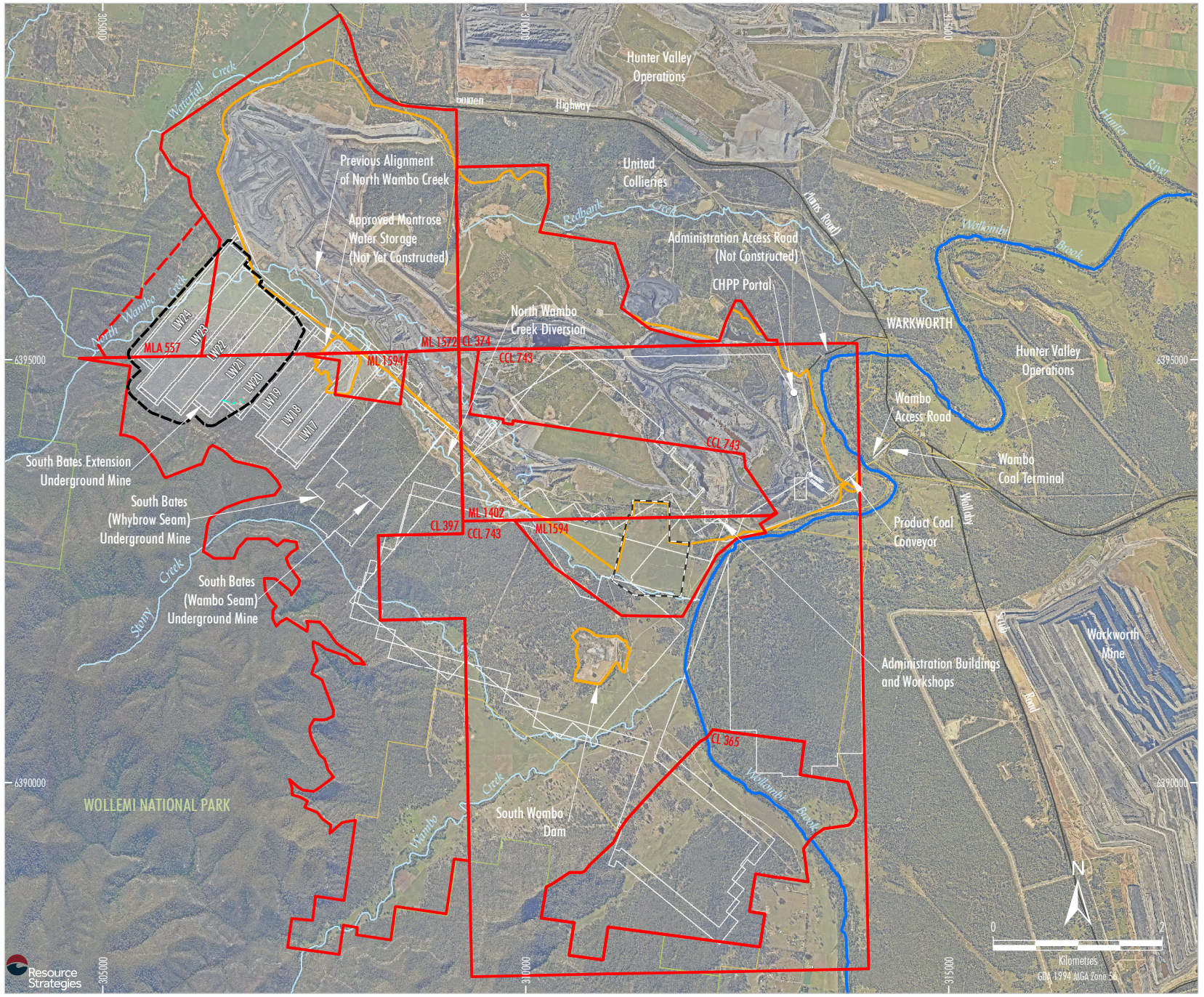
The Wambo Homestead Complex is located approximately 3.5 km south-east of Longwalls 17 to 25 (**Figures 8a and 8b**) and will experience no measurable subsidence from the South Bates Extension Underground Mine.

Monitoring of consequences against performance indicators and measures relating to the Wambo Homestead Complex is not considered necessary for Longwalls 21 to 24. Monitoring and management measures for the Wambo Homestead Complex were addressed in previous Extraction Plans for the North Wambo Underground Mine.

Table 5
Subsidence Impact Performance Measures

Feature	Performance Measure
Wollombi Brook	Negligible subsidence impacts and environmental consequences. Release of water from the site only in accordance with Environment Protection Licence requirements.
Low level cliffs within the South Bates Extension Area	Minor environmental consequences (that is occasional rockfalls, displacement or dislodgement of boulders or slabs, or fracturing that in total do not impact more than 5% of the total face area of such features).
Wollemi National Park	Negligible subsidence impacts and environmental consequences.
Warkworth Sands Woodland Community	Minor cracking and ponding of the land surface or other subsidence impacts. Negligible environmental consequences.
White Box, Yellow Box, Blakely's Red Gum Woodland/Grassy White Box Woodland Community	Minor cracking and ponding of the land surface or other subsidence impacts. Negligible environmental consequences.
Central Hunter Valley Eucalypt Forest and Woodland Ecological Community	Minor cracking and ponding of the land surface or other subsidence impacts. Negligible environmental consequences
Conservation Areas (including the proposed Wambo offset area under SSD 7142)	Negligible reduction to previously identified biodiversity credits.
Wambo Homestead Complex (WHC)	Negligible impact on heritage values, unless approval has been granted by the Heritage Branch and/or the Minister.
All built features (including public infrastructure and all structures on privately-owned land)	Always safe. Serviceability should be maintained wherever practicable. Loss of serviceability must be fully compensated. Damage must be fully repairable, and must be fully repaired or else replaced or fully compensated.
Public Safety	Negligible additional risk.

Source: After Tables 1 and 2 of the Development Consent (DA 305-7-2003).



LEGEND

- WCPL Owned Land
- Mining and Coal Lease Boundary
- Mining Lease Application Boundary
- Existing/Approved Surface Development Area
- Approved Underground Development
- Extraction Plan Application Area

Features with Subsidence Impact Performance Measures

- Wollombi Brook
- Low Level Cliffs
- Wambo Homestead Complex Curtilage

Source: WCPL (2019); NSW Spatial Services (2019) MSEC (2020)
Orthophoto: WCPL (May 2019)

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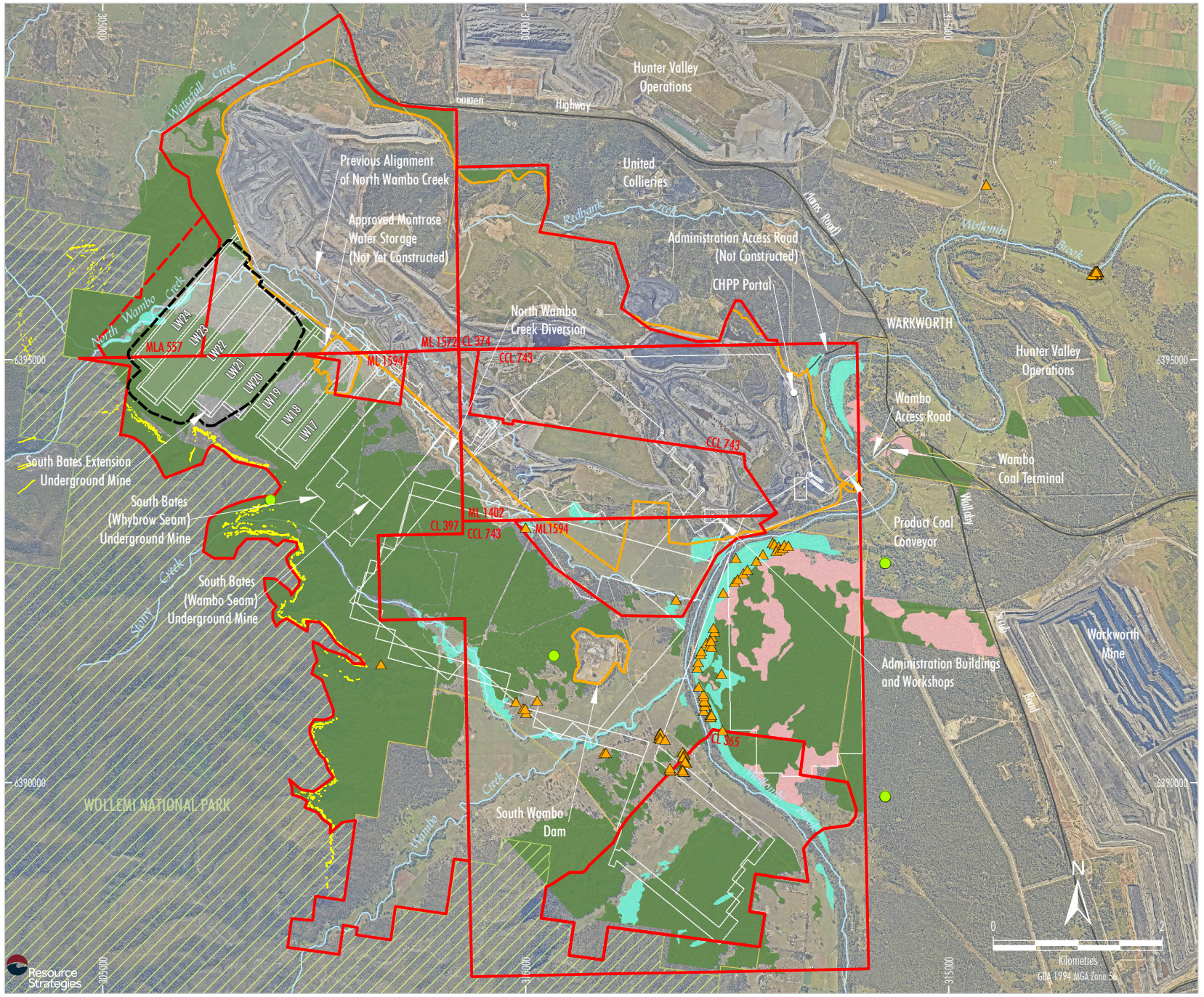
WAMBO COAL MINE

Features with Subsidence Impact Performance Measures - Water, Cliffs and Heritage

Figure 8a

WAM-09-15_SBX EP_LW21-24_204C



LEGEND

- WCPL Owned Land
- Mining and Coal Lease Boundary
- Mining Lease Application Boundary
- Existing/Approved Surface Development Area
- Approved Underground Development
- Extraction Plan Application Area

Features with Subsidence Impact Performance Measures

- Wollemi National Park
- Wollemi National Park Escarpment
- Central Hunter Valley Eucalypt Forest and Woodland Community
- Warkworth Sands Woodland
- Other Threatened Ecological Community[1]
- Threatened Population
- Threatened Species

Note: [1] Listed as endangered or critically endangered under the Biodiversity Conservation Act, 2016.

Source: WCPL (2020); NSW Spatial Services (2019) MSEC (2020); FloraSearch (2016, 2017)
Orthophoto: WCPL (May 2019)

Peabody

WAMBO COAL MINE

Features with Subsidence Impact Performance Measures - Biodiversity

Figure 8b

WAM-09-15_SBX EP_LW21-24_205C

1.6 SUBSIDENCE MANAGEMENT APPROACH

Potential environmental consequences from mining of Longwalls 21 to 24 will be managed in accordance with the relevant requirements of the Development Consent (DA 305-7-2003) and other approvals, through:

- **Mine Design** – Longwalls 21 to 24 have been designed to meet the subsidence impact performance measures for the Wollemi National Park (**Section 1.6.1**).
- **Subsidence Monitoring** – visual and survey monitoring and reporting will be conducted to confirm predictions of subsidence effects and detect subsidence impacts and environmental consequences (**Section 3.8**).
- **Remediation** – remediation of any subsidence impacts or environmental consequences detected by subsidence monitoring will be conducted where required in consideration of: the potential impacts of the unmitigated impact (including potential risks to safety and the potential for self-healing or long-term degradation); and the potential impacts of the remediation (**Sections 3.1 to 3.7**).
- **Contingency Response** – a contingency response will be implemented where a potential exceedance of a subsidence impact performance measure or an unexpected impact is detected (**Section 4.1**), including consideration of identified potential contingency measures (**Sections 3.1, 3.3 and 3.5**).
- **Adaptive Management and Review** – WCPL will implement an adaptive management approach by reviewing and evaluating the effectiveness of management strategies, and adjusting management strategies to improve performance, particularly following an exceedance of a subsidence impact performance measure or detection of an unexpected impact (**Sections 4.1 to 4.5**).

1.6.1 Wollemi National Park Escarpment Offset

The cliffs associated with the Wollemi National Park escarpment were considered in the South Bates Extension Modification EA (WCPL, 2017). WCPL (2017) states:

> *The longwalls have been designed to achieve negligible impact on the Wollemi National Park escarpment. The extent of the Modification longwalls to the south-west is set back based on a 26.5° angle of draw from the base of the mapped escarpment.*

The length of Longwalls 21 to 24 has been limited such that the base of the cliffs associated with the Wollemi National Park escarpment is located outside of a 26.5° angle of draw from Longwalls 21 to 24. Longwalls 21 to 24 will meet the performance measures of negligible subsidence impacts to, and negligible environmental consequences for, the Wollemi National Park.

The predicted vertical subsidence for cliffs associated with the Wollemi National Park escarpment are all less than 20 mm. Vertical movements of these magnitudes are in the order of those which naturally occur due to wetting and drying of the surface soils (**Technical Report 1**). Any low level far-field horizontal movements are not expected to impact the cliffs associated with the Wollemi National Park escarpment (**Technical Report 1**).

2 DEVELOPMENT OF THE EXTRACTION PLAN

2.1 REVIEW OF PREDICTIONS

The predicted subsidence effects, subsidence impacts and environmental consequences of the South Bates Extension Underground Mine have been assessed in the South Bates Extension Modification EA (WCPL, 2017), and by MSEC (2020), SLR (2020) and Alluvium (2020) (**Technical Reports 1 to 3**). This section describes the process of reviewing these predictions.

As discussed in Section 1.3, a number of small changes to the layout of Longwalls 17 to 25 have been approved by DPIE since the South Bates Extension Modification EA was approved and the Development Consent (DA 305-7-2003) was granted. The revised longwall layout has been considered in this Extraction Plan.

2.1.1 Predicted Subsidence Effects and Subsidence Impacts

A detailed subsidence assessment for Longwalls 21 to 24 has been prepared in support of this Extraction Plan, with the outcomes of this assessment incorporated into the management plans in **Appendices A to F**.

Review of Subsidence Prediction Methodology

The predictions of subsidence effects were developed by MSEC using the Incremental Profile Method (**Technical Report 1**), calibrated using local monitoring data from Longwall 11 at the South Bates Underground Mine, Longwalls 1 to 6 at the North Wambo Underground Mine and from other nearby collieries in the Hunter Coalfield.

Ground movements measured along the 7XL-Line and 8XL-Line above Longwalls 11 to 13 at the South Bates Underground Mine and Longwall 17 at the South Bates Extension Underground Mine were also considered by MSEC (**Technical Report 1**). The observed profiles of subsidence, tilt and curvature along the 7XL-Line and 8XL-Line, reasonably match those predicted using the standard Incremental Profile Method for the Hunter Coalfield.

Based on the comparisons, it was found that the standard Incremental Profile Method for the Hunter Coalfield provides reasonable predictions of subsidence, tilt and curvature, for the longwall mining conditions at the South Bates Extension Underground Mine (**Technical Report 1**). It was considered, therefore, that the Incremental Profile Method provides predictions that are consistent with the measurements and that it was not necessary to re-calibrate the model based on the monitoring data for the Whybrow Seam.

Comparison with Previous Predictions of Subsidence Effects

Predicted subsidence parameters for Longwalls 17 to 25 were provided in the subsidence assessment prepared by MSEC (2017) in the South Bates Extension Modification EA (WCPL, 2017).

MSEC (2020) presents subsidence predictions based on Longwalls 21 to 24 (Technical Report 1). As discussed in Section 1.3 there have been small changes to the longwall layout between MSEC (2017) and MSEC (2020) which considers shortened finishing ends for Longwalls 17 to 24 and shortened commencing ends for Longwalls 19 and 20 (**Technical Report 1**).

The latest subsidence predictions for the Extraction Plan are shown on **Figure 7**.

The maximum vertical subsidence predicted by MSEC (**Technical Report 1**) is 1,950 mm, which is the same as the maxima presented in the South Bates Extension Modification EA (WCPL, 2017). The maximum tilt predicted by MSEC (**Technical Report 1**) (85 mm/m) is less than the maxima presented in the South Bates Extension Modification EA (WCPL, 2017) (90 mm/m).

Predicted Subsidence Impacts

Subsidence impacts predicted by MSEC (2017) above Longwalls 21 to 24 include:

- ground cracking above the longwalls with the greatest extent of cracking expected over the shallowest sections;
- potential for localised erosion of the ground surface depending on ground conditions, with the effects more prevalent in steeper terrain and along drainage flow paths; and
- alteration of existing surface drainage patterns with isolated ponding potentially occurring in low-lying areas overlying the longwalls.

The revised subsidence impacts predicted by MSEC (**Technical Report 1**) are consistent with, or less than, the predictions presented in the South Bates Extension Modification EA (WCPL, 2017). A summary of the changes to predictions and assessed levels of potential impact for environmental and built features is provided in Table 6.

Table 6
Changes to Predictions and Assessed Levels of Potential Impact as a Result of the Updated Longwall Layout

Issue/Feature	Summary of Changes as a Result of the Updated Longwall Layout	Extraction Plan Reference
Surface Water		
North Wambo Creek Diversion	• Direct subsidence impacts reduced in the areas no longer proposed for extraction above the previous finishing ends of Longwalls 17 to 24. • No changes in grade along the North Wambo Creek Diversion predicted and accordingly, no increased ponding predicted. • Topographical depressions previously predicted over the finishing ends of Longwalls 17 to 20 (managed in a previous Extraction Plan) are now predicted to develop coinciding with an existing farm dam. • Increased connectivity between the workings and the North Wambo Creek Diversion is no longer predicted.	Refer to the WMP and **Technical Report 3** for more detail.
North Wambo Creek	• Direct subsidence impacts reduced in the areas no longer proposed for extraction above the previous finishing ends of Longwalls 17 to 24. • It is possible for a meander cutoff to develop across Longwalls 23 and 24 pillar towards the finishing (north-eastern) end of the panels.	
Ephemeral Drainage Lines	• Direct subsidence impacts reduced in the areas no longer proposed for extraction above the previous finishing ends of Longwalls 17 to 24. • Existing drainage bund overlying Longwalls 17 to 20 (managed in a previous Extraction Plan) now predicted to be overtopped in only one location (instead of two). As a result, only one batter chute is predicted to be required for management of overland flow into the North Wambo Creek Diversion.	
Groundwater		
Permian Aquifers	• No change.	Refer to the WMP for more detail.

Table 6 (Continued)
Changes to Predictions and Assessed Levels of Potential Impact as a Result of the Updated Longwall Layout

Issue/Feature	Summary of Changes as a Result of the Updated Longwall Layout	Extraction Plan Reference
Land		
Land Use	• Direct subsidence impacts reduced in the areas no longer proposed for extraction above the previous finishing ends of Longwalls 17 to 24.	Refer to the LMP for more detail.
Land Capability	• Direct subsidence impacts reduced in the areas no longer proposed for extraction above the previous finishing ends of Longwalls 17 to 24.	
Steep Slopes	• No change.	
Wollemi National Park Escarpment and Intermediate Level Cliffs	• No change.	
Low Level Cliffs	• No change.	
Land in General	• Direct subsidence impacts reduced in the areas no longer proposed for extraction above the previous finishing ends of Longwalls 17 to 24.	
Biodiversity		
Flora	• Direct subsidence impacts reduced in the areas no longer proposed for extraction above the previous finishing ends of Longwalls 17 to 24. • Based on the previous layout of Longwalls 17 to 24, there was a predicted increase in the area of topographic depressions, potentially leading to increased ponding of water on the surface (and subsequently resulting in vegetation death in ponded areas). The only location predicted to experience increased topographic depressions as a result of the updated layout (shortened finishing ends) coincides with an existing farm dam. It is not anticipated, therefore, that increased ponding (resulting in vegetation death) would occur based on this layout.	Refer to the BMP for more detail.
Fauna	• No change.	
Aquatic Ecosystems	• No changes in grade along the North Wambo Creek Diversion predicted and accordingly, no increased ponding predicted.	
Wollemi National Park	• No change.	
Aboriginal Cultural Heritage		
Rock shelters with PAD	• No change.	Refer to the HMP for more detail.
Scarred Tree	• No change.	
Open Artefact Sites	• Direct subsidence impacts to Open Artefact Site 231 reduced. • No change to other Open Artefact Sites.	
Historic Heritage		
Whynot Homestead	• No change.	Refer to the HMP for more detail.
Built Features		
WCPL Assets	• Direct subsidence impacts reduced to WCPL assets in the areas no longer proposed for extraction above the previous finishing ends of Longwalls 17 to 24.	Refer to the BFMP for more detail.
Public Safety		
Public Safety	• No change.	Refer to the PSMP for more detail.

2.1.2 Potential Environmental Consequences

Detailed discussion of potential environmental consequences is provided in the component management plans in **Appendices A to F** and summarised in **Section 3**.

Review of Potential Environmental Consequences to Groundwater

A groundwater assessment review, supported by review of numerical model outputs and monitoring data, was prepared by SLR (2020) as part of the Extraction Plan for Longwalls 21 to 24 (**Technical Report 2**).

The groundwater assessment review considered the cumulative predicted impacts on groundwater during the period of extraction of Longwalls 21 to 24 (**Technical Report 2**).

Following a review of monitoring data, SLR (**Technical Report 2**) concluded that revision of the potential cumulative environmental consequences for groundwater is not required. Of note to Longwalls 21 to 24, SLR (**Technical Report 2**) concluded:

- Groundwater drawdowns of up to 200 m are expected in the Whybrow Seam, due to extraction of Longwalls 21 to 24.
- Extraction of Longwalls 21 to 24 would not have a significant impact on water levels in the Permian coal measures from a regional perspective due to the regional zone of depressurisation within the Permian coal measures created by historical and ongoing open cut and underground mining.
- Minor additional leakage from the natural North Wambo Creek is predicted due to extraction of Longwalls 21 to 24, however, surface remediation is required to maintain the long-term flow regime along North Wambo Creek. This is dependent on surface water flows, with flows along North Wambo Creek dependent on peak rainfall periods.
- There are no private registered bores that would be likely to be affected by 2 m drawdown or more as a result of the incremental impacts of Longwalls 21 to 24.

Review of Potential Environmental Consequences to Surface Water

An assessment of the potential subsidence effects and impacts on the North Wambo Creek, North Wambo Creek Diversion and ephemeral drainage lines was prepared by MSEC (**Technical Report 1**) as part of the Extraction Plan. Alluvium (**Technical Report 3**) has undertaken detailed modelling to further quantify the environmental consequences and to design appropriate mitigation works to minimise the potential for increased scour or increased sediment loads in consideration of the subsidence effects predicted by MSEC (**Technical Report 1**).

North Wambo Creek Diversion

The North Wambo Creek Diversion is located 330 m north-east of Longwall 22 (at its closest point to Longwalls 21 to 24). MSEC (**Technical Report 1**) predicts that, at this distance, the extraction of Longwalls 21 to 24 would result in maximum vertical subsidence to the North Wambo Creek Diversion of less than 20 millimetres (mm). While the North Wambo Creek Diversion could experience very low levels of subsidence, it is not expected to experience measurable tilts, curvatures or strains. This is consistent with previous subsidence effect predictions.

Potential direct (1st order) subsidence impacts to the North Wambo Creek Diversion are considered unlikely as a result of extracting Longwalls 21 to 24 (MSEC, 2020).

Modelling by Alluvium (**Technical Report 3**) concluded that potential geomorphic impacts may occur as a result of further reduction of bedload sediment transport into North Wambo Creek Diversion, increasing erosion potential, should flow actually get to the diversion. The potential for flow to reach the diversion will be reduced.

North Wambo Creek (Upstream of the North Wambo Creek Diversion)

North Wambo Creek is located directly above Longwalls 23 and 24, with a total length of 1.2 km to experience direct subsidence as a result of the extraction of the longwalls. It is noted that, due to the shortened finishing ends of the longwalls, the length of creek above Longwalls 23 and 24 has reduced by approximately 0.3 km compared to the previous layout considered in WCPL (2017).

Approved subsidence impacts and environmental consequences on North Wambo Creek include the creation of ephemeral or semi-permanent pools, changes in grade, potential for flow diversion and cracking of surface soil and underlying rock (WCPL, 2017).

Potential environmental consequences to the North Wambo Creek Diversion were reviewed by MSEC (**Technical Report 1**) and Alluvium (**Technical Report 3**).

Potential direct (1st order) subsidence impacts to the North Wambo Creek include (MSEC, 2020):

- Surface cracking and heaving above Longwalls 23 and 24 (similar to that observed above Longwall 11) and minor cracking along the section of the North Wambo Creek not located directly above the longwalls.
- Changes in grade along the North Wambo Creek.
- Creation of two topographical depressions along the North Wambo Creek directly above Longwalls 23 and 24. The depressions are estimated to be up to 1.4 m deep, with overall lengths up to 300 m.
- Potential for increased connectivity between the workings and the North Wambo Creek (noting that an increase in water make in the workings was not observed during the extraction of Longwalls 11 to 16 or Longwall 17 beneath the North Wambo Creek Diversion).

Alluvium (**Technical Report 3**) undertook detailed modelling to further quantify the environmental consequences described in the South Bates Extension Modification EA (WCPL, 2017) and to design appropriate mitigation works to minimise the potential for increased scour or increased sediment loads.

Modelling by Alluvium (**Technical Report 3**) concluded that the extraction of Longwalls 21 to 24 will increase in-channel storage when compared to existing conditions. As well as increasing in-channel storage, the subsidence of Longwalls 21 to 24 will result in ponding of water at the north-eastern ends of all of the panels.

Modelling also identified that a possible meander cutoff could develop across the Longwalls 23 and 24 pillar towards the finishing (north-eastern) end of the panels. Alluvium (**Technical Report 3**) concluded that, if the meander cutoff were to form, the length of North Wambo Creek would be decreased by 150-200 m, therefore increasing the channel grade. However erosion of an elevated section of bed over the Longwalls 23 and 24 pillar is likely to occur, which would reinstate flows down the existing North Wambo Creek channel (Alluvium, 2020).

In accordance with the suggestions made by Alluvium (**Technical Report 3**), WCPL proposes to monitor this area of North Wambo Creek following completion of subsidence of Longwalls 23 and 24 to identify if stream bank and bed stabilisation measures need to be implemented.

The impact of Longwalls 21 to 24 (including Longwalls 17 to 20) on flow from a pure surface water perspective in North Wambo Creek is relatively small and is estimated to result in a reduction in flow volume of 8.7% for a 2 year Annual Recurrence Interval rainfall event.

WCPL proposes to maintain any in-channel ponding, as it results in minimal impacts on flows in North Wambo Creek, and works to allow free drainage of the pools would require significant disturbance of the North Wambo Creek.

Alluvium (**Technical Report 3**) considers that an increase in suspended sediments in North Wambo Creek and North Wambo Creek Diversion is possible from increased erosion, however management measures can be put in place to reduce the risk of an increase in suspended sediments to negligible.

SLR (**Technical Report 2**) estimates that increased leakage from the North Wambo Creek to the underground workings could conservatively be up to 0.19 megalitres per day (ML/day) (69 ML/year) during periods of flow prior to remediation. As outlined in the SWMP, monitoring of flows on North Wambo Creek is undertaken at two sites upstream of the North Wambo Creek Diversion (US FM1 and FM1).

Until February 2020, no flow events had been recorded at US FM1 since its installation in December 2017. US FM1 flowed for 18 days between 9 February and 27 February 2020. This equates to flow being recorded at US FM1 on North Wambo Creek approximately 8 days per year (on average). It should be noted that this is heavily influenced by the extended period of flow recently observed in February 2020, following drought conditions.

Flow events at FM1 have been recorded a total of 72 times since its installation in 2008 (it should be noted that these events primarily occurred between 2008-2009 and between 2015-2016, with three events recently recorded from 9 February to 11 February 2020). This equates to flow being recorded at FM1 on North Wambo Creek approximately 6 days per year (on average).

Management and remediation measures to mitigate the risk of scour and leakage associated with Longwalls 21 to 24 are summarised in **Section 3.1**.

Other Ephemeral Drainage Lines

The unnamed ephemeral drainage lines above Longwalls 21 to 24 have shallow incisions into the natural surface soils, with some isolated bedrock outcropping along the upper reaches (WCPL, 2017).

Potential subsidence impacts and environmental consequences on ephemeral drainage lines identified in the South Bates Extension Modification EA (WCPL, 2017) included:

- development of topographical depressions and potential for ponding in areas of low topographic relief (i.e. above the north-eastern ends of the longwall panels); and
- cracking of surface soil and underlying rock that may result in temporary changes in surface flow and/or sediment loads prior to remediation.

No significant change is expected in the water quality in the ephemeral drainage lines as a result of the South Bates Extension Underground Mine (WCPL, 2017).

Alluvium (**Technical Report 3**) undertook detailed modelling to further quantify the impacts described in the South Bates Extension Modification EA (WCPL, 2017) and to design appropriate mitigation works to minimise the potential for increased scour or increased sediment loads.

Surficial and subsurface erosion responses can be expected where cracks occur as a result of Longwalls 21 to 24 in colluvial and alluvial sediments (Alluvium, 2020). The sediments across this terrain above Longwalls 21 to 24 can be dispersive, which makes them prone to changes in rates of erosion (Alluvium, 2020).

The geometry of flow paths towards North Wambo Creek and North Wambo Creek Diversion would also change as a result of Longwalls 21 to 24 (Alluvium, 2020). The changes in flow paths have been identified by Alluvium (2020) based on the software CatchmentSIM using the predicted subsidence digital terrain model (DTM).

Without appropriate mitigation measures, the changes in flow paths may result in the streamlines over Longwall 23 becoming discontinuous at the northern extent of the panel with no defined entry point into North Wambo Creek. This indicates that ponding will occur in this area and creation of a new flow entry point, which will potentially lead to erosion (headcut) where it enters North Wambo Creek. Mitigation measures to manage this risk are summarised in **Section 5** and described in detail in Alluvium (2020).

2.2 RISK ASSESSMENT

A Subsidence Risk Assessment (Risk Mentor, 2020) for Longwalls 21 to 24 was undertaken to identify subsidence impacts with high risk levels and/or potentially severe consequences, including a workshop conducted in February 2020. The workshop was facilitated by a risk assessment specialist and attended by relevant WCPL personnel and technical specialists. The Subsidence Risk Assessment is provided as **Technical Report 4** of the Extraction Plan.

With the implementation of the identified controls, the risk assessment team consensus was that subsidence related impacts over Longwalls 21 to 24 could be managed at a tolerable level of risk (**Technical Report 4**).

A summary of the key potential consequences/hazards associated with Longwalls 21 to 24, as identified in the risk assessment workshop, is provided in **Table 7**. The table also provides a cross-reference to where these key potential consequences/hazards have been addressed in the Extraction Plan.

Table 7
Key Potential Consequences/Hazards Identified by the Subsidence Risk Assessment

Subject Area	Potential Consequence/Hazard	Extraction Plan Reference
Natural Features	Impacts to downstream water quality as a result of subsidence.	**Section 3.1** and WMP (**Appendix A**)
	Failure of the monitoring program to detect and respond to an impact on the groundwater system.	
	Induced leakage from North Wambo Creek (natural and diverted sections) due to subsidence.	
	Environmental consequences associated with water flow and quality changes in unnamed minor drainage lines resulting from subsidence impacts associated with the extraction of Longwalls 21 to 24.	
	Reduced base flow to North Wambo Creek and North Wambo Creek Diversion resulting from a lowering of the water table associated with the extraction of Longwalls 21 to 24.	
	Impacts on the North Wambo Creek Diversion arising from changes in bed-flow impact leading to erosion in downstream areas.	
	Licensing requirements for base flow water loss and confidence in modelled numbers to address licensing requirements for the whole complex.	

Table 7 (Continued)
Key Potential Consequences/Hazards Identified by the Subsidence Risk Assessment

Subject Area	Potential Consequence/Hazard	Extraction Plan Reference
Natural Features (cont.)	Potential for cracking enlargement in dispersive subsoils (where there are steep slopes).	**Section 3.1** and WMP (**Appendix A**)
	Potential for a change in the location of North Wambo Creek (due to a change in surface topography over Longwall 24).	
	Mine subsidence impacts resulting in impacts on vegetation along the North Wambo Creek.	**Sections 3.1 and 3.3**, WMP (**Appendix A**) and BMP (**Appendix C**)
	Unintended subsidence impacts resulting in rock instability of the Wollemi National Park escarpment and associated environmental consequences.	**Section 3.3** and BMP (**Appendix C**)
	Subsidence impacts on Remnant Woodland Enhancement Program (RWEP) areas and potential United Wambo Joint Venture Offset areas reducing biodiversity values.	
	Creation of subsidence repairs, monitoring or other tracks affects the conservation values of the RWEP areas and potential United Wambo Joint Venture Offset areas.	
	Subsidence impacts and surface disturbance due to extraction of Longwalls 21 to 24 resulting in long-term loss of native vegetation.	
	Subsidence impacts and surface disturbance due to extraction of Longwalls 21 to 24 resulting in loss of habitat for threatened species.	
	Commitment to return vegetation in creek diversion to riparian could be impacted by drawdowns and losses.	
	Exceedance of subsidence impact performance measure for the low level cliffs above longwalls.	**Section 3.2** and LMP (**Appendix B**)
	Subsidence impacts resulting in significant cracking and downslope movement of steep slopes and associated environmental consequences.	
	Subsidence impacts resulting in instability or rock fall of major or intermediate cliff lines and associated environmental consequence (i.e. lower level cliff lines and spur).	
Heritage	Potential impacts on rock shelters (three sites located directly above and one outside the extent of the longwalls).	**Section 3.4** and HMP (**Appendix D**)
Mine Infrastructure	Subsidence impacts to unsealed gravel access roads or fire trails.	**Section 3.5** and BFMP (**Appendix E**)
	Ingress of oxygen into mine workings as a result of subsidence cracking and subsequent spontaneous combustion events.	
	Subsidence impacts to WCPL power and communication lines.	
	Subsidence impact to fences on WCPL owned land.	
	Structural damage to wells and bores close to the mine footprint, in particular monitoring bores and other gas drainage infrastructure.	
	Impact on ventilation shaft MG21.	
	North Wambo Creek damaged by subsidence (surface cracking along diversion directly above Longwalls 23 and 24) resulting in inflow to workings and delay to operations.	**Section 3.1** and WMP (**Appendix A**)
Other	Controls and/or remediation that were committed to be implemented were not executed to a standard that meets regulator expectations and significant later works are required.	**Section 2.3** and MOP (**Appendix I**)
	Impacts on access for firefighting or fire management purposes over Longwalls 21 to 24.	**Section 3.6** and PSMP (**Appendix F**)

Source: After Risk Mentor (**Technical Report 4**).

2.3 CONSULTATION

Consultation is being conducted for the Extraction Plan in accordance with the requirements of the Development Consent (DA 305-7-2003) and in consideration of the Draft Extraction Plan Guidelines. Consultation with relevant stakeholders is described further below.

Evidence of WCPL's consultation process for the Extraction Plan is provided in **Attachment 2**.

The consultation approach for this Extraction Plan recognises the extensive consultation that has occurred recently in relation to the South Bates Extension Underground Mine for MOD 17 to DA 305-7-2003. This consultation included:

- meetings and correspondence with State Government agencies to obtain input on the proposed management approaches;
- consultation with registered Aboriginal parties in accordance with the Office of Environment and Heritage (OEH) policy *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (NSW Department of Environment, Climate Change and Water [DECCW], 2010);
- a public exhibition process for the South Bates Extension Modification EA between March and May 2017; and
- a public meeting held by the NSW Planning Assessment Commission in December 2017.

The layout and timing of Longwalls 21 to 24 has not changed significantly compared to the layout and timing presented and assessed in the South Bates Extension Modification EA.

2.3.1 Government Agencies

A summary of the consultation with government agencies and the key issues raised is provided in **Table 8**. Draft management plans were distributed for comment as summarised in **Table 9**. There are no 'affected public authorities' relevant to the Longwalls 21 to 24 Application Area, therefore the LMP was not distributed for comment.

Table 8
Summary of Consultation with Government Agencies

Agency	Consultation Conducted	Key Issues Raised
DPIE	• 28 February 2020 – endorsement of Extraction Plan team for Longwalls 21 to 24 and review of proposed approach to management of Extraction Plan process in relation to Phase 2 of the United Wambo Joint Venture Project. • July 2020 – provided with a copy of the Extraction Plan for Longwalls 21 to 24.	• No issues raised to date.
NSW Resources Regulator	• 2 May 2017 – submission on the South Bates Extension Modification EA raised no issues. • December 2017 – lodgement of MOP (2018-2020) including Longwalls 17 to 21. • January, February and March 2018 – consultation on first workings for Longwalls 17 to 21. • 1 February 2018 – approval of MOP (2018-2020). • 23 October 2019 – lodgement of MOP (2019-2020) including Longwalls 17 to 21. • 11 November 2019 – approval of MOP (2019-2020). • 29 May 2020 – WCPL requested confirmation that the first workings for Longwalls 22 to 24 were designed to be long-term stable and non-subsiding. • 7 July 2020 – the RR indicated satisfaction with the first workings for Longwall 22 to 24 (including minor change). • July 2020 – provided with a copy of the Extraction Plan for Longwalls 21 to 24.	• No issues raised to date.
NSW Environment Protection Authority (EPA)	• 2 May 2017 – submission on the South Bates Extension Modification EA raised no subsidence-related issues. • 3 March 2020 – consulted regarding proposed approach to management of Extraction Plan process in relation to Phase 2 of the United Wambo Joint Venture Project. • 20 March 2020 – provided with draft Water Management Plan. • 9 April 2020 – meeting to discuss water related matters (including the Longwalls 21 to 24 Extraction Plan). • July 2020 – provided with a copy of the Extraction Plan for Longwalls 21 to 24.	• No issues raised to date.
NSW Biodiversity and Conservation Division (BCD)	• 3 May 2017 – submission on the South Bates Extension Modification EA requested implementation of monitoring and management measures. • 20 March 2020 – draft revised BMP provided. • 23 March 2020 – draft revised HMP provided. • 3 May 2020 – BCD advised it would not be providing comments on the HMP. • 3 May 2020 – BCD provided comments on the draft revised BMP. • July 2020 – provided with a copy of the Extraction Plan for Longwalls 21 to 24, incorporating changes to address BCD comments.	• Revision of HMP in consultation with Aboriginal stakeholders (**Section 2.3.4** and **Appendix D**). • Allowance for offsets for unexpected mine subsidence events (**Section 3.3** and **Appendix C**). • Monitoring of cliffs associated with the Wollemi National Park escarpment (**Section 3.3** and **Appendix C**).

Table 8 (Continued)
Summary of Consultation with Government Agencies

Agency	Consultation Conducted	Key Issues Raised
Heritage Division, within BCD	• 2 May 2017 – submission on the South Bates Extension Modification EA requested a condition requiring archival recoding of the Whynot homestead and outbuildings. • July 2020 – provided with a copy of the Extraction Plan for Longwalls 21 to 24.	• Archival recoding of the Whynot homestead and outbuildings (**Section 3.4**).
DPIE – Water (also NSW Natural Resources Access Regulator [NRAR])	• January 2017 – provided with Water Management Plan for Longwalls 11 to 16. • 29 June 2017, 12 October 2017, 2 November 2017 – submissions on the South Bates Extension Modification EA and Responses to Submissions. • 3 March 2020 – consulted regarding proposed approach to management of Extraction Plan process in relation to Phase 2 of the United Wambo Joint Venture Project. • 20 March 2020 – provided with draft Water Management Plan. • 9 April 2020 – meeting to discuss water related matters (including the Longwalls 21 to 24 Extraction Plan). • July 2020 – provided with a copy of the Extraction Plan for Longwalls 21 to 24.	• Augmentation of the surface water and groundwater monitoring programs (**Section 3.1** and **Appendix A**). • Impacts on groundwater dependent ecosystems on the natural section of North Wambo Creek (refer **Section 3.1** and **Attachment 3**). • Accounting of passive take of water against licences held/required (refer Section 1.4 of the GWMP in **Appendix A**).
Department of Primary Industries – Fisheries (DPI Fisheries)	• 29 June 2017 – submission on South Bates Extension Modification EA from DPI included no concerns raised by DPI Fisheries. • July 2020 – provided with a copy of the Extraction Plan for Longwalls 21 to 24.	• No issues raised to date.
Subsidence Advisory NSW	• 6 July 2017 – submission on South Bates Extension Modification EA raised no issues. • July 2020 – provided with a copy of the Extraction Plan for Longwalls 21 to 24.	• No issues raised to date.
Singleton Shire Council	• February 2018 – received a briefing on South Bates Extension Underground Mine. • March 2018 – received a copy of the South Bates Extension Modification EA. • July 2020 – provided with a copy of the Extraction Plan for Longwalls 21 to 24.	• No issues raised to date.

Table 9
Management Plans Distributed for Comment

Management Plan	Agencies	Date Distributed
Water Management Plan (WMP)	DPIE-Water, EPA, NRAR	20 March 2020
	DPIE, DPIE-Water, EPA	July 2020
Biodiversity Management Plan (BMP)	BCD, AWE	20 March 2020
	DPIE, BCD	July 2020
Heritage Management Plan (HMP)	Registered Aboriginal Parties	23 March 2020
	BCD, Heritage Division (BCD)	23 March 2020
	DPIE, BCD, Heritage Division (BCD)	July 2020
Subsidence Monitoring Program (SMP)	NSW Resources Regulator	July 2020

AWE = Commonwealth Department of Agriculture, Water and the Environment.

2.3.2 Infrastructure Owners

All infrastructure within the Longwalls 21 to 24 Application Area is owned by WCPL and there are no other relevant infrastructure owners.

2.3.3 Public Consultation

The consultation approach for the Extraction Plan reflects that the Application Area is wholly within WCPL-owned land.

The Community Consultative Committee (CCC) was consulted during the preparation of the South Bates Extension Modification EA (DA 305-7-2003 MOD 17) and receive regular updates on the current status of underground mining operations at the Wambo Coal Mine.

An electronic copy of the Extraction Plan will be distributed to the members of the CCC for consultation purposes and the final Extraction Plan will be placed on the WCPL website.

2.3.4 Consultation with Aboriginal Stakeholders

Aboriginal stakeholders were consulted on the management of Aboriginal sites associated with Longwalls 21 to 24 through the preparation of an Aboriginal Cultural Heritage Assessment (ACHA) that accompanied the South Bates Extension Modification EA (DA 305-7-2003 MOD 17) and associated application for an AHIP (AHIP #C0003213). Consultation for the ACHA and AHIP was conducted in accordance with the OEH policy *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (DECCW, 2010) and Condition B87, Schedule 2 of the Development Consent (DA 305-7-2003).

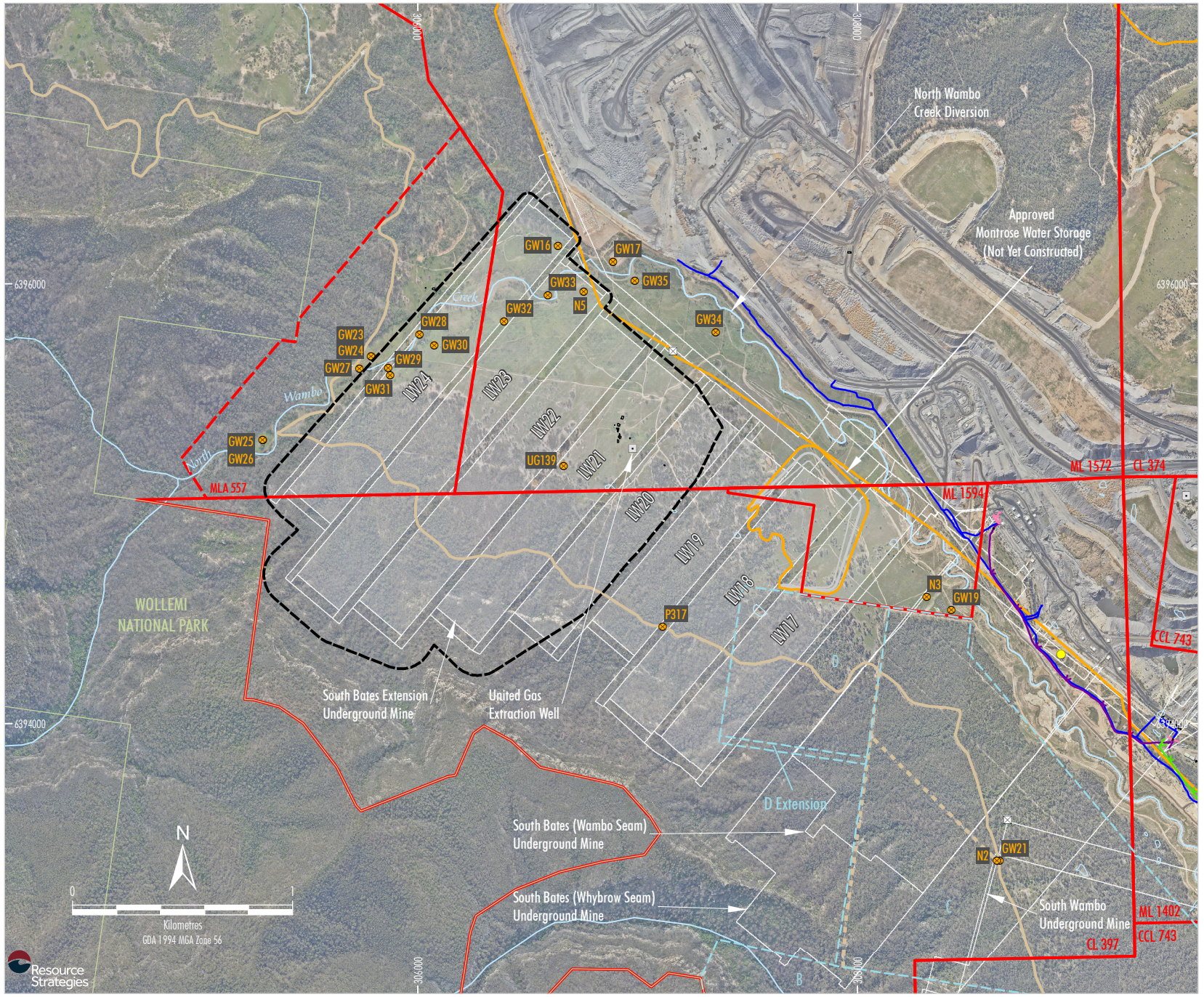
A draft version of the complex-wide HMP (incorporating management associated with Longwalls 21 to 24) was provided to Aboriginal parties registered at the Wambo Coal Mine in March 2020 for their review and comment (**Appendix D**). No comments from Aboriginal parties were received.

3 SUBSIDENCE MANAGEMENT AND MONITORING

Surface and sub-surface features within, or in the vicinity of, the Longwalls 21 to 24 Application Area are listed in **Table 10**. These features may be potentially impacted by the secondary extraction of Longwalls 21 to 24. The locations of built features are shown in **Figure 9** and environmental features are shown in **Figures 3 and 10**. Descriptions of each of these features are contained within the relevant management plan referenced in **Table 10**.

Table 10
Surface and Sub-surface Features

Feature	Section/Management Plan Reference
Natural Features	
North Wambo Creek	**Section 3.1** and WMP (**Appendix A**)
Permian aquifers	
Ephemeral drainage lines	
Threatened and protected species	**Section 3.3** and BMP (**Appendix C**)
Natural vegetation	
Low level cliffs	**Section 3.2** and LMP (**Appendix B**)
Intermediate level cliffs	
Cliffs associated with the Wollemi National Park escarpment	
Steep slopes	
Farm Land and Facilities	
Use of WCPL-owned land for agistment	**Section 3.2** and LMP (**Appendix B**)
Fences and gates	
Mine Infrastructure	
North Wambo Creek Diversion	**Section 3.1** and WMP (**Appendix A**)
11 kilovolt (kV) powerline	**Section 3.5** and BFMP (**Appendix E**)
Ventilation shaft for South Bates Extension Underground Mine	
Groundwater monitoring bores	
Montrose West Open Cut pit walls and emplacement areas	
Fences	
Exploration bores and gas wells	
Roads (all types)	
Wells or bores	
Farm dams	
Exploration plant that may be located in the area	
Drainage culverts	
Farm buildings or sheds	
Tanks	
House (Whynot Homestead)	**Section 3.4** and HMP (**Appendix D**)
Areas of Archaeological and/or Heritage Significance	
Artefact scatters, isolated finds	**Section 3.4** and HMP (**Appendix D**)
Rock shelters with potential archaeological deposits (PADs)	
Scarred trees	



LEGEND

- Mining and Coal Lease Boundary
- Mining Lease Application Boundary
- National Park Boundary
- Existing/Approved Surface Development Area
- Approved Underground Development
- Ventilation Shaft
- Remnant Woodland Enhancement Program (RWEP) Area
- Extraction Plan Application Area
- Fire Trail
- Access Track
- 11 kV Power Line
- 11 kV Power Line Buried
- 66 kV Power Line and Fibre Optic Cable
- Surface Water Supply/Dewatering Pipeline
- Buildings
- Dams
- Groundwater Monitoring Site
- Gas Riser 01

Source: WCPL (2020, 2016); NSW Spatial Services (2019)
Orthophoto: WCPL (May 2019)

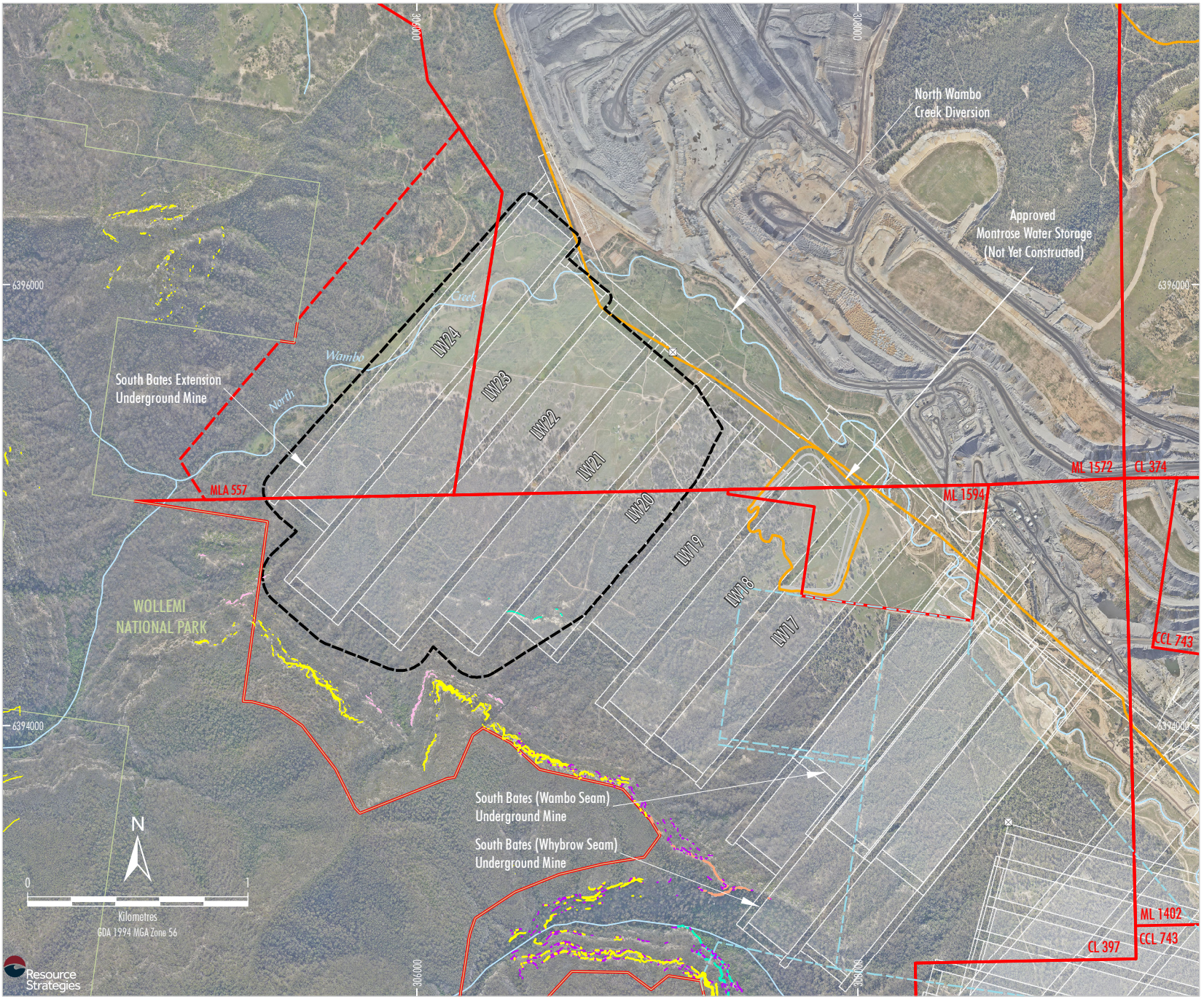
Peabody

WAMBO COAL MINE

Location of Built Features

Figure 9

WAM-09-15_SBX EP_LW21-24_206D



LEGEND

- Mining and Coal Lease Boundary
- Mining Lease Application Boundary
- National Park Boundary
- Existing/Approved Surface Development Area
- Approved Underground Development
- Ventilation Shaft
- Remnant Woodland Enhancement Program (RWEP) Area
- Extraction Plan Application Area

Cliffs

- Cliffs associated with Wollemi National Park Escarpment
- Intermediate Level Cliffs
- Low Level Cliffs
- Spur
- Minor Cliffs

Source: WCPL (2020); MSEC (2020); NSW Spatial Services (2019)
Orthophoto: WCPL (May 2019)

Peabody

WAMBO COAL MINE

Cliffs in the Vicinity of Longwalls 21 to 24

Figure 10

WAM-09-15_SBX EP_LW21-24_207C

The Longwalls 21 to 24 Application Area is located wholly within the Patrick Plains Mine Subsidence District (proclaimed 2 July 1980 and revised on 7 July 2017). Fences, gates, and tracks are the only man-made structures in the Longwalls 21 to 24 Application Area known to have been constructed prior to the declaration of the Mine Subsidence District.

The Longwalls 21 to 24 Application Area is wholly within WCPL-owned land and there are no relevant proposed developments within the Application Area proposed by other parties.

Wollemi National Park (and its escarpment) may be considered an area of environmental sensitivity. Longwalls 21 to 24 would meet the performance measures of negligible subsidence impacts and negligible environmental consequences for the Wollemi National Park.

Subsidence predictions and impact assessments for surface and sub-surface features have been provided in **Technical Report 1**. Management and monitoring actions for each feature are included in management plans as indicated in **Table 10** and summarised in **Sections 3.1 to 3.7**.

The component management plans to this Extraction Plan form part of WCPL's Environmental Management System for the Wambo Coal Mine as shown on **Figure 4**. In order to avoid duplication of existing Environmental Management Plans, these management plans reference components of the following existing plans:

- Site Water Management Plan, including:
  - Surface Water Monitoring Program (SWMP) (Version 12);
  - Groundwater Monitoring Program (GWMP) (Version 12);
  - Surface and Groundwater Response Plan (SGWRP) (Version 12); and
  - Erosion and Sediment Control Plan (ESCP) (Version 10).
- Biodiversity Management Plan (BMP) (complex-wide consolidated plan) (revisions to this plan proposed as part of this Extraction Plan revision) (Version 1).
- Heritage Management Plan (HMP) (complex-wide consolidated plan) (revisions to the plan proposed as part of this Extraction Plan revision) (Version 1).
- Health Safety Management System (HSMS) as summarised in the HSMS Overview.

Following approval of the United Wambo Joint Venture Project (Modification 16) in 2019, DPIE issued a revised Development Consent (DA 305-7-2003) for the Wambo Coal Mine. In accordance with Condition B66, Schedule 2 of DA 305-7-2003, WCPL is preparing a contemporary Water Management Plan, including a Site Water Balance, Salt Balance, Erosion and Sediment Control Plan, Surface Water Management Plan and Groundwater Management Plan[1].

As these plans are still in preparation, and to avoid duplication of existing Environmental Management Plans, this Extraction Plan references components of the existing WCPL Site Water Management Plan and associated plans. When the Surface Water Management Plan and Groundwater Management Plan have been completed and approved by the relevant agencies in accordance with the Development Consent (DA 305-7-2003), this Extraction Plan will be updated accordingly.

[1] It is noted that sections of the existing plans will be out of date, including references to the Development Consent (DA 305-7-2003). This is not considered to be likely to result in any issues as the changes required for the new Water Management Plan largely revolve around the removal of aspects related to the open cut (as a result of the determination of the United Wambo Joint Venture Project).

It should be noted that a SGWRP is no longer required by the Development Consent (DA 305-7-2003). When the Surface Water Management Plan and Groundwater Management Plan are completed, the SGWRP will be removed. Relevant components of the SGWRP will be included in the Surface Water Management Plan and the Groundwater Management Plan.

A summary of the proposed monitoring for the Extraction Plan is provided in **Section 3.8**.

3.1 WATER MANAGEMENT

3.1.1 Overview

The WMP is provided in **Appendix A**. The purpose and scope of the WMP are summarised below:

Purpose: Management of potential environmental consequences of the proposed secondary workings described in the Extraction Plan on water resources.

Scope: Surface water resources, groundwater resources and flooding within the Longwalls 21 to 24 Application Area (**Figure 3**).

The WMP references components of the SWMP, GWMP and SGWRP.

3.1.2 Key Water Issues, Monitoring and Management Measures

The key issues relating to subsidence impacts on surface water resources, groundwater resources and flooding described in the WMP and the relevant monitoring and management measures are summarised in **Table 11**.

The WMP addresses monitoring and management measures for ephemeral drainage lines in the Longwalls 21 to 24 Application Area.

The WMP also address monitoring and management measures for the North Wambo Creek and North Wambo Creek Diversion, a constructed water control structure for the Wambo Coal Mine. A summary of potential impacts on North Wambo Creek and North Wambo Creek Diversion is provided in **Section 2.1.2**, with further detail provided by Alluvium (**Technical Report 3**).

Alluvium (2020) reviewed the current subsidence and diversion monitoring program in the SWMP and recommended the installation of six additional subsidence and diversion monitoring points and nine additional groundwater monitoring sites (GW27 to GW35) along North Wambo Creek.

SLR (2020) reviewed the current groundwater monitoring program and concluded it provides appropriate and sufficient coverage for Longwalls 21 to 24, but included recommendations for ongoing review of the condition of the bores to ensure bores are not impacted by subsidence. The bores should be remediated/replaced as required, to maintain a long-term monitoring network.

As required by Condition B65, Schedule 2 of the Development Consent (DA 305-7-2003), this Extraction Plan takes into account the findings of the Groundwater Dependent Ecosystem Study required under Condition B64, Schedule 2 of the Development Consent (DA 305-7-2003) and the monitoring results obtained to date from GW23, GW24, GW25, GW26, P317 and UG139.

If monitoring results that indicate a change to the monitoring or management program for the South Bates Extension Underground Mine are obtained prior to the extraction of Longwall 23 from these monitoring sites or the additional monitoring sites that WCPL will install along North Wambo Creek, this Extraction Plan would be updated accordingly.

3.1.3 Assessment of Performance Indicators and Measures

Performance indicators developed for the subsidence impact performance measures relating to water are presented in the WMP and are summarised in **Table 12**. Monitoring conducted to inform the assessment of the extraction of Longwalls 21 to 24 against these performance indicators is summarised in **Section 3.8** and **Appendix H**.

The procedure followed to assess the extraction of Longwalls 21 to 24 against the performance indicators and performance measures is outlined in **Figure 11** and described in detail in **Appendix A**.

3.1.4 Contingency Plan

In the event that the subsidence impact performance measures relating to water, summarised in **Table 12**, are considered to have been exceeded or are likely to be exceeded, WCPL will implement a Contingency Plan as described in **Section 4.1**. Potential contingency measures for the performance measures relating to water are outlined in **Table 12**.

Table 11
Water Management Issues Associated with the Extraction of Longwalls 21 to 24

Issue	Approved Impact	Revised Impact	Monitoring	Management
Surface Water				
North Wambo Creek	• Creation of ephemeral or semi-permanent pools.[1] • Potential for surface cracking above Longwalls 23 and 24 (similar to that observed above Longwall 11) and minor cracking along the section of the North Wambo Creek not located directly above the longwalls.[1] • Potential for changes in grade and increased scour (and associated suspended solids) prior to the implementation of scour protection works.[1] • Potential for increased leakage from the North Wambo Creek prior to crack remediation works.[1]	• Potential for surface cracking and heaving above Longwalls 23 and 24 (similar to that observed above Longwall 11) and minor cracking along the section of the North Wambo Creek not located directly above the longwalls.[2, 3] • Creation of two topographical depressions along the North Wambo Creek directly above Longwalls 23 and 24. The depressions are estimated to be up to 1.4 m deep, with overall lengths up to 300 m.[2, 3] • Potential for increased connectivity between the workings and the North Wambo Creek.[2, 3] • Possible meander cutoff could develop across the Longwalls 23 and 24 pillar towards the finishing (north-eastern) end of the panels.[2, 3]	• Monitoring of subsidence in accordance with the Subsidence Monitoring Program (**Appendix H**). • Subsidence and diversion monitoring program in accordance with the SWMP, including: - surface water quality and flow monitoring; - monitoring of the Index of Diversion Condition (IDC); - Landscape Function Analysis (LFA) monitoring; - riparian vegetation assessment; - aerial photography analysis; - analysis of long and cross-section surveys; and - reviews of the geomorphic condition and assessment of efficacy of subsidence management or rehabilitation works. • Monitoring in accordance with the GWMP, including inflows to underground workings. • Weekly visual inspections when extraction is occurring within 100 m of North Wambo Creek. • Visual inspection of surface areas which required remediation in accordance with the LMP (**Appendix B**).	• Stockpile sufficient materials and make equipment and necessary resources available for sealing any surface cracks (particularly in areas that are predicted to be ponded) and installation of scour protection works. • Remediation of surface cracks along North Wambo Creek and in other areas where practicable using conventional earthmoving equipment. • Installation of scour protection works in areas that may be vulnerable to scour following completion of subsidence. • Stabilisation of any areas of surface cracking or erosion, using erosion protection measures (e.g. vegetation planting). • Review of remediation measures and implementation of additional measures if required. • Review of areas that may be vulnerable to instabilities along North Wambo Creek and North Wambo Creek Diversion and implementation of vegetation management and channel stabilisation measures if necessary. • Implementation of the SGWRP.

Table 11 (Continued)
Water Management Issues Associated with the Extraction of Longwalls 21 to 24

Issue	Approved Impact	Revised Impact	Monitoring	Management
Surface Water (continued)				
Ephemeral Drainage Lines	• Localised increased ponding and surface cracking.[1]	• Impacts resulting from the extraction of Longwalls 21 to 24 will be consistent with those presented in the South Bates Extension Modification EA.[2, 3]	• Visual inspection of drainage line flow paths for evidence of erosion or channelisation following a rainfall event of greater than 40 mm in 24 hours.[5]	• Implementation of the SGWRP. • Post-subsidence assessment of impacts to Stony Creek and other ephemeral drainage lines and implementation of any minor remedial works.
Groundwater				
Permian Aquifers	• Dewatering of the Permian aquifer and lowering of groundwater levels.[1] • Impact on Permian water quality through mining will not be detrimental to the area.[1]	• Impacts resulting from the extraction of Longwalls 21 to 24 will be consistent with those presented in the South Bates Extension Modification EA.[4]	• Monitoring in accordance with the GWMP.	• Implementation of the SGWRP.

1 After the South Bates Extension Modification EA (WCPL, 2017).

2 After Alluvium (**Technical Report 3**).

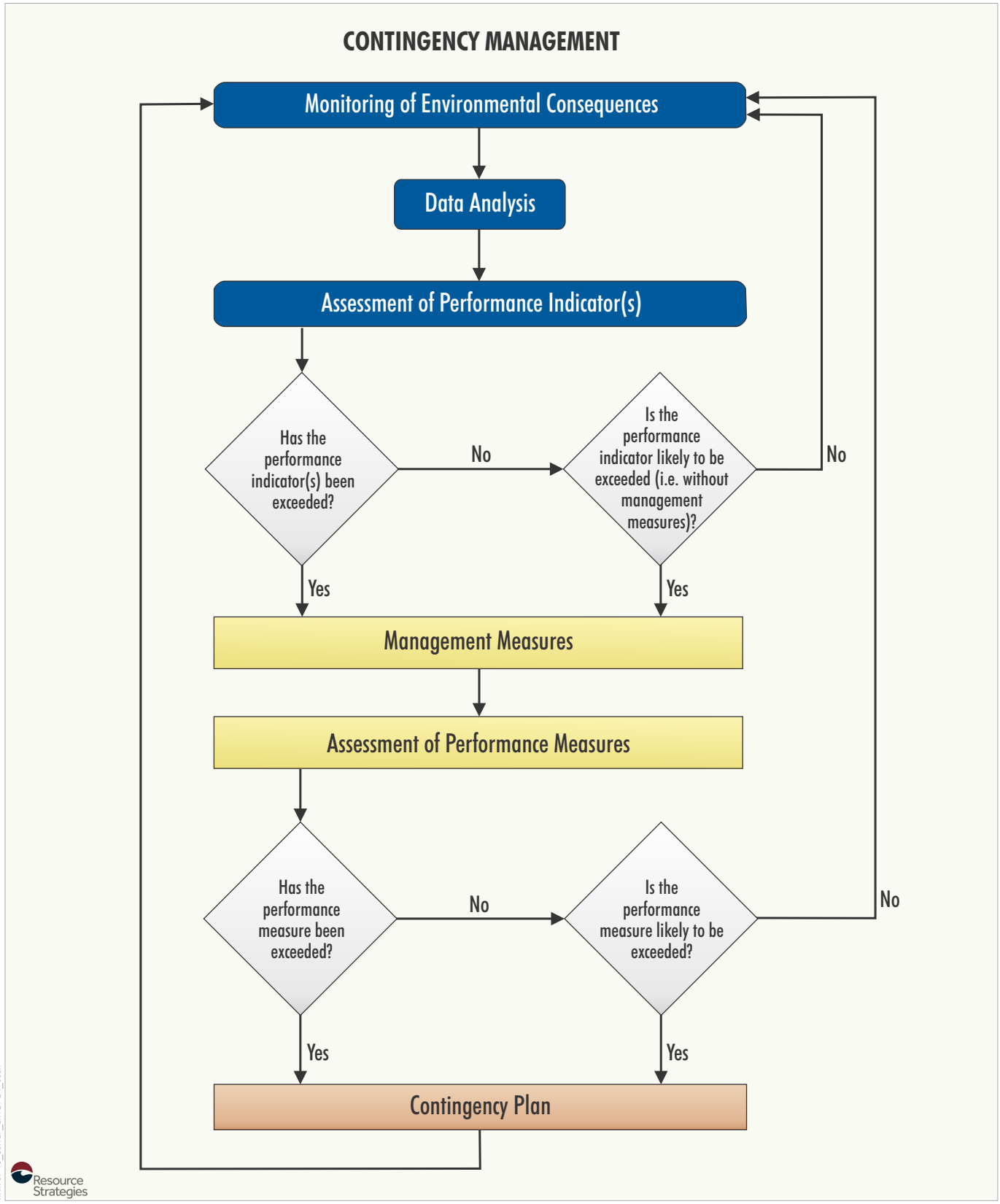
3 After MSEC (**Technical Report 1**).

4 After SLR (**Technical Report 2**).

5 Inspection to occur once access is practicably available following the rainfall event. Inspections would not occur for subsequent rainfall events within 7 days of previous inspection.

Table 12
Water Performance Measures, Performance Indicators and Contingency Measures for Longwalls 21 to 24

Performance Measure	Performance Indicator(s)	Relevant Management and Contingency Measures
Wollombi Brook Negligible subsidence impacts and environmental consequences.	• The performance indicators will be considered to have been exceeded if the **surface water quality in Wollombi Brook exceeds the surface water quality criteria in the SWMP**. • The performance indicators will be considered to have been exceeded if the **groundwater levels in alluvial bores exceed the groundwater level criteria in the GWMP**. • The performance indicators will be considered to have been exceeded if the **groundwater quality in alluvial bores exceeds the groundwater quality criteria in the GWMP**.	• Consider whether the performance measure has been exceeded based on subsidence, groundwater and surface water monitoring data and hydrological and/or hydrogeological analysis. • If the performance measure has been exceeded, implement a Contingency Plan, which may include: – Implementation of stream flow loss remediation techniques (e.g. injection grouting or installation of a geomembrane). – Provision of offsets (i.e. retirement of an equivalent volume of water licence). – Implementation of erosion and sediment control measures and stabilisation techniques. – Additional monitoring (e.g. increase in monitoring frequency). – Consideration of changes to longwall extraction geometry in consultation with relevant regulatory authorities.
Release of water from the site only in accordance with EPL requirements.	• The performance indicator will be considered to have been exceeded if **water is released from the site, and it is not in accordance with the EPL requirements**.	



Peabody

WAMBO COAL MINE

Monitoring of Environmental Consequences against Performance Indicators and Measures

Figure 11

3.2 LAND MANAGEMENT

3.2.1 Overview

The LMP is provided in **Appendix B**. The purpose and scope of the LMP are summarised below:

Purpose: Management of potential environmental consequences of the proposed secondary workings described in the Extraction Plan on land in general (including cliffs).

Scope: Land in general within the Longwalls 21 to 24 Application Area and cliffs in the vicinity of the Longwalls 21 to 24 Application Area (**Figure 3**).

The LMP references components of the ESCP.

3.2.2 Key Land Issues, Monitoring and Management Measures

The Longwalls 21 to 24 Application Area is wholly located on WCPL-owned land. Land uses include the North Wambo Creek Diversion, RWEP areas and, occasionally, the agistment of stock.

MSEC (2017) identified cliffs near the Wollemi National Park escarpment and over Longwalls 17 to 25 using Light Detection and Ranging (LiDAR) and separated them into three categories to assess the effects of subsidence on each separately: cliffs associated with the Wollemi National Park escarpment, intermediate level cliffs and low level cliffs (directly overlying Longwalls 20 and 21). The locations of these cliffs are shown on **Figure 10**.

MSEC (**Technical Report 1**) notes that it is difficult to assess the likelihood of cliff instabilities based upon predicted subsidence effects, as the likelihood of a cliff being unstable is dependent on a number of factors which are difficult to fully quantify.

Therefore, MSEC based its assessment on case studies where longwalls have been extracted directly beneath cliffs having similar mine subsidence parameters (i.e. similar depths of cover, similar cliff sizes and proximities, etc.). It is expected that:

- the cliffs associated with the Wollemi National Park escarpment and the intermediate level cliffs will be unlikely to experience any adverse impacts; and
- approximately 3% to 5% of the total face areas of the low level cliffs located directly above Longwalls 20 and 21 could be impacted.[2]

Potential impacts on agricultural activities within the Longwalls 21 to 24 Application Area include:

- possible injury to persons undertaking agricultural activities;
- possible injury to livestock caused by surface cracking; and
- loss of integrity of stock fences.

The key issues relating to subsidence impacts on land in general described in the LMP and the relevant monitoring and management measures are summarised in **Table 13**.

[2] The total length of the low level cliffs is approximately 150 m (MSEC, 2020). The predicted impacts equate to a length of disturbance of approximately 15 m, or a face area of disturbance of approximately 100 square metres.

Table 13
Land Management Issues Associated with the Extraction of Longwalls 21 to 24

Issue	Approved Impact	Revised Impact	Monitoring	Management
Land Use Land Capability Steep Slopes	• Surface cracking.[1] • Increased erosion.[1] • Ponding of surface water in areas where isolated depressions form.[1] • Increased depth and duration of inundation during flood events.[1]	• Impacts resulting from the extraction of Longwalls 21 to 24 will be consistent with those presented in the South Bates Extension Modification EA.[3]	• Monitoring of subsidence in accordance with the Subsidence Monitoring Program (**Appendix H**). • Visual observations of fences. • Visual observations of the ground surface.	• Notification to agistees of areas of longwall mining and active subsidence, and exclusion of agistment grazing from areas where surface cracking presents a reasonable risk to people and/or livestock. • Remediation of surface cracks[2] where practicable using conventional earthmoving equipment (e.g. a backhoe), including: - infilling of surface cracks with soil or other suitable materials; or - locally regrading and re-compacting the surface. • Repair of fences prior to allowing access for agistment grazing. • Stabilisation of any areas of surface cracking using erosion protection measures (e.g. vegetation planting). • Drainage works and rehabilitation of subsidence troughs (i.e. areas of induced ponding) as necessary. • Management measures in accordance with the ESCP.

Table 13 (Continued)
Land Management Issues Associated with the Extraction of Longwalls 21 to 24

Issue	Approved Impact	Revised Impact	Monitoring	Management
Wollemi National Park Escarpment and Intermediate Level Cliffs	• The cliffs associated with the Wollemi National Park escarpment and the intermediate level cliffs will be unlikely to experience any adverse impacts.[1] • The predicted subsidence effects for the cliffs associated with the Wollemi National Park escarpment are less than 20 mm (i.e. "no" vertical subsidence).[1] • The predicted subsidence effects for the intermediate level cliffs are up to 30 mm.[1]	• Impacts resulting from the extraction of Longwalls 21 to 24 will be consistent with those presented in the South Bates Extension Modification EA.[3]	• Visual observations of cliffs for signs of recent rock fall and/or instability (high definition video/photos recorded via an unmanned aerial vehicle [UAV]).	• Relevant management and contingency measures if the performance measure has been exceeded are addressed in the BMP (**Section 3.3**).
Low Level Cliffs	• Approximately 3 to 5% of the total face areas of the low level cliffs located directly above Longwalls 20 and 21 could be impacted.[1]	• Impacts resulting from the extraction of Longwalls 21 to 24 will be consistent with those presented in the South Bates Extension Modification EA.[3]	• Visual observations of cliffs for signs of recent rock fall and/or instability (high definition video/photos recorded via an UAV).	• Measures to stabilise/mitigate impacts to rock faces/cliffs if considered beneficial and practicable in consultation with relevant regulatory agencies (e.g. artificial rock support, standing supports, dislodgement of remaining loose rock, etc.). • Relevant management and contingency measures, if the performance measure has been exceeded, are addressed in the BMP (**Section 3.3**).
Surface Water	• Addressed in **Section 3.1**.	• Addressed in **Section 3.1**.	• Addressed in **Section 3.1**.	• Addressed in **Section 3.1**.

[1] After the South Bates Extension Modification EA (WCPL, 2017).

[2] Minor cracks that develop are not expected to require remediation as geomorphologic process will result in natural filling of these cracks over time.

[3] After MSEC (**Technical Report 1**).

3.2.3 Assessment of Performance Indicators and Measures

The performance indicator for the performance measure relating to low level cliffs will be considered to have been exceeded if impacts to low level cliffs are identified (i.e. new rockfall, displacement or dislodgement of boulders or slabs or fracturing). Monitoring conducted to inform the assessment of the extraction of Longwalls 21 to 24 against these performance indicators is summarised in **Section 3.8** and **Appendix H**.

If data analysis indicates the performance indicator has been exceeded or is likely to be exceeded, an assessment will be made against the performance measure. This assessment will include relevant geotechnical and/or subsidence investigations to determine if:

- the impact(s) cumulatively affect more than 5% of the total face area; and
- the impact(s) can be attributed to the extraction of Longwalls 21 to 24 (or previous longwalls).

If the performance measure is considered to have been exceeded, the Contingency Plan will be implemented. If data analysis indicates that the performance measure has not been exceeded, WCPL will continue monitoring.

The performance measure relating to the Wollemi National Park and associated escarpment is addressed in the BMP (**Section 3.3**).

3.2.4 Contingency Plan

WCPL will implement a Contingency Plan as described in **Section 4.1**, in the event that:

- subsidence impacts to land in general have occurred and are not effectively mitigated by the management measures summarised in **Table 13**; and/or
- the subsidence impact performance measure related to low level cliffs (summarised in **Section 3.2.3**) is considered to have been exceeded or is likely to be exceeded.

3.3 BIODIVERSITY MANAGEMENT

3.3.1 Overview

The BMP is provided in **Appendix C**. The purpose and scope of the BMP are summarised below:

Purpose: Management strategies, procedures, controls and monitoring programs required to manage flora and fauna at the Wambo Coal Mine, including management of potential environmental consequences of the proposed secondary workings described in this Extraction Plan.

Scope: All activities undertaken within WCPL's mining authorisations and approved mining areas that may impact on biodiversity (including the Longwalls 21 to 24 Application Area) as well as biodiversity in WCPL's RWEP areas and open cut revegetation areas.

3.3.2 Key Biodiversity Issues, Monitoring and Management Measures

The key issues relating to subsidence impacts on biodiversity are described in the BMP and the relevant monitoring and management measures are summarised in **Table 14**.

FloraSearch (2017) recorded the following threatened communities above the South Bates Extension Underground Mine:

- one critically endangered ecological community (CEEC) listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act, 1999* (EPBC Act) (*Central Hunter Valley Eucalypt Forest and Woodland*); and
- two endangered ecological communities (EECs) listed under the former NSW *Threatened Species Conservation Act, 1995* (*Central Hunter Grey Box – Ironbark Woodland in the New South Wales North Coast and Sydney Basin Bioregions* and the *Hunter Lowland Redgum Forest in the Sydney Basin and New South Wales North Coast Bioregions*).

Hunter Lowland Redgum Forest does not overlie Longwalls 21 to 24 and is not expected to experience any impacts as a result of the extraction of these longwalls.

In the South Bates Extension Underground Mine area, the *Central Hunter Grey Box – Ironbark Woodland in the New South Wales North Coast and Sydney Basin Bioregions* EEC is equivalent to the *Central Hunter Valley Eucalypt Forest and Woodland* CEEC (listed under the EPBC Act), and is collectively referred to as the Central Hunter Grey Box – Ironbark Woodland EEC/CEEC.

No listed threatened flora species or populations have been found in targeted searches or other sampling conducted over the South Bates Extension Underground Mine area (WCPL, 2017).

3.3.3 Assessment of Performance Indicators and Measures

Performance indicators developed for the subsidence impact performance measures relating to biodiversity relevant to the extraction of Longwalls 21 to 24 are presented in the BMP and are summarised in **Table 15**. Monitoring conducted to inform the assessment of the extraction of Longwalls 21 to 24 against these performance indicators is summarised in **Section 3.8** and **Appendix H**.

The procedure followed to assess the extraction of Longwalls 21 to 24 against the performance indicators and performance measures is outlined in **Figure 11** and described in detail in **Appendix C**.

As described in **Appendix C**, monitoring of environmental consequences against performance indicators and measures relating to the Warkworth Sands Woodland Community and the White Box, Yellow Box, Blakely's Red Gum Woodland/Grassy White Box Woodland Community is not considered necessary for Longwalls 21 to 24. Monitoring relevant to these communities will be addressed in subsequent Extraction Plans.

3.3.4 Contingency Plan

In the event that the subsidence impact performance measures relating to biodiversity summarised in **Table 15** are considered to have been exceeded or are likely to be exceeded, WCPL will implement a Contingency Plan as described in **Section 4.1**. Potential contingency measures for the performance measures relating to biodiversity relevant to the extraction of Longwalls 21 to 24 are outlined in **Table 15**.

Table 14
Biodiversity Management Issues Associated with the Extraction of Longwalls 21 to 24

Issue	Approved Impact	Revised Impact	Monitoring	Management
Flora	• Ponding of surface water in areas where isolated depressions form.[1] • A change in flora species composition and structure expected to occur as a result of increased ponding, which is likely to occur along and adjacent to the North Wambo Creek Diversion and other ephemeral drainage lines (where remnant vegetation is absent).[1] • Impacts are unlikely to place any threatened flora species, populations, ecological communities, or their habitats at risk of extinction.[1]	• Topographical depressions previously predicted to coincide with vegetation no longer coincide with any mapped woodland.[2] • As no ponding coinciding with vegetation is predicted, no change in flora species composition and structure is expected to occur along and adjacent to the North Wambo Creek Diversion and other ephemeral drainage lines (where remnant vegetation is absent). • Other impacts resulting from the extraction of Longwalls 21 to 24 will be consistent with those presented in the South Bates Extension Modification EA.[2]	• Monitoring of subsidence in accordance with the Subsidence Monitoring Program (**Appendix H**). • Monitoring in accordance with the BMP. This monitoring includes: - monitoring of revegetation of disturbance areas (including areas subject to subsidence from underground mining); - monitoring of the RWEP areas; and - riparian zone monitoring transects. • Visual inspections as described in **Section 3.8**, the BMP and the Subsidence Monitoring Program (**Appendix H**).	• The Vegetation Clearance Protocol (VCP), described in the BMP. • The Threatened Species Management Protocol (TSMP), described in the BMP. • Management measures for the RWEP areas, described in the BMP. • Rehabilitation as described in the MOP.
Fauna	• Impacts are unlikely to affect any threatened fauna species to the extent of undermining the viability of a local population of that species.[1]	• Impacts resulting from the extraction of Longwalls 21 to 24 will be consistent with those presented in the South Bates Extension Modification EA.[2]		
Aquatic Ecosystems	• Alterations to aquatic habitat due to the approved operations are unlikely to significantly alter the macroinvertebrate or fish community composition, or the conservation values of North Wambo Creek.[1]	• Impacts resulting from the extraction of Longwalls 21 to 24 will be consistent with those presented in the South Bates Extension Modification EA.[2]		

Table 14 (Continued)
Biodiversity Management Issues Associated with the Extraction of Longwalls 21 to 24

Issue	Approved Impact	Revised Impact	Monitoring	Management
Conservation Areas (including the proposed Wambo offset area under SSD 7142)	• Negligible reduction to previously identified biodiversity credits.	• Impacts resulting from the extraction of Longwalls 21 to 24 will be consistent with those presented in the South Bates Extension Modification EA.[2]	• Monitoring of subsidence in accordance with the Subsidence Monitoring Program (**Appendix H**). • Monitoring in accordance with the BMP. This monitoring includes: - monitoring of revegetation of disturbance areas (including areas subject to subsidence from underground mining); - monitoring of the RWEP areas; and - riparian zone monitoring transects. • Visual inspections as described in **Section 3.8**, the BMP and the Subsidence Monitoring Program (**Appendix H**).	• An assessment of the biodiversity credits provided by the proposed Wambo offset area under SSD 7142 will be undertaken by an accredited assessor within two years of the completion of subsidence at the South Bates Extension Underground Mine.
Wollemi National Park	• No material subsidence to the Wollemi National Park.1	• Impacts resulting from the extraction of Longwalls 21 to 24 will be consistent with those presented in the South Bates Extension Modification EA.[2]	• Visual observations of cliffs for signs of recent rock fall and/or instability (high definition video/photos recorded via an UAV).	• If monitoring detects impacts resulting from the extraction of Longwalls 21 to 24, relevant management and contingency measures presented in the BMP and summarised in **Table 15** will be implemented.

[1] After the South Bates Extension Modification EA (WCPL, 2017).

[2] After MSEC (**Technical Report 1**).

Table 15
Biodiversity Performance Measures, Performance Indicators and Contingency Measures for Longwalls 21 to 24

Performance Measure	Performance Indicator(s)	Relevant Management and Contingency Measures
Wollemi National Park Negligible subsidence impacts and environmental consequences.	• The performance indicators will be considered to have been exceeded if conventional vertical subsidence exceeds 20 mm or the limit of survey accuracy (whichever is greater) at the base of the Wollemi National Park escarpment. • The performance indicators will be considered to have been exceeded if visual inspections identify cliff or rock face instability at the Wollemi National Park escarpment.	• Consider whether the performance measure has been exceeded. • If the performance measure has been exceeded, implement a Contingency Plan, which may include: – Implementation of erosion and sediment control measures and stabilisation techniques. – Scaling/dislodgement/removal of remaining loose rock. – Measures to improve the aesthetic values if cliff instability occurs (e.g. planting of endemic native vegetation at the base of the escarpment). – Additional monitoring (e.g. increase in monitoring frequency). – Consideration of changes to longwall extraction geometry in consultation with relevant regulatory authorities. – Offset in accordance with Condition 22, Schedule 4 of the Development Consent (DA 305-7-2003).
Central Hunter Valley Eucalypt Forest and Woodland Ecological Community Minor cracking and ponding of the land surface or other impact. Negligible environmental consequences.	• The performance indicator will be considered to have been exceeded if annual monitoring at flora monitoring sites or bird monitoring sites above Longwalls 21 to 24 indicate a statistically significant downward trend or change between monitoring periods not observed at analogue/reference sites.	• Consider whether the performance measure has been exceeded. • If the performance measure has been exceeded, implement a Contingency Plan, which may include: – Filling of minor cracks with appropriate material (e.g. soil or mulch) to avoid the creation of drainage channels. – Re-grading of isolated depressions or highpoints and revegetation. – Re-grading of slopes to minimise the potential for erosion. – Remediation of creek beds to minimise bank and headwater erosion. – Revegetation with monitoring in accordance with the MOP. – Additional monitoring (e.g. increase in monitoring frequency). – Offset in accordance with Condition 22, Schedule 4 of the Development Consent (DA 305-7-2003).

Table 15 (Continued)
Biodiversity Performance Measures, Performance Indicators and Contingency Measures for Longwalls 21 to 24

Performance Measure	Performance Indicator(s)	Relevant Management and Contingency Measures
Conservation Areas (including the proposed Wambo offset area under SSD 7142) Negligible reduction to previously identified biodiversity credits.	• The performance indicator will be considered to have been exceeded if annual monitoring at flora monitoring sites or bird monitoring sites within RWEAs A, B, C, D, D Extension or E indicate a statistically significant downward trend or change between monitoring periods not observed at analogue/reference sites.	• Consider whether the performance measure has been exceeded. • If the performance measure has been exceeded, implement a Contingency Plan, which may include: – Filling of minor cracks with appropriate material (e.g. soil or mulch) to avoid the creation of drainage channels. – Re-grading of isolated depressions or highpoints and revegetation. – Re-grading of slopes to minimise the potential for erosion. – Remediation of creek beds to minimise bank and headwater erosion. – Revegetation with monitoring in accordance with the MOP. – Additional monitoring (e.g. increase in monitoring frequency). – Offset in accordance with Condition B3 of the Development Consent (DA 305-7-2003).
	• The performance indicator will be considered to be exceeded if the assessment identifies a reduction to previously identified biodiversity credits.	• Consider whether the performance measure has been exceeded. • If the performance measure has been exceeded, implement a Contingency Plan, which may include: – Filling of minor cracks with appropriate material (e.g. soil or mulch) to avoid the creation of drainage channels. – Re-grading of isolated depressions or highpoints and revegetation. – Re-grading of slopes to minimise the potential for erosion. – Remediation of creek beds to minimise bank and headwater erosion. – Acquisition of sufficient additional biodiversity credits in accordance with the *Biodiversity Conservation Act, 2016*.

3.4 HERITAGE MANAGEMENT

3.4.1 Overview

The HMP is provided in **Appendix D**. The purpose and scope of the HMP are summarised below:

Purpose: Consolidated description of the management of Aboriginal heritage and historic heritage at the Wambo Coal Mine, incorporating the requirements of the existing AHIPs #2222, #C0001474, #C0002000 and #C0003213 and Development Consent (DA 305-7-2003), including management of potential environmental consequences of the proposed secondary workings described in the Extraction Plan on heritage sites or values.

Scope: The extent of the Development Application area of the Development Consent (DA 305-7-2003).

3.4.2 Key Heritage Issues, Monitoring and Management Measures

There are no listed heritage items in the Longwalls 21 to 24 Application Area under the Australian Heritage Database (which incorporates the National Heritage List and the Commonwealth Heritage List); the NSW Heritage Inventory; or the *Singleton Local Environmental Plan 2013*.

The majority of the Longwalls 21 to 24 Application Area is covered by the Whynot property granted to Noah Long in 1906 and now owned by WCPL. There is a homestead, other outbuildings and fenced yards on the Whynot property that appear to date from the Federation Period (EJE Heritage, 2017). The buildings are not currently tenanted, are in a degraded state, and show signs of termite activity. An assessment of heritage significance (EJE Heritage, 2017) concluded that the Whynot property has little significance under any and all criteria within a local context.

The homestead and outbuildings on the Whynot property are located inside of the Longwalls 21 to 24 Application Area and are predicted to experience 1,800 mm vertical subsidence due to the extraction of Longwalls 21 to 24.

Aboriginal sites located by surveys are identified in WCPL's Aboriginal heritage site database and shown in the HMP.

The key issues relating to subsidence impacts on heritage sites and values described in the HMP and the relevant monitoring and management measures are summarised in **Table 16**.

3.4.3 Assessment of Performance Indicators and Measures

The Wambo Homestead Complex is located approximately 3.5 km south-east of Longwalls 17 to 25 and will experience no measurable subsidence from the South Bates Extension Underground Mine. Monitoring of consequences against performance indicators and measures relating to the Wambo Homestead Complex is not considered necessary for Longwalls 21 to 24. Monitoring and management measures for the Wambo Homestead Complex were addressed in previous Extraction Plans for the North Wambo Underground Mine.

Performance indicators developed for heritage sites and values relevant to the extraction of Longwalls 21 to 24 are presented in the HMP and are summarised in **Table 16**. Monitoring conducted to inform the assessment of the extraction of Longwalls 21 to 24 against the performance indicators is summarised in **Section 3.8** and **Appendix H**. The procedure followed to assess the extraction of Longwalls 21 to 24 against the performance indicators and performance measures is outlined in **Figure 11** and described in detail in **Appendix D**.

Table 16
Heritage Management Issues Associated with the Extraction of Longwalls 21 to 24

Issue	Approved Impact	Revised Impact	Monitoring	Management
Aboriginal cultural heritage (Rock shelters with PAD, scarred tree, open artefact sites)	• Potential for impacts to rock shelter sites and potential scarred tree recorded above the South Bates Extension Underground Mine.[1] • Potential for surface cracking and/or erosion in the vicinity of surface artefacts, although unlikely that the artefact scatters or isolated finds themselves would be adversely impacted.[1] • Consent to damage or destroy all Aboriginal cultural heritage sites within the extent of AHIP #2222 and #C0003213.	• Impacts resulting from the extraction of Longwalls 21 to 24 will be consistent with those presented in the South Bates Extension Modification EA.[2] • Rock shelter Site 499 – possible for adverse impacts from Longwalls 21 to 24 (>25% probability).[2] • Rock shelter Sites 504 – very unlikely for adverse impacts from Longwalls 21 to 24 (<10% probability).[2] • Rock shelter Sites 503 – rare for adverse impacts from Longwalls 21 to 24 (<5% probability).[2] • The previously reported scar tree (Wambo Site 324) has been reassessed as probably being of non-Aboriginal origin.[2]	• Monthly visual observations of artefact scatters and isolated finds to identify any significant surface cracks and/or erosion in the vicinity of a site during extraction of longwall panels in immediate proximity to a site. • Recording of the condition of Wambo Site 507 post-mining to identify instances of block/rock fall, cracking, opening of bedding planes, exfoliation and/or overhang collapse. • Recording of the condition of Wambo Site 499 will occur after the extraction of Longwall 21.	• Based on the recommendations of Kuskie (2017), artefact scatters, isolated finds, open context PADs, scarred trees and rock shelters with PAD will be left *in situ*. • If subsidence monitoring identifies cracking or erosion proximal to a site, artefacts will be salvaged in accordance with the protocols in the HMP. • WCPL will maintain a database of site locations and locate any surface activities to avoid impacts to Aboriginal sites where practicable. • If a site is to be impacted by surface remediation activities and it is located within an AHIP area, that site will be salvaged in accordance with the HMP. • WCPL will lodge updated Aboriginal Site Recording Forms and/or Aboriginal Site Impact Recording Forms with the BCD when required.

Table 16 (Continued)
Heritage Management Issues Associated with the Extraction of Longwalls 21 to 24

Issue	Approved Impact	Revised Impact	Monitoring	Management
Historic heritage (Whynot Homestead)	• The buildings associated with the Whynot property would be impacted by subsidence. The predicted ground movements could result in distortion of the timber frames of the homestead on the Whynot property, and it is possible that the structure could become unsafe due to its poor existing condition. Other structures on the property may also become unsafe due to subsidence movements and their current condition.[1]	• Impacts resulting from the extraction of Longwalls 21 to 24 will be consistent with those presented in the South Bates Extension Modification EA.[2]	• Structural assessment of the Whynot Homestead will be undertaken post-mining to assess if demolition is required.	• The Whynot Homestead and outbuildings have been archivally recorded in accordance with accordance with the Development Consent (DA 305-7-2003) (condition now repealed). • The Whynot Homestead will be fenced to prevent access prior to secondary extraction of Longwall 21. • Demolition to be considered in the future if the structure(s) present an ongoing safety concern.

1 After the South Bates Extension Modification EA (WCPL, 2017).

2 After MSEC (**Technical Report 1**).

3.4.4 Contingency Plan

In the event that the impacts relating to Aboriginal cultural heritage summarised in **Table 16** are considered to have been exceeded or are likely to be exceeded, WCPL will implement a Contingency Plan as described in **Section 4.1**.

3.5 BUILT FEATURES MANAGEMENT

3.5.1 Overview

The BFMP is provided in **Appendix E**. The purpose and scope of the BFMP are summarised below:

Purpose: Management of all public infrastructure and all classes of other built features for the proposed secondary workings described in the Extraction Plan.

Scope: All public infrastructure and all other classes of built features within the Longwalls 21 to 24 Application Area (**Figure 9**).

The BFMP comprises one component plan, the WCPL Asset Management Plan (WAMP), which provides further detail on the management of WCPL assets.

3.5.2 Key Built Features Issues, Monitoring and Management Measures

Built features within the Longwalls 21 to 24 Application Area consist of a number of WCPL-owned assets (as described in **Table 10** and the WAMP) (**Figure 9**). The key issues relating to management of these built features in regard to subsidence impacts are described in the WAMP. A summary of the relevant monitoring and management measures for these built features is provided in **Table 17**.

The Longwalls 21 to 24 Application Area does not intersect the Notification Area of any Prescribed Dam gazetted under the *Dams Safety Act, 1978*.

There are two State survey control mark in the vicinity of the Longwalls 21 to 24 Application Area (MSEC, 2020). Under the *Surveying and Spatial Information Act, 2002*, survey marks cannot be displaced or damaged without a relevant authorisation. WCPL will manage the impacts of mine subsidence on these survey marks in consultation with NSW Spatial Services, including lodging a relevant application under the NSW *Surveying and Spatial Information Regulation, 2017* as required by the *Surveyor-General's Direction No. 11 Preservation of Survey Infrastructure*.

3.5.3 Assessment of Performance Indicators and Measures

Performance indicators developed for the subsidence impact performance measures relating to built features relevant to the extraction of Longwalls 21 to 24 are presented in the WAMP and summarised in **Table 18**. Monitoring conducted to inform the assessment of the extraction of Longwalls 21 to 24 against these performance indicators is summarised in **Section 3.8** and **Appendix H**. The procedure followed to assess the extraction of Longwalls 21 to 24 against the performance indicators and performance measures is outlined in **Figure 11** and described in detail in **Appendix E**.

3.5.4 Contingency Plan

In the event that the subsidence impact performance measures relating to built features summarised in **Table 18** are considered to have been exceeded or are likely to be exceeded, WCPL will implement a Contingency Plan as described in **Section 4.1**.

Table 17
Built Feature Management Issues Associated with the Extraction of Longwalls 21 to 24

Issue	Monitoring	Management
WCPL assets	• Monitoring of subsidence in accordance with the Subsidence Monitoring Program (**Appendix H**). • Visual inspections as described in **Section 3.8** and the Subsidence Monitoring Program (**Appendix H**).	• Assessment of WCPL assets to identify modifications potentially required prior to subsidence. • Assessment of bores and decommissioning and sealing prior to extraction if required (dependent on condition). • Decommissioning of the disused United gas extraction well near the Whynot Homestead prior to secondary extraction of Longwall 21. • Whynot Homestead will be fenced prior to secondary extraction of Longwall 21 to prevent access. • Maintenance of safe access to WCPL assets such that WCPL personnel are able to undertake routine maintenance and remediation works as required. • Implementation of communication protocols, including the provision of WCPL internal longwall panel status reports, to ensure internal WCPL stakeholders are aware of the longwall progression and are able to provide sufficient notification to relevant WCPL personnel regarding potential subsidence to WCPL assets. • Posting of warning signs at suitable locations on roads and site access tracks and updating warning signs if a change to the WCPL asset is identified during monitoring. • Provision of a 15 m separation barrier around the Montrose West Open Cut pit walls. • Structural assessment of WCPL assets post-Longwalls 21 to 24 extraction. • Structural assessment of Whynot Homestead to assess if demolition is required post-subsidence. • Repair of WCPL assets in accordance with associated standards and procedures.

Table 18
Built Feature Performance Measures, Performance Indicators and Contingency Measures for Longwalls 21 to 24

Performance Measure	Performance Indicator(s)	Relevant Management and Contingency Measures
For all built features: • Ensure built features are always safe. • Serviceability should be maintained wherever practicable. • Loss of serviceability must be fully compensated. • Damage must be fully repairable, and must be fully repaired or else replaced or fully compensated.	The performance indicators developed for WCPL assets will be considered to have been exceeded if: • the **structural integrity** of any WCPL assets is assessed to have been compromised; • the **functionality** of any WCPL powerlines, cables or pipelines is compromised; or • the **integrity of access roads** required for the serviceability of WCPL assets is not maintained.	Contingency measures will be developed as required on a case-by-case basis in consultation with the relevant WCPL stakeholders and government agencies.

3.6 PUBLIC SAFETY MANAGEMENT

3.6.1 Overview

The PSMP is provided in **Appendix F**. The purpose and scope of the PSMP and the primary hazards and risks addressed by the PSMP are summarised below:

Purpose: Management of potential risks to public safety resulting from the proposed secondary workings described in the Extraction Plan for Longwalls 21 to 24.

Scope: Risks to public safety associated with extraction of Longwalls 21 to 24 at the South Bates Extension Underground Mine (**Figure 3**).

Hazards: The primary hazards associated with the extraction of Longwalls 21 to 24 include:

- surface cracking;
- cliff instability;
- ground deformations; and
- damaged infrastructure (e.g. powerlines, roads and access tracks).

Risks: Members of the general public potentially at risk due to the extraction of Longwalls 21 to 24 are limited to those accessing WCPL-owned land.

The PSMP references components of the existing HSMS as summarised in the HSMS Overview.

3.6.2 Key Public Safety Issues, Monitoring and Management Measures

The key issues relating to potential risks to public safety resulting from the extraction of Longwalls 21 to 24 described in the PSMP, and the relevant monitoring and management measures are summarised in **Table 19**. The location of predicted subsidence is presented in **Figure 7**.

A subsidence risk assessment was undertaken as part of the Extraction Plan process for Longwalls 21 to 24 (**Technical Report 4**).

The subsidence risk assessment did not identify any public safety issues in addition to those summarised in **Table 19**.

3.6.3 Assessment of Performance Indicators and Measures

The performance indicator for the subsidence impact performance measures relating to public safety (**Table 5**) will be considered to have been exceeded if a hazard to the general public arising from subsidence effects, not previously identified and mitigated accordingly, becomes evident.

Monitoring conducted to inform the assessment of the extraction of Longwalls 21 to 24 against this performance indicator is summarised in **Section 3.8** and **Appendix H**.

The procedure followed to assess the extraction of Longwalls 21 to 24 against the performance indicators and performance measures is outlined in **Figure 11** and described in detail in **Appendix F**.

3.6.4 Contingency Plan

In the event that the subsidence impact performance measure relating to public safety summarised in **Section 3.6.3** is considered to have been exceeded or is likely to be exceeded, WCPL will implement a Contingency Plan as described in **Section 4.1.**

Table 19
Public Safety Management Issues Associated with the Extraction of Longwalls 21 to 24

Issue	Approved Impact	Revised Impact	Monitoring	Management
Agistees accessing the Longwalls 21 to 24 Application Area to manage stock. Unauthorised access to the Longwalls 21 to 24 Application Area (e.g. looking for firewood, hunting or horse riding). Members of the Rural Fire Service accessing the Longwalls 21 to 24 Application Area.	Subsidence impacts, which may be considered to pose a safety hazard, currently approved include: • surface cracking;[1] • erosion;[1] and • ponding.[1]	Impacts resulting from the extraction of Longwalls 21 to 24 will be consistent with those presented in the South Bates Extension Modification EA.[2]	• Monitoring of subsidence in accordance with the Subsidence Monitoring Program (**Appendix H**). • Visual inspection of the integrity of fences. • Visual assessment of the effectiveness of warning signs (e.g. legibility). • Visual inspection of integrity of cliffs and steep slopes. • Visual inspections per standard measures in the Health and Safety Management System (e.g. security, site staff around site).	• Restricted access (i.e. the general public are not allowed on WCPL-owned land used for mining purposes). Permanent signage located at the entrance to WCPL-owned land will be maintained. • All personnel and visitors accessing the Wambo site are subject to the requirements of: - WA-TRG-MP-302 Wambo Training and Competency Management Plan; and - WA-SAH-PRO-315.7 Site Introduction of Personnel Procedure. • Posting and maintenance of warning signs at suitable locations on property boundaries, fences and access tracks. The signs will indicate that underground mining (with surface subsidence) is being undertaken on WCPL-owned land and will prohibit entry by unauthorised persons. • Notification to agistees of areas of longwall mining and active subsidence, and exclusion of agistment grazing from areas z surface cracking presents a reasonable risk to people and/or livestock. • Whynot Homestead will be fenced prior to secondary extraction of Longwall 21 to prevent access. • Structural assessment of Whynot Homestead to assess if demolition is required post-subsidence. • Management of surface cracking, areas of subsidence troughs and potential cliff or steep slope instability in accordance with the LMP (**Table 13**). • Repair of fences in accordance with the LMP (**Table 13**). • All safety incidents will be handled in accordance with the HSMS. • Following mining, review of warning sign placement and removal if no longer required.

[1] After the South Bates Extension Modification EA (WCPL, 2017).

[2] After MSEC (**Technical Report 1**).

3.7 REHABILITATION MANAGEMENT

The *Wambo Coal Mine Mining Operations Plan 2019 – 2020* (MOP) was approved by the NSW Resources Regulator on 23 October 2019, and incorporates Longwalls 17 to 21. The NSW Resources Regulator approved the MOP as addressing the requirements of a Rehabilitation Management Plan under Condition 94C, Schedule 4 of the Development Consent (DA 305-7-2003) (now Condition B108, Schedule 2). An updated Rehabilitation Management Plan is currently in preparation for the next term (nominally a three year period) and will incorporate Longwalls 21 to 24.

Rehabilitation associated with subsidence impacts from the extraction of Longwall 21 will be undertaken in accordance with the approved MOP (in particular, Section 3.3.4 of the MOP) and the management and mitigation measures outlined in this Extraction Plan and the relevant component plans (e.g. the LMP). Rehabilitation associated with subsidence impacts from the extraction of Longwalls 22 to 24 will be undertaken in accordance with the updated Rehabilitation Management Plan (in prep.).

A Subsidence Risk Assessment has been undertaken, which included consideration of subsidence impacts to public safety, livestock and wildlife. The Subsidence Risk Assessment is provided in **Technical Report 4** and summarised in **Section 2.2**. Observed subsidence features and potential risks to public safety, livestock and wildlife will be reported through incident reports, subsidence management status reports and Annual Reviews described in **Section 4.2**.

A number of potential management measures are available to mitigate/remediate subsidence impacts on land in general resulting from the extraction of Longwalls 21 to 24. The requirement and methodology for any subsidence remediation techniques will be determined in consideration of:

- potential impacts of the unmitigated impact, including potential risks to public safety and the potential for self-healing or long-term degradation; and
- potential impacts of the remediation technique, including site accessibility.

Minor cracks that develop are not expected to require remediation as geomorphologic process will result in the natural filling of these cracks over time.

Remediation of typical surface cracks (generally in the order of 25 mm to 50 mm, but up to approximately 150 mm) will use conventional earthmoving equipment (e.g. a backhoe) and will include:

- infilling of surface cracks with soil or other suitable materials; or
- locally regrading and re-compacting the surface.

Areas of surface cracking will be stabilised using erosion protection measures (e.g. vegetation planting). Drainage works and rehabilitation of subsidence troughs (i.e. areas of induced ponding) will be conducted as necessary and may include stabilisation of banks subject to soil slumping.

If surface crack remediation works are required in remnant vegetation areas, compact mobile equipment will be utilised, where practicable, to minimise damage to surrounding vegetation. If the remediation work requires clearing of remnant vegetation to an extent that would exceed the benefit of the remediation, the requirement for remediation will be revised. Vegetation that requires clearance will be subject to the VCP (Vegetation Clearance Protocol, in the BMP in **Appendix C**).

A summary of subsidence monitoring is provided in **Section 3.8**, including cross references to components of the Extraction Plan with further detail.

Visual monitoring of remediated subsidence areas will be conducted monthly to identify any requirement for maintenance measures and/or remedial works in accordance with the MOP (**Appendix I**).

Any installed sediment control structures will be inspected on a monthly basis, or following rainfall events of equal to or greater than 20 mm per day (midnight to midnight) as recorded by the Wambo Meteorological Station. The sediment control structures will be inspected for capacity, structural integrity and effectiveness in accordance with the ESCP.

3.8 MONITORING PROGRAM SUMMARY

The various monitoring programs presented in each of the management plans described in **Sections 3.1 to 3.6** are summarised in **Table 20**, and the location of environmental monitoring sites included in WCPL's various environmental monitoring programs are presented in **Figures 12 to 14**.

Figure 12 presents the locations of air quality, noise and dust monitoring sites. **Figure 13** presents the location of surface water and groundwater monitoring sites. **Figure 14** presents the location of biodiversity monitoring sites. As described in **Table 20**, visual observation of cliffs and the Wollemi National Park escarpment will be undertaken as part of the LMP monitoring program.

Details of any subsidence impacts observed will be recorded in the Subsidence Impact Register with visual observations documented in the Subsidence Impact Register Assessment Form as provided in Attachment 2 of the Subsidence Monitoring Program (**Appendix H**). Visual inspections will be undertaken in accordance with the inspection checklist provided in Attachment 2 of the Subsidence Monitoring Program (**Appendix H**). The Subsidence Impact Register will be maintained as an electronic spreadsheet on-site, with hard copies of assessment forms filed in a folder.

Table 20
Longwalls 21 to 24 Monitoring Program Summary

Management Plan	Monitoring Component	Parameter	Frequency
Water Management Plan	Monitoring of surface water quality and flow monitoring sites.	• Monitoring of surface water flow and quality along North Wambo Creek, North Wambo Creek Diversion, Stony Creek and Wollombi Brook in accordance with the SWMP.	• In accordance with the SWMP.
	Monitoring of groundwater level and quality, including additional alluvial sites along North Wambo Creek (GW27 to GW35).	• Monitoring of groundwater level and quality (including depth to water, electrical conductivity, pH and temperature) within the vicinity of the Wambo Coal Mine.	• In accordance with the GWMP.
	Inflows to underground workings.	• Dewatering volumes and underground water levels in accordance with the GWMP.	• In accordance with the GWMP.
	Diversion and subsidence monitoring program, including six additional sites (UA, UB, UC, UD, UE and UF).	• As outlined in the SWMP, including: monitoring of Index of Diversion Condition; LFA; riparian vegetation; aerial photography; long and cross-section surveys (extracted from LiDAR); and geomorphic condition and efficacy of subsidence management or rehabilitation works.	• In accordance with the SWMP.
	Visual inspection of the North Wambo Creek.	• Inspections for surface cracking and/or surface ponding.	• Weekly inspections when extraction is occurring within 100 m of North Wambo Creek.
	Visual inspection of drainage line flow paths.	• Evidence of erosion or channelisation.	• Following a rainfall event of greater than 40 mm in 24 hours.[1]
Land Management Plan	Fences.	• Visual observation to record the condition of fences.	• Prior to secondary extraction of Longwalls 21 to 24. • Prior to secondary extraction within 100 m of any active WCPL fences (i.e. fences being used to hold stock or prevent public access) and undertaken at 50 m intervals until the active mining face is 100 m past the WCPL fence. • Following completion of secondary extraction of Longwalls 21 to 24.

Table 20 (Continued)
Longwalls 21 to 24 Monitoring Program Summary

Management Plan	Monitoring Component	Parameter	Frequency
Land Management Plan (Cont.)	Ground surface.	• Visual observations to record the initial condition of the ground surface. • Visual observations of the ground surface behind the longwall face to identify potential surface cracks.	• Prior to secondary extraction of Longwalls 21 to 24. • Monthly inspections during secondary extraction of Longwalls 21 to 24, increased to weekly inspections when extraction is within 100 m of the North Wambo Creek.
	Cliffs[2].	• Visual observations of cliffs[2] for signs of recent rock fall and/or instability (high definition video/photos recorded via an unmanned aerial vehicle [UAV]).	• Prior to, and following completion of, secondary extraction of each of Longwalls 21 to 24.
	Low lying areas.	• Visual observations of low lying areas to identify potential surface ponding.	• Following a significant rainfall event (i.e. 40 mm within 24 hours).[1]
	Surface areas which required remediation.	• Visual observations of the ground surface to identify stabilisation of erosion and groundcover.	• Monthly inspections until stabilisation of erosion and groundcover is >60%.
Biodiversity Management Plan	General monitoring of flora, fauna and aquatic ecosystems (including groundwater dependent ecosystems).	• Monitoring in accordance with the BMP.	• In accordance with the BMP.
	Subsidence impacts to Wollemi National Park escarpment.	• Visual observations of the Wollemi National Park escarpment for signs of recent rock fall and/or instability (high definition video/photos recorded via an UAV).	• Prior to secondary extraction of Longwalls 21 to 24 and following completion of each longwall in accordance with the LMP.
Heritage Management Plan	Artefact scatters, isolated finds and PADs.	• Significant surface cracks and/or erosion in the vicinity of artefact scatters or isolated finds.	• In accordance with the HMP (prior to secondary extraction of Longwalls 21 to 24 and monthly during extraction of longwall panels in immediate proximity to a site).
	Rock Shelters with PAD.	• Inspections to identify instances of block/rock fall, cracking, opening of bedding planes, exfoliation and/or overhang collapse at Wambo Site 499 and Wambo Site 507.	• Following completion of secondary extraction of Longwall 24.

Table 20 (Continued)
Longwalls 21 to 24 Monitoring Program Summary

Management Plan	Monitoring Component	Parameter	Frequency
Heritage Management Plan (Cont.)	Scarred trees.	• Baseline recording[3] of the confirmed and possible scarred trees (Wambo Site 324) will be undertaken by a suitably qualified archaeologist (and a surveyor where required), including noting the tilt of the trees.	• Prior to secondary extraction of Longwalls 21 to 24.
Built Features Management Plan – WCPL Asset Management Plan	All built features.	• Visual observations to record the general condition of WCPL assets including safety and serviceability.	• Prior to secondary extraction within 1,000 m of WCPL assets. • Monthly inspection during secondary extraction of Longwalls 21 to 24.
	Active service lines.[5]	• Visual observations to record the general condition of WCPL active service lines including safety and serviceability.	• Weekly inspections.
		• Monitoring of pipeline integrity at fixed points.	• Daily inspections commencing when secondary extraction is within 100 m of WCPL pipelines and undertaken until the active mining face is 100 m past the pipeline.
		• Monitoring to detect abnormal changes in flow.	• Continuous (SCADA) monitoring of pump and pipeline conditions.
	Ventilation shaft.	• Monitoring of ventilation shaft, fan surface infrastructure and underground workings at base of shaft.	• Weekly inspections in mines inspections program.
	Groundwater monitoring bores.	• Integrity of groundwater monitoring bores by reviewing groundwater monitoring data.	• Once the active mining face is 100 m past the bore.
	Culverts.	• Visual observations to record cracking of concrete culverts or grade reversal.	• Prior to secondary extraction within 100 m of culverts and undertaken at 50 m intervals until the active mining face is 100 m past the culverts.

Table 20 (Continued)
Longwalls 21 to 24 Monitoring Program Summary

Management Plan	Monitoring Component	Parameter	Frequency
Built Features Management Plan – WCPL Asset Management Plan (Cont.)	Roads and tracks.	• Visual observations to record condition of roads and tracks, including surface cracks, buckling and general safety.	• Prior to secondary extraction within 100 m of any WCPL asset and undertaken at 50 m intervals until the active mining face is 100 m past the WCPL asset.
	Farm buildings, sheds, tanks and house (Whynot Homestead).	• Structural assessment.	• Following completion of active mining.
Public Safety Management Plan	Fences.	• Visual observation to record the condition of fences.	• Prior to secondary extraction of each longwall. • Prior to secondary extraction within 100 m of any active WCPL fences (i.e. fences being used to hold stock or prevent public access) and undertaken at 50 m intervals until the active mining face is 100 m past the WCPL fence. • Following completion of secondary extraction of Longwalls 21 to 24.
	Warning signs.	• Visual observation to record the initial condition of existing warning signs (e.g. legibility). • Visual observations to record the condition of warning signs (e.g. legibility) during extraction of Longwalls 21 to 24.	• Prior to secondary extraction of each longwall. • Monthly inspections during secondary extraction of Longwalls 21 to 24.
	Whynot Homestead.	• Structural assessment to determine if demolition is required.	• Following completion of active mining.

Table 20 (Continued)
Longwalls 21 to 24 Monitoring Program Summary

Management Plan	Monitoring Component	Parameter	Frequency
Rehabilitation Management Plan (MOP)	Remediated subsidence areas.	• Visual monitoring to identify any requirement for maintenance measures and/or remedial works.	• Monthly inspections until monitoring confirms stabilisations of erosion and groundcover is >60%.
	Installed sediment control structures.	• Inspection of capacity, structural integrity and effectiveness in accordance with the ESCP.	• Monthly and/or following a significant rainfall event (i.e. 20 mm within 24 hours, midnight to midnight).

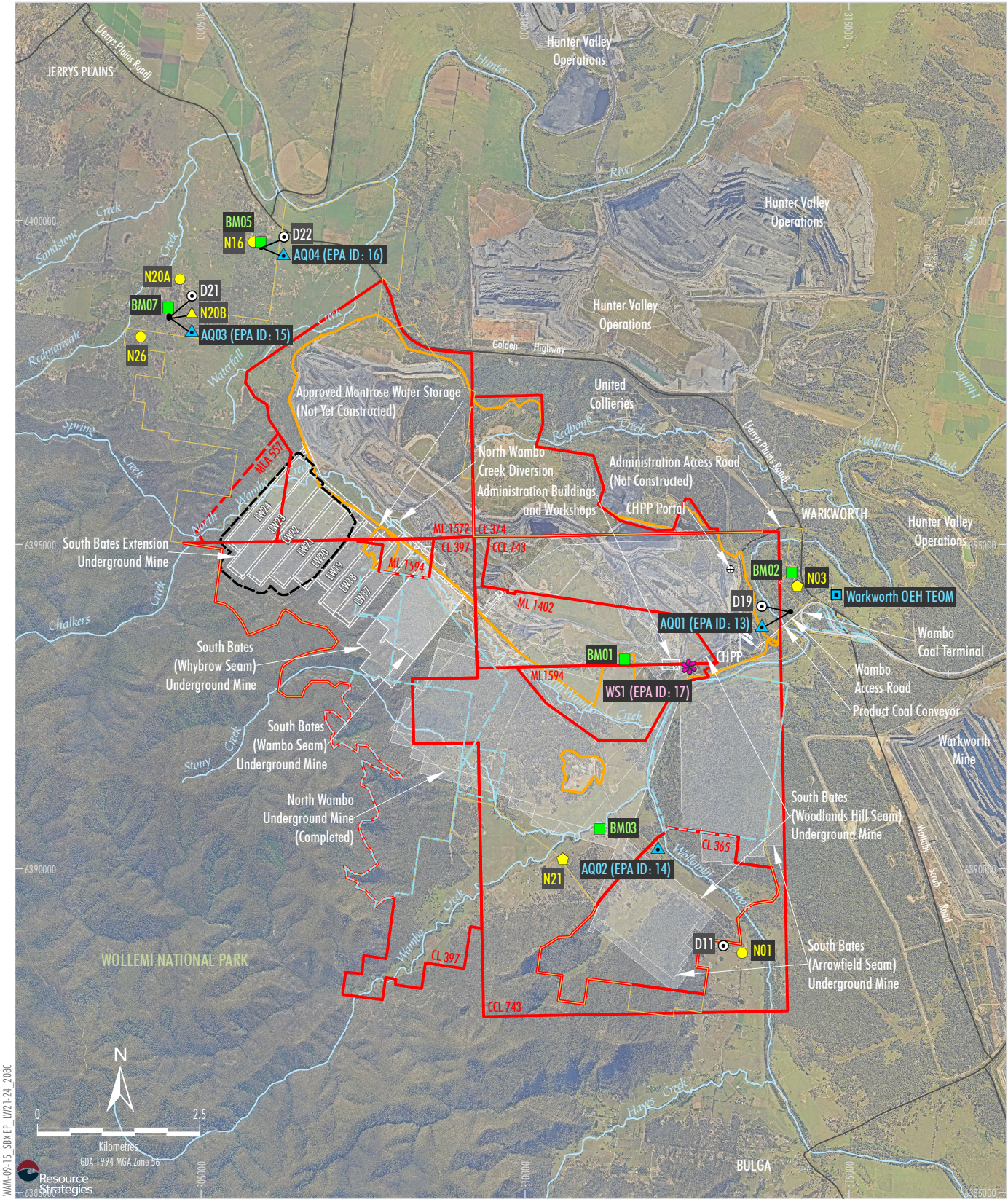
[1] Inspection to occur once access is practicably available following the rainfall event. Inspections will not occur for subsequent rainfall events within 7 days of previous inspection.

[2] Cliffs include: the low level cliffs, intermediate level cliffs and cliffs associated with the Wollemi National Park escarpment located within the vicinity of Longwalls 21 to 24.

[3] Where sufficient data for a baseline record has not already been obtained by WCPL.

[4] If no change is detected then this will be documented. If any adverse changes that threaten the stability of the tree are identified, then appropriate stabilisation works and/or salvage will be considered and undertaken as required.

[5] Active service lines include all services required for mining at the Wambo Coal Mine (electricity supply, telecommunications, water supply and mine dewatering).



LEGEND

- Mining and Coal Lease Boundary
- Mining Lease Application Boundary
- WCPL Owned Land
- Existing/Approved Surface Development Area
- South Bates (Whybrow Seam) Underground Mine
- South Bates (Wambo Seam) Underground Mine
- Other Approved Underground Development
- Remnant Woodland Enhancement Program (RWEP) Area
- Extraction Plan Application Area

Monitoring Types

- Meteorological Station
- Noise Monitoring Site (Attended and Real-time)
- Noise Monitoring Site (Attended)
- Noise Monitoring Site (Real-time)
- OEH PM_{10} Monitor
- WCPL TEOM (PM_{10})
- Dust Deposition Gauge
- Blast Monitoring Site

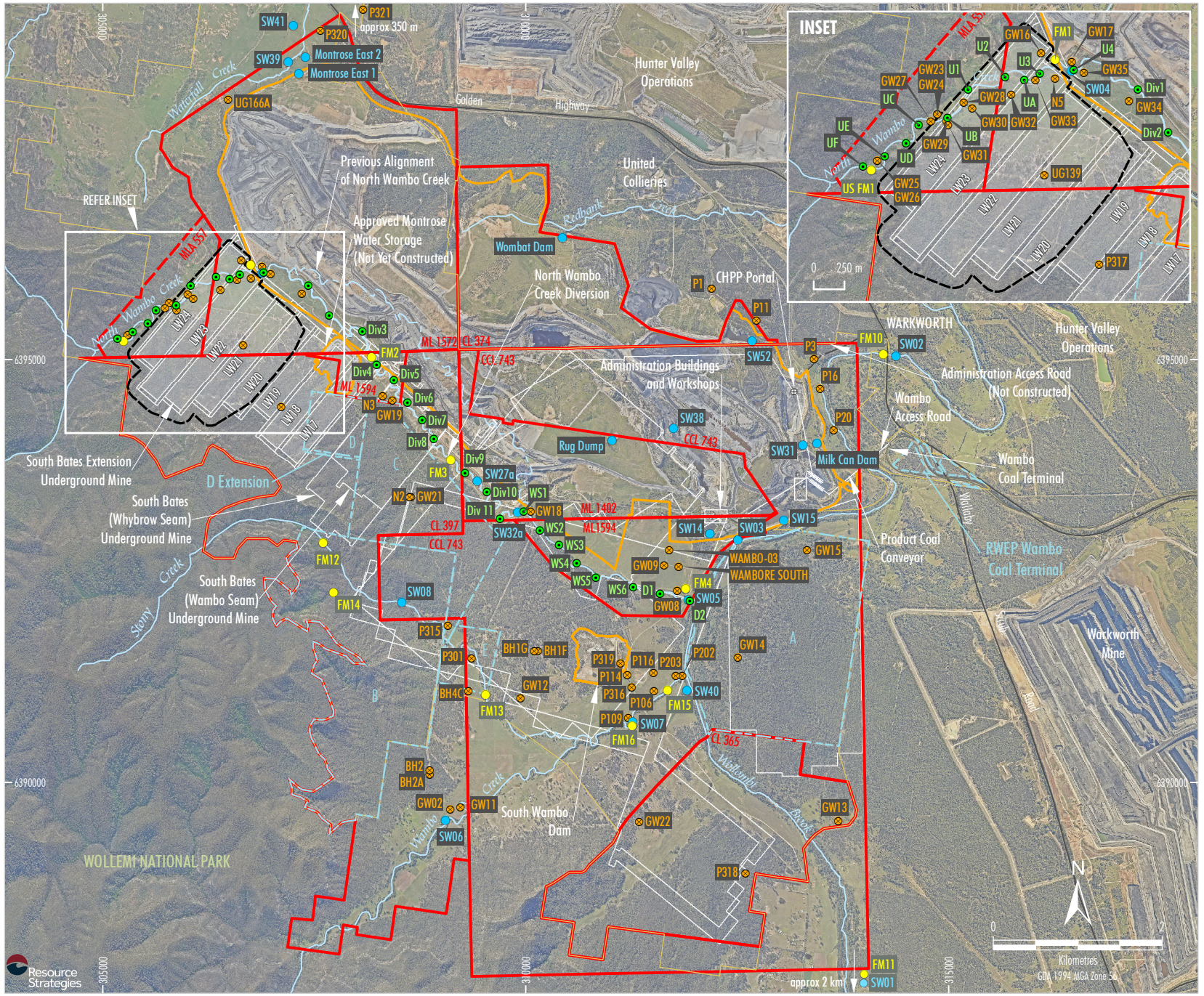
Source: WCPL (2020); NSW Spatial Services (2019)
Orthophoto: WCPL (May 2019)

Peabody

WAMBO COAL MINE

Locations of Air Quality, Noise and Blast Monitoring Sites

Figure 12



LEGEND

- WCPL Owned Land
- Mining and Coal Lease Boundary
- Mining Lease Application Boundary
- Existing/Approved Surface Development Area
- Approved Underground Development
- Remnant Woodland Enhancement Program (RWEP) Area
- Extraction Plan Application Area
- Groundwater Monitoring Site
- Surface Water Quality Monitoring Site
- Surface Water Flow Monitoring Site
- Diversion and Subsidence Monitoring Site

Source: WCPL (2020); NSW Spatial Services (2019)
Orthophoto: WCPL (May 2019)

Peabody

WAMBO COAL MINE

Locations of Surface Water and Groundwater Monitoring Sites

Figure 13

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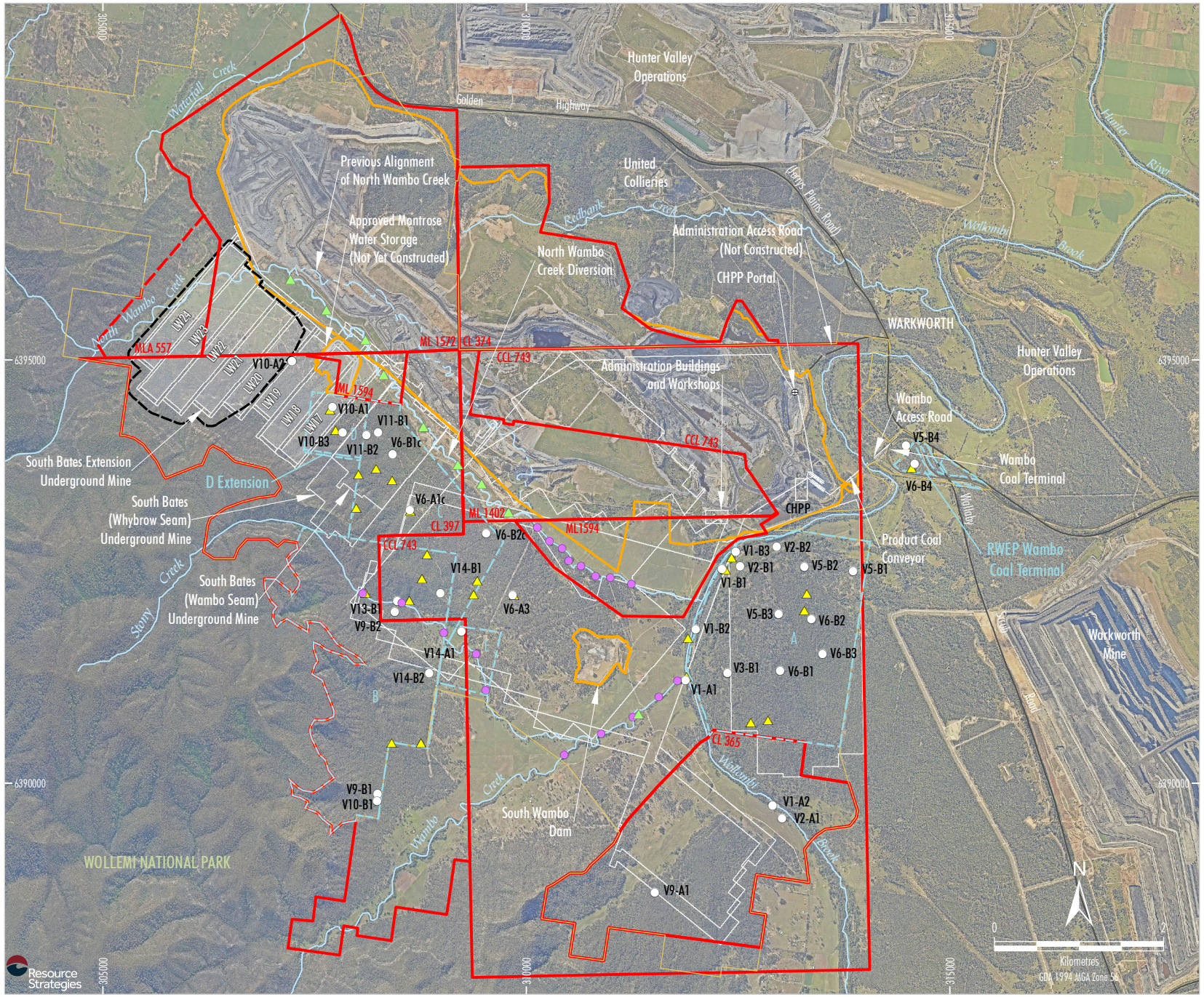

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WAMBO COAL MINE

Locations of Relevant Biodiversity Monitoring Sites

Figure 14

4 IMPLEMENTATION

4.1 ADAPTIVE MANAGEMENT AND CONTINGENCY RESPONSE

4.1.1 Adaptive Management

WCPL will implement an adaptive management approach to ensure subsidence impact performance measures (**Table 5**) are achieved at the South Bates Extension Underground Mine. Adaptive management will involve:

- **Planning** – developing management strategies to meet performance measures; identifying performance indicators to assess performance; and establishing monitoring programs to monitor against the performance measures.
- **Implementation** – implementing management strategies and monitoring impacts against performance indicators.
- **Review** – reviewing and evaluating the effectiveness of management strategies by analysis of monitoring data against predicted impacts, performance indicators and performance measures in accordance with the schematic presented in **Figure 11**.
- **Contingency Response** – implementing contingency plans where a potential exceedance of a subsidence impact performance measures or an unexpected impact is detected (**Section 4.1.2**).
- **Adjustment** – adjusting management strategies to improve performance, particularly following an exceedance of a subsidence impact performance measure or detection of an unexpected impact.

4.1.2 Contingency Response

In the event the performance measures in **Table 5** are considered to have been exceeded or are likely to be exceeded, WCPL will implement the Contingency Plan outlined further below.

Responsibilities during contingency response are outlined in **Table 21**, which is designed to clearly outline actions, levels of responsibility within WCPL and reporting requirements where monitoring results indicate that impacts are exceeding (or likely to exceed) predicted or approved limits. This table is designed to support the Trigger Action Response Plans (TARPs) provided in the component management plans (**Appendices A to F**). These TARPs will be developed further as this Extraction Plan is reviewed and revised.

Relevant management and contingency measures are summarised in **Section 3** and outlined in the component management plans (**Appendices A to F**). WCPL will consider changes to longwall extraction geometry (in consultation with relevant regulatory authorities) if greater than negligible subsidence impacts or environmental consequences occur to the Wollemi National Park.

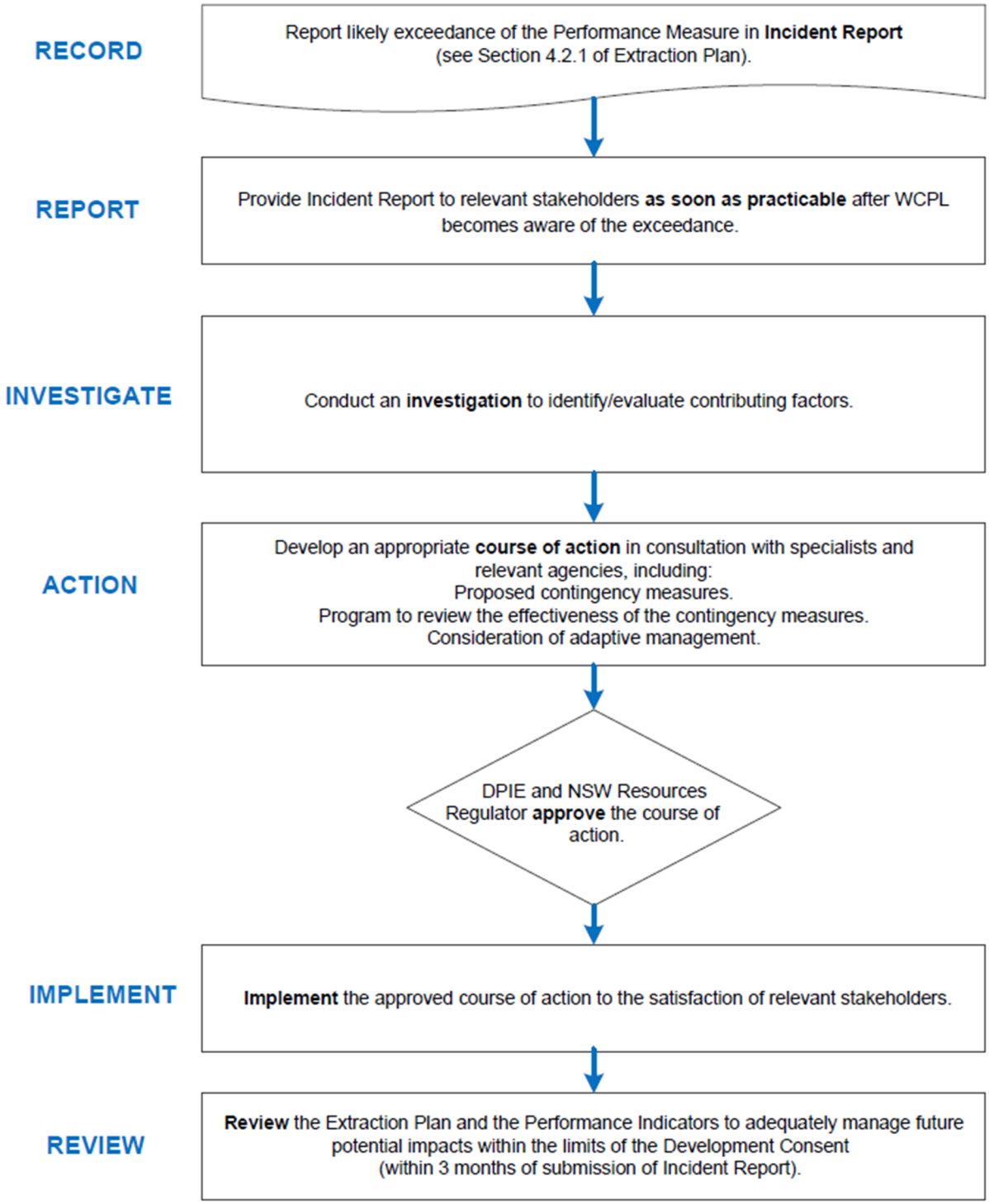
Changes to longwall geometry would be implemented through WCPL's internal Mine Plan Design Alteration procedure (SWP 9004) administered by the Mine Surveyor.

Table 21
Contingency Plan Responsibilities

Condition	Normal Predicted Impacts	Level 1 Implement Management Measures	Level 2 Contingency Phase
Mine Surveyor	Work to continue as normal in accordance with: • Extraction Plan and component plans; • Development Consent; and • Mining Lease conditions.	• Complete **Subsidence Impact Register**. • Report to TSM, UME and ECM. • Additional survey of area to confirm subsidence impacts and effects, where required.	• As per Level 1, but respond **immediately**.
Underground Mining Engineer (UME)		• Where related to built features or public safety, investigate area and advise of additional works or remediation, where required. • Increase monitoring frequency in immediate vicinity, where required. • Consult with external expert(s) for advice where appropriate. • Report findings and recommendations to TSM.	• As per Level 1, and **immediately** report findings to TSM (may include recommendation to stop mining).
Environment and Community Manager (ECM)		• Where related to environmental impact, investigate area and advise of additional works or remediation, where required. • Increase monitoring frequency in immediate vicinity, where required. • Consult with external expert(s) for advice where appropriate. • Review information and **approve** and instruct implementation of remediation/corrective action/compensation, if necessary. • Report findings/recommendations to TSM, MME and/or GM where required. • Report impact and response in Annual Review, where required.	• As per Level 1, but respond **immediately**. • As soon as practical, lodge **Incident Report**, with DPIE and relevant agencies (e.g. BCD, NSW Resources Regulator, DPIE-Water) and report on corrective actions. • Within 3 months, review this Extraction Plan.
Technical Services Manager (TSM)		• Review investigation(s). • Review information and **approve** and instruct implementation of remediation/corrective action/ compensation, if necessary. • Report findings/recommendations to ECM, MME and/or GM where required. • Report impact/response in **Subsidence Management Status Report**.	• As per Level 1, but respond **immediately**. • In making recommendations, review need to stop mining (including safety implications). • Consult with external expert(s) for advice where appropriate. • As soon as practical, notify NSW Resources Regulator and Subsidence Advisory NSW on corrective actions. • As soon as practical, notify relevant infrastructure owners of impacts.
Mining Engineering Manager (Underground Mine Manager) (MME)		• Ensure adequate resources are available for implementation of remediation/corrective actions. • Report to GM, where required.	• As per Level 1, but respond **immediately**. • If recommended, direct operations to stop in a safe manner.
General Manager (GM)		• Review information and **approve** and instruct implementation of remediation/corrective action/compensation, if necessary.	• As per Level 1, but respond **immediately**.

As noted in the Contingency Plan, within 3 months of submission of an Incident Report, the relevant components of the Extraction Plan will be review and revised, where necessary. The process of review is outlined in **Section 4.3**.

Contingency Plan



4.2 REPORTING FRAMEWORK

WCPL has developed a reporting framework for the Extraction Plan based on the Draft Extraction Plan Guidelines (DP&E and DRE, 2015).

Table 22 provides a summary of the reporting framework, including which stakeholders will receive copies of each report and the distribution method. The subsections below provide further detail on the contents of each reporting mechanism.

The proposed reporting framework for the South Bates Extension Underground Mine is considered adequate as the Application Area is wholly within WCPL-owned land and Longwalls 21 to 24 are not predicted to have greater than negligible impact on items of environmental sensitivity.

4.2.1 Incident Report

WCPL will notify the relevant agencies (**Table 22**) of a subsidence incident as soon as practicable after WCPL becomes aware of the incident. Within **7 days** of the date of the incident, WCPL will provide the relevant agencies with a detailed Incident Report.

A subsidence incident includes any of the following:

- a potential exceedance of a subsidence impact performance measure or an unexpected impact is detected, including impacts to the natural environment or impacts that may be adverse to the serviceability and/or safety of built features;
- detection of any significant unpredicted and/or higher-than-predicted subsidence and/or abnormalities in subsidence development in any surface areas that may be affected by longwall mining;
- detection of an incident caused by subsidence which has a potential to expose any person to health and safety risks;
- detection of significant deviation from the predicted nature, magnitude, distribution, timing and duration of subsidence effects, and of the potential impacts and consequences of those deviations on built features and the health and safety of any person;
- significant failure or malfunction of a monitoring device or risk control measure set out in the Extraction Plan addressing built features, public safety or subsidence monitoring;
- reports of any adverse subsidence impacts by any relevant stakeholder; or
- any other subsidence related incident requiring prompt notification.

An Incident Report will include the following:

- details on the nature of the incident (including survey results, photographs and date of the incident);
- results of investigation(s) to identify/evaluate the contributing factors to the incident;
- proposed course of action to remedy the incident, including proposed contingency measures and a program to review the effectiveness of the contingency measures; and
- relevant WCPL contact details to obtain further information on the incident.

Table 22
Summary of Reporting Framework

Report	Frequency	Distribution[1]	Distribution Method[1]	Responsibility for Data Collation and Preparation	Responsibility for Submission
Incident Report	As required – see **Section 4.2.1**	DPIE (Manager, Mining Projects) NSW Resources Regulator (Subsidence Executive Officer) Subsidence Advisory NSW (District Manager) Other regulators as specified in management plans	Email	Environment and Community Manager	General Manager
Subsidence Management Status Report	To be updated fortnightly. Must be submitted if impacts greater than predicted are identified or upon request.	DPIE (Manager, Mining Projects) NSW Resources Regulator (Subsidence Executive Officer)	Email	Technical Services Manager Environment and Community Manager	Technical Services Manager (in consultation Mining Engineering Manager and Environment and Community Manager)
Six Monthly Report	Annual (for the period 1 January to 30 June)	DPIE (Manager, Mining Projects) NSW Resources Regulator (Subsidence Executive Officer)	Email	Environment and Community Manager	General Manager
Annual Review	Annual (for the period 1 January to 31 December)	DPIE (Manager, Mining Projects) NSW Resources Regulator (Subsidence Executive Officer) NSW Resources Regulator (Manager Environmental Sustainability) Subsidence Advisory NSW (District Manager) BCD/EPA (General Contact) DPIE-Water (Water Regulation) Singleton Shire Council (General Manager) CCC Members	Email and/or Post	Environment and Community Manager	General Manager

[1] See **Attachment 4** for distribution details.

4.2.2 Subsidence Management Status Report

The Subsidence Management Status Report will include the following:

- Current face position of the longwall panel being extracted and a note on the current location of development.
- Summary of any comments, advice and feedback from consultation with stakeholders in relation to subsidence management undertaken in the month and a summary of WCPL's responses.
- Summary of observed and/or reported subsidence impacts, including a full description and good photos of the impact.
- Summary of any observed and/or reported incidents, service difficulties, asset owner complaints or community complaints related to subsidence and a summary of WCPL's response to these issues.
- Report on any unusual subsidence development (to facilitate early detection of potential subsidence impacts).

The Subsidence Management Status Report will be updated regularly on site and submitted if impacts greater than predicted are identified or upon request from DPIE or NSW Resources Regulator.

4.2.3 Six Monthly Report

A Six Monthly Report will be prepared to summarise monitoring results for the period 1 January to 30 June. The Six Monthly Report will include:

- Current face position of the longwall panel being extracted and a note on the current location of development.
- Summary of any comments, advice and feedback from consultation with stakeholders in relation to subsidence management undertaken in the reporting period and a summary of WCPL's responses.
- Summary of all observed and/or reported impacts (where monitoring has been undertaken within the six month period).
- Any management measures or contingency responses proposed or implemented.
- Update on the effectiveness of the contingency measures outlined in any Incident Report submitted (**Section 4.2.1**).
- Summary of all quantitative and qualitative environmental monitoring results (summarised in **Section 3.8**) (noting that monitoring conducted on an annual basis will be summarised in the Annual Review).
- Assessment of compliance against performance indicators and performance measures.
- Summary of subsidence development based on monitoring information compared with any defined triggers and/or the predicted subsidence (to facilitate early detection of potential subsidence impacts).
- Statement regarding any additional and/or outstanding management actions to be undertaken or the need for early responses or emergency procedures to ensure adequate management of any potential subsidence impacts due to longwall mining.

4.2.4 Annual Review

The Annual Review will be prepared and submitted in accordance with Condition D10 of Schedule 2 of the Development Consent (DA 305-7-2003).

Annual Reviews will include:

- summary of subsidence effects monitoring results and a comparison to predicted subsidence effects; and
- summary of all environmental and subsidence monitoring results and a comparison of actual impacts with predicted subsidence impacts and the subsidence impact performance measures.

4.3 REVIEW OF THE EXTRACTION PLAN

This Extraction Plan and its component management plans will be reviewed in detail, and revised if necessary, in the following circumstances:

- within 3 months of the submission of an **Incident Report** relating to a subsidence impact (**Section 4.2.1**) taking into consideration any contingency response implemented following submission of the Incident Report (**Section 4.1.2**); and/or
- where there is a significant change in operation that may affect the environment or the community.

In addition to the above, this Extraction Plan will also be reviewed within 3 months of:

- the submission of an Annual Review;
- the submission of an audit report; or
- any modification to the conditions of the Development Consent (DA 305-7-2003).

The component management plans of this Extraction Plan reference components of a number of existing Environmental Management Plans to avoid duplication (**Section 3**). If these Environmental Management Plans are revised separately in accordance with the Development Consent (DA 305-7-2003) the management plans will be updated accordingly.

4.4 REVIEW OF OTHER MANAGEMENT PLANS

WCPL commits to updating the Inrush Management Plan (as part of the notification under clause 33 of the *Work Health and Safety (Mines and Petroleum Sites) Regulation, 2014*) to incorporate this revision of the Extraction Plan.

This Extraction Plan references the following management plans with revisions proposed as part of this Extraction Plan revision:

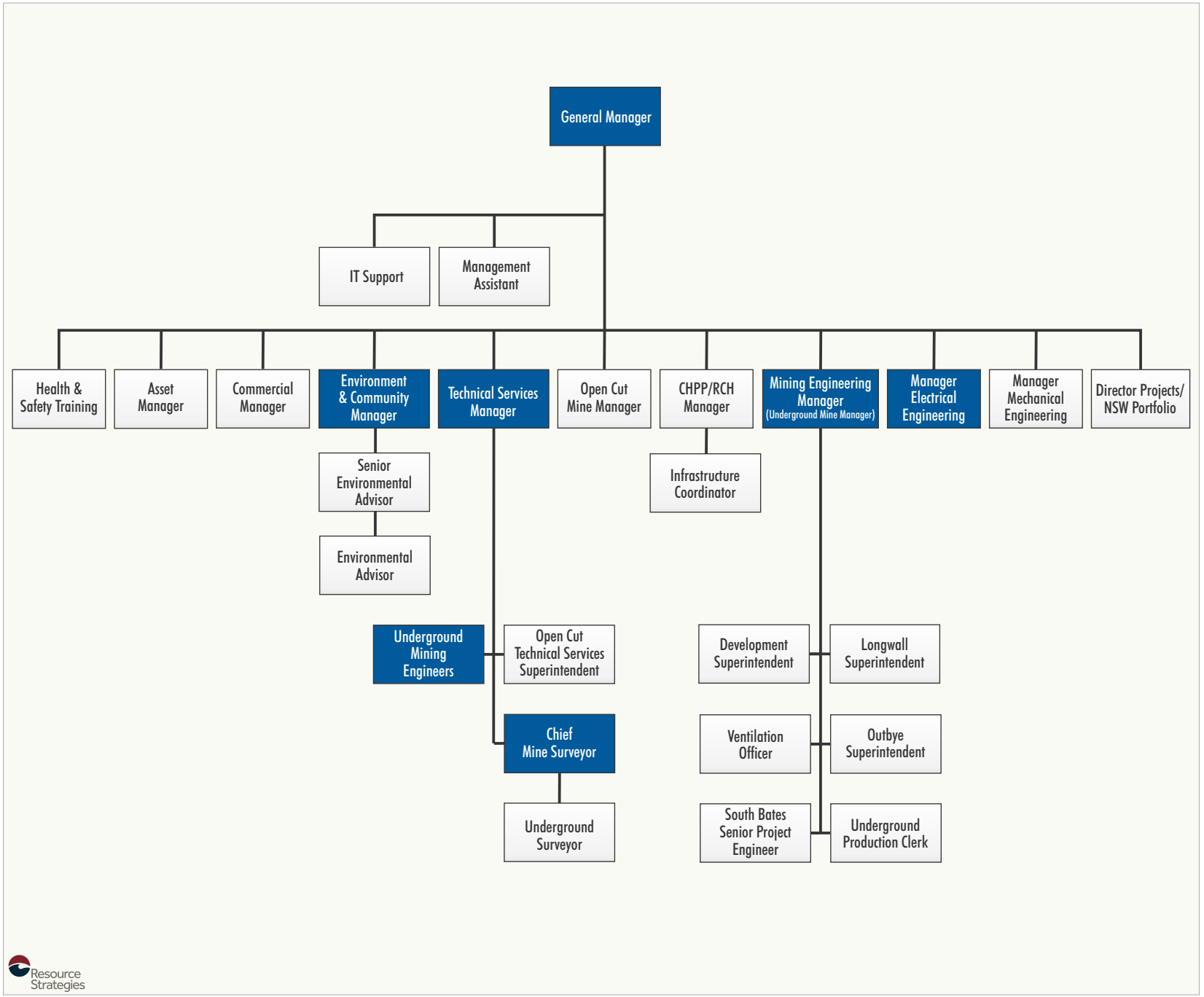
- BMP (Version 1); and
- HMP (Version 1).

4.5 KEY RESPONSIBILITIES

Key responsibilities under this Extraction Plan are summarised in **Table 23**. The component management plans provide additional responsibilities under the plans. A summary WCPL organisation structure is provided in **Figure 15**.

Table 23
Key Extraction Plan Responsibilities

Responsibility	Task
General Manager	• Ensure resources are available to WCPL personnel to facilitate the completion of responsibilities under this Extraction Plan. • Ensure the safety of WCPL employees and the public in relation to WCPL operations. • Approve and instruct implementation of remediation/corrective action/compensation, if necessary.
Mining Engineering Manager (Underground Mine Manager)	• Ensure the safety of WCPL employees and the public in relation to WCPL operations. • Ensure adequate resources are available for implementation of remediation/corrective actions.
Technical Services Manager	• Liaise with relevant stakeholders regarding subsidence impact management and related public safety hazards.
Environment and Community Manager	• Liaise with relevant stakeholders regarding environmental management. • Ensure monitoring and reporting required in accordance with this Extraction Plan are carried out within specified timeframes, are adequately checked and processed and are prepared to the required standard. • Ensure that any Incident Reports are lodged in accordance with regulatory requirements with all available information. • Ensure that reviews of this Extraction Plan and other plans are conducted as described in **Sections 4.3 and 4.4**.
Underground Mining Engineer	• Undertake relevant monitoring and implementation of management measures summarised in **Section 3**.
Mine Surveyor	• Undertake all subsidence monitoring to the required standard within the specified timeframes and ensure data are adequately checked, processed and recorded. • Record and maintain observations of subsidence impacts in the Subsidence Impact Register.



LEGEND

Key personnel responsible for implementation of the Extraction Plan

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WAMBO COAL MINE

WCPL Organisation Structure

Resource Strategies

WAM-09-15_SBX EP_LW21-24_004A

Figure 15

5 REFERENCES

Alluvium (2020) *Surface Water Technical Report for South Bates Extension Underground Mine (Longwalls 21-24).* Report prepared for Wambo Coal Pty Limited.

Department of Environment, Climate Change and Water (2010) *Aboriginal Cultural Heritage Consultation Requirements for Proponents*.

Department of Mineral Resources (1993) *Hunter Coalfield Regional Geology 1:100 000 Sheet*. New South Wales.

Department of Planning and Environment and NSW Trade & Investment – Division of Resources and Energy (2015) *Guidelines for the Preparation of Extraction Plans Required under Conditions of Development Consents, Project Approvals and Mining Lease Conditions for Underground Coal Mining.* Version 5. Draft.

EJE Heritage (2017) *Statement of Heritage Impact, Wambo Coal Mine, South Bates Extension Modification, Near Warkworth NSW.*

FloraSearch (2017) *South Bates Extension Modification – Flora Assessment*. Report prepared for Wambo Coal Pty Limited.

Kuskie, P. (2017) *Wambo Coal Mine, Hunter Valley, New South Wales: South Bates Extension Modification – Aboriginal Cultural Heritage Assessment*. Report prepared for Wambo Coal Pty Limited.

MineConsult (2001) *Wambo Strategic Mine Plan Vol 1*. Report prepared for Wambo Mining Corporation Ltd.

Mine Subsidence Engineering Consultants (2017) *South Bates Extension Modification Subsidence Assessment – Subsidence Predictions and Impact Assessments for the Natural and Built Features in Support of the Modification Application for the South Bates Extension Modification*. Report MSEC848 prepared for Wambo Coal Pty Limited.

Mine Subsidence Engineering Consultants (2020) *South Bates Extension Subsidence Assessment – Subsidence Predictions and Impact Assessments for the Natural and Built Features in Support of the Extraction Plan Application for the South Bates Extension WYLW21 to WYLW24.* Report MSEC1080 prepared for Wambo Coal Pty Limited.

Risk Mentor (2020) *Wambo U/G South Bates Extension – Longwalls 21-24 – Extraction Plan Risk Assessment Report*. Report prepared for Wambo Coal Pty Limited.

SLR Consulting Pty Ltd (2020) *SBE LW21-24 Groundwater Technical Review – Underground Mine Longwalls 21-24 Groundwater Assessment in Support of the Extraction Plan*.

Wambo Coal Pty Limited (2003) *Wambo Development Project Environmental Impact Statement.*

Wambo Coal Pty Limited (2016) *South Wambo Underground Mine Modification Environmental Assessment*.

Wambo Coal Pty Limited (2017) *South Bates Extension Underground Mine Modification – Environmental Assessment*.

6 ABBREVIATIONS, ACRONYMS AND GLOSSARY

6.1 ABBREVIATIONS AND ACRONYMS

ACHA	Aboriginal Cultural Heritage Assessment
AHIP	Aboriginal Heritage Impact Permit
BCD	Biodiversity and Conservation Division
BFMP	Built Features Management Plan
BMP	Biodiversity Management Plan
CCC	Community Consultative Committee
CEEC	critically endangered ecological community
CL	Coal Lease
CRRP	Coal Resource Recovery Plan
DA	Development Approval
DECCW	NSW Department of Environment, Climate Change and Water
DPIE-Water	NSW Department of Planning, Industry and Environment – Water
DMR	NSW Department of Mineral Resources (now MEG)
DP&E	NSW Department of Planning and Environment (now DPIE)
DPIE	NSW Department of Planning, Industry and Environment
Draft Extraction Plan Guidelines	*Guidelines for the Preparation of Extraction Plans Required under Conditions of Development Consents, Project Approvals and Mining Lease Conditions for Underground Coal Mining* (Department of Planning and Environment and NSW Trade & Investment – Division of Resources and Energy, 2015).
DRE	Division of Resources and Energy (now MEG)
DRG	Division of Resources and Geoscience (now MEG)
EEC	endangered ecological community
EPA	NSW Environment Protection Authority
EP&A Act	NSW *Environmental Planning and Assessment Act, 1979*
EPBC Act	Commonwealth *Environment Protection and Biodiversity Conservation Act, 1999*
EPL	Environment Protection Licence
ESCP	Erosion and Sediment Control Plan
GWMP	Groundwater Monitoring Program
HSMS	Health Safety Management System
HMP	Heritage Management Plan
IDC	Index of Diversion Condition
km	kilometre
km^{-1}	per kilometre
kV	kilovolt
LiDAR	Light Detection and Ranging
LFA	Landscape Function Analysis
LMP	Land Management Plan
m	metre
MEG	Mining, Exploration and Geosciences
ML	Mining Lease
ML/day	megalitre per day
mm	millimetre
mm/m	millimetre per metre
MOP	Mining Operations Plan
MSEC	Mine Subsidence Engineering Consultants
Mt	million tonnes
NPW Act	NSW *National Parks and Wildlife Act, 1974*
NSW	New South Wales

NSW Trade & Investment	NSW Department of Trade and Investment, Regional Infrastructure and Services
OEH	NSW Office of Environment and Heritage
PAD	potential archaeological deposit
PSMP	Public Safety Management Plan
ROM	Run-of-mine
RWEP	Remnant Woodland Enhancement Program
SGWRP	Surface and Ground Water Response Plan
SMP	Subsidence Monitoring Program
South Bates Extension Modification EA	*South Bates Extension Modification Environmental Assessment* (WCPL, 2017)
SWMP	Surface Water Monitoring Program
TARP	Trigger Action Response Plan
TSMP	Threatened Species Management Plan
UAV	unmanned aerial vehicle
VCP	Vegetation Clearance Protocol
VWP	vibrating wire piezometer
the Wambo Development Project EIS	*Wambo Development Project Environmental Impact Statement* (WCPL, 2003)
WAMP	WCPL Asset Management Plan
WCPL	Wambo Coal Pty Limited
WHC	Wambo Homestead Complex
WMP	Water Management Plan
°	degree
%	percent

6.2 GLOSSARY

Note: Terms in bold are defined in the Development Consent (DA 305-7-2003).

Adaptive management	Adaptive management includes monitoring subsidence impacts and subsidence effects and, based on the results, modifying the mining plan as mining proceeds to ensure that the effects, impacts and/or associated environmental consequences remain within predicted and designated ranges and in compliance with the conditions of the Development Consent.
Alluvial	A general term for clay, silt, sand and gravel transported by water and deposited, on the bed of a floodplain, river or stream.
Angle of draw	The angle between the vertical and the line joining the edge of the mining void with the limit of vertical subsidence, usually taken as 20 millimetres.
Aquifer	A sub-surface rock formation containing water in recoverable quantities.
Baseflow	The discharge of sub-surface water into a stream (i.e. groundwater seepages).
Built features	Includes any building or work erected or constructed on land, and includes dwellings and infrastructure such as any formed road, street, path, walk, or driveway; any pipeline, water, sewer, telephone, gas or other service main.
Development Consent	Development Consent (DA 305-7-2003) for the Wambo Coal Mine was granted on 4 February 2004 by the then NSW Minister for Urban Affairs and Planning under Part 4 of the NSW *Environmental Planning and Assessment Act, 1974*.
Environmental consequences	The environmental consequences of subsidence impacts, including: damage to infrastructure, buildings and residential dwellings; loss of surface flows to the subsurface; loss of standing pools; adverse water quality impacts; development of iron bacterial mats; cliff falls; rock falls; damage to heritage items; impacts on aquatic ecology; ponding.

Fault	Major fracture of the Earth's crust caused by the relative movement of the rock masses on either side.
First workings	Development of main headings, longwall gate roads, related cut throughs and other workings for mine access and ventilation.
Geological structures	Geological structures are faults, igneous intrusions, joints or any other significant type of discontinuity or disturbances within the rock strata.
Goaf	The mined-out area into which the immediate roof strata break.
Low level cliffs	Low level cliffs as defined in the Subsidence Assessment (Appendix A) of the South Bates Extension Modification Environmental Assessment (WCPL, 2017).
Mitigation	Activities associated with reducing the impacts of the development.
Remediation	Activities associated with partially or fully repairing or rehabilitating the impacts of the development or controlling the environmental consequences of this impact.
Risk	The chance of something happening that will have an impact upon objectives. It is measured in terms of consequence and likelihood.
Safe, serviceable and repairable	Safe means no danger to users who are present, serviceable means available for its intended use, and repairable means damaged components can be repaired economically.
Second workings	Extraction of coal from longwall panels, mini-wall panels or pillar extraction.
Strain	The change in the horizontal distance between two points at the surface and is typically expressed in units of mm/m. *Tensile strain* is an increase in the distance between two points (i.e. stretching) and *compressive strain* is a decrease in distance (i.e. squeezing).
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 subsidence and surface depressions or troughs.
Tilt	The change in the slope of a land surface as a result of differential subsidence and is expressed in units of millimetres per metre (mm/m) or a change in grade where 1 mm/m = 0.1%.
Upsidence	Relative vertical upward movements of the ground surface associated with subsidence.
Vertical subsidence	Vertical downward movements of the ground surface caused by underground coal mining.

WAMBO COAL PTY LIMITED

SOUTH BATES EXTENSION UNDERGROUND MINE

EXTRACTION PLAN
LONGWALLS 21 TO 24

ATTACHMENT 1
STATUTORY REQUIREMENTS

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Attachment 1
Statutory Requirements

This Attachment outlines relevant statutory and guideline requirements and provides the relevant section of the Extraction Plan where the requirements are addressed. This Attachment considers the statutory instruments and guidelines in **Table A1-1**.

Table A1-1
Relevant Statutory Instruments and Guidelines

Statutory Instrument or Guideline	Attachment 1 Reference
Development Consent (DA 305-7-2003)	Table A1-2
Draft *Guidelines for the Preparation of Extraction Plans Required under Conditions of Development Consents, Project Approvals and Mining Lease Conditions for Underground Coal Mining* (Version 5) (Draft Extraction Plan Guidelines) (Department of Planning & Environment [now Department of Planning, Industry and Environment (DPIE)] and Division of Resources and Energy [now Mining Exploration and Geosciences (MEG)], 2015)	Table A1-3
Mining Lease Conditions	Table A1-4

Table A1-2
Development Consent DA 305-7-2003 Requirements

<table>
<tr><th>Condition Number</th><th>Condition</th><th>Document Reference/Comment</th></tr>
<tr><td colspan="3">Performance Measures – Natural and Heritage Features, etc</td></tr>
<tr><td>B1.</td><td>The Applicant must ensure that underground mining operations undertaken following the approval of Modification 9 comply with the performance measures in Table 1.
Table 1: Subsidence Impact Performance Measures – Natural and Heritage Features etc
<table>
<tr><th>Feature</th><th>Performance Measures</th></tr>
<tr><td colspan="2">Water</td></tr>
<tr><td>Wollombi Brook</td><td>Negligible subsidence impacts and environmental consequences
Release of water from the site only in accordance with EPL requirements</td></tr>
<tr><td colspan="2">Land</td></tr>
<tr><td>Low level cliffs within the South Bates Extension Area</td><td>Minor environmental consequences (that is occasional rockfalls, displacement or dislodgement of boulders or slabs, or fracturing that in total do not impact more than 5% of the total face area of such features)</td></tr>
<tr><td colspan="2">Biodiversity</td></tr>
<tr><td>Wollemi National Park</td><td>Negligible subsidence impacts and environmental consequences</td></tr>
<tr><td>Warkworth Sands Woodland Community</td><td>Minor cracking and ponding of the land surface or other subsidence impacts
Negligible environmental consequences</td></tr>
<tr><td>White Box, Yellow Box, Blakely’s Red Gum Woodland/Grassy White Box Woodland Community</td><td>Minor cracking and ponding of the land surface or other subsidence impacts
Negligible environmental consequences</td></tr>
</table></td><td>This Extraction Plan has been developed to meet the subsidence impact performance measures.
Section 3.1 and Appendix A (Water Management Plan).
Section 3.2 and Appendix B (Land Management Plan).
Section 3.3 and Appendix C (Biodiversity Management Plan).
Given the absence of the Warkworth Sands Woodland Community and the White Box, Yellow Box, Blakely’s Red Gum Woodland/Grassy White Box Woodland Community from the South Bates Extension Underground Mine area, these communities are not expected to experience impacts resulting from the extraction of Longwalls 21 to 24.</td></tr>
</table>

Table A1-2 (Continued)
Development Consent DA 305-7-2003 Requirements

<table>
<tr><th>Condition Number</th><th>Condition</th><th>Document Reference/Comment</th></tr>
<tr><td>B1. (Cont.)</td><td>Table 1: Subsidence Impact Performance Measures (Continued)
<table>
<tr><td colspan="2">Biodiversity (Continued)</td></tr>
<tr><td>Central Hunter Valley Eucalypt Forest and Woodland Ecological Community</td><td>Minor cracking and ponding of the land surface or other subsidence impacts
Negligible environmental consequences</td></tr>
<tr><td>Conservation Areas (including the proposed Wambo offset area under SSD 7142)</td><td>Negligible reduction to previously identified biodiversity credits</td></tr>
<tr><td colspan="2">Heritage</td></tr>
<tr><td>Wambo Homestead Complex</td><td>Negligible impact on heritage values, unless approval has been granted by the Heritage Branch and/or the Minister</td></tr>
</table></td><td>Section 3.3 and Appendix C (Biodiversity Management Plan).

Section 3.3 and Appendix C (Biodiversity Management Plan).

Section 3.4 and Appendix D (Heritage Management Plan).</td></tr>
<tr><td colspan="3">Performance Measures – Built Features</td></tr>
<tr><td>B4.</td><td>The Applicant must ensure that underground mining operations undertaken following the approval of Modification 9 comply with the performance measures in Table 2.
Table 2: Subsidence Impact Performance Measures – Built Features
<table>
<tr><th>Feature</th><th>Performance Measures</th></tr>
<tr><td colspan="2">Built Features</td></tr>
<tr><td>All built features (including public infrastructure and all structures on privately-owned land)</td><td>Always safe.
Serviceability should be maintained wherever practicable.
Loss of serviceability must be fully compensated.
Damage must be fully repairable, and must be fully repaired or else replaced or fully compensated.</td></tr>
<tr><td colspan="2">Public Safety</td></tr>
<tr><td>Public Safety</td><td>Negligible additional risk</td></tr>
</table></td><td>This Extraction Plan has been developed to meet the subsidence impact performance measures.

Section 3.5 and Appendix E (Built Features Management Plan).

Section 3.6 and Appendix F (Public Safety Management Plan).</td></tr>
</table>

Table A1-2 (Continued)
Development Consent DA 305-7-2003 Requirements

Condition Number	Condition	Document Reference/Comment
B5.	Any dispute between the Applicant and the owner of any built feature over the interpretation, application or implementation of the performance measures in Table 2 is to be settled by the Planning Secretary, following consultation with the Resources Regulator. Any decision by the Planning Secretary shall be final.	The Longwalls 21 to 24 Application Area is located entirely within WCPL-owned land. All built features are to be managed in accordance with Section 3.5 and the Built Features Management Plan (Appendix E).
First Workings		
B6.	The applicant may carry out first workings within the underground mining area, other than in accordance with an approved Extraction Plan, provided that the Resources Regulator is satisfied that the first workings are designed to remain stable and non-subsiding in the long term, except insofar as they may be impacted by approved second workings. ***Note:*** *The intent of this condition is to ensure that first workings are built to geotechnical and engineering standards sufficient to ensure long term stability, with negligible direct subsidence impacts.*	Confirmation from the Division of Resources and Geosciences was provided on 27 March 2018 that the proposed first workings for Longwalls 17 to 21 satisfied the requirements of Condition 22E, Schedule 4 of the Development Consent (DA 305-7-2003) (now Condition B6, Schedule 2), subject to the Mine Manager undertaking adequate monitoring of the stability of the first workings and implementing appropriate ground support of the roadways in accordance with the results of the monitoring. The above monitoring requirements are undertaken in accordance with the Strata Failure Management Plan. WCPL will consult with MEG regarding the first workings for Longwalls 22 to 24 prior to commencing these works.
Extraction Plan		
B7.	The Applicant must prepare an Extraction Plan for all second workings on the site to the satisfaction of the Planning Secretary. Each Extraction Plan must:	
	(a) be prepared by a suitably qualified and experienced person/s whose appointment has been endorsed by the Planning Secretary;	Section 1.1 and Attachment 2.
	(b) include detailed plans of existing and proposed first and second workings and any associated surface development;	This application. Section 1.3 and Appendix G (Coal Resource Recovery Plan).
	(c) provide updated predictions of the potential subsidence effects, subsidence impacts and environmental consequences of the proposed mining covered by the Extraction Plan, incorporating any relevant information obtained since this consent;	Section 2.1 and Technical Reports 1 to 3.

Table A1-2 (Continued)
Development Consent DA 305-7-2003 Requirements

Condition Number	Condition	Document Reference/Comment
B7. (Cont.)	(d) describe in detail the performance criteria to be implemented to ensure compliance with the performance measures in Table 1 and Table 2, and manage or remediate any impacts and/or environmental consequences to meet the rehabilitation objectives in condition B104, including: (i) a trigger action response plan to identify risks and specific follow up actions to avoid exceedances of the performance measures; and (ii) a contingency plan that expressly provides for adaptive management where monitoring indicates that there has been an exceedance of the performance measures, or where any such exceedance appears likely;	Section 3 and Appendices A, B, C, E and F.
	(e) include the following to the satisfaction of the Resources Regulator (or DRG, as the case may require):	Section 2.1 and Technical Reports 1 to 3.
	(i) a coal resource recovery plant that demonstrates effective recovery of the available resource;	Appendix G (Coal Resource Recovery Plan).
	(ii) a **Subsidence Monitoring Program** to: • provide data to assist with the management of the risks associated with subsidence (conventional and non-conventional); • validate the subsidence predictions; and • analyse the relationship between the subsidence effects and impacts under the plan against those predicted and any ensuing environmental consequences;	Section 3.8 and Appendix H (Subsidence Monitoring Program).
	(iii) a **Built Features Management Plan** to manage the potential subsidence impacts and/or environmental consequences of the proposed second workings on built features, and which: • addresses, in appropriate detail, all items of public infrastructure and all classes of other built features; and • has been prepared following appropriate consultation with the owner/s of potentially affected feature/s;	Section 3.5 and Appendix E (Built Features Management Plan). There is no public infrastructure in the Longwalls 21 to 24 Application Area.
	(iv) a **Public Safety Management Plan** to ensure public safety in the mining area; and	Section 3.6 and Appendix F (Public Safety Management Plan).

Table A1-2 (Continued)
Development Consent DA 305-7-2003 Requirements

Condition Number	Condition	Document Reference/Comment
B7. (Cont.)	(f) appropriate revisions to the Rehabilitation Management Plan required under condition B107; and	The Rehabilitation Management Plan, in the form of the approved Mining Operations Plan (MOP), is provided in Appendix I. The latest version of the MOP was approved by the DRG (now MEG) on 11 November 2019 and addresses the requirements of a Rehabilitation Management Plan. An updated version of the MOP is currently in preparation for Phase 2 of the United Wambo Joint Venture Project.
	(g) include a:	
	(i) **Water Management Plan**, which has been prepared in consultation with EPA, DPIE Water and NRAR, which provides for the management of the potential impacts and/or environmental consequences of the proposed second working on surface water resources, groundwater resources and flooding, and which includes: • surface and groundwater impact assessment criteria, including trigger levels for investigating any potentially adverse impacts on water resources (level, yield and quality); • a program to monitor and report on compliance with the surface and groundwater impact assessment criteria; • a program to monitor and report on groundwater inflows to underground workings; and • a program to manage and monitor impacts on privately-owned licensed bores;	Section 3.1 and Appendix A (Water Management Plan). The Environment Protection Authority (EPA), Department of Planning, Industry and Environment – Water (DPIE-Water) and Natural Resources Access Regulator (NRAR) have been provided with copies of this Extraction Plan, including the Water Management Plan. Drafts of the component plans for this Water Management Plan were provided to the EPA, DPIE-Water and NRAR on 20 March 2020. None of the agencies have provided any comments to date.
	(ii) **Biodiversity Management Plan**, which has been prepared in consultation with BCD, which provides for the management of the potential impacts and/or environmental consequences of the proposed second workings on flora and fauna, with a specific focus on threatened species, populations and their habitats, EECs and groundwater dependent ecosystems;	Section 3.3 and Appendix C (Biodiversity Management Plan). A draft of the Biodiversity Management Plan was provided to the Biodiversity Conservation Division (BCD) on 20 March 2020. On 3 May 2020, BCD provided comments on the Biodiversity Management Plan which have been addressed in the latest revision.

Table A1-2 (Continued)
Development Consent DA 305-7-2003 Requirements

Condition Number	Condition	Document Reference/Comment
B7. (Cont.)	(iii) **Land Management Plan,** which has been prepared in consultation with any affected public authorities, which provides for the management of the potential impacts and/or environmental consequences of the proposed second workings on land in general, with a specific focus on cliffs, minor cliffs, rock face features, steep slopes and agricultural enterprises;	Section 3.2 and Appendix B (Land Management Plan). There are no 'affected public authorities' relevant to the Longwalls 21 to 24 Application Area. Therefore, the Land Management Plan was not distributed for comment.
	(iv) **Heritage Management Plan**, which has been prepared in consultation with BCD and relevant stakeholders for Aboriginal and non-Aboriginal heritage, to manage the potential impacts and/or environmental consequences of the proposed second workings on heritage items; and	Section 3.4 and Appendix D (Heritage Management Plan). A draft of the Heritage Management Plan was provided to the BCD on 23 March 2020. Aboriginal parties registered at the Wambo Coal Mine were consulted through the preparation of a Cultural Heritage Impact Assessment that accompanied DA 305-7-2003 MOD 17 and associated application for an Aboriginal Heritage Impact Permit, and a copy of the Heritage Management Plan was also provided in March 2020. No comments on the Heritage Management Plan were received from BCD or registered Aboriginal parties.
	(h) include a program to collect sufficient baseline data for future Extraction Plans.	Attachment 3.
B9.	The Applicant must implement the Extraction Plan as approved by the Planning Secretary. ***Notes**:* • *Management plans prepared under condition B7(e)&(f) should address all potential impacts of proposed underground coal extraction on the relevant features. Other site-wide management plans required under this consent are not required to duplicate these plans or re-address the specific impacts associated with underground coal extraction.*	Appendices A to D.

Table A1-3
Requirements of the Draft Extraction Plan Guideline

Guideline Section	Requirement	Document Reference/Comment
Structure		

-	The high-level structure for the required elements of an Extraction Plan should be as follows:
	• Title block;
	• Development of the Plan;
	• Overview;
	• Six key component plans:
	  - Water Management Plan;
	  - Land Management Plan;
	  - Biodiversity Management Plan;
	  - Built Features Management Plan;
	  - Heritage Management Plan; and
	  - Public Safety Management Plan.
	• Subsidence Monitoring Program;
	• Implementation;
	• Graphical Plans; and
	• Attachments.
		The Extraction Plan has been structured as follows:
		• Overview and Summary of Commitments.
		• Section 1 – Overview of the Extraction Plan.
		• Section 2 – Development of the Extraction Plan.
		• Section 3 – Subsidence Management and Monitoring.
		Summarises the monitoring and management measures in the component management plans.
		Section 3.8 provides an overview of subsidence monitoring.
		• Section 4 – Implementation.
		• Section 5 – References.
		• Section 6 – Abbreviations, Acronyms and Glossary.
		• Attachments 1 to 4.
		• Appendices A to I (component management plans).
		Graphical plans are provided in Appendix G (Coal Resource Recovery Plan).
		• Technical Reports 1 to 4.

Table A1-3 (Continued)
Requirements of the Draft Extraction Plan Guideline

Guideline Section	Requirement	Document Reference/Comment
Title Block		
1	A title block should be included at the beginning of the Extraction Plan, which contains the: • name of the applicant company; • name of mine; • development consent and mining lease reference numbers; • Extraction Plan title, date and reference number; and • the signature(s) of person(s) taking responsibility for the accuracy and comprehensiveness of the information contained within the plan, including an authorised representative of the lease holder and the mine manager (for the purposes of relevant safety legislation).	Document Control page.
Development		
2	Most importantly, this section should address ***consultation undertaken by the Applicant with affected agencies and other key stakeholders***, such as the owners and/or operators of both publicly and privately-owned infrastructure and the mine's Community Consultative Committee.	Section 2.3
	Mines are encouraged to provide draft copies of the Extraction Plan and/or some of its component plans (see **Section 4** below) to key regulators for review and feedback.	Table 8.
	Owners of both publicly and privately-owned infrastructure that may be impacted by subsidence should also be consulted.	Section 2.3.3. All assets within the Longwalls 21 to 24 Application Area are WCPL-owned.
	Landowners (whether public or private) may also need to be consulted.	The Longwalls 21 to 24 Application Area is located entirely within WCPL-owned land.
	Where conditions of consent *require* consultation with affected agencies, then evidence of the Applicant's consultative process should be appended to the Extraction Plan, or else provided separately. This evidence should address who was consulted and when, and whether and to what degree their feedback has been incorporated into the Plan.	Attachment 2.

Table A1-3 (Continued)
Requirements of the Draft Extraction Plan Guideline

Guideline Section	Requirement	Document Reference/Comment
2 (Cont.)	This section should also describe the ***process of reviewing and updating the predictions of subsidence effects, subsidence impacts and environmental consequences*** used in previous environmental impact assessment or environmental management plan documentation relied upon by the Applicant (e.g. the predictions in any previous Environmental Impact Statement and/or the predictions in any previous Extraction Plan or SMP). Essentially, this sub-section should provide assurance that previous predictions either remain current (perhaps because this is the first Extraction Plan to be approved following grant of development consent), or that they have been recently revised to take into account monitoring undertaken since the last set of detailed predictions were developed. For guidance, all predictions of subsidence effects, subsidence impacts and environmental consequences should normally take into account the monitored results of the last complete longwall extraction, or all results of monitoring more than six months prior to the date of submission in the case of other types of extraction panels.	Section 2.1 and Technical Reports 1 to 3.
Overview		
3	The overview section is an essential introduction to the Extraction Plan. It should accurately describe:	
	• mine planning and design, including:	Section 1.3.
	- area covered by the Plan and proposed mine layout, described in both text and figures and/or graphical plans. The Plans should also describe and depict all key landscape features, heritage sites and environmental values;	Section 1.1 and Figures 2 and 3.
	- area of underground mining domains (both extracted and approved) for the mine as a whole, showing in context the area covered by the Plan and proposed mine layout, described in text, figures and graphical plans;	Figures 2, 3 and 6.
	- all key proposed mining parameters (described in text, figures and graphical plans) such as proposed mining methods, seam thickness, panel and void widths, chain pillar width, mining height, depth of cover, mining rate, extraction stages and sequencing, resource recovery;	Table 2 and Figure 6. Further detail is provided in the Coal Resource Recovery Plan (Appendix G).

Table A1-3 (Continued)
Requirements of the Draft Extraction Plan Guideline

Guideline Section	Requirement	Document Reference/Comment
3 (Cont.)	- all key existing mining parameters (described in text, figures and graphical plans) such as existing workings (including abandoned workings), whether in the proposed extraction seam or in overlying or underlying seams, and the distribution, geometry and stability of significant voids, standing pillars or remnants which may interact with any proposed workings; and	Section 1.3.1 and Coal Resource Recovery Plan (Appendix G).
	- any special features such as proposed and/or existing multi-seam mining, unusual roof and/or floor conditions, and any conditions that may cause elevated or abnormal subsidence or the formation of sinkholes;	Section 1.3.1 and Coal Resource Recovery Plan (Appendix G).
	• subsidence predictions, including:	
	- all key currently-predicted subsidence parameters (for each proposed longwall or other extraction panel) in both text and figures and/or plans; such as vertical subsidence, tilts, compressive and tensile strains, upsidence and valley closure, relevant far-field movements, including (where relevant) the timing and duration of these parameters;	Section 1.4.
	• performance objectives and other regulatory requirements, including:	
	- what is required to be achieved by the Applicant under the conditions of development consent that establish the requirement for the Extraction Plan and other relevant conditions, including all performance measures listed in the consent; and	Table 5.
	- what is required to be achieved by the Applicant under other regulatory requirements, including the mining lease, relevant safety legislation, environment protection licence and other required approvals, and limitations and other key requirements of these statutes and approvals;	Section 1.5 and this Attachment.
	• subsidence management, strategies and measures, ie the means by which the requirements of the conditions of consent and other approvals and statutes are going to be achieved by the Applicant, through:	Section 1.6.
	- selection of mine design elements and best practice methods (ie avoidance and mitigation strategies);	Further detail is provided in Section 1.6.1.
	- remediation strategies and measures proposed to be implemented in response to predicted subsidence impacts and/or environmental consequences;	Further detail is provided in Sections 3.1 to 3.7.

Table A1-3 (Continued)
Requirements of the Draft Extraction Plan Guideline

Guideline Section	Requirement	Document Reference/Comment
3 (Cont.)	- monitoring of subsidence effects, subsidence impacts and environmental consequences (including plans showing all proposed monitoring points);	Further detail is provided in Section 3.8.
	- adaptive management to avoid repetition of any unpredicted subsidence impacts and/or environmental consequences, including capacity to detect early warning of and respond to deviations from required performance measures;	Further detail is provided in Section 4.1.
	- procedures for investigations of incidents (including all exceedances of performance measures) and appropriate response; and	Further detail is provided in Section 4.1.2.
	- procedures for quality assurance and review of the management system.	Further detail is provided in Sections 4.1 to 4.4.
Key Component Plans		
4	The main body of the Extraction Plan primarily comprises a set of six key component plans. It is appropriate that these are presented in a particular order, even if some of the later plans deserve a particular priority due to local circumstances (eg the Built Features or Heritage Management Plans). The preferred order for these component plans is as follows: • Water Management Plan; • Land Management Plan; • Biodiversity Management Plan; • Heritage Management Plan; • Built Features Management Plan; and • Public Safety Management Plan.	Section 3 summarises the monitoring and management measures in the following component management plans: • Appendix A – Water Management Plan; • Appendix B – Land Management Plan; • Appendix C – Biodiversity Management Plan; • Appendix D – Heritage Management Plan; • Appendix E – Built Features Management Plan; and • Appendix F – Public Safety Management Plan.

Table A1-3 (Continued)
Requirements of the Draft Extraction Plan Guideline

Guideline Section	Requirement	Document Reference/Comment
4 (Cont.)	Each of these key component plans should follow the structure of:	
	• overview of all landscape features, heritage sites, environmental values, built features or other values to be managed under the component plan;	Table 2 and Section 1.1 of Appendix A, Section 1.1 of Appendix B, Section 1 of Appendix C, Section 1 of Appendix D, Sections 1.1 and 2 of Appendix E and Section 1.1 of Appendix F.
	• setting out all performance measures included in the development consent relevant to the features or values to be managed under the component plan;	Section 2 of Appendix A, Section 2 of Appendix B, Section 5.4 of Appendix C, Section 5.2 of Appendix D, Section 3 of Appendix E and Section 2 of Appendix F.
	• setting out clear objectives to ensure the delivery of the performance measures and all other relevant statutory requirements (including relevant safety legislation);	Section 2 of Appendix A, Section 2 of Appendix B, Section 5.4 of Appendix C, Section 3 of Appendix E and Section 2 of Appendix F.
	• proposing performance indicators to establish compliance with these performance measures and statutory requirements;	Section 6 of Appendix A, Section 6 of Appendix B, Section 5.4 of Appendix C, Attachment 1 of Appendix E and Section 6 of Appendix F.
	• describing the landscape features, heritage sites and environmental values to be managed under the component plan, and their significance. It should be noted that a full description of such features, sites and values would commonly have been provided and considered in a recent environmental impact assessment. Consequently, this section can be relatively brief, and focus on the presentation of appropriate figures and/or graphical plans;	Table 2 and Section 3 of Appendix A, Section 3 of Appendix B, Section 3 and Appendix L of Appendix C, Sections 2 and 5 of Appendix D, Table 1 of Appendix E and Section 3 of Appendix F.
	• fully describing all currently-predicted subsidence impacts and environmental consequences relevant to the features, sites and values to be managed under the component plan;	Section 3 of Appendix A, Section 3 of Appendix B, Appendix L of Appendix C, Appendix C of Appendix D, Section 5 and Attachment 1 of Appendix E and Section 3 of Appendix F.
	• fully describing all measures planned to remediate these impacts and/or consequences, including any measures proposed to ensure that impacts and/or consequences comply with performance measures and/or the Applicant's commitments;	Table 2 and Section 5 of Appendix A, Section 5 of Appendix B, Section 6.2 of Appendix C, Section 4.7 of Appendix D, Attachment 1 of Appendix E and Section 5 of Appendix F.
	• describing the existing baseline monitoring network and the current baseline monitoring results, including pre-subsidence photographic surveys of key landscape features and key heritage sites which may be subject to significant subsidence impacts (such as significant watercourses, swamps and Aboriginal heritage sites);	Table 2 of Appendix A, Section 3 and Table 2 of Appendix B, Section 3 of Appendix C and Sections 2, 3 and 5 of Appendix D.

Table A1-3 (Continued)
Requirements of the Draft Extraction Plan Guideline

Guideline Section	Requirement	Document Reference/Comment
4 (Cont.)	• fully describing the proposed monitoring of subsidence impacts and environmental consequences;	Section 4 and Table 2 of Appendix A, Section 4 of Appendix B, Section 7.1 of Appendix C, Section 4.7 of Appendix D, Attachment 1 of Appendix E and Section 4 of Appendix F.
	• describing the proposed monitoring of the success of remediation measures following implementation;	Section 6 of Appendix A, Section 6 of Appendix B, Attachment 1 of Appendix E and Section 6 of Appendix F.
	• fully describing adaptive management proposed to avoid repetition of unpredicted subsidence impacts and/or environmental consequences;	Section 6 of Appendix A, Section 6 of Appendix B, Section 8 of Appendix C, Section 9.1 of Appendix D, Attachment 1 of Appendix E and Section 6 of Appendix F.
	• fully describing contingency plans proposed to prevent, mitigate or remediate subsidence impacts and/or environmental consequences which substantially exceed predictions or which exceed performance measures;	Sections 6 and 7 of Appendix A, Sections 6 and 7 of Appendix B, Section 8 of Appendix C, Section 9 of Appendix D, Attachment 1 of Appendix E and Sections 6 and 7 of Appendix F.
	• listing responsibilities for implementation of the plan; and	Table 2 of Appendix A, Section 8 of Appendix B, Section 12 of Appendix C, Section 10 of Appendix D, Attachment 1of Appendix E and Section 8 of Appendix F.
	• an attached Trigger, Action, Response Plan (effectively a tabular summary of most of the above).	Attachment 1 of Appendices A to B, Section 8.2 of Appendix C and Attachment 1 of Appendices E and F.
	All six key component plans should give appropriate consideration to risk assessment and risk management. This is particularly the case for Public Safety Management Plans and Built Features Management Plans. These two plans should include: • the results of risk assessment conducted by a competent person in accordance with relevant standards and guidelines; • description of the investigation and analysis methods used in determining the risk control measures and procedures, carried out by a competent person; • description of all risk control measures and procedures, including a statement of the feasibility to manage identified risks; and • a proposed program for implementation of the proposed risk control measures and procedures.	Technical Report 4 and reflected in Appendices A to F. Technical Report 4, Section 6 of Appendix E and Section 3 of Appendix F.

Table A1-3 (Continued)
Requirements of the Draft Extraction Plan Guideline

Guideline Section	Requirement	Document Reference/Comment
4 (Cont.)	The Public Safety Management Plan must address all potential safety hazards to the public. The scope of the Plan should include management of health and safety risks due to: • potential subsidence impacts on built features; • potential instability of cliff formations or steep slopes caused by subsidence; • deformations or fracturing of any land caused by subsidence, and • any other impacts of subsidence.	Sections 1.1 and 3 of Appendix F.
	This Plan should address management measures such as:	
	• monitoring of areas posing safety risks;	Section 4 of Appendix F.
	• erection of warning signs and possible entry or use restrictions;	Section 5 of Appendix F.
	• backfilling of surface cracks and/or re-profiling of humps and swales on tracks and roads;	Section 5 of Appendix F and Appendix B.
	• infilling of pot holes;	Section 5 of Appendix F and Appendix B.
	• securing of potentially unstable structures and rock masses;	Section 5 of Appendix F and Appendix B.
	• identification of potential flood-related impacts that may pose a risk to public safety; and	Not applicable.
	• provision of regular updates regarding mining progress to the community where management of public safety is a significant issue.	Not applicable (WCPL-owned land).
	It may be appropriate that owners of either land or infrastructure are compensated in some manner for damage, disturbance, access requirements or other inconvenience associated with mining and mine subsidence. Such compensation may reflect the requirements of the *Mine Subsidence Compensation Act 1961*, Part 13 of the *Mining Act 1992* and/or conditions of development consent.	The Longwalls 21 to 24 Application Area is located entirely within WCPL-owned land. All assets within the Longwalls 21 to 24 Application Area are WCPL-owned.

Table A1-3 (Continued)
Requirements of the Draft Extraction Plan Guideline

Guideline Section	Requirement	Document Reference/Comment
Subsidence Monitoring Program		
5	The key component plans should be followed by a Subsidence Monitoring Program.	Section 3.8 and Appendix H (Subsidence Monitoring Program).
	This program should address two purposes. The first is to set out the program for monitoring the *subsidence effects* associated with the proposed coal extraction.	Section 3 of Appendix H.
	The second is to summarise and consolidate the various environmental monitoring programs presented in each of the key component plans.	Section 4 of Appendix H.
	Subsidence Effects Monitoring Program The Subsidence Effects Monitoring Program must provide sufficient information on subsidence effects to fully support implementation of the Extraction Plan. It should have clearly stated objective(s) and address the following:	
	• proposed subsidence monitoring activities (individually specified);	Section 3 and Table 1 of Appendix H.
	• information or subsidence parameters to be obtained from each monitoring activity;	Table 1 of Appendix H.
	• proposed locations and/or extents where each monitoring activity will be undertaken, in particular, the proposed layout and/or locations of instrumentation, monitoring points or inspections (including graphical plans);	Table 1 and Attachment 1 of Appendix H.
	• proposed timing, frequency and duration of each monitoring activity;	Table 1 of Appendix H.
	• proposed monitoring methods, technologies, industry standards (eg ICSM Standards (SP1) Version 2.0) or Codes of Practice to be applied in undertaking each monitoring activity;	Table 1 of Appendix H.
	• proposed measures and procedures for quality assurance and competence of personnel undertaking monitoring activities;	Section 3 of Appendix H.
	• proposed procedures to record monitoring results;	Section 3.3 of Appendix H.
	• proposed reporting monitoring results, including the frequency of reporting. The primary recipient of reports is DRE, and required reporting frequency will depend on the significance of features which are subject to risk of subsidence impact and consequence, and the scale of that risk; and	Section 3.3 of Appendix H.
	• capacity of the program to detect early warning of deviations from the defined performance measures and associated performance indicators.	Section 3 of Appendix H.

Table A1-3 (Continued)
Requirements of the Draft Extraction Plan Guideline

Guideline Section	Requirement	Document Reference/Comment
5 (Cont.)	*Environmental Monitoring Program Summary* The Subsidence Effects Monitoring Program must summarise and consolidate the various monitoring programs presented in each of the key component plans, including the Built Features and Public Safety Management Plans. These environmental monitoring programs should be directed towards *monitoring the subsidence impacts and environmental consequences* of mine subsidence.	Section 3.8, and Section 4 of Appendix H.
	It should contain figures showing the monitoring sites for each of the various monitoring programs, as well as a consolidated figure or figures showing all monitoring sites.	Figure 1 and 2 of Appendix H.
	It should be noted that the purpose of this summary is not to *repeat* the monitoring programs which are in themselves important elements of each of the key component plans. Instead the purpose is to present a consolidated overview of the six monitoring programs, enabling ready review of the overall monitoring program. As such, clear figures and tabulated information are critical.	Noted.
Implementation		
6	This section of the Extraction Plan should address all key elements of how the plan is going to be implemented, including reporting, regular review and key responsibilities. This section should follow the structure set out below: • Reporting Framework; • Review of the Extraction Plan; • Review of other Management Plans; and • Key Responsibilities.	Section 4 has been structured as follows: • Section 4.1 – Adaptive Management and Contingency Response. • Section 4.2 – Reporting Framework. • Section 4.3 – Review of the Extraction Plan. • Section 4.4 – Review of Other Management Plans. • Section 4.5 – Key Responsibilities.

Table A1-3 (Continued)
Requirements of the Draft Extraction Plan Guideline

Guideline Section	Requirement	Document Reference/Comment
6 (Cont.)	The ***reporting framework*** is a critical section of the Extraction Plan. DPE and DRE both consider that there is value in developing and applying a standard reporting framework for all mines which are operating under an Extraction Plan approved after 30 September 2014. The required elements of this framework are: • incident reporting, following any occasion of incident, in accordance with the conditions of consent and/or environment protection licence and/or any requirements in the TARP(s); • bi-monthly subsidence impact reporting, following regular monthly inspections, but only if any new impact is identified. Impacts should be clearly distinguished between those which are within predictions, those which exceed predictions but remain within performance measures and/or performance indicators, and those which exceed performance measures and/or performance indicators. Impact reporting must include a full description, location identification using aerial photos with longwall layout superimposed, good photos of the impact, and preliminary characterisation of the impact in accordance with the relevant TARP(s); • six-monthly reporting of all impacts and environmental monitoring results, including: - a comprehensive summary of all impacts, including a revised characterisation according to the relevant TARP(s); - any proposed actions resulting from Triggers being met in the TARP, or other actions; - assessment of compliance with all relevant performance measures and indicators; - a comprehensive summary of all quantitative and qualitative environmental monitoring results, including landscape monitoring, water quality data, water flow and pool level data, piezometer readings, etc; and • Annual Review (or Annual Environmental Management Report) reporting, to be based on each two successive six-monthly reports of impacts and environmental monitoring results. A summary of subsidence effects monitoring results should also be included. DPE and/or DRE may agree to a lesser frequency for the bi-monthly and six-monthly reporting set out above, where subsidence impacts and environmental consequences at the mine are relatively rare and benign in character. This section of the Extraction Plan should also set out, clearly and in tabular fashion, which agencies will receive copies of each of the types of reports discussed above. The means of submission should also be set out. DPE and DRE's preferred method of submission for all reports provided at less than annual frequency is by email.	Table 21 presents the proposed reporting framework for Longwalls 21 to 24.

Table A1-3 (Continued)
Requirements of the Draft Extraction Plan Guideline

Guideline Section	Requirement	Document Reference/Comment
6 (Cont.)	Processes for the future ***review of the Extraction Plan*** should also be set out in detail. Such reviews should take place in the following circumstances: • as required under consent conditions (see below); • where unpredicted subsidence impacts and/or environmental consequences have required the implementation of contingency plans; and • when preparing a subsequent Extraction Plan.	Section 4.3.
	Where unpredicted subsidence impacts and/or environmental consequences have occurred, adaptive management requires the implementation of previously approved processes to consider and implement measures to prevent their re-occurrence. However, in certain circumstances (ie where the exceedances are particularly significant and/or are continuing to occur), adaptive management may require a more fundamental review of the Extraction Plan. The Extraction Plan should set out the circumstances in which it is considered that the Plan itself (or any of its key elements) would be reviewed.	Section 4.1.2.
	Development of an Extraction Plan may require ***review of other management plans***. For example, conditions of consent regarding Extraction Plans require that the Extraction Plan include any consequential revisions for the mine's Rehabilitation Management Plan. Other plans may also need to be reviewed (eg management plans applying more broadly to the whole minesite, such as DRE's Mine Operations Plan). This section of the Extraction Plan should set out the process for such review, but not the proposed revisions themselves. The proposed revisions should be separately forwarded, as a proposed amendment to the relevant plan.	Management plans proposed to be reviewed to incorporate Longwalls 21 to 24 are identified in Section 4.4.
	The Implementation section of the plan should also set out in detail who is responsible for implementing its various requirements (***key responsibilities***). This sub-section should clearly identify which officers of the Applicant (or consultancy) have key responsibility for ensuring the implementation of the overall Extraction Plan, its key component plans and other elements, who has responsibility for incident and other reporting, who is responsible for decisions to activate TARPs, who is responsible for various elements of the plan's future review, etc.	Section 4.5.

Table A1-3 (Continued)
Requirements of the Draft Extraction Plan Guideline

Guideline Section	Requirement	Document Reference/Comment
Graphical Plans		
7	The following plans are required as part of the application. Plan 1 Plan 5 Plan 2 Plan 6 Plan 3 Plan 7 Plan 4	Plans 1 to 7 in Coal Resource Recovery Plan (Appendix G).
	Notes to all Plans: *(i) While the plans need not be in the exact format set out above, all the requested information must be supplied.* *(ii) All plans need to be clear, uncluttered and legible.* *(iii) All plans should be of the same scale and size and cover the same area so that they can be compared to assess surface and underground features.* *(iv) A copy of coloured aerial photography of the Extraction Plan application area and its immediate surroundings with an outline of existing and proposed workings should be included, where available. Aerial photography of an adequate scale to show significant surface features should be used.* *(v) The preferred sheet size is A0. The plans should be contained within a border. There should be a title block on the plans containing:* • *name of the Applicant;* • *name of mine;* • *Extraction Plan title;* • *graphical plan title and reference number;* • *scale;* • *date of last revision; and* • *Mine Manager's signature and date of signing to testify to the Manager's acceptance of the information shown on the plans.*	Plans 1 to 7 in Coal Resource Recovery Plan (Appendix G).

Table A1-3 (Continued)
Requirements of the Draft Extraction Plan Guideline

Guideline Section	Requirement	Document Reference/Comment
Attachments to the Extraction Plan		
8	Any required ***Coal Resource Recovery Plan*** should also be included as an attachment.	Coal Resource Recovery Plan (Appendix G).
	Extraction Plans are also required to include details of a program to collect sufficient baseline data for any necessary future Extraction Plans. Details regarding the program to gather baseline data to support future plans should also be included as an attachment.	Attachment 3.

Table A1-4
Mining Lease Requirements

Condition Number	Condition	Document Reference/Comment
Mining Lease 1594 and Mining Lease 1572		
4	(b) The lease holder must not undertake any underground mining operations that may cause subsidence except in accordance with an approved Extraction Plan.	This application.
	(c) The lease holder must ensure that the approved Extraction Plan provides for the effective management of risks associated with any subsidence resulting from mining operations carried out under this lease.	Technical Report 4 and Appendices A to F.
	(d) The lease holder must notify the Secretary within 48 hours of any: (i) incident caused by subsidence which has a potential to expose any person to health and safety risks; (ii) significant deviation from the predicted nature, magnitude, distribution, timing and duration of subsidence effects, and of the potential impacts and consequences of those deviations on built features and the health and safety of any person; or (iii) significant failure or malfunction of a monitoring device or risk control measure set out in the approved Extraction Plan addressing: A. built features; B. public safety; or C. subsidence monitoring.	Section 4.2.
12	Operations must be carried out in a manner that ensures the safety of persons or stock in the vicinity of the operations. All drill holes shafts and excavations must be appropriately protected, to the satisfaction of the Director General, to ensure that access to them by persons and stock is restricted. Abandoned shafts and excavations opened up or used by the lease holder must be filled in or otherwise rendered safe to a standard acceptable to the Director-General.	Appendix F (Public Safety Management Plan).
13	(a) Land disturbed must be rehabilitated to a stable and permanent form suitable for a subsequent land use acceptable to the Director-General and in accordance with the Mining Operations Plan so that:- • there is no adverse environmental effect outside the disturbed area and that the land is properly drained and protected from soil erosion. • the state of the land is compatible with the surrounding land and land-use requirements. • the landforms, soils, hydrology and flora require no greater maintenance than that in the surrounding land.	Appendix I (Rehabilitation Management Plan).

Table A1-4 (Continued)
Mining Lease Requirements

Condition Number	Condition	Document Reference/Comment
13 (cont.)	• in cases where revegetation is required and native vegetation has been removed or damaged, the original species must be re-established with close reference to the flora survey included in the Mining Operations Plan. If the original vegetation was not native, any re-established vegetation must be appropriate to the area and at an acceptable density. • the land does not pose a threat to public safety.	Appendix I (Rehabilitation Management Plan). Appendix F (Public Safety Management Plan).
	(b) Any topsoil that is removed must be stored and maintained in a manner acceptable to the Director-General.	Appendix I (Rehabilitation Management Plan).
16	Operations must be carried out in a manner that does not cause or aggravate air pollution, water pollution (including sedimentation) or soil contamination or erosion, unless otherwise authorised by a relevant approval, and in accordance with an accepted Mining Operations Plan. For the purpose of this condition, water shall be taken to include any watercourse, waterbody or groundwaters. The lease holder must observe and perform any instructions given by the Director-General in this regard.	Appendix A (Water Management Plan) and Appendix B (Land Management Plan).
17	Operations must not interfere with or impair the stability or efficiency of any transmission line, communication line, pipeline or any other utility on the lease area without prior written approval of the Director-General and subject to any conditions he may stipulate.	Appendix E (Built Features Management Plan) All assets within the Longwalls 21 to 24 Application Area are WCPL-owned.
18	(a) Activities on the lease must not interfere with or damage fences without the prior written approval of the owner thereof or the Minister and subject to any conditions the Minister may stipulate.	Appendix B (Land Management Plan) All fences within the Longwalls 21 to 24 Application Area are WCPL-owned.
19	(a) Operations must not affect any road unless in accordance with an accepted Mining Operations Plan or with the prior written approval of the Director-General and subject to any conditions he may stipulate.	Appendix B (Land Management Plan) and Appendix E (Built Features Management Plan) All roads and tracks within the Longwalls 21 to 24 Application Area are WCPL-owned.
27	(A) Notwithstanding any Mining Operations Plan, the lease holder must not mine within any part of the lease area which is within the notification area of the **Wambo Tailings Dam** without the prior written approval of the Minister and subject to any conditions that he may stipulate.	The Longwalls 21 to 24 Application Area does not intersect the Notification Area of any Prescribed Dams (Appendix E [Built Features Management Plan]).
Annexure A (12/11/2013)	(a) Notwithstanding any Mining Operations Plan, the leaseholder must not mine within any part of the lease area which is within the notification area of the Wambo South Water Dam without the prior written approval of the Minister and subject to any conditions that he may stipulate.	The Longwalls 21 to 24 Application Area does not intersect the Notification Area of any Prescribed Dams (Appendix E [Built Features Management Plan]).

Table A1-4 (Continued)
Mining Lease Requirements

Condition Number	Condition	Document Reference/Comment
Coal Lease 397		
1	(d) Where the registered holder desires to commence and to carry out underground mining operations within the subject area or where the Minister notifies the registered holder that he proposes to issue a direction pursuant to paragraph (c) of this condition the registered holder shall furnish to the Minister a plan showing the proposed workings in the section of land to be so mined together with such other details as the Minister may require.	Workings which are the subject of this application are shown on Plan 7 of Appendix G (Coal Resource Recovery Plan).
26	The registered holder shall not interfere in any way with any fences on or adjacent to the subject area unless with the prior written approval of the owner thereof of the Minister and subject to such conditions as the Minister may stipulate.	Appendix B (Land Management Plan) and Appendix E (Built Features Management Plan). All fences within the Longwalls 21 to 24 Application Area are WCPL-owned.
27	The registered holder shall observe any instruction given or which may be given by the Minister with a view to minimising or preventing public inconvenience or damage to public or private property.	Appendix E (Built Features Management Plan). All assets within the Longwalls 21 to 24 Application Area are WCPL-owned.
30	Subject to any specific condition of this lease providing for rehabilitation of any particular part of the subject area affected by mining or activities associated therewith, the registered holder shall; (a) reinstate, level, regrass, reforest and contour to the satisfaction of the Minister, any part of the subject area that may in the opinion of the Minister have been damaged or deleteriously affected by mining operations; and (b) fill in, seal or fence, to the satisfaction of the Minister, any excavation within the subject area.	Appendix I (Rehabilitation Management Plan).
31	If requested so to do by the Minister and within such time as may be stipulated by the Minister the registered holder shall carry out to the satisfaction of the Minister surveys of structures, buildings and pipelines on adjacent landholdings to determine the effect of operations on any such structures, buildings and pipelines.	Pre-mining inspections are outlined in Appendix E (Built Features Management Plan). All assets within the Longwalls 21 to 24 Application Area are WCPL-owned.
33	If so directed by the Minister the registered holder shall rehabilitate to the satisfaction of the Minister and within such time as may be allowed by the Minister any lands within the subject area which may have been disturbed by the operations hereby authorised.	Appendix I (Rehabilitation Management Plan).
36	If so directed by the Minister the lease holder shall rehabilitate to the satisfaction of the Minister and within such time as may be allowed by the Minister any lands within the subject area which may have been disturbed by mining or prospecting operations whether such operations were or were not carried out by the lease holder.	Appendix I (Rehabilitation Management Plan).

Table A1-4 (Continued)
Mining Lease Requirements

Condition Number	Condition	Document Reference/Comment
40	The lease holder shall provide and maintain to the satisfaction of the Minister efficient means to prevent contamination, pollution, erosion or siltation of any river, stream, creek, tributary, lake, dam, reservoir, watercourse or catchment area or any undue interference to fish or their environment and shall observe any instruction given or which may be given by the Minister with a view to preventing or minimising the contamination, pollution, erosion or siltation of any river stream, creek, tributary, lake, dam, reservoir, watercourse or catchment area or any undue interference to fish or their environment.	Appendix A (Water Management Plan), Appendix B (Land Management Plan) and Appendix C (Biodiversity Management Plan).
46	Operations shall be carried out in such a manner as to interfere as little as possible with natural flora and fauna and the registered holder shall comply with any direction given or which may be given in this regard by the Minister or the Director-General.	Appendix B (Land Management Plan) and Appendix C (Biodiversity Management Plan).
52	The lease holder shall conduct operations in such a manner as to not cause or aggravate soil erosion and the lease holder shall observe and perform any instructions given or which may be given by the Minister with a view to minimising or preventing soil erosion.	Appendix B (Land Management Plan) and Appendix I (Rehabilitation Management Plan).
59	In the event of operations being conducted on the surface of any road, track or firetrail traversing the subject area or in the event of such operations causing damage to or interference with any such road, track or firetrail the lease holder, at his own expense, shall if directed to do so by the Minister provide to the satisfaction of the Minister an alternate road, track or firetrail in a position as required by the Minister and shall allow free and uninterrupted access along such alternate road, track or firetrail and, if required to do so by the Minister, the lease holder shall upon completion of operations rehabilitate the surface of the original road, track or firetrail to a condition satisfactory to the Minister.	Appendix B (Land Management Plan) and Appendix D (Built Features Management Plan) All roads and tracks within the Longwalls 21 to 24 Application Area are WCPL-owned.
68	(a) The marks in connection with any trigonometrical station erected on or near the subject area shall not be interfered with and the unrestricted right of access to such station by authorised persons and also the right to clear sight lines to surrounding stations is reserved at all times.	There are state survey control marks located within the Longwalls 21 to 24 Application Area. Any movements to survey control marks would be managed in accordance with this condition.
73	(a) The registered holder shall as far as is practicable so conduct operations as not to interfere with or impair the stability of any:- (i) telephone line; (ii) power transmission line; (iii) pipeline traversing the subject area.	Appendix E (Built Features Management Plan). All assets within the Longwalls 21 to 24 Application Area are WCPL-owned.

Table A1-4 (Continued)
Mining Lease Requirements

Condition Number	Condition	Document Reference/Comment
Schedule A	(b) The lease holder must not undertake any underground mining operations that may cause subsidence except in accordance with an approved Extraction Plan.	This application.
	(c) The lease holder must ensure that the approved Extraction Plan provides for the effective management of risks associated with any subsidence resulting from mining operations carried out under this lease.	Technical Report 4 and Appendices A to F.
	(d) The lease holder must notify the Secretary within 48 hours of any: (i) incident caused by subsidence which has a potential to expose any person to health and safety risks; (ii) significant deviation from the predicted nature, magnitude, distribution, timing and duration of subsidence effects, and of the potential impacts and consequences of those deviations on built features and the health and safety of any person; or (iii) significant failure or malfunction of a monitoring device or risk control measure set out in the approved Extraction Plan addressing: A. built features; B. public safety; or C. subsidence monitoring.	Section 4.2.

WAMBO COAL PTY LIMITED

SOUTH BATES EXTENSION UNDERGROUND MINE

EXTRACTION PLAN
LONGWALLS 21 TO 24

ATTACHMENT 2
RELEVANT CONSULTATION RECORDS

Peabody

Planning, Industry & Environment

Mr Peter Jaeger
Environment and Community Manager
Wambo Coal Pty Limited
PMB 1
Singleton NSW 2330

28/02/2020

Dear Mr Jaeger

Wambo Coal Project (DA 305-7-2003)
Endorsement of Experts

I refer to your letter dated 11 February 2020, requesting the Secretary's approval of suitably qualified persons to prepare the Extraction Plan for Longwalls 21 to 24 for the Wambo Coal Project (DA 305-7-2003).

The Department has reviewed the nominations and information you have provided and is satisfied that these experts are suitably qualified and experienced. Consequently, I can advise that the Secretary approves the appointment of the following experts to prepare the Extraction Plan for Longwalls 21 to 24:

- Mr Joshua Hunt (Resource Strategies) - Extraction Plan preparation;
- Mr James Barbato (Mine Subsidence Engineering Consultants) - Subsidence;
- Mr Rohan Lucas (Alluvium) - Surface Water;
- Dr Noel Merrick (SLR Consulting) - Groundwater;
- Mr Martin Sullivan (Eco Logical Australia) – Biodiversity; and
- Mr Peter Kuskie (South East Archaeology) - Aboriginal cultural heritage.

In relation the upcoming revisions of complex-wide management plans, to align with the commencement of United Wambo Phase 2, it is recommended that the Department's Water Group is consulted on this approach.

If you wish to discuss the matter further, please contact Melanie Hollis on 8217 2043.

Yours sincerely

Matthew Sprott
A/Director
Resource Assessments (Coal & Quarries)

as nominee of the Planning Secretary

WAMBO COAL PTY LTD

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11 February 2020

Department of Planning, Industry and Environment
GPO Box 39
SYDNEY NSW 2001

Attention: Mr Mike Young

Dear Mr Young

RE: WAMBO COAL MINE DEVELOPMENT CONSENT (DA 305-7-2003) – APPOINTMENT OF SUITABLY QUALIFIED AND EXPERIENCED PERSONS AND INTERACTION WITH COMPLEX-WIDE MANAGEMENT PLANS

Interaction between Longwalls 21 to 24 Extraction Plan and Complex-wide Management Plans

Wambo Coal Pty Ltd (WCPL) is currently preparing an Extraction Plan for the next set of longwall panels at the South Bates Extension Underground Mine (i.e. Longwalls 21 to 24). Longwall 21 is scheduled for commencement on 19 October 2020. To allow for the 90 business day assessment period, the Longwalls 21 to 24 Extraction Plan is anticipated to be submitted by the end of April 2020.

The modified Development Consent issued after the determination of the United Wambo Joint Venture Project (MOD 16) requires the preparation of updated complex-wide management plans. This includes the Water Management Plan (and associated sub-plans) and Biodiversity Management Plan which are also referenced as components of WCPL's Extraction Plans.

The complex-wide management plans are required to be updated and approved prior to the commencement of Phase 2 of the United Wambo Joint Venture Project. This is currently anticipated to commence in December 2020.

WCPL is developing these plans with the aim of targeting submission to the Department in July 2020 following consultation with the relevant parties specified in the Development Consent. This timing is aimed at providing the Department reasonable time for assessment prior to commencement of Phase 2 in December 2020.

Development of the complex-wide management plans includes time consuming components such as updating modelling (including the groundwater model), incorporating outcomes of the Longwalls 21-24 Extraction Plan and other works required to address new/revised Development Consent conditions.

Given this, WCPL anticipates that the complex-wide management plans will be in the process of being updating after the Extraction Plan for Longwalls 21 to 24 has been submitted (end April 2020).

WCPL does not envisage any issues relating to the South Bates Extension Underground Mine, and specifically the Longwalls 21 to 24 Extraction Plan, to arise during the update of the complex-wide management plans. This is because the updates will be primarily related to removing the open cut aspects of the site following approval of the United Wambo Joint Venture Project

Once the complex-wide management plans are assessed and approved, WCPL will review the Longwalls 21 to 24 Extraction Plan for any material inconsistencies and propose updates, as required. This would be undertaken in consultation with the Department.

Notwithstanding, WCPL is able to include some of the complex-wide management plans that require more simple updates in the Longwalls 21-24 Extraction Plan. A summary table of the plans that will be updated and included in the Longwalls 21-24 Extraction Plan is provided below.

Plan	Updated for LW21-24 Extraction Plan
Longwalls 21-24 Water Management Plan	✓
Surface Water Monitoring Program*	×
Groundwater Monitoring Program*	×
Surface and Groundwater Response Plan*	×
Erosion and Sediment Control Plan*	×
Site Water Balance*	×
Longwalls 21-24 Land Management Plan	✓
Biodiversity Management Plan	✓
Heritage Management Plan	✓
Longwalls 21-24 Built Features Management Plan	✓
Longwalls 21-24 Public Safety Management Plan	✓
Longwalls 21-24 Coal Resource Recovery Plan	✓
Longwalls 21-24 Subsidence Monitoring Program	✓
Rehabilitation Management Plan/Mining Operations Plan	✓

*Currently approved version will be included in the LW21-24 Extraction Plan

Both the Longwalls 21 to 24 Extraction Plan and the complex-wide management plans require endorsement by the Secretary of suitably qualified and experienced person/s. The below sections describe the teams that WCPL propose to prepare these documents.

Extraction Plan for Longwalls 21 to 24 – Suitably Qualified and Experienced Persons

WCPL is currently preparing an Extraction Plan for Longwalls 21 to 24 at the South Bates Extension Underground Mine.

We refer to Condition B7, Schedule 2 of the Development Consent (DA 305-7-2003) for the Wambo Development Project:

> *B7. The Applicant must prepare an Extraction Plan for all second workings on the site to the satisfaction of the Planning Secretary. Each Extraction Plan must:*
>
> *(a) be prepared by a suitably qualified and experienced person/s whose appointment has been endorsed by the Planning Secretary;*
>
> *…*

In accordance with Condition B7, Schedule 2 of the Development Consent (DA 305-7-2003), WCPL kindly requests the endorsement of the Secretary of the team outlined in this letter and listed below, as suitably qualified and experienced persons for the review and preparation of the Longwalls 21 to 24 Extraction Plan.

Complex-wide Water Management Plan and Biodiversity Management Plan – Suitably Qualified and Experienced Persons

WCPL is also currently preparing updated versions of the complex-wide Water Management Plan and Biodiversity Management Plan.

We refer to Conditions B66 and B75, Schedule 2 of the Development Consent (DA 305-7-2003) for the Wambo Development Project:

> *B66. The Applicant must prepare a Water Management Plan for the Wambo Mining Complex to the satisfaction of the Planning Secretary. This plan must:*
>
> *(a) be prepared by a suitably qualified and experienced person/s whose appointment has been endorsed by the Planning Secretary;*
>
> *…*
>
> *B75. The Applicant must prepare a Biodiversity Management Plan to the satisfaction of the Planning Secretary. This plan must:*
>
> *(a) be prepared by a suitably qualified and experienced person/s;*
>
> *…*

In accordance with Conditions B66 and B75, Schedule 2 of the Development Consent (DA 305-7-2003), WCPL kindly requests the endorsement of the Secretary of the team outlined in this letter and listed below, as suitably qualified and experienced persons for the preparation of the complex-wide Water Management Plan and Biodiversity Management Plan.

Background of Suitably Qualified and Experienced Persons

WCPL considers that the proposed team is suitable for preparation of the Extraction Plan, Water Management Plan and/or Biodiversity Management Plan. The curriculum vitae of the primary contributing suitably qualified and experienced persons are attached with a summary provided below.

Team Member	Role
Dr James Barbato (Mine Subsidence Engineering Consultants)	Preparation of relevant subsidence components, including prediction of subsidence effects and assessment of potential impacts.
Dr Noel Merrick (SLR Consulting Pty Ltd)	Preparation of relevant groundwater components.
Mr Rohan Lucas (Alluvium)	Preparation of relevant surface water components.
Mr Peter Kuskie (South East Archaeology)	Provision of advice on monitoring and management of Aboriginal cultural heritage sites.
Mr Martin Sullivan (Eco Logical Australia)	Provision of advice on biodiversity monitoring and management measures.
Mr Joshua Hunt (Resource Strategies)	Preparation of management plans and overall Extraction Plan documentation.

The following experienced WCPL employees would also be involved in preparation of the Extraction Plan, Water Management Plan and/or Biodiversity Management Plan.

Team Member	Role
Mr Peter Jaeger (Manager: Environment & Community)	Responsible for review, sign-off and implementation of the Extraction Plan.
Mrs Nicole Dobbins (Senior Environmental Advisor)	Review of management plans and overall Extraction Plan documentation.
Mr Michael Berry (Technical Services Manager)	Review of management plans and overall Extraction Plan documentation.
Mr Malcolm Walker (Registered Mine Surveyor)	Preparation of survey plans.

Dr Barbato

Mine Subsidence Engineering Consultants Pty Ltd (MSEC) is a private engineering consultancy company specialising in the fields of mine subsidence prediction and mine subsidence impact assessment. Dr Barbato is an associate director at MSEC and has written or co-written more than 300 subsidence prediction and assessment reports. Dr Barbato has significant experience at Wambo, having undertaken subsidence assessments in support of several Extraction Plan and Modification applications.

Dr Barbato has been involved in recent subsidence studies for the Wambo Coal Mine, including development of the subsidence components of the approved South Bates Extension Underground Mine Extraction Plan for Longwalls 17 to 20.

Dr Merrick

Dr Merrick is a senior groundwater modeller, hydrogeologist and geophysicist with decades of experience in groundwater science. Dr Merrick has extensive experience with numerical modelling, assessment and modelling of groundwater/surface water interactions and groundwater impact assessment for infrastructure and mining projects.

As author of the peer review section of the Murray Darling Basin Commission groundwater flow model guidelines, Dr Merrick has been heavily involved in peer reviewing modelling studies for coal mines in New South Wales, Victoria and Queensland, and he actively builds groundwater models for open cut and longwall mines. Dr Merrick has been involved in recent groundwater studies for the Wambo Coal Mine, including development of the groundwater components of the approved South Bates Extension Underground Mine Extraction Plan for Longwalls 17 to 20, and completion of the Groundwater Assessment for MOD 17.

Mr Lucas

Mr Lucas has 25 years of experience in environmental and natural resource management with a focus on waterways. This experience has been gained in a consulting role to government and industry in Australia and Asia-Pacific. Mr Lucas is a Registered Professional Engineer Queensland (RPEQ).

Mr Lucas has significant experience in designing and managing diversions. In addition, he has experience in modelling, assessment, design and documentation of subsidence impact management on waterways and diversions. Alluvium staff (principally Rohan Lucas and Ross Hardie) were the authors of the ACARP diversion projects (C8030 and C9068) in 1999-2002 that have been adopted by the Queensland government as a guideline against which diversions have been assessed and licensed since. This body of work has recently been updated to provide current leading practice guidance on constructed diversions through ACARP projects C20017 and C23030.

Mr Lucas was also principal author of the *Isaac River cumulative impacts assessment of mine developments* (2008). This project developed the hierarchy for assessing subsidence impacts on waterways which has been adopted by Queensland Government as their guidance and is now routinely utilized in subsidence impact assessments, including the extraction plans at Wambo Coal Mine.

Mr Lucas has been involved in recent surface water studies for the Wambo Coal Mine, including development of the surface water components of the approved South Bates Extension Underground Mine Extraction Plan for Longwalls 17 to 20.

Mr Kuskie

Mr Kuskie is the director of South East Archaeology with 29 years experience in Aboriginal cultural heritage issues, Aboriginal community consultation, and legislative requirements. Mr Kuskie's experience includes conducting surface surveys, salvage collections and excavations. He has prepared Indigenous and non-Indigenous components of environmental impact statements, Aboriginal Heritage Impact Permit applications, Aboriginal Heritage Management Plans and Aboriginal Heritage Impact Assessments compliant with Office of Environment and Heritage, Department of Planning and Environment and other Government requirements. Mr Kuskie has strong familiarity with the area, having completed surveys at the Wambo Coal Mine.

Any updates to the Heritage Management Plan based on the advice of Mr Kuskie will be implemented by WCPL and subject to consultation with the Aboriginal community and the Office of Environment and Heritage.

Mr Sullivan

Mr Sullivan is the Principal Ecologist and Discipline Leader Ecology & Impact Assessment for Eco Logical Australia with more than 10 years of experience in biodiversity related issues. Mr Sullivan has been involved in the preparation of multiple Biodiversity Management Plans, Rehabilitation Management Plans and monitoring programs. Eco Logical Australia has been involved at the Wambo Coal Mine for a number of years and has a comprehensive understanding of the site.

Updates to the Biodiversity Management Plan will be based on the advice of Mr Sullivan and subject to consultation with DPIE and the Office of Environment and Heritage.

Mr Hunt

Mr Hunt has extensive experience in environmental impact assessment for the mining sector, and was project manager for the Wambo Development Project Environmental Impact Statement (Resource Strategies, 2003) and the currently approved South Bates Extension Underground Mine Extraction Plan for Longwalls 17 to 20 (as well as other previously approved Extraction Plans at Wambo Coal Mine). Mr Hunt has also managed the preparation of a number of Metropolitan Coal Subsidence Management Plans and Extraction Plans.

Summary

It would be greatly appreciated if the Department would consider the above details regarding the qualifications and experience of the persons proposed to review and prepare the Extraction Plan, Water Management Plan and/or Biodiversity Management Plan and provide the Secretary's endorsement in accordance with Conditions B7(a), B66(a) and B75(a), Schedule 2 of the Development Consent (DA 305-7-2003).

It would also be appreciated if the Department could confirm if the interaction between the Longwalls 21 to 24 Extraction Plan and complex-wide management plans (and associated timing) outlined above is suitable.

If you have any queries or would prefer to organise a meeting to discuss, please do not hesitate to contact Nicole Dobbins, Senior Environmental Advisor on (02) 6570 2209.

Yours faithfully

Peter Jaeger
Manager: Environment & Community
WAMBO COAL PTY LIMITED

Enclosure 1. Dr James Barbato's Curriculum Vitae.
Enclosure 2. Dr Noel Merrick's Curriculum Vitae.
Enclosure 3. Mr Rohan Lucas' Curriculum Vitae.
Enclosure 4. Mr Peter Kuskie's Curriculum Vitae.
Enclosure 5. Mr Martin Sullivan's Curriculum Vitae.
Enclosure 6. Mr Joshua Hunt's Curriculum Vitae.

ENCLOSURE 1

DR JAMES BARBATO'S CIRRICULUM VITAE

Dr James Barbato, Associate Director

Company:	Mine Subsidence Engineering Consultants Pty Ltd
Profile:	James Barbato has had 8 years' experience as a structural engineer and 15 years' experience as a specialist in mine subsidence engineering. His roles include the prediction, assessment and management of mine subsidence due to underground mining. Specialist advice is provided to manage potential impacts to surface infrastructure and natural features and to minimise risk to public safety.
Education:	Bachelor of Engineering (Civil, Hons.), 1995 UNSW – School of Civil Engineering Doctorate of Philosophy (PhD), 2017 UNSW – School of Mining Engineering
Affiliations:	MIEAust, CPEng, NER

James joined Mine Subsidence Engineering Consultants (MSEC) in July 2004 and has worked on many subsidence studies and reports, some of which are listed below. He has extensive experience in the prediction of mine subsidence parameters, the assessment of mine subsidence impacts on natural features and built features and the development of strategies to manage the potential impacts from mine subsidence.

He has been deeply involved in developing the analytical methods to improve the speed and reliability of subsidence predictions. Software has been developed using C++, Java and SQL for the subsidence prediction models, survey database and libraries. The survey database is now one of the largest collections of ground monitoring data for underground longwall mining in Australia.

James has completed post graduate research at the University of New South Wales in 2017. The title of the thesis is *Development of improved methods for the prediction of horizontal movement and strain at the surface due to longwall coal mining*.

He has written or co-written more than 300 subsidence prediction and assessment reports and has been involved in a number of Technical Committees to manage the potential subsidence impacts on natural and built features.

Some recent projects in which James has been involved include the following:

- Appin Longwalls 705 to 710 – co-author of subsidence report to support the SMP Application, including mining beneath the M31 Hume Highway and the Main Southern Railway;
- Appin Longwalls 901 to 904 – subsidence report to support the Extraction Plan Application, including mining beneath the Main Southern Railway;
- Dendrobium Mine – subsidence reports to support the Modification, SMP and Extraction Plan Applications for Areas 2, 3A, 3B, 5 and 6;
- Integra Underground Longwalls 13 to 16 – subsidence predictions and the Management Plans for mining beneath the Mt. Owen Railway and Bridges;
- Maxwell Project – subsidence report to support the Environmental Impact Statement;
- Tahmoor Longwalls 26 to 30 – co-author of the subsidence report to support the SMP Application including mining beneath houses, services and other built infrastructure; and
- Wambo Coal Mine – subsidence reports to support the Modification and Extraction Plan Applications for the North Wambo Underground Mine, South Bates Underground Mine and South Bates Extension Underground Mine.

James is a current member of the Mine Subsidence Technological Society (MSTS) and has been involved in the preparation of the previous four conferences (2007, 2011, 2014 and 2017), which included the review of technical papers, compilation of the conference proceedings and organisation of the presentations.

He has also assisted in two ACARP Research projects and have presented or co-authored a number of technical papers including:

1. Waddington, A.A. and Barbato, J.P. *The Undermining of Railways*. Mine Subsidence Technological Society, Sixth Triennial Conference – Subsidence Management Issues. Maitland, October-November 2004, pp. 173-182.
2. Barbato, J.P., Kay, D.J., Pinkster, H. & de Somer, B. *Monitoring of subsidence movements at major infrastructure.* Seventh AusIMM Australasian Institute of Mining and Metallurgy Underground Coal Operators Conference on Sustainable Coal Mine Development. University of Wollongong, 2006, pp. 305-312.
3. Kay, D.J., Barbato, J.P., Brassington, G. & de Somer, B. *Impacts of Longwall Mining to Rivers and Cliffs in the Southern Coalfield*. Seventh AusIMM Australasian Institute of Mining and Metallurgy Underground Coal Operators Conference on Sustainable Coal Mine Development. University of Wollongong, 2006, pp. 327-336.
4. Kay, D.R., Barbato, J.P. & Mills, K.W. *Review of Mechanisms resulting in Observed Upsidence and Closure Movements.* Mine Subsidence Technological Society, Seventh Triennial Conference, University of Wollongong, Nov. 2007, pp. 197-205.
5. Barbato, J.P. & Sisson, S.A. *Analysis of Mining Induced Strains*. Mine Subsidence Technological Society, Eighth Triennial Conference, Management of Subsidence: State of the Art, Pokolbin, 15 to 17 May 2011, pp. 15-24.
6. Barbato, J.P. & Garlinge, S. *Continuous Monitoring of Longwall Undermining – Blakefield South LW1*. Mine Subsidence Technological Society, Eighth Triennial Conference, Management of Subsidence: State of the Art, Pokolbin, 15 to 17 May 2011, pp. 131-136.
7. Waddington, A.A., Barbato, J.P., Bullock, D.W. & Kay, D.J. *The Assessment of Subsidence Impacts on Building Structures*. Mine Subsidence Technological Society, Eighth Triennial Conference, Management of Subsidence: State of the Art, Pokolbin, 15 to 17 May 2011, pp. 155-166.
8. Barbato, J.P., Brassington, G. and Walsh, R. *Valley Closure Impact Model for Rockbar Controlled Streams in the Southern Coalfield.* Mine Subsidence Technological Society, Ninth Triennial Conference, Mine Subsidence: Risk Management in Action, Pokolbin, NSW, 11 to 13 May 2014.
9. Barbato, J., B. Hebblewhite, R. Mitra, and K. Mills (2016). *Review of horizontal surface movements due to longwall coal mining using numerical modelling*. In: Proceedings of the Coal Operators Conference. University of Wollongong, 10-12 February 2016, pp. 213-223.
10. Barbato, J., B. Hebblewhite, R. Mitra, and K. Mills (2016). *Prediction of horizontal movement and strain at the surface due to longwall coal mining*. In: International Journal of Rock Mechanics and Mining Sciences, Volume 84, April 2016, pp. 105-118. https://doi.Org/10.1016/j.ijrmms.2016.02.006.
11. Barbato, J., B. Hebblewhite, R. Mitra, K. Mills, and A. Waddington (2017). *Development of predictive methods for strain at the surface due to longwall coal mining*. In: Mining Technology, October 2017. http://dx.doi.org/10.1080/14749009.2017.1386815.
12. Barbato, J., et al. (2017). *Development of Predictive Methods for Horizontal Movement and Strain at the Surface due to Longwall Mining*. Proceedings of the tenth triennial Mine Subsidence Technological Society Conference, Pokolbin, Hunter Valley, NSW, 5-7 November 2017. pp. 207-222.

ENCLOSURE 2

DR NOEL MERRICK'S CURRICULUM VITAE

CURRICULUM VITAE

NOEL MERRICK

TECHNICAL DIRECTOR

HYDROGEOLOGY, Asia-Pacific

QUALIFICATIONS

PhD	2000	PhD, Groundwater Management, University of Technology, Sydney, NSW, Australia
Grad Dip	1980	Graduate Diploma, Data Processing, NSW Institute of Technology, NSW, Australia
M Sc	1977	Master of Science, Research (Geophysics), University of Sydney, NSW, Australia
B Sc	1971	Bachelor of Science, University of Sydney, NSW, Australia

EXPERTISE

- Peer Reviewer using groundwater flow modelling guidelines for mines in NSW, VIC, WA, QLD
- Groundwater modeller
- Hydrogeologist and geophysicist
- Water Resource Investigations
- Environmental Impact Assessment
- Contaminated Site Assessment
- Quarry Projects

Noel is a groundwater modeller, hydrogeologist and geophysicist with over 45 years of experience in groundwater science. He retired in May 2009 from the University of Technology, Sydney where he was Associate Professor and Director of the National Centre for Groundwater Management. He ran courses in Groundwater Modelling, Groundwater Geophysics and Groundwater Policy and Management. As a researcher, he pioneered methods for resource sustainability quantification and management, particularly using optimisation techniques and has been engaged in research projects with the Aquaculture, Rice, Cotton and Contaminant CRCs. He was a member of the NSW working group that drafted the State Groundwater Policy documents and advised the Office of Water on prescriptive elements of the Aquifer Interference Policy (2012).

Noel has participated on a number of expert panels as the water expert for the NSW government. He regularly reviews groundwater resource models for Commonwealth, WA, QLD, VIC and SA government departments. He has been longtime member of the Murray-Darling Basin Independent Audit Group – Salinity, covering the ACT and the basin States and on a Technical Advisory Panel for the Department of Environment, Land, Water and Planning (Victoria)

Currently, he is a member of the Surat CMA Technical Advisory Panel for the Office of Groundwater Impact Assessment (Queensland). He has presented expert witness opinions at several court cases; NSW Land and Environment Court (Sydney, Singleton), QLD Land Court (Brisbane, Townsville), New Zealand High Court (Wellington) and NZ Environment Canterbury Water Allocation Hearing (Christchurch).

Having authored the peer review section of MDBC groundwater flow modelling guidelines, he has been heavily involved in peer reviewing modelling studies for mines in New South Wales Victoria, Western Australia and Queensland.

PROJECTS

	Suitably Qualified Expert
Foxleigh Mine Groundwater Monitoring Plan	Federal Department of the Environment.

Wilpinjong Coal Surface and Ground Water Response Plan	Department of Planning and Environment.
Metropolitan Mine, Extraction Plans	Department of Planning and Environment – Metropolitan Mine LW20-22, LW23-27, LW301-303 Extraction Plans.
Stratford Coal Mine Groundwater Management Plan	Department of Planning and Environment.
	Mining Projects
Development of Longwall Coal Models	South Galilee and Galilee (QLD), Metropolitan, Bulli Seam Operations. Dendrobium and Tahmoor (Southern Coalfield), Ulan and Wilpinjong (Western Coalfield), Narrabri and Caroona (Gunnedah Coalfield), Wambo, Spur Hill and Doyles Creek (Hunter Coalfield, NSW).
Development of Open Cut Models	Duralie and Stratford (Gloucester), Tarrawonga and Vickery (Gunnedah), Ensham (QLD).
Development of Lithium Mine, Argentina	Development of density-coupled solute model for lithium mine.
Peer Reviews of numerous mining models	Carmichael (Galilee, Qld), Clermont Qld, Kestrel Gregory Crinum Qld, Coppabella Qld, Latrobe Vic, Phulbari (Bangladesh), Bickham, Abel, Moolarben, Wilpinjong, Boggabri, Ulan, Dendrobium, Ashton, Narrabri, Maules Creek, Caroona, Watermark, Mt Owen, Liddell, Drayton South, West Wallsend, Neubeck, Mandalong, Werris Ck, Airly, United, Gloucester Gas Project, Brandy Hill, Bylong, Awaba, Dartbrook, United, Integra, Mangoola, Glendell (all NSW), etc.
	Quarrying Projects
Somersby Fields Project (Sand Quarry)	Membership of the IHAP Panel for the Somersby Fields Project.
Calga Sand Quarry	Development of a groundwater model
Expert Witness Testimony	Rocla's Calga Sand Quarry; Carwell Limestone Quarry, East End Limestone Quarry.
Peer Review of groundwater assessments	Central Coast Sands Quarry, Somersby; Brandy Hill Quarry, Raymond Terrace; Balranald mineral sands; Hawsons iron.
	Water Resource Investigations
Development of Finite element groundwater flow model	Port Botany reclamation; Sydney Airport Third Runway; Eastern Distributor & Airport Link tunnels (Sydney)
Development of Regional Water Resource Models	Lower Namoi, Mooki, Botany Sands, Buronga (all NSW).

Development of Solute Transport Models	Buronga, Helensburgh.
Peer Reviews of numerous models and groundwater investigations	▪ Infrastructure (Badgery's Creek airport, Epping-Chatswood Rail Link), ▪ Water supply: Parkes-Forbes, Upper Namoi, Murrumbidgee, Upper Nepean (NSW); Perth, Pilbara, Albany (WA); Bribie Island. North Stradbroke Island, Pioneer (Qld); Adelaide Plains (SA); Corangamite, Loddon, Campaspe, Anglesea (Vic); Murray-Darling Basin (3 states); Canterbury (NZ); Baruun Naran (Mongolia), ▪ Sewage (Gerringong; Cronulla) and waste (Castlereagh), ▪ Contamination (Botany; Mascot; Homebush; Pasminco & Incitec Newcastle), ▪ Irrigation (Swagman-Farm software; Coleambally NSW; Werribee Vic) and salinity (Padthaway SA, Eastern Mallee NSW/Vic), ▪ Seawater intrusion (Pioneer Qld; Uley SA; Albany WA), swamps (Newnes NSW).
	Environmental Impact Assessment
Preparation of groundwater assessments	Baralaba, Galilee and South Galilee (Qld); Metropolitan, Bulli Seam
Development of water level and water quality triggers management plans	Metropolitan Mine NSW; Duralie NSW; Stratford NSW; Springvale NSW; Angus Place NSW. Peer review: Foxleigh, Qld.
	Contaminated Site Assessment
Development of groundwater contamination models	Botany Sands (Orica); Boolaroo (Pasminco); Boolaroo (Incitec); Sydney Domestic Airport; Mt Piper (Delta Electricity); Blenheim (NZ).

PROFESSIONAL TRAINING

Supervisor	Supervision of 20 PhD research projects
Supervisor	Supervision of 72 Masters research projects.
Presenter	Specialist introductory and advanced modelling short courses from 1997
Chairman/presenter	"Water in Coal Mining" schools 2011 (Brisbane), 2012 (Newcastle)
Chairman/presenter	"Water in Mining" school 2013 (Adelaide)
Academic Lecturer	From 1987 to 2009
Presenter	National Groundwater Schools (1975+)

PUBLICATIONS	Insert details of any publications here. Delete section if not required
	Keynote Speaker at seven conferences (four international)
	500 report and journal publications.
	Associate Editor for international *Hydrogeology Journal* (5 years)

ENCLOSURE 3

MR ROHAN LUCAS' CURRICULUM VITAE

Rohan Lucas

Education and training:

Bachelor of Engineering (Honours) (Environmental)
University of Melbourne, 1996

Bachelor of Science (Earth Sciences)
University of Melbourne, 1994

Other ongoing training in river sciences and engineering

Industry affiliations:

Registered Professional Engineer Queensland (RPEQ)

Engineers Australia

Professionals Australia

Institute of Engineers in Papua New Guinea

Rohan is a Principal Consultant – Environmental Engineering and Geomorphology and Director of Alluvium Consulting. He has over 20 years' experience in environmental and natural resource management with a focus on waterways. This experience has been gained in a consulting role to government and industry in Australia and Asia-Pacific for the assessment, design, review and implementation of waterway management and rehabilitation programs and of the interactions of resource and infrastructure projects with surface water systems and the risks posed to each other.

Rohan has had extensive involvement in the planning and implementation of catchment and watercourse management programs for Catchment Management Authorities or equivalents in Queensland, Victoria, South Australia and New South Wales. Rohan also has extensive experience with private industry clients including mining and gas companies and infrastructure developers and associated regulator engagement across Australia and parts of the Asia-Pacific.

Key skill areas:

- Fluvial geomorphology, hydrology and hydraulics
- Design, rehabilitation and monitoring of waterway diversions for mining companies
- Watercourse rehabilitation program priority setting, design and implementation of works
- Waterway crossing assessments for large linear infrastructure projects
- Mining related subsidence impact assessment and management measures for waterways
- Development impact assessment on waterways
- Programs – RORB, HECRAS, 12d Model, Chute, RipRap

Relevant projects:

Project	Description	Role	Client	Year
Surface Water Technical Report for South Bates Underground Extraction Plan	Geomorphology and surface water exisiting conditions and impact assessment of longwalls LW11-16 at Wambo Coal Mine.	Project Director, Geomorphologist	Wambo Coal	2016-17
North Wambo Creek Diversion review of condition	Development and implementation of a monitoring program to understand diversion condition and condition trajectory.	Principal Engineer /Geomorphologist	Wambo Coal	2016-18
Wilpinjong Mine final landform	Regional assessment of geomorphology of valley and waterway character and behaviour to inform design of final landforms and their hydrologic and geomorphologic characteristics.	Principal Engineer /Geomorphologist	Wilpinjong Coal	2016-18

m. 0429 610 001
e. rohan.lucas@alluvium.com.au
w. www.alluvium.com.au

Project	Description	Role	Client	Year
waterway requirements				
Murragamba and Eastern Creek diversion designs	Concept designs of diversions at Moolarben Coal Mine that optimise environmental outcomes associated with the mine plan and final landforms	Principal Engineer /Geomorphologist	Moolarben Coal	2017
Sydney Basin Bioregional Assessment	Workshop to determine impacts of underground coal mining on water resources of the Sydney Basin Bioregion	Technical expert	Australian Government	2017
Sydney drinking water catchment audit	As required by legislation an audit of Sydney's drinking water supply catchments is required every three years.	Mining impacts chapter	NSW Government	2017
Western Slopes Pipeline EIS	Geomorphologic and flood behaviour assessments to inform the EIS of the Western Slopes Pipeline EIS from Narrabri to central southern NSW.	Geomorphologist	APA	2017-18
MRA diversion of Walker Creek	To allow continuation of the South Walker Creek mine in central Queensland a significant diversion of Walker Creek was required. This was undertaken from concept design, detail design, approvals and construction. Capital cost ~$25M.	Technical Director and principal Owners Engineer	BHP	2014-2017
Diversions at Roy Hill Mine	Review of designs, development and implementation of monitoring programs for diversions	Project Director, Engineer, Geomorphologist	Roy Hill	2016
Marillana Creek diversion	Expert review of proposed diversions of Marillana Creek at Yandi Mine	Project Director, Engineer, Geomorphologist	BHP Billiton	2016
Design and rehabilitation criteria for Bowen Basin River Diversions	Undertaken for the Australian Coal Association Research Program (ACARP) this project (C9068) developed design and rehabilitation criteria for diversions in mining in Australia. Prior to that design of diversions was often undertaken to empirical northern hemisphere rules of thumb. This resulted in very poor performance and a moratorium from the Queensland Government for 5 years. The criteria developed in the project have been adopted and utilised by the Queensland Government since as their guidelines.	Geomorphologist	ACARP	2001-2
Criteria for functioning river landscape units in mining and post mining landscapes	ACARP (http://acarp.com.au/abstracts.aspx?repId=C20017). This project reviewed the performance of diversions implemented since the C9068 project a decade earlier and incorporated best practice improvements internationally into a revised set of criteria for diversions in the mining industry. The project clearly demonstrated those implemented to the C9068 standard are performing much better than those which don't meet the standard.	Project director, geomorphologist	ACARP	2012-14
Collaborative performance trajectories for diversion approvals relinquishment	ACARP (http://acarp.com.au/abstracts.aspx?repId=C23030). This project developed a stakeholder assessment tool for assessing diversion condition and suitability for relinquishment of approvals by mining companies. The project also developed a vegetation condition trajectory tool to assist in the relinquishment process.	Project director	ACARP	2014-16
Subsidence Management Plans	Modelling, assessment, design and documentation of subsidence management plans for 4 major underground coal mines in central Queensland. These focus on the management of impacts to the waterways impacted by subsidence.	Project Director, Engineer, Geomorphologist	AAMC, Peabody, BMA	2011-2016
Waterway rehabilitation programs	Investigation, prioritisation, design and implementation of waterway rehabilitation programs for Victorian Catchment Management Authorities and River Murray Water	Geomorphologist, Engineer	CMA's	1998-2006
Isaac River cumulative impact assessment of mine developments	See https://www.ausimm.com.au/publications/epublication.aspx?ID=5407 as an explanation of project outcomes. QLD government have adopted the outcomes to utilise in a set of guidelines for subsidence impact assessment and management (Draft Central West Water Management and Use Regional Guideline 'Watercourse Subsidence – Central Qld Mining Industry')	Project manager, Geomorphologist	BHP Billiton Mitsubishi Alliance, Anglo American Metallurgical Coal and QLD government	2007-2009
Grosvenor EIS	Specialist waterway impact assessment input to EIS for proposed Grosvenor underground longwall mine near Moranbah, central	Project Director / Geomorphologist	AAMC	2010-2011

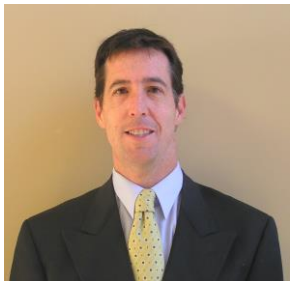
Project	Description	Role	Client	Year
	Queensland. Baseline condition assessment, monitoring program and modeling of potential impacts of proposed mine development.			
Murray River scoping study and implementation of management programs	A scoping study to manage the Murray River downstream of the major water storages and upstream of major offtakes. Development of actions plans with multi-stakeholder drivers to mitigate the impacts regulated river flow on river health, landholder values and economic benefit.	Project Engineer and Geomorphologist	River Murray Water	2000-2003
PNG-Queensland Gas Pipeline Feasibility Study	Geomorphic and hydrologic assessment of waterway crossings on pipeline route from Cape York to Gladstone and Charters Towers to Ballera (over 3,500km). Assessment of untreated and treated risk to the environmental values of the waterway and the in-service integrity of the pipe for in excess of 1,000 waterway crossings. Assessment involved digital aerial photography assessment in GIS, helicopter and ground survey.	Project Engineer and Geomorphologist	AGL-Petronas consortium	2005-06
Wallace South surface water management (Cloncurry)	Assessment of hydrologic, hydraulic and geomorphic character and behaviour of surface water systems at proposed mine development. Assessment and design of potential watercourse diversions to facilitate development.	Project Director and Geomorphologist	Copperchem and Exco	2015-
Cannington Mine open cut expansion studies	Surface water studies for the EIS involving hydrology, hydraulics, geomorphology and ecology of the surface water systems in the vicinity of the mine. Included assessment and design of multiple options for diversion of local river.	Project Director and Geomorphologist	BHP Billiton	2007-2011 and 2015-
Lady Annie Mine – Anthill project	Assessment of hydrologic, hydraulic and geomorphic character and behaviour of surface water systems at proposed mine development. Assessment and design of potential watercourse diversions to facilitate development.	Project Director and Geomorphologist	CST Minerals	2012-2014
Monitoring program for waterways and diversions in central Queensland mines	Development and application of best practice guidelines for design and rehabilitation of waterway diversions in central Queensland. Associated baseline condition and impact assessment, monitoring and evaluation.	Project director, Geomorphologist /Engineer	Mining companies and ACARP	Ongoing
Caval Ridge Diversions – Horse & Caval Creeks	Functional and detailed design of waterway diversions to facilitate open cut mine development. Following regulatory approval, diversions and associated levees are currently under construction with Alluvium providing oversight.	Project Director / Geomorphologist	BMA/Bechtel	2010 - ongoing
Back Creek Diversion detailed design and monitoring	Back Creek diversion attempts to recreate the natural features of the existing Back Creek as best as possible and includes a low flow channel, floodplain and terrace features constructed through spoil. A revegetation plan for the Diversion was developed and baseline monitoring undertaken in 2008. The diversion is being progressively constructed with the first round of construction monitoring undertaken in 2013.	Project Director / Geomorphologist	Millmerran Power Partners	2007 - ongoing
Bath Creek & Breaker Creek diversion design	Functional and detailed design of realignment options for existing diversions to meet new mining requirements and site closure requirements at Blair Athol mine.	Project Director / Geomorphologist	Rio Tinto	2009 - 2012
Foxleigh Plains EIS & Cockatoo Creek Diversions	Surface water component of EIS including, baseline assessment of waterway condition and processes through the proposed Foxleigh Plains MLA and existing Foxleigh mine operation. Project also included concept and functional designs for watercourse diversions on Cockatoo Creek, flood protection requirements and cumulative impact assessment.	Project Director / Geomorphologist	AAMC	2009 - 2012
Carlo Creek Diversion	Baseline condition assessment, monitoring program implementation, functional and detailed design of a diversion for Carlo Creek to allow open cut mine expansion.	Project Director / Geomorphologist	Ensham Resources	2008 - ongoing
Waterway Rehabilitation	Assessment, development of strategies and design of works to address impacts of flood event in early 2008 on the Nogoa River system through the mine site.	Project Director / Geomorphologist	Ensham Resources	2008
Spring Creek Diversion	Functional design of options to divert Spring Creek around proposed mining operations and rehabilitate an old reach of diverted creek. Geomorphic, hydrologic and hydraulic assessment of Spring Creek in	Project Director / Geomorphologist	BMA	2004-2005

Project	Description	Role	Client	Year
	the vicinity of the mine. Detailed design, technical specification and construction drawings.			
Boggy Creek Diversion Rehabiliation	Functional design of rehabilitation options for Boggy Creek diversion (2005). Design of rehabilitation measures for rock chutes in the diversion to meet licensing requirements, risk to mining operations and improved environmental management.	Project Director / Geomorphologist	Ensham Resources	2005
Crossbed Creek Diversion Rehabilitation	Functional design of rehabilitation options to meet environmental and mining requirements. Detailed design and implementation of monitoring program.	Project Director / Geomorphologist	BMA	2004 - 2007
Cherwell Creek Diversion Rehabilitation	Functional design of rehabilitation options to meet environmental and mining requirements for Cherwell Creek Diversion 1. Implementation of ongoing monitoring.	Project Director / Geomorphologist	BMA	2006
New Chum Creek Diversion Design	Functional design of options to divert New Chum Creek around proposed open cut coal mining operations. Geomorphic, hydrologic and hydraulic assessment of existing creek and potential diversion options.	Geomorphologist /Engineer	BMA	2005-2006
Harrow Creek Diversion Rehabilitation	Functional design of rehabilitation options to meet environmental and mining requirements. Detailed design, monitoring programme, technical oversight of construction, identifications of maintenance requirements for the Harrow Creek diversion through the mine site.	Geomorphologist /Engineer	BMA	2003-2006
Burdekin fish barriers	Fish barrier assessment and prioritisation project for the Burdekin River catchment	Geomorphologist	Dry Tropics NRM	2006-8
Bohle River environmental values	Assessment of values and threats in the Bohle River catchment, Townsville	Geomorphologist	Townsville City Council	2007

ENCLOSURE 4

MR PETER KUSKIE'S CURRICULUM VITAE

CURRICULUM VITAE



NAME: **(Mr) KUSKIE, PETER JAMES**

Position: Director, South East Archaeology Pty Limited

Address: 24 Bamford Street
Hughes ACT 2605

Telephone: (02) 6260 4439
Facsimile: (02) 6260 4439
Mobile: (0417) 691 231
Email: *peter@southeastarchaeology.com.au*
Web: *www.southeastarchaeology.com.au*

Relevant Employment Experience:

Consultant Archaeologist, South East Archaeology, 1989 - present.

Key projects as principal consultant include:

- Part 3A assessment of Ulan Coal Mine's Continued Operations Project near Mudgee, involving extensive survey of a 50 square kilometre area over 21 weeks, with in excess of 900 Aboriginal sites recorded, including open artefact sites, rock shelters, grinding grooves, scarred trees, stone arrangements and art sites (UCML/Glencore);
- Survey over a five week period, with over 1,000 Aboriginal sites recorded, and salvage excavations over a 27 week period at the 37 square kilometre Mount Arthur North Coal Mine (URS Australia, BHP Billiton);
- Part 3A and Part 4.1 State Significant Development assessments of major coal mining Projects, Extensions and Modifications including at Spur Hill (Spur Hill Management / Resource Strategies), Tasman (Donaldson Coal), Abel Mine (Ellemby Resources / Donaldson Coal), Bloomfield (Bloomfield Colliery), Wilpinjong (Peabody) and Moolarben (Yancoal);
- Part 3A assessment of the Australian Rail Track Corporation's 32 kilometre Maitland to Minimbah and 11 kilometre Minimbah to Wittingham rail upgrades in the Hunter Valley, involving surveys and mitigation measures (Hunter 8 Alliance);
- Pacific Highway Upgrades, including extensive survey and test excavations of the 37 kilometre Oxley Highway to Kempsey route near Port Macquarie and survey of the 27 kilometre Woolgoolga to Wells Crossing route near Coffs Harbour (GHD/RTA);
- Surveys, test excavations and salvage excavations for large residential developments at Thornton North in the Hunter Valley (Investa Property Group, County Property Group and Defence Housing Australia);
- Surveys and mitigation projects for numerous water and sewerage pipeline routes in the Hunter Valley and Central Coast (GHD, Hunter Water Corporation, Department of Commerce, Wyong Shire Council);
- Surveys and mitigation projects for The Vintage residential golf course (Stevens Group);
- Salvage and test excavations over an 18 week period for 'The Dairy' ('The Lakes') residential development near Ulladulla (Elderslie Property Investments) and over a 10 week period for Australian Property Growth Fund;

- Salvage excavations over a 12 week period at Lemington Mine, near Singleton (Lemington Coal Mines);
- Salvage excavations over a 14 week period of two Aboriginal sites along the F3 Freeway (M1) at Black Hill, near Maitland (RTA);
- Survey of BHP Petroleum and Westcoast Energy Australia's 740 kilometre long Eastern Gas Pipeline, from Longford, Victoria, to Wilton, NSW;
- Surveys of Optus Communications' mobile telecommunications network throughout NSW and Queensland and fibre optic cable network from Sydney to Brisbane and Cootamundra to Canberra (Optus Communications, Landscan);
- Survey for Dorrigo Three Year Environmental Impact Study (State Forests of NSW);
- Heritage studies at Coffs Harbour (Coffs Harbour and District Local Aboriginal Land Council), Bingie Bingie Point (Cobowra LALC) and the Hunter Valley (Mindaribba LALC);
- Excavations in Guam, Micronesia, USA (Dames and Moore, National Heritage Studies);
- Acting Senior Conservation Officer, Australian Heritage Commission (1993);
- Additional sub-surface investigations and salvage projects in NSW at numerous locations, including Rothbury (RTA), Thornton (GHD, Beechwood Homes, CPG, UrbisJHD), St. Georges Basin (Shoalhaven City Council), Cudmirrah National Park (DECCW), Bewong (Cowman Stoddart), Wollongong (Wollongong City Council), Merimbula (Ridge Consolidated, Bega Valley Shire Council, RTA and Bega Traditional Aboriginal Elders Council), Old Erowal Bay (Matrix Planning), Fishermans Paradise (Matrix Planning) and various locations (Optus Communications).
- Additional surveys throughout NSW, including:
  - Hunter Valley - numerous locations, such as Anna Bay, Bayswater, Beresfield, Cessnock, Fishermans Bay, Jerrys Plains, Lemington, Maitland, Rothbury, Singleton, Thornton, Tomago, Wambo and Wyong - for clients including Egis, Devine Erby Mazlin, GHD, HWC, Lemington Mine, MPE, Newcastle City Council, Rail Access Corporation and Umwelt;
  - Central Coast - numerous locations, including Wyong, Warnervale, Mardi, Wamberal, Ourimbah, Dora Creek, Toronto, Fennell Bay, Boolaroo, West Wallsend and Woy Woy - for clients including GHD, Department of Commerce, Wyong Shire Council and Connell Wagner;
  - South Coast - numerous locations, including Batemans Bay, Bendalong, Berry, Bewong, Broulee, Callala Beach, Cobargo, Congo, Conjola, Cudmirrah, Dapto, East Nowra, Eurobodalla NP, Fishermans Paradise, Jervis Bay NP, Kangaroo Valley, Lake Conjola, Milton, Moruya, Nowra, Potato Point, St. Georges Basin, West Dapto, Wollongong - for clients including Bullock Walters & Associates, Cowman Stoddart, Crescent Home Plan & Design Service, Eurobodalla Shire Council, Forbes Rigby, Glenshaw Holdings, Grenon-Walker, Horseshoe Pastoral Company, Matrix Planning, Maunsell, Miltonbrook, Niche Environmental Information, DECCW, P.W. Rygate & West, Shoalhaven City Council, State Forests of NSW, Town & Country Real Estate and Travers Morgan;
  - Far South Coast - numerous locations, including Bournda NP, Dalmeny, Bega, Merimbula, Tuross Falls - for clients including Bega Valley Shire Council, Great Southern Energy, GHD, Caddey Searl and Jarman, DECCW and RTA;
  - Southern and Central Tablelands - numerous locations, including Goulburn, Marulan, Yass, Snowy Mountains, Tallaganda, Gundagai, Cowra and Ulan - for clients including Ulan Coal Mine, Cowra Shire Council, Matrix Planning, Cowman Stoddart, SMEC, State Forests of NSW, DECCW and Gundagai Shire Council;
- Surveys in the ACT at Mitchell, Hume, Conder, Banks, Gungahlin and West Belconnen (ACT Government) and ACT site mapping project (Canberra Archaeological Society).

Professional Skills:

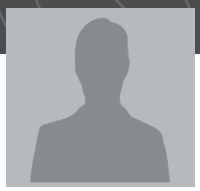
- Managing and conducting large-scale and small-scale Aboriginal heritage projects;
- Planning and conducting archaeological surveys of Aboriginal and non-indigenous heritage sites;
- Planning and conducting archaeological excavations of Aboriginal sites, including artefact scatters, shell middens and rock shelters;
- Preparation of OEH Section 90 applications and the conduct of sub-surface investigations and mitigation measures;
- Preparing Aboriginal heritage management plans and Aboriginal heritage impact assessment reports compliant with the OEH, Department of Planning and Environment and other Government requirements;
- Liaising with Aboriginal communities, clients and government agencies;
- Assessing heritage site significance;
- Analysing shell midden deposits and stone artefacts; and
- Statistical analysis of archaeological data.

Academic Qualifications:

Tertiary degree: Bachelor of Arts (Honours) Australian National University
Result, 1989 Prehistory IV Honours: H2A

ENCLOSURE 5

MR MARTIN SULLIVAN’s CURRICULUM VITAE



Martin Sullivan PRINCIPAL ECOLOGIST, DISCIPLINE LEADER ECOLOGY & IMPACT ASSESSMENT

Principal Ecologist and Discipline Leader Ecology & Impact Assessment with a high level of technical expertise, I am responsible for leading large multidisciplinary teams to deliver nationally significant projects for key clients in Government, resources, infrastructure and urban development sectors. I'm motivated by delivering the best possible environmental and project outcomes with no compromises. With each project I seek to understand our clients' unique challenges and objectives and use an innovative and robust scientific approach to solve problems and navigate complex regulatory requirements. Responsive and timely project management is always at the centre of every project I undertake, with the highest standards applied to each deliverable, ensuring a quality result from start to finish. My specialities include: Vegetation mapping, Major Project Ecological Impact Assessment, biodiversity offsets including Bio-Banking and Bio-certification projects, federal approvals, revegetation and landscape management, biodiversity monitoring and species habitat modelling. Passion: I'm passionate about all aspects of ecology, but particularly in applying innovative techniques (such as 3D vegetation mapping), threatened species survey and habitat modelling, and definitely orchids. My latest passion is leading the ecology and impact assessment discipline and working with such an amazing team of ecologists across the country. Regions of expertise include: all of NSW (with particular specialisation in western NSW), northern Victoria and southern QLD.

QUALIFICATIONS

- Bachelor of Science (Biodiversity and Conservation), Macquarie University, 2004
- Biodiversity Assessment Method (BAM) Accredited Assessor

PROJECT EXPERIENCE

MANAGEMENT PLANS/ STRATEGIES

- Narrabri Gas Project Biodiversity Management Plans (draft), Santos Limited
- Mt Arthur Coal Biodiversity Management Plan Update, BHP
- Ingleside Chase Escarpment Plan of Management (PoM), Pittwater Council
- Warriewood and Nareen Wetlands Plans of Management, Pittwater Council.
- Central West Catchment Environmental Weeds Strategy, Central West Catchment Management Authority.

REHABILITATION PLANS / STRATEGIES

- Narrabri Gas Project Rehabilitation Strategy, Santos Limited
- Authority to Prospect (ATP) 940P Rehabilitation Strategy, Cooper Creek QLD, Drillsearch Limited
- Lower Hunter Recycled Water Initiative – Tree planting for carbon offsetting, Hunter Water
- Rockley Falls Quarry Rehabilitation and Vegetation Offset Management Plan, Abigroup
- Hume Highway Duplication, Table Top to Mullengandra – Landscape Manager and Botanist, RTA.

MONITORING

- Narrabri Gas Project Rehabilitation Monitoring 2012-2019, Eastern Star Gas and Santos Limited
- Drayton Mine Annual Biodiversity Monitoring, Drayton Management
- Dewhurst and Bibblewindi Biodiversity Monitoring 2014-2019, Santos Limited
- Baseline waterway monitoring Gunnedah and Narrabri, Santos Limited
- Liddell Coal Operations Annual Flora and Fauna Monitoring, Xstrata NSW
- Greta Train Support Facility Project Ecologist, Abigroup

- Rockley Falls Quarry Annual Vegetation Offset Monitoring 2009-2013, Hume Highway Woomargama Alliance
- Metropolitan Colliery - Vegetation Monitoring, Metropolitan Coal.
- Pre and Post Flow Release Vegetation Monitoring at Avon Dam, Sydney Catchment Authority.

ECOLOGICAL IMPACT ASSESSMENT

- Nine Corehole Project, Santos NSW (Eastern) Pty Ltd
- Bonshaw Solar Farm Preliminary Environmental Assessment, APA Group
- Narrabri South Mine Baseline Biodiversity Assessment, Whitehaven Coal
- Western Slopes Pipeline Preliminary Environmental Assessment, APA Group
- Narrabri Gas Project, Santos NSW (Eastern) Pty Ltd
- Dewhurst and Bibblewindi CSG Pilots Ecological Assessment, Eastern Star Gas
- E&A Program, Santos NSW (Eastern) Pty Ltd
- Cumulative Impact Assessment, Santos limited
- Oceanic Coal Continued Operations Project, OCAL Pty Ltd
- Liddell Coal Operations MOD 5 expansion, Glencore Xstrata
- Boco Rock Wind Farm Transmission Line Ecological Constraints Study, Wind Prospect.
- Great Western Highway Upgrade (Mount Victoria to Lithgow) Preliminary Ecological Assessment, RTA.
- Edmondson Park Release Area Ecological Constraints Investigation, Sydney Water.
- Erskine Park Link Road Network Flora and Fauna Impact Assessment, Department of Planning.
- Caloundra Mooloolaba Road (MMTC) Ecological Impacts Study, Main Roads Queensland.
- Gunning Windfarm Transmission Line Ecological Impact Assessment, Gunning, Acciona Energy.
- Leonay/ Emu Plains - Wallacia Borefield Investigation Study, Sydney, Sydney Catchment Authority.
- Ecological and hydrogeological Investigation for a Proposed Irrigation Development, Avoca Station, Wentworth

VEGETATION SURVEY AND MAPPING

- Central Coast Local Government Area Plant Community Type Equivalences, Central Coast Council
- Vegetation Survey, Analysis & Mapping in Barool National Park, Linton Nature Reserve, Hobden Hill National Park, Woodsreef State Conservation Area and Serpentine Ridge National Park, NPWS/OEH
- Goonoo Reserves vegetation survey and mapping, NPWS/OEH
- Validation and accuracy assessment of Groundwater Dependent Ecosystem vegetation across the Hunter, Namoi and Lachlan Catchments, NSW DPI, Water
- Breelong and Drillwarrina National Parks vegetation survey and mapping, NPWS/OEH
- Narrabri Gas Project vegetation survey and mapping, Santos NSW (Eastern) Pty Ltd
- Baseline Biodiversity Assessment, ATP940P far south-west QLD, Drillsearch Limited
- Murrumbidgee Plot Data Collection. Vegetation survey across the South West Slopes, DEWHA.

BIOBANKING AND BIOCERTIFICATION

- Nooroo Biodiversity Stewardship Agreement, Hillbrad Pty Ltd
- Wyong Strategic Lands Biocertification Assessment, Wyong Shire Council
- Clarencetown BioBank Agreements, HillBrad Pty Ltd
- Narrabri Gas Project Major Project Credit Calculations, Santos Limited

ENCLOSURE 6

MR JOSHUA HUNT'S CURRICULUM VITAE

JOSHUA HUNT

mine project approvals
environmental management
regulatory approvals
environmental impact assessment

EDUCATION

Bachelor of Engineering (Civil)

PROFESSIONAL HISTORY

- Resource Strategies (Brisbane), Principal, 1999 to present.
- Mouchel Consulting Limited (London), Environmental Engineer, 1998 to 1999.
- Resource Strategies (Brisbane), Environmental Project Manager, 1997 to 1998.
- Woodward-Clyde (Brisbane), Civil Engineer, 1996 to 1997.
- Fujita Corporation (Singapore), Project Engineer 1994 to 1996.
- MPA Williams & Associates (Melbourne), Civil Engineer.

EXPERIENCE

Josh has extensive professional experience as a civil and environmental engineer. He has specialist experience in environmental impact assessment in the mining industry.

A civil engineer with a broad range of experience in engineering and environmental management for the mining industry, including:

- broad based environment studies and environmental impact assessment in relation to the approval and ongoing statutory requirements of mining projects.
- project feasibility and risk assessment studies.
- environmental auditing and compliance reporting.
- conceptual design of environmental management systems (particularly water management systems).
- management of consultation and negotiation processes with government and non-government stakeholders.

PROFESSIONAL EXPERIENCE – RELEVANT ENVIRONMENTAL/SUBSIDENCE ASSESSMENTS

Bulli Seam Operations – Appin and West Cliff Mines (BHP Billiton - Illawarra Coal)

- Bulli Seam Operations Environmental Assessment (NSW).
- Bulli Seam Operations Environmental Impact Statement (Commonwealth).
- Submission to the Bulli Seam Operations Review Panel of the Planning Assessment Commission.

Tasman Extension Project, NSW

- Tasman Extension Project Environmental Impact Statement.

Metropolitan Coal Mine, NSW

- Metropolitan Coal Project Environmental Assessment.
- Submission to the Metropolitan Coal Project Review Panel of the Planning Assessment Commission.
- Metropolitan Mine Longwalls 20-22 Extraction Plan.
- Metropolitan Mine Longwalls 23-27 Extraction Plan.
- Metropolitan Colliery Longwalls 18-19A Subsidence Management Plan Application.
- Metropolitan Colliery Longwalls 14-17 Subsidence Management Plan Application.

Wambo Coal Mine, NSW

- Wambo Development Project Environmental Impact Statement.
- Various modification applications for the North Wambo Underground Mine.
- North Wambo Underground Mine Longwalls 1 to 6 Subsidence Management Plan Application.
- North Wambo Underground Mine and South Bates Underground Mine Extraction Plan Applications.
- Referral of the Wambo Development Project under the Commonwealth *Environment Protection and Biodiversity Conservation Act, 1999*.

Abel Underground Mine, NSW

- Contributions to modifications and Subsidence Management Plan approvals.

AREQ0009792

Peter Jaeger, Manager Environment & Community
Wambo Coal Pty Ltd
PMB 1
Singleton, NSW, 2330
By email: PJaeger@peabodyenergy.com

Dear Peter

Subject: South Bates Extension Underground Mine – First Workings for Longwalls 22 to 24, Schedule 2 Condition 6B of DA 307-7-2003

I refer to your letter dated 29 May 2020 and associated attachments in relation to the proposed mining of first workings for Longwalls 22 to 24.

The Resources Regulator is satisfied that the applicant can achieve the required outcomes of Schedule 2, Condition 6B, of Development Consent DA 307-7-2003, subject to the following condition:

1. The mine operator must undertake adequate monitoring of the stability of first workings in the subject area and to implement appropriate ground support of the roadways in accordance with the results of the said monitoring, to ensure compliance with the outcome requirements of Schedule 2, Condition 6B of the Development Consent for DA 305-7-2003.

Note, this advice does not constitute any form of endorsement of the proposed mining in relation to work health and safety laws.

Yours sincerely

Garvin Burns
Chief Inspector of Mines

07 July 2020

WAMBO COAL PTY LTD

ABN: 13 000 668 057

100 Melbourne Street
South Brisbane Qld 4101

PMB 1
Singleton NSW 2330
Australia
Tel + 61 (0) 2 6570 2200
Fax + 61 (0) 2 6570 2290

29 May 2020

NSW Department of Planning, Infrastructure and Environment
Resource Regulator
PO Box 344
Hunter Region Mail Centre NSW 2320

Attention: Mr Alex Love, Advisory Officer Assessment Coordination

By email to cau@planning.nsw.gov.au
nswresourcesregulator@service-now.com
alex.love@planning.nsw.gov.au

Dear Alex,

RE: SOUTH BATES EXTENSION UNDERGROUND MINE – FIRST WORKINGS FOR LONGWALLS 22 TO 24

The South Bates Extension Underground (SBEU) Mine is a component of the approved Wambo Coal Mine. The SBEU Mine was approved in December 2017 and involves extraction of coal by longwall mining methods from the Whybrow Seam. The approved South Bates Extension Underground Mine comprises Longwalls 17 to 25.

Wambo Coal Pty Ltd (WCPL) operates the Wambo Coal Mine in accordance with Development Consent DA 305-7-2003. Condition B6, Schedule 2 of the Development Consent states:

> *B6. The Applicant may carry out first workings within the underground mining areas of the approved mine plan, other than in accordance with an approved Extraction Plan, provided that the Resources Regulator is satisfied that the first workings are designed to remain stable and non-subsiding in the long-term, except insofar as they may be impacted by approved second workings.*
>
> *Note: The intent of this condition is to ensure that first workings are built to geotechnical and engineering standards to ensure long term stability, with negligible direct subsidence impacts.*

Approval was received for first workings of longwall 17 to longwall 21 (TG17 to MG21) on 27 March 2018 (your ref OUT18/5435). WCPL has progressed the mine plan to allow for continued safe and efficient resource extraction from Longwalls 22 to 24 (MG22 to MG24 in attached Figure). The pillar design is consistent with the Mine Advice Pty Ltd document *WAM37-01 Preliminary Coal Pillar Design Recommendation for the South Bates Underground Extension Project.* Pillar design exceeds legislative requirements to ensure pillars remain stable and non-subsiding in the long-term. To date there have been no roadway or pillar failures and subsidence monitoring has shown no subsidence over first workings areas.

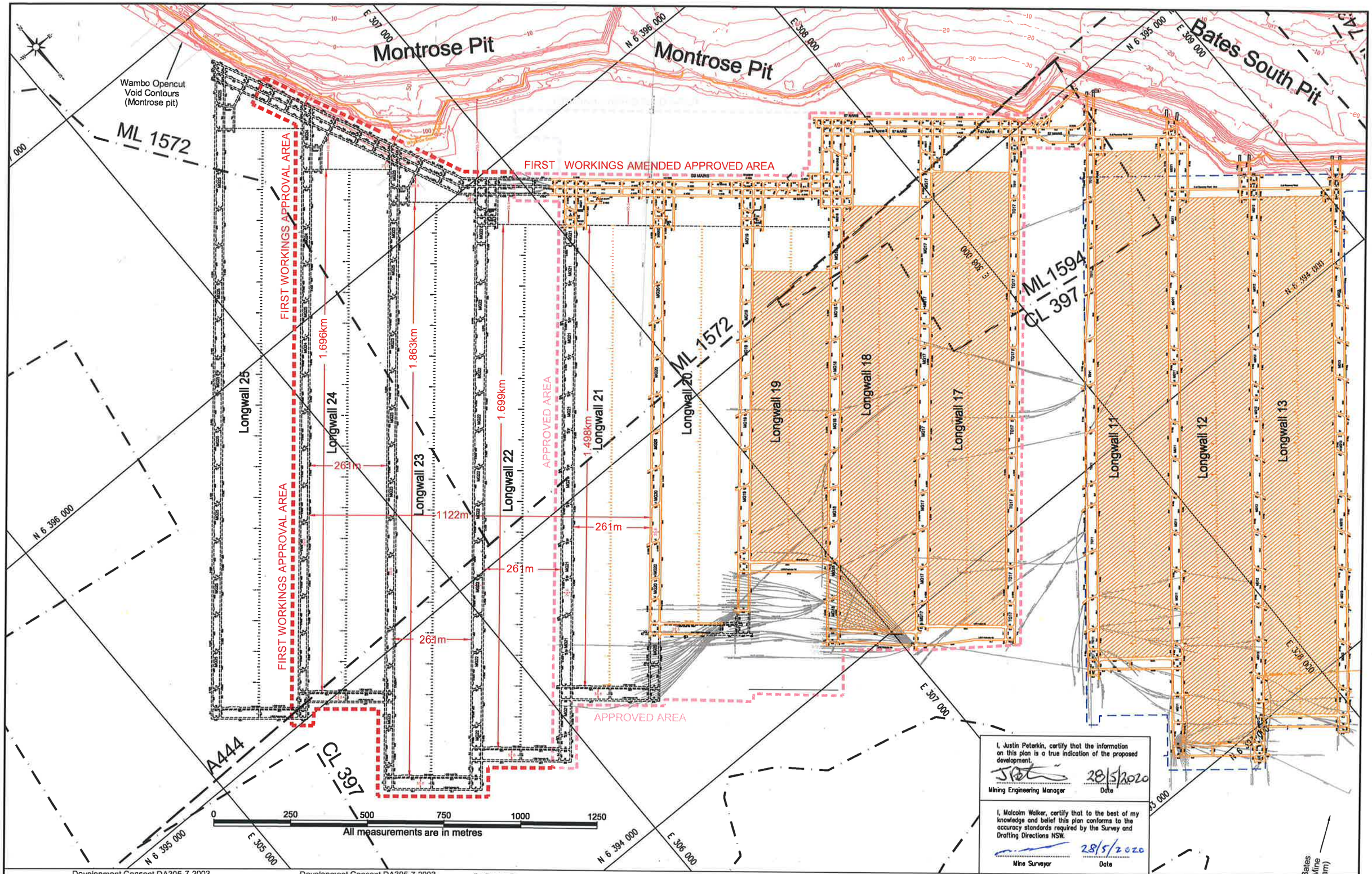
In accordance with Condition B6, Schedule 2 of the Development Consent, WCPL requests confirmation from the Resources Regulator that the proposed first workings are stable and non-subsiding in the long-term.

Please do not hesitate to contact me on (02) 6570 2206 if you have any queries in regard to the above or if you require additional information.

Yours faithfully,

Peter Jaeger
Manager: Environment & Community
WAMBO COAL PTY LTD

Attached Figure - First Workings Approval MG22 to MG24 (DWG2734 Rev C)



I, Justin Peterkin, certify that the information on this plan is a true indication of the proposed development.

Mining Engineering Manager — Date 28/5/2020

I, Malcolm Walker, certify that to the best of my knowledge and belief this plan conforms to the accuracy standards required by the Survey and Drafting Directions NSW.

Mine Surveyor — Date 28/5/2020

REVISIONS

REV.	DATE	BY	DESCRIPTION	CHK.
A	2/02/2018	MW	INITIAL ISSUE - TAILGATE 17 TO MAINGATE 21	JFA
B	12/03/2018	MW	STEPPED MAINS AMENDMENT - MAINGATE 18 TO MAINGATE 21	PJ
C	27/4/2020	MW	MAINGATE 22 TO MAINGATE 24	ND

Peabody

WAMBO COAL PTY LIMITED
ABN 13 000 668 057
Jerry's Plains Rd, Warkworth
Via Singleton, NSW, 2330
Phone: 02 65 702200
Fax: 02 65 702290
Prepared by NWU Survey Ph: 02 65 702318

South Bates Extension Underground (Whybrow Seam) Development Consent DA-305-7-2003 Condition B6 First Workings Approval MG22 to MG24.

Drawing No. 2734
Revision No. C
Sheet Size A0

Date	Scale:	Drawn	Checked	Approved
27/4/2020	1: 4000	MJW	PJ	JP

Subject: FW: Wambo Coal South Bates Underground Extension_Amended First Workings LW17-21

From: Jaeger, Peter F <PJaeger@peabodyenergy.com>
Sent: Friday, 15 March 2019 7:51 AM
To: Alex Love <alex.love@planning.nsw.gov.au>
Cc: Dobbins, Nicole <NDobbins@peabodyenergy.com>
Subject: Wambo Coal South Bates Underground Extension_Amended First Workings LW17-21

Dear Alex,

Please find attached file transfer link to correspondence relating to amended first workings for the Wambo Coal South Bates Underground Extension Longwalls 17 to 21. Changes to the first workings are required to step around geological structures. The changes have been included in the amended Extraction Plan recently submitted.

https://securefile.peabodyenergy.com/w/WR5o36vT

If you have any difficulty downloading the file or require anything further, please contact myself at the details below or Nicole Dobbins on 0408969988.

Kind regards,

Peter Jaeger
Manager: Environment & Community
Wambo Coal
PMB 1 | Singleton, NSW 2303
Office Phone: +61 2 6570 2206 | Mob: +61 417 527 585
pjaeger@peabodyenergy.com

Planning & Environment
Resources & Geoscience

OUT18/5435

Mr Peter Jandzio
Mining Engineering Manager
North Wambo Underground Mine
PMB1
Singleton, NSW 2330

By email:pjaeger@peabodyenergy.com

Dear Mr Jandzio

Requirements under Schedule 4, Condition 22E Development Consent DA 305-7-2003(MOD 12) South Bates Underground Extension

I refer to your letter dated 5 February 2018 subject Wambo Coal South Bates Underground Extended – First Workings Update and attachments.

The Division of Resources and Energy is satisfied that the Leaseholder can achieve the required outcomes of the first workings condition of Development Consent DA 305-7-2003 (MOD 12) Schedule 4 Condition 22E subject to the following condition:

> *"The Mine Manager must undertake adequate monitoring of the stability of first workings in the subject area and to implement appropriate ground support of the roadways in accordance with the results of the said monitoring, to ensure compliance with the outcome requirements of Schedule 4, Condition 22E of the Development Consent for DA 305-7-2003 (MOD12)."*

The proposed mine workings are shown in the forwarded plan titled "South Bates Underground Extension (Whybrow Seam) Development Consent DA-305-7-2003 Condition 22C (sic) First Workings Application for the Main Headings, TG17 to MG21" Dwg. No. 2367, signed by the Mining Engineering Manager on 2 February 2018.

If you have any further enquiries do not hesitate to contact Mr Alex Love, Project Coordinator, on 02 9842 8582.

Yours sincerely

Matt Gagan
A/Manager Royalty & Advisory Services
Division of Resources and Geosciences
27 March 2018

Planning, Industry & Environment

Peter Jaeger
Environment & Community Manager
Wambo Coal Pty Ltd
PMB 1
Singleton NSW 2330

15/04/2020

Dear Mr Jaeger

Wambo Coal Mine (DA 305-7-2003)
South Bates Extension - Shortening of Longwall 20

I refer to your letter dated 26 February 2020 and 25 March 2020, requesting the Secretary's approval to shorten Longwall 20 by a total of 187.5 metres compared to the longwall layout in Extraction Plan (EP), approved 4 June 2019, due to the presence of a previously unidentified fault intersecting the longwall's commencing end.

The Department notes that the reduction in longwall length would likely result in reduced or negligible changes to subsidence impacts and environmental consequences on the surface and therefore would not significantly change predicted impacts to natural and built features as described in the Environmental Assessment for Modification 17.

The Department considers that the subsidence impacts and environmental consequences would be similar or less than compared to the approved layout.

Considering the above, the Secretary agrees that the proposed modified layout would still comply with condition A2 of Schedule 2 of the Wambo Coal Mine development consent (DA 305-7-2003).

The Department also considers the management and mitigation measures described in the approved EP remain appropriate. However, the Department requests that relevant figures in the EP are updated to reflect the changed layout.

If you wish to discuss the matter further, please contact Melanie Hollis on 8217 2043.

Yours sincerely

Matthew Sprott
Director
Resource Assessments (Coal & Quarries)

as nominee of the Planning Secretary

WAMBO COAL PTY LTD

ABN: 13 000 668 057

100 Melbourne Street
South Brisbane Qld 4101

PMB 1
Singleton NSW 2330
Australia
Tel + 61 (0) 2 6570 2200
Fax+ 61 (0) 2 6570 2290

25 March 2020

Department of Planning, Industry and Environment
Locked Bag 5022
PARRAMATTA NSW 2124

Attention: Executive Director Energy and Resources

By email: mike.young@planning.nsw.gov.au
Cc: melanie.hollis@planning.nsw.gov.au

Dear Mr Young,

SOUTH BATES EXTENSION UNDERGROUND MINE – FURTHER SHORTENING OF LONGWALL 20

On 22 February 2020, Wambo Coal Pty Limited (WCPL) wrote to the Department of Planning, Infrastructure and Environment (the Department) requesting approval to shorten Longwall 20 by 176.5 metres (m).

Since the identification of the fault requiring the shortening of Longwall 20, WCPL has continued to conduct inseam drilling operations. Drilling has confirmed the commencing (south-western) end of Longwall 20 is required to be shortened by an additional 11m, resulting in a total shortening of **187.5** m.

Environmental features directly overlying or in the vicinity of the commencing (south-western) end of Longwall 20 are shown in Table 1 and Enclosure 1. Shortening Longwall 20 by an additional 11 metres will not increase previously assessed impacts to any of these features.

Please do not hesitate to contact me on (02) 6570 2206 if you have any queries in regard to the above or if you require additional information.

Yours faithfully,

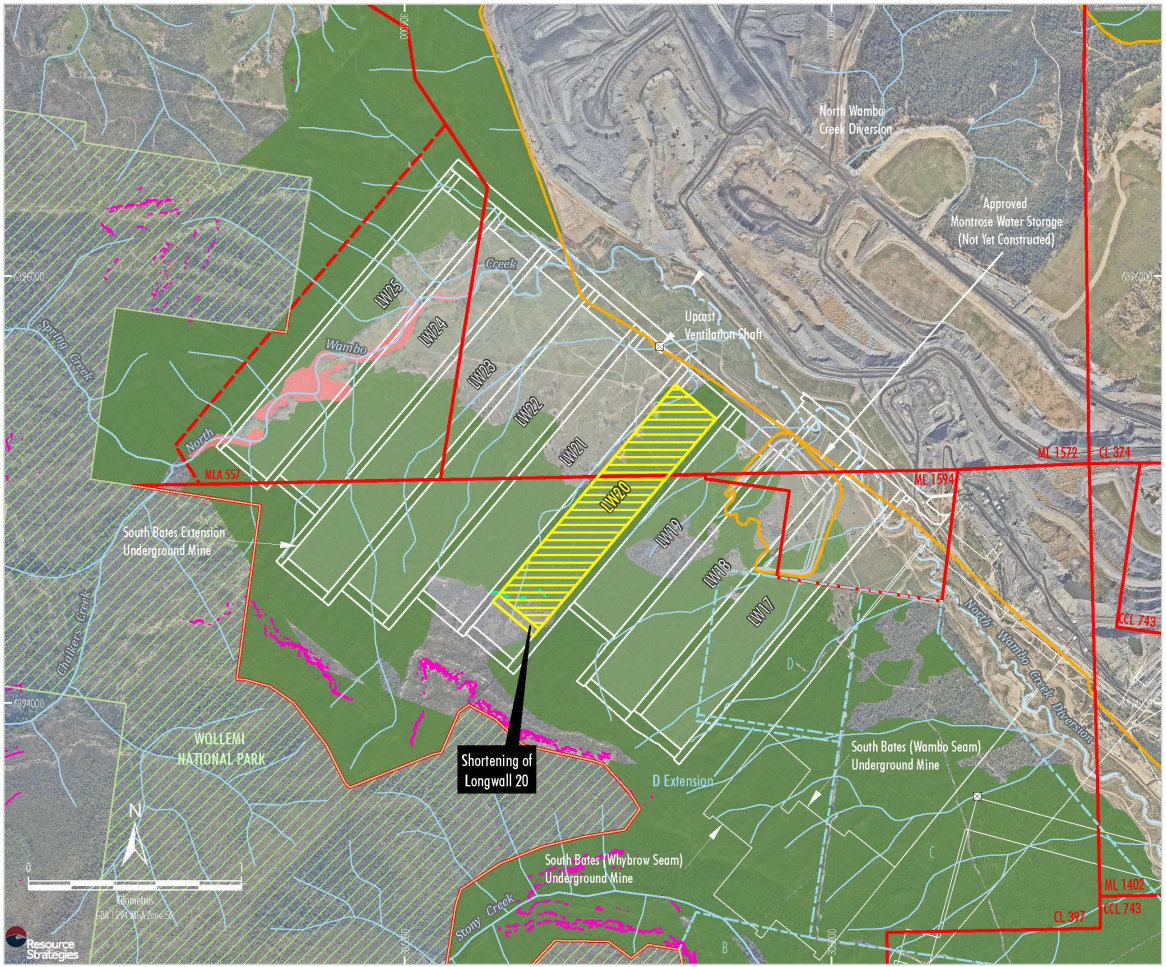
Peter Jaeger
Manager: Environment & Community
WAMBO COAL PTY LTD

Table 1 – Environmental Features in the Vicinity of Longwall 20

Environmental Feature	Full Length Longwall 20	Shortened Longwall 20
Central Hunter Valley Eucalypt Forest and Woodland Community	Directly overlying.	Reduced area directly overlying.
	Direct subsidence impacts predicted.	Reduced area of direct subsidence impacts.
Small and unimportant ephemeral drainage lines	Directly overlying.	Reduced length of drainage lines directly overlying.
	Direct subsidence impacts predicted.	Reduced direct subsidence impacts anticipated.
	No ponding predicted.	No change.
Wollemi National Park	Approximately 286 m to the south-west.	Approximately 469 m to the south-west.
	Outside of 26.5° angle of draw.	No change.
	No material subsidence predicted.	No change.
Wollemi National Park Escarpment	Approximately 196 m to the south-west.	Approximately 384 m to the south-west.
	Outside of 26.5° angle of draw.	No change.
	Negligible subsidence impacts and environmental consequences predicted.	No change.
Low level cliffs	Directly overlying Longwall 20.	No change.
	Direct subsidence impacts predicted from Longwall 20.	No change.
	Indirect subsidence impacts predicted from Longwall 19.	No change.

ENCLOSURE 1

ENVIRONMENTAL FEATURES OVERLYING LONGWALL 20



LEGEND

- Mining and Coal Lease Boundary
- Mining Lease Application Boundary
- National Park Boundary
- Existing/Approved Surface Development Area
- Approved Underground Development
- Ventilation Shaft
- Remnant Woodland Enhancement Program (RWEP) Area

Features with Subsidence Impact Performance Measures

- Wollemi National Park
- Wollemi National Park Escarpment
- Low Level Cliffs
- Central Hunter Valley Eucalypt Forest and Woodland
- Other Threatened Ecological Community [1]

[1] Listed as endangered or critically endangered under the Biodiversity Conservation Act, 2016.

Source: NSW Department of Industry (2017); WCPL (2020); FloraSearch (2017); MSEC (2016)
Orthophoto: WCPL (May 2019)

Peabody

WAMBO COAL MINE

Shortening of Longwall 20

WAM-09-15_SBX_EP_LW17-20_Shortened LW 20_2018 (23/09/2020)

WAMBO COAL PTY LTD

ABN: 13 000 668 057

100 Melbourne Street
South Brisbane Qld 4101

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Australia
Tel + 61 (0) 2 6570 2200
Fax+ 61 (0) 2 6570 2290

26 February 2020

Department of Planning, Industry and Environment
Locked Bag 5022
PARRAMATTA NSW 2124

Attention: Executive Director Energy and Resources

By email: mike.young@planning.nsw.gov.au
Cc: melanie.hollis@planning.nsw.gov.au

Dear Mr Young,

SOUTH BATES EXTENSION UNDERGROUND MINE – VARIATION TO LONGWALL 20

On 15 October 2019, Wambo Coal Pty Limited (WCPL) wrote to the Department of Planning, Infrastructure and Environment (the Department) requesting approval to shorten Longwall 19 at the South Bates Extension Underground Mine due to the identification of a previously unknown fault intercepting Longwall 19's commencing end. The size and orientation of the fault rendered the first 369 metres (m) of Longwall 19 un-mineable.

On 13 November 2019, the Department approved the request to shorten Longwall 19 by 369 m.

WCPL flagged in the correspondence regarding Longwall 19 that it was likely, although not certain, that the fault intercepting Longwall 19 would also effect the commencing end of Longwall 20. WCPL has undertaken additional inseam drilling operations which have confirmed the fault will require the shortening of Longwall 20 by 176.5 m.

WCPL is notifying the Department of the required change to the commencing position of Longwall 20.

Could you please advise if we can now update the Longwalls 17-20 Extraction Plan with the updated figures showing the shortened Longwalls 19 and 20 and replace the version currently available on our website.

Background

The South Bates Extension Underground Mine is a component of the approved Wambo Coal Mine. The South Bates Extension Underground Mine was approved in December 2017 and involves extraction of coal by longwall mining methods from the Whybrow Seam. The approved South Bates Extension Underground Mine comprises Longwalls 17 to 25.

WCPL lodged an Extraction Plan for Longwalls 17 to 20 at the South Bates Extension Underground Mine with the Department of Planning and Environment (now Department of Planning, Industry and Environment) (herein referred to as the Department) in April 2018 for review and approval.

Subsequent to the submission of the Longwalls 17-20 Extraction Plan:

- WCPL encountered geological structures that required changes to the main headings and the finishing ends of Longwalls 18, 19 and 20.
- Accordingly, on 4 September 2018, WCPL requested that the Department approve the Extraction Plan for extraction of Longwall 17 only.
- On 7 September 2018, the Department approved the extraction of Longwall 17 only, on the basis that WCPL would prepare an amended Extraction Plan for Longwalls 18, 19 and 20.
- On 1 March 2019, WCPL submitted an amended Extraction Plan for Longwalls 17-20.
- On 4 June 2019, the Department approved the amended Longwalls 17-20 Extraction Plan.
- On 11 October 2019, WCPL submitted a request for approval to shorten the commencing end of Longwall 19.
- On 13 November 2019, the Department approved the request to shorten the commencing end of Longwall 19.

Consistent with the correspondence regarding Longwall 19, WCPL notes that the Modification 17 Development Consent (applicable to the Longwalls 17-20 Extraction Plan) states that:

Note: With the approval of the Secretary, longwall panels may be shortened or narrowed, providing that the proposed variations do not result in increased subsidence impacts or environmental consequences.

Shortening of Longwall 20

Since the identification of a previously unknown fault requiring the shortening of Longwall 19, WCPL has continued to conduct inseam drilling operations. Exploration drilling from other locations has proven the fault to be a normal fault with a displacement of 8 m coinciding with the commencing end of Longwall 20. The size and orientation of this fault makes it un-mineable with current longwall mining methods and equipment.

As a result of the identified fault, the commencing (south-western) end of Longwall 20 is required to be shortened by 176.5 m (Enclosure 1).

Environmental Features in the Vicinity of Longwall 20

The depth of cover in the vicinity of the commencing end of Longwall 20 is between 290 m and 310 m. Environmental features directly overlying or in the vicinity of the

commencing (south-western) end of Longwall 20 are summarised in Table 1 and shown in Enclosure 1.

Shortening Longwall 20 will not increase previously assessed impacts to any of these features.

Please do not hesitate to contact me on (02) 6570 2206 if you have any queries in regard to the above or if you require additional information.

Yours faithfully,

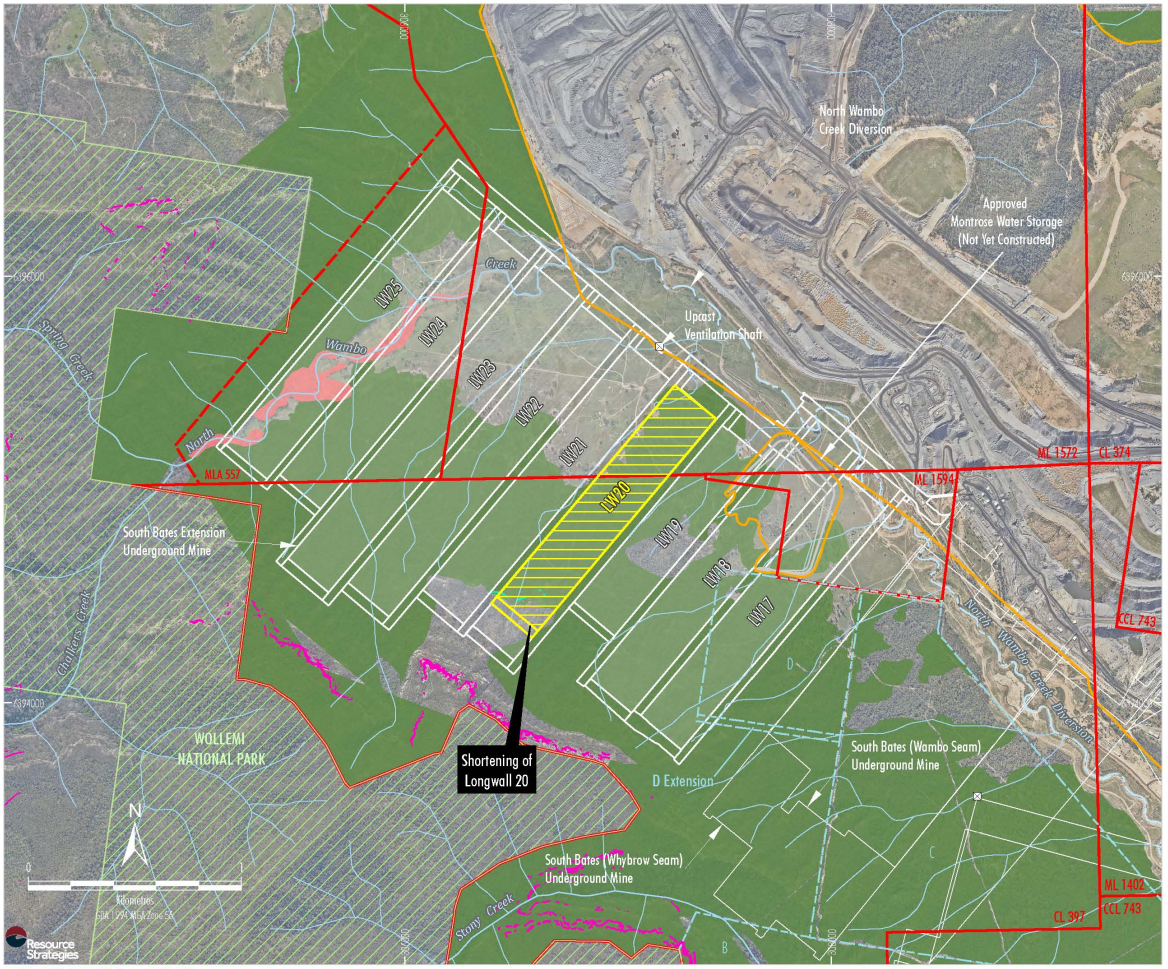
Peter Jaeger
Manager: Environment & Community
WAMBO COAL PTY LTD

Table 1 – Environmental Features in the Vicinity of Longwall 20

Environmental Feature	Full Length Longwall 20	Shortened Longwall 20
Central Hunter Valley Eucalypt Forest and Woodland Community	Directly overlying.	Reduced area directly overlying.
	Direct subsidence impacts predicted.	Reduced area of direct subsidence impacts.
Small and unimportant ephemeral drainage lines	Directly overlying.	Reduced length of drainage lines directly overlying.
	Direct subsidence impacts predicted.	Reduced direct subsidence impacts anticipated.
	No ponding predicted.	No change.
Wollemi National Park	Approximately 286 m to the south-west.	Approximately 458 m to the south-west.
	Outside of 26.5° angle of draw.	No change.
	No material subsidence predicted.	No change.
Wollemi National Park Escarpment	Approximately 196 m to the south-west.	Approximately 373 m to the south-west.
	Outside of 26.5° angle of draw.	No change.
	Negligible subsidence impacts and environmental consequences predicted.	No change.
Low level cliffs	Directly overlying Longwall 20.	No change.
	Direct subsidence impacts predicted from Longwall 20.	No change.
	Indirect subsidence impacts predicted from Longwall 19.	No change.

ENCLOSURE 1

ENVIRONMENTAL FEATURES OVERLYING LONGWALL 20



LEGEND

- Mining and Coal Lease Boundary
- Mining Lease Application Boundary
- National Park Boundary
- Existing/Approved Surface Development Area
- Approved Underground Development
- Ventilation Shaft
- Remnant Woodland Enhancement Program (RWEP) Area

Features with Subsidence Impact Performance Measures

- Wollemi National Park
- Wollemi National Park Escarpment
- Low Level Cliffs
- Central Hunter Valley Eucalypt Forest and Woodland
- Other Threatened Ecological Community [1]

[1] Listed as endangered or critically endangered under the Biodiversity Conservation Act, 2016.

Source: NSW Department of Industry (2017); WCPL (2019); FloraSearch (2017); MSEC (2016)
Orthophoto: WCPL (May 2019)

Peabody

WAMBO COAL MINE

Shortening of Longwall 20

WAM-09-15_SBX_EP_LW17-20_Shortened LW 20_201A

Planning, Industry & Environment

Planning and Assessment
Energy and Resources
Contact: Melanie Hollis
Phone: 8217 2043
Email: Melanie.hollis@planning.nsw.gov.au

Peter Jaeger
Manager Environmental & Community
Wambo Coal Pty Ltd
PMB 1
SINGLETON NSW 2330

Dear Mr Jaeger

South Bates Extension Underground Mine
Variation to Longwall 19

I refer to your correspondence of 16 October 2019 seeking the Secretary's approval to reduce the length of Longwall 19 by approximately 369 metres compared to the longwall layout in Extraction Plan (EP), approved 4 June 2019, and without the need to further amend this EP.

The Department understands that the reduction is being sought due to exploration drilling identifying a previously unknown fault intercepting the commencing end of Longwall 19.

The Department notes that the reduction in longwall length would likely result in reduced or negligible changes to subsidence impacts and environmental consequences on the surface and therefore would not significantly change predicted impacts to natural and built features as described in the Environmental Assessment for Modification 17.

The Department considers that the subsidence impacts and environmental consequences would be similar or less than compared to the approved layout. The Department also considers the management and mitigation measures described in the approved EP remain appropriate.

Considering the above, the Secretary agrees that the proposed modified layout would still comply with condition A2 of Schedule 2 of the Wambo Coal Mine development consent (DA 305-7-2003). Please update the relevant figures of the revised South Bates Extension Longwalls 17 to 20 EP to reflect this updated layout.

If you wish to discuss this matter further, please contact Melanie Hollis at the details listed above.

Yours sincerely

13/11/19

Steve O'Donoghue
Director
Resource Assessments
as the Secretary's nominee

WAMBO COAL PTY LTD

ABN: 13 000 668 057

100 Melbourne Street
South Brisbane Qld 4101

PMB 1
Singleton NSW 2330
Australia
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Fax+ 61 (0) 2 6570 2290

15 October 2019

Department of Planning, Industry and Environment
Level 22, 320 Pitt St
SYDNEY NSW 2000

Attention: Executive Director Energy and Resources

By email: mike.young@planning.nsw.gov.au

Dear Mr Young

SOUTH BATES EXTENSION UNDERGROUND MINE – SHORTENING OF LONGWALL 19

Wambo Coal Pty Limited (WCPL) has recently identified a previously unknown fault intercepting the commencing end of Longwall 19 of the South Bates Extension Underground Mine. The size and orientation of the fault renders the first 369 metres (m) of Longwall 19 un-mineable. Longwall 18 is approximately 50% complete and the commencement of Longwall 19 is scheduled for 12 December 2019.

WCPL is notifying the Department of Planning, Industry and Environment of the required change to the commencing position of Longwall 19. It is likely, although not yet certain, that the fault intercepting Longwall 19 will also affect the commencing end of Longwall 20. WCPL will notify the Department if a subsequent shortening of Longwall 20 is also required.

Background

The South Bates Extension Underground Mine is a component of the approved Wambo Coal Mine. The South Bates Extension Underground Mine was approved in December 2017 and involves extraction of coal by longwall mining methods from the Whybrow Seam. The approved South Bates Extension Underground Mine comprises Longwalls 17 to 25.

WCPL lodged an Extraction Plan for Longwalls 17 to 20 at the South Bates Extension Underground Mine with the Department of Planning and Environment (now Department of Planning, Industry and Environment) (herein referred to as the Department) in April 2018 for review and approval.

Subsequent to the submission of the Longwalls 17-20 Extraction Plan:

- WCPL encountered geological structures that required changes to the main headings and the finishing ends of Longwalls 18, 19 and 20.
- Accordingly, on 4 September 2018, WCPL requested that the Department approve the Extraction Plan for extraction of Longwall 17 only.
- On 7 September 2018, the Department approved the extraction of Longwall 17 only, on the basis that WCPL would prepare an amended Extraction Plan for Longwalls 18, 19 and 20.
- On 1 March 2019, WCPL submitted an amended Extraction Plan for Longwalls 17-20.
- On 4 June 2019, the Department approved the amended Longwalls 17-20 Extraction Plan.

WCPL notes that the Modification 17 Development Consent (applicable to the Longwalls 17-20 Extraction Plan) states that:

> *Note: With the approval of the Secretary, longwall panels may be shortened or narrowed, providing that the proposed variations do not result in increased subsidence impacts or environmental consequences.*

Shortening of Longwall 19

WCPL is currently conducting inseam drilling operations for the purpose of gas drainage and exploration. Whilst drilling from maingate (MG) 17 16 cut-through (ct) an exploration hole was drilled into the Longwall 19 mining area and a previously unknown fault was discovered (Enclosure 1).

Subsequent exploration drilling from other locations has proven the fault to be a normal fault with a displacement of 8 m. The size and orientation of this fault makes it un-mineable with current longwall mining methods and equipment.

As a result of the identified fault, the commencing (south-western) end of Longwall 19 is required to be shortened by 369 m (Enclosure 2).

Environmental Features in the Vicinity of Longwall 19

The depth of cover in the vicinity of the commencing end of Longwall 19 is between 280 m and 300 m. Environmental features directly overlying or in the vicinity of the commencing (south-western) end of Longwall 19 are summarised in Table 1 and shown in Enclosure 3. Mine Subsidence Engineering Consultants (MSEC) have prepared revised subsidence contours for the longwalls as shown in Enclosure 4.

Table 1 – Environmental Features in the Vicinity of Longwall 19

Environmental Feature	Full Length Longwall 19	Shortened Longwall 19
Central Hunter Valley Eucalypt Forest and Woodland Community	Directly overlying.	Reduced area directly overlying.
	Direct subsidence impacts predicted.	Reduced area of direct subsidence impacts.
Small and unimportant ephemeral drainage lines	Directly overlying.	Reduced length of drainage lines directly overlying.
	Direct subsidence impacts predicted.	Reduced direct subsidence impacts anticipated.
	No ponding predicted.	No change.
Wollemi National Park	Approximately 286 m to the south-west.	Approximately 658 m to the south-west.
	Outside of 26.5° angle of draw.	No change.
	No material subsidence predicted.	No change.
Wollemi National Park Escarpment	Approximately 225 m to the south-west.	Approximately 594 m to the south-west.
	Outside of 26.5° angle of draw.	No change.
	Negligible subsidence impacts and environmental consequences predicted.	No change.
Low level cliffs	Approximately 118 m to the north.	Approximately 135 m to the north-west.
	Directly overlying Longwall 20.	No change.
	Direct subsidence impacts predicted from Longwall 20.	No change.
	Indirect subsidence impacts predicted from Longwall 19.	No change.

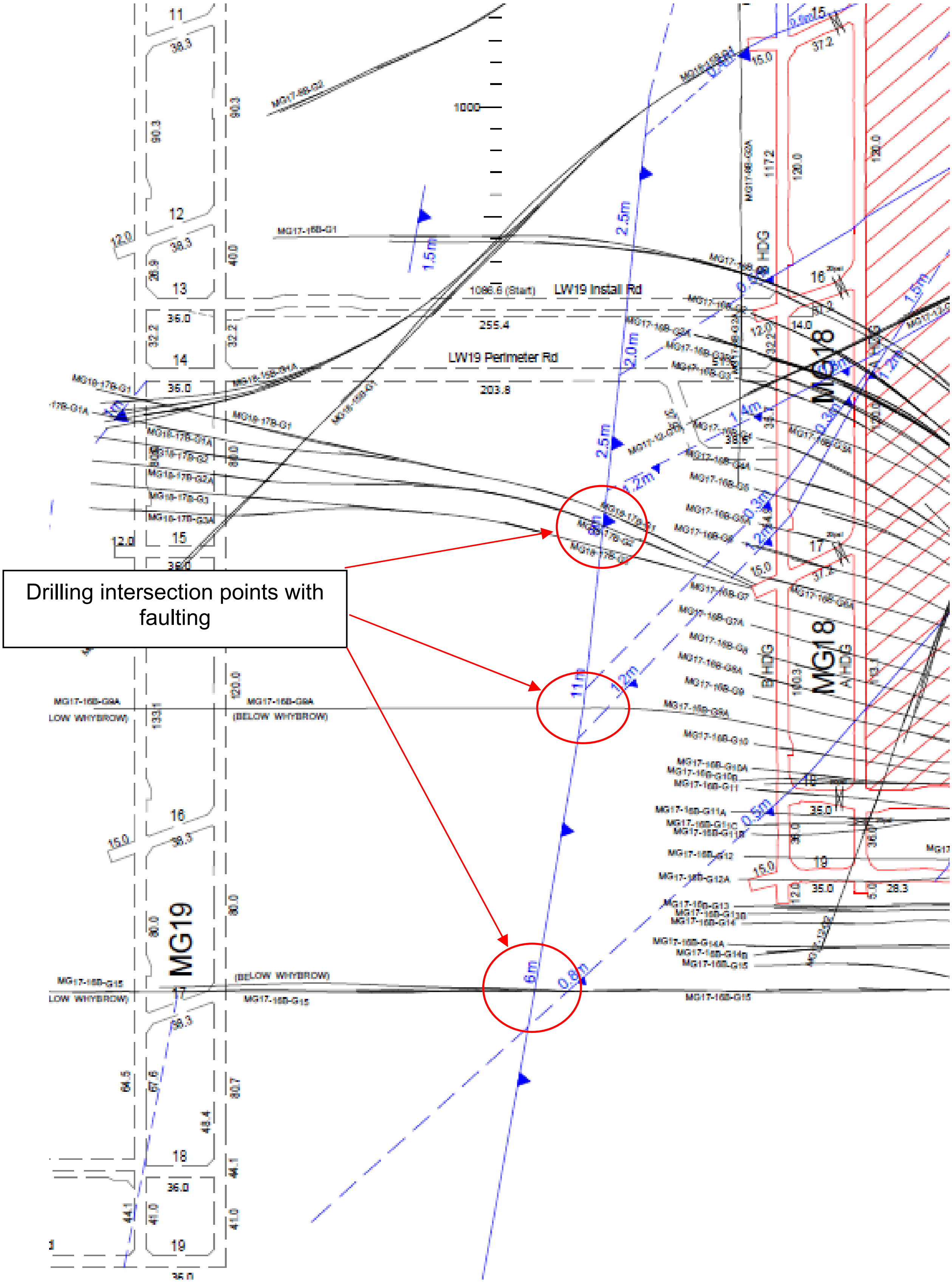
Please do not hesitate to contact me on (02) 6570 2206 if you have any queries in regard to the above or if you require additional information.

Yours faithfully,

Peter Jaeger
Manager: Environment & Community
WAMBO COAL PTY LTD

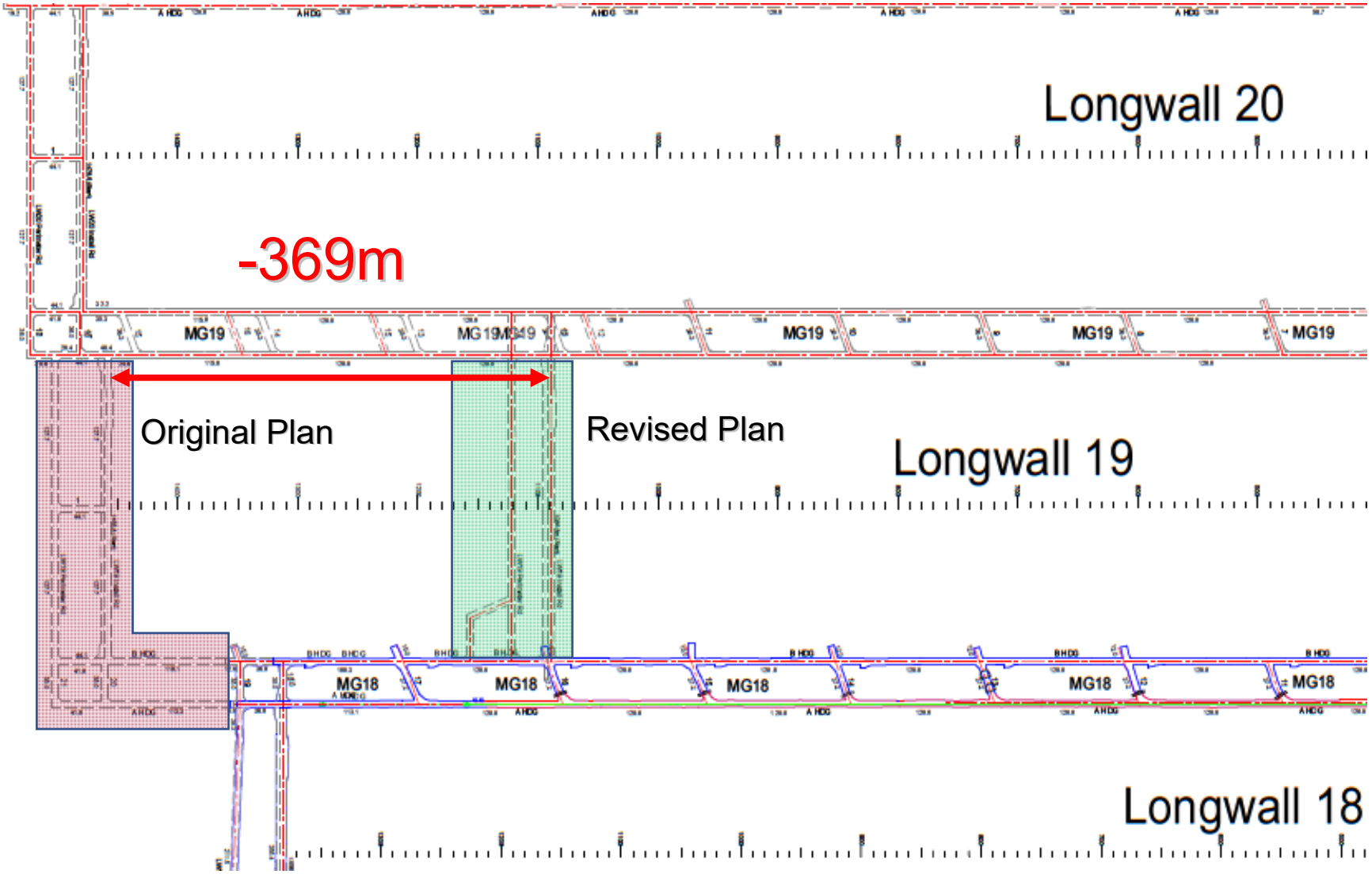
ENCLOSURE 1

FAULT IDENTIFIED IN LONGWALL 19 VIA INSEAM DRILLING OPERATIONS


Drilling intersection points with faulting
LW19 Install Rd
LW19 Perimeter Rd
1000
1086.6 (Start)
255.4
203.8
MG19
MG18
(BELOW WHYBROW)
MG17-16B-G9A
MG17-16B-G15

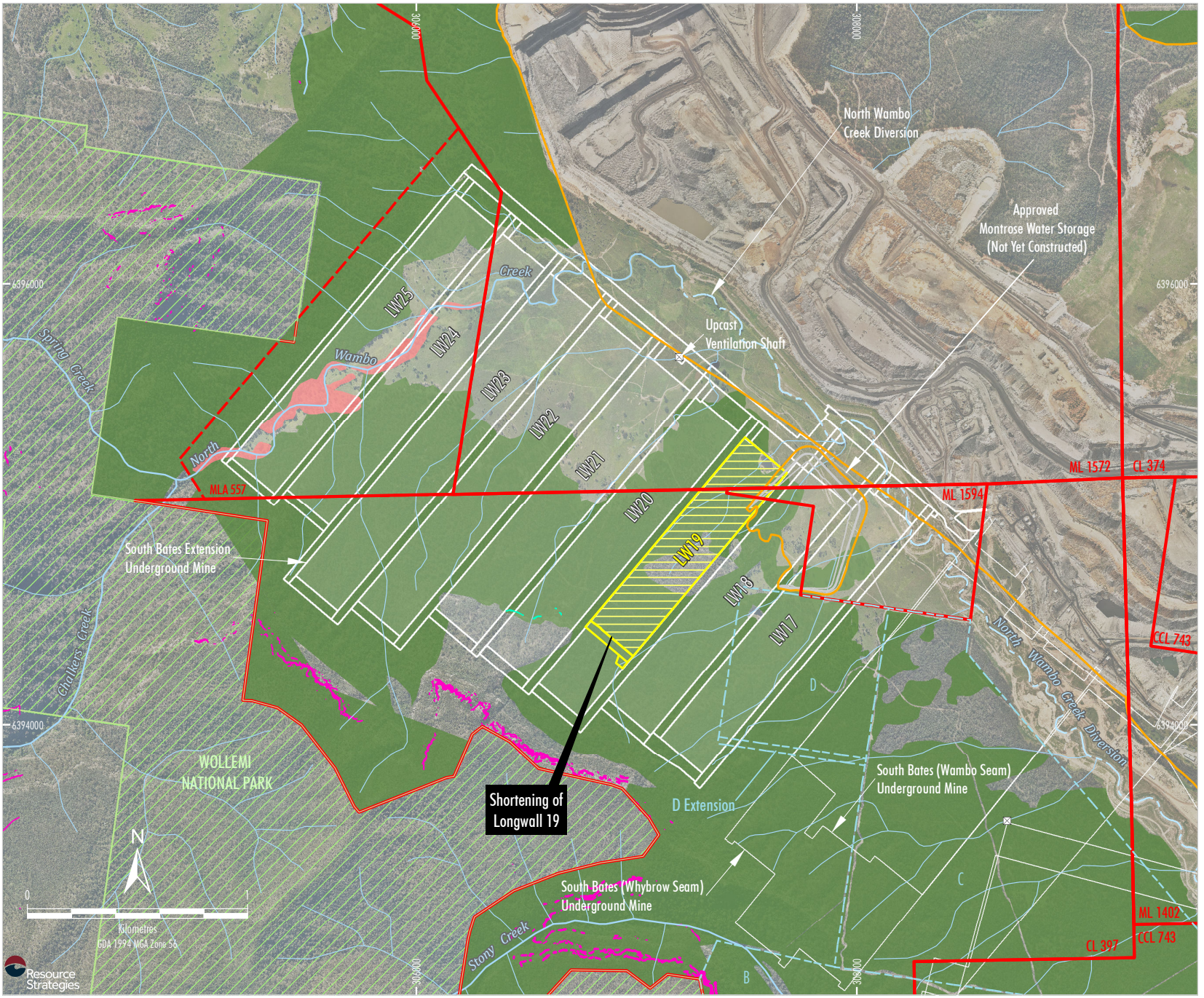
ENCLOSURE 2

PROPOSED CHANGES TO LONGWALL 19


Longwall 20
-369m
MG19
MG19
MG19
MG19
MG19
Original Plan
Revised Plan
Longwall 19
MG18
MG18
MG18
MG18
MG18
Longwall 18

ENCLOSURE 3

ENVIRONMENTAL FEATURES OVERLYING LONGWALL 19



WAM-09-15_SBX_EP_LW17-20_Wkg Dwg_LW 19 _Revision_201A

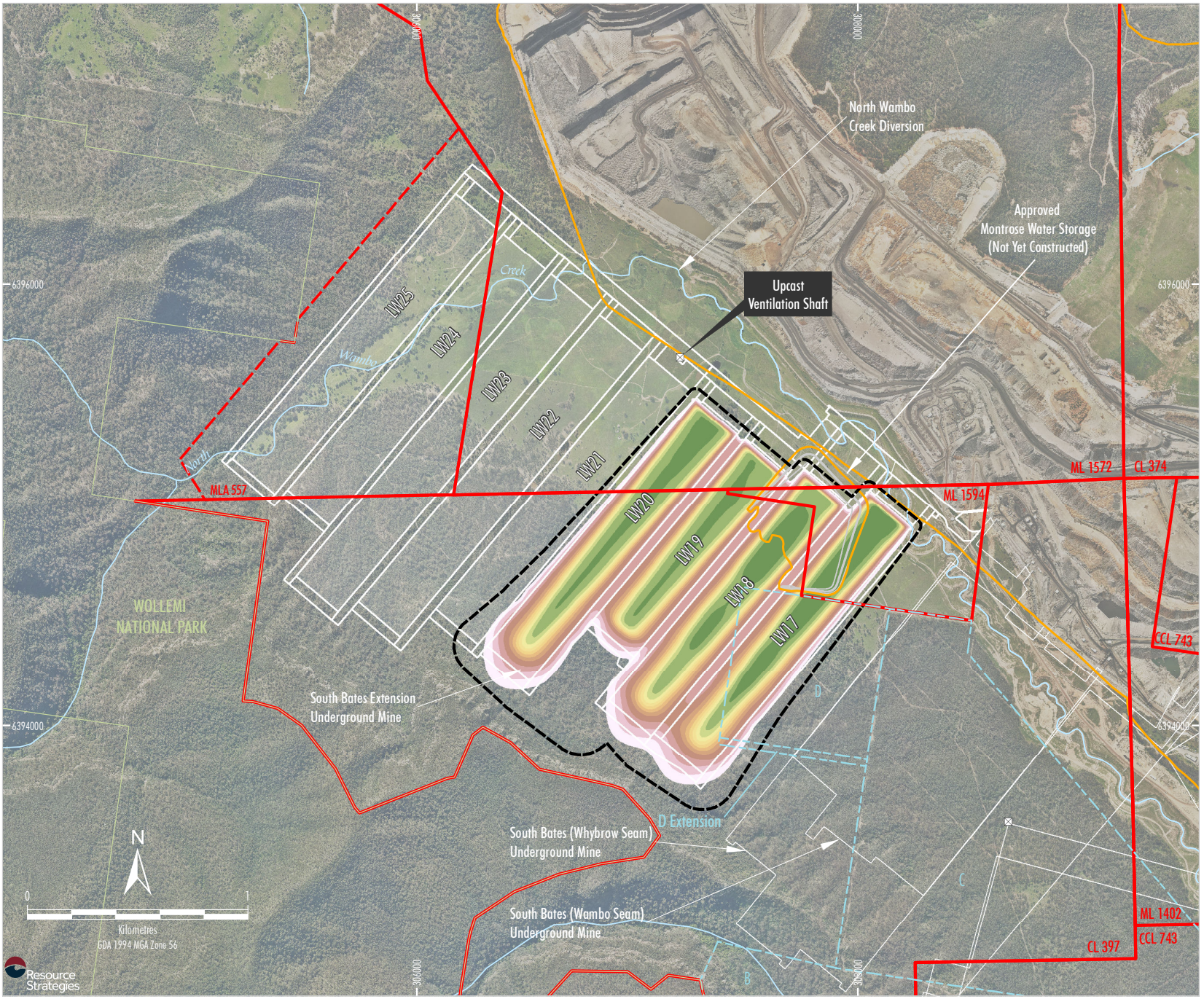
Peabody

WAMBO COAL MINE

Shortening of Longwall 19

ENCLOSURE 4

PREDICTED SUBSIDENCE FROM THE SOUTH BATES EXTENSION UNDERGROUND MINE



LEGEND

- Mining and Coal Lease Boundary
- Mining Lease Application Boundary
- National Park Boundary
- Existing/Approved Surface Development Area
- Approved Underground Development
- Ventilation Shaft
- Remnant Woodland Enhancement Program (RWEP) Area
- Extraction Plan Application Area

Subsidence Contour Colour Scale (mm)

- 20
- 50
- 100
- 200
- 400
- 600
- 800
- 1000
- 1200
- 1400
- 1600
- 1800

Source: NSW Department of Industry (2017); WCPL (2019); MSEC (2019)
Orthophoto: WCPL (May 2017)

Peabody

WAMBO COAL MINE

Predicted Subsidence from the South Bates Extension Underground Mine

Figure 7

WAM-09-15_SBX_EP_LW17-20_Wkg Dwg_LW 19_Revision_202B

Our ref: DOC20/240325-4
Your ref: DA/305-7-2003

Nicole Dobbins

Senior Environmental Advisor
Wambo Coal Mine
Peabody Australia
ndobbins@peabodyenergy.com

Dear Ms Dobbins

Wambo Coal Mine Heritage Management Plan

I refer to your e-mail dated 23 March 2020 in which you invited the Biodiversity and Conservation Division (BCD) of the Department of Planning, Industry and Environment to review the new Heritage Management Plan for the Wambo Mine. BCD understands that the plan has been revised following the update to Development Consent for the South Bates Extension Underground Mine (DA 305-7-2003), and that the new plan has been prepared as part of the Extraction Plan for Longwalls 21 to 24.

BCD is unable to provide comments on the Heritage Management Plan at this time. This does not represent BCD support for the proposal. Aboriginal cultural heritage matters may still need to be considered by the consent authority.

If you have any further questions in relation to this matter, please contact Robert Gibson, Regional Biodiversity Conservation Officer, on 4927 3154 or via email at rog.hcc@environment.nsw.gov.au

Yours sincerely

03 May 2020

STEVEN COX
Senior Team Leader Planning
Hunter Central Coast Branch
Biodiversity and Conservation Division

WAMBO COAL PTY LTD

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South Brisbane Qld 4101

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Singleton NSW 2330
Australia
Tel + 61 (0) 2 6570 2200
Fax + 61 (0) 2 6570 2290

23 March 2020

Janet Fenwick
PO Box 62
SINGLETON NSW 2330

Dear Janet

RE: SOUTH BATES EXTENSION UNDERGROUND MINE LONGWALLS 21 TO 24 HERITAGE MANAGEMENT PLAN

The South Bates Extension Underground Mine is a component of the approved Wambo Coal Mine. The South Bates Extension Underground Mine was approved in December 2017 and involves extraction of coal by longwall mining methods from the Whybrow Seam. The approved South Bates Extension Underground Mine comprises Longwalls 17 to 25.

Wambo Coal Pty Limited (WCPL) is preparing an Extraction Plan for Longwalls 21 to 24 at the South Bates Extension Underground Mine. The Extraction Plan has been prepared in accordance with Condition B7(f), Schedule 2 of Development Consent (DA 305-7-2003) granted for the Wambo Development Project.

Following approval of the United Wambo Joint Venture Project (Modification 16) in August 2019, the Department of Planning, Industry and Environment (DPIE) updated the entirety of the Development Consent (DA 305-7-2003). To avoid administrative complications, WCPL has prepared a new iteration of the Heritage Management Plan (Version 0) (HMP) and undertaken a full review and update. This iteration of the HMP builds upon the content in, and consultation undertaken for, the previous iteration of the HMP.

WCPL is required to prepare the HMP in consultation with the Biodiversity and Conservation Division and relevant stakeholders for Aboriginal and non-Aboriginal heritage. The enclosed USB includes the following documents:

- a complete copy of the HMP (including all appendices);
- a tracked change version of the HMP, identifying the updates made in this iteration; and
- a tracked change version of the HMP for Remnant Woodland Enhancement Area A, identifying the updates made in this version.

WCPL would appreciate any comments you would like to make on the enclosed Heritage Management Plan.

Please provide any feedback to WCPL via the following contact details:

Nicole Dobbins
Senior Environmental Advisor
Wambo Coal Pty Ltd
PMB1, SINGLETON NSW 2303
Phone: (02) 6570 2209
Email: ndobbins@peabodyenergy.com

Please submit any comments you may have on the Heritage Management Plan (either verbally or in writing) by **5.00pm Monday 13th April 2020.**

Yours faithfully,

Peter Jaeger
Manager: Environment and Community
WAMBO COAL PTY LTD

Subject: FW: Wambo Coal Mine Heritage Management Plan

From: Dobbins, Nicole
Sent: Monday, March 23, 2020 2:05 PM
To: 'rog.hcc@environment.nsw.gov.au' <rog.hcc@environment.nsw.gov.au>; 'heritage@heritage.nsw.gov.au' <heritage@heritage.nsw.gov.au>
Subject: Wambo Coal Mine Heritage Management Plan

Good afternoon,

Wambo Coal Pty Limited (WCPL) is preparing an Extraction Plan for Longwalls 21 to 24 at the South Bates Extension Underground Mine. The Extraction Plan has been prepared in accordance with Condition B7(f), Schedule 2 of Development Consent (DA 305-7-2003) granted for the Wambo Development Project.

Following approval of the United Wambo Joint Venture Project (Modification 16) in August 2019, the Department of Planning, Industry and Environment (DPIE) updated the entirety of the Development Consent (DA 305-7-2003). To avoid administrative complications, WCPL has prepared a new iteration of the Heritage Management Plan (Version 0) (HMP) and undertaken a full review and update. This iteration of the HMP builds upon the content in, and consultation undertaken for, the previous iteration of the HMP.

WCPL is required to prepare the HMP in consultation with the Biodiversity and Conservation Division and relevant stakeholders for Aboriginal and non-Aboriginal heritage. The link below includes the following documents:

- a complete copy of the HMP (including all appendices);
- a tracked change version of the HMP, identifying the updates made in this iteration; and
- a tracked change version of the HMP for Remnant Woodland Enhancement Area A, identifying the updates made in this version.

Sharefile link to download: https://resourcestrategies.sharefile.com/d-s63b493b1d4f43ce9

WCPL would appreciate any comments you would like to make on the Heritage Management Plan.

Kind regards,

Nicole Dobbins
Senior Environmental Advisor
Contract
Peabody Australia
PMB 1, Singleton NSW 2330
Office: +61 (02) 6570 2209
ndobbins@peabodyenergy.com

Subject: FW: Wambo Coal Mine Revised Biodiversity Management Plan [SEC=OFFICIAL]

From: Vaughn Cox <Vaughn.Cox@awe.gov.au>
Sent: Thursday, March 26, 2020 2:27 PM
To: Dobbins, Nicole <NDobbins@peabodyenergy.com>
Subject: RE: Wambo Coal Mine Revised Biodiversity Management Plan [SEC=OFFICIAL]

Hi Nicole,

Thanks for taking my call. As discussed, if the revised BMP is a revision of a management plan approved under one or more of the project's EPBC Act conditions of approval the revised plan needs to be submitted to the Department for review and approval by the Minister or delegate.

Given the plan is being reviewed/approved by NSW then its probably best you first satisfy NSW's requirements, then forward the revised plan and NSW review comments to the Dept for review/approval. I'll leave the juggling act to you, but my experience is NSW tends to have more prescriptive conditions of consent, which are best worked through first.

Thanks again. Any questions please call me on 0422 369 431.

Vaughn Cox

From: Dobbins, Nicole <NDobbins@peabodyenergy.com>
Sent: Thursday, 26 March 2020 7:59 AM
To: Vaughn Cox <Vaughn.Cox@awe.gov.au>
Subject: RE: Wambo Coal Mine Revised Biodiversity Management Plan [SEC=OFFICIAL]

Hi Vaughn,

Wambo Mine has three EPBC Act approvals EPBC 2003/1138, EPBC 2016/7636 and EPBC 2016/7816. As required by Condition 5 of EPBC 2003/1138, the Wambo Coal Biodiversity MP was previously approved by the Commonwealth 16 November 2016.

Let me know if you need anything further.

Thanks
Nicole

From: Vaughn Cox <Vaughn.Cox@awe.gov.au>
Sent: Wednesday, March 25, 2020 9:05 AM
To: Dobbins, Nicole <NDobbins@peabodyenergy.com>
Subject: FW: Wambo Coal Mine Revised Biodiversity Management Plan [SEC=OFFICIAL]

Hi Nicole,

Thanks for your email. Can you please advise whether this project has an EPBC Act approval? Our interest is that the revised BMP may need to be approved by the Minister or delegate.

If the above is not the case then I believe the department will not take up the opportunity to comment on the revised plan.

Cheers

Vaughn Cox
Post Approvals Section
0422 369 431

From: Dobbins, Nicole <NDobbins@peabodyenergy.com>
Sent: Friday, 20 March 2020 4:21 PM
To: Post Approval <PostApproval@environment.gov.au>
Subject: Wambo Coal Mine Revised Biodiversity Management Plan

Good afternoon,

The South Bates Extension Underground Mine is a component of the approved Wambo Coal Mine. The South Bates Extension Underground Mine was approved in December 2017 and involves extraction of coal by longwall mining methods from the Whybrow Seam. The approved South Bates Extension Underground Mine comprises Longwalls 17 to 25.

Wambo Coal Pty Limited (WCPL) is preparing an Extraction Plan for Longwalls 21 to 24 at the South Bates Extension Underground Mine. The Extraction Plan has been prepared in accordance with Condition B7(f), Schedule 2 of Development Consent (DA 305-7-2003) granted for the Wambo Development Project.

Following approval of the United Wambo Joint Venture Project (Modification 16) in August 2019, the Department of Planning, Industry and Environment updated the entirety of the Development Consent (DA 305-7-2003). To avoid administrative complications, WCPL has prepared a new iteration of the Biodiversity Management Plan (Version 0) (BioMP) and undertaken a full review and update. This iteration of the BioMP builds upon the content in, and consultation undertaken for, the previous iteration of the BioMP.

In accordance with Conditions B75 and B7(f), Schedule 2 of DA305-7-2003, WCPL is required to prepare the BioMP in consultation with relevant agencies. Please see below a sharefile link to download the following documents:

- a complete copy of the BioMP (including all appendices); and
- a tracked change version of the BioMP, identifying the updates made in this iteration.

Link to download the revised Biodiversity Management Plan: https://resourcestrategies.sharefile.com/d-s731b5f4e98b453ba

Please provide any comments on the enclosed documentation to the undersigned at your earliest convenience.

Kind regards,

Nicole Dobbins
Senior Environmental Advisor
Contract
Peabody Australia
PMB 1, Singleton NSW 2330
Office: +61 (02) 6570 2209
ndobbins@peabodyenergy.com

Our ref: DOC20/238396-3
Your ref: DA 305-7-2003

Nicole Dobbins

Senior Environmental Advisor
Wambo Coal Mine
Peabody Australia
ndobbins@peabodyenergy.com

Dear Ms Dobbins

Wambo Coal Mine Revised Biodiversity Management Plan

I refer to your e-mail dated 20 March 2020 in which Biodiversity and Conservation Division (BCD) of the Department of Planning, Industry and Environment was invited to review the revised Biodiversity Management Plan for the South Bates Extension Underground Mine prepared by Wambo Coal Pty Limited (dated March 2020). The Biodiversity Management Plan forms part of the Extraction Plan for the South Bates Extension Underground Mine, Longwalls 21 to 24, but covers all biodiversity issues for the Wambo Mine site.

BCD has reviewed the revised Biodiversity Management Plan and BCD's recommendations are provided in **Attachment A**. Detailed comments are provided in **Attachment B**. If you require any further information regarding this matter, please contact Robert Gibson, Regional Biodiversity Conservation Officer, on 4927 3154 or via email at rog.hcc@environment.nsw.gov.au

Yours sincerely

03 May 2020

STEVEN COX
Senior Team Leader Planning
Hunter Central Coast Branch
Biodiversity and Conservation Division

Enclosure: Attachments A and B

Attachment A

BCD's recommendations

Wambo Coal Mine Revised Biodiversity Management Plan

1. BCD recommends that changes are made to the colour ramp in the vegetation communities map, Figure 3, to make it easier for the reader to identify each vegetation community shown.

2. BCD recommends that the same colour scheme from Figure 3 is applied to Figure 9 to allow ready comparison between both figures.

3. BCD recommends that the revised Biodiversity Management Plan includes a figure showing the location of threatened species recorded on the Wambo Mine land.

4. BCD recommends that at least two BioMetric plots are established to take a representative sample of areas of riparian rehabilitation, and that floristic data is collected in areas of pasture rehabilitation in order to better understand Landscape Function Analysis results, and to gauge whether rehabilitation goals are likely to be met.

5. BCD recommends that Table 9 and Table 13 include the minimum and maximum values measured in each zone as well as the average value.

6. BCD recommends that all BioMetric field data collected from the rehabilitation areas is provided in the Annual Review.

BCD's detailed comments

Wambo Coal Mine Revised Biodiversity Management Plan

1. The colour ramp for the vegetation map includes colours that are difficult to distinguish

Figure 3 'Floristic Communities' of the Biodiversity Management Plant (BMP) has a colour ramp with some colours that are difficult to distinguish on the map. This is so for the two yellow shades in the current map (Coastal Myall Shrubland and Weeping Myall Woodland), the two pale blue shades (Narrow-leaved Ironbark – Grey Box Woodland and Native Quince – Rust Fig Dry Rainforest) and the two pink tones (Forest Red Gum – Rough-barked Apple – River Sheoak Forest (Disturbed) and Spotted Gum – Narrow-leaved Ironbark – Grey Box Woodland).

Recommendation 1

BCD recommends that changes are made to the colour ramp in the vegetation communities map, Figure 3, to make it easier for the reader to identify each vegetation community shown.

2. Inconsistent colours for vegetation communities in Figure 5 are confusing

Figure 9 'RWEA A – E Flora Communities' of the BMP uses different colours to represent the same vegetation communities within the six Remnant Woodland Enhancement Areas (RWEAs).

Recommendation 2

BCD recommends that the same colour scheme from Figure 3 is applied to Figure 9 to allow ready comparison between both figures.

3. A map of threatened species recorded on the Wambo Mine Land will flag areas for different management

Sections 3.6.1 and 3.6.2 of the BMP list threatened flora species and fauna species, that are known or are considered likely to occur on the Wambo Mine lands. However, the report does not include a figure showing the locations of the threatened species. Such a figure would help identify areas of higher biodiversity values that may require different management, as per the *Wambo Coal Threatened Species Management Protocol* given in Appendix L of the BMP.

Recommendation 3

BCD recommends that the revised Biodiversity Management Plan includes a figure showing the location of threatened species recorded on the Wambo Mine land.

4. Species composition and plant structure data add value to Landscape Function Analysis results

Section 3.6.5 of the BMP discusses how Landscape Function Analysis (LFA) is used to measure and monitor rehabilitation success. LFA is an index of surface stability, water infiltration and nutrient cycling but it does not collect or present data on the plant species on a site. Therefore, a positive trend in LFA values may be due to an increase in the cover and abundance of an invasive exotic grass species, or the persistence of annual species, rather than the establishment of perennial species, which may not meet overall rehabilitation objectives. Figure 12 (Floristic and Habitat Monitoring Sites) and Figure 13 (LFA Monitoring

Locations) shows that floristic data is collected near LFA sites near areas of woodland regeneration.

Recommendation 4

BCD recommends that at least two BioMetric plots are established to take a representative sample of areas of riparian rehabilitation, and that floristic data is collected in areas of pasture rehabilitation in order to better understand Landscape Function Analysis results, and to gauge whether rehabilitation goals are likely to be met.

5. Completion Criteria needs to be applied to individual sites rather than an average of sites

Section 5 of the BMP discusses Completion Criteria for rehabilitation areas using averaged values of sites in each plant community type or other management zone. However, using average values can mask problem areas. Including the minimum and maximum values measured in each zone as well as the average value in Table 9 and Table 13 would identify rehabilitation zones that are all performing well, and any zones where there may be some areas that require additional management.

Recommendation 5

BCD recommends that Table 9 and Table 13 include the minimum and maximum values measured in each zone as well as the average value.

6. Background data behind monitoring provides more meaning to monitoring results

Chapter 7 of the BMP describes the biodiversity monitoring program for rehabilitation areas of the Wambo Mine. It includes the collection of data using the BioMetric method. The BioMetric method collects data for ten attributes. The presentation of the background data for the BioMetric method, such as the flora species found and their cover and abundance, enables the BioMetric results to be better understood. This in turn helps identify if rehabilitation issues may be present, and whether rehabilitation outcomes are likely to be met.

Recommendation 6

BCD recommends that all BioMetric field data collected from the rehabilitation areas is provided in the Annual Review.

Subject: FW: Wambo Coal Mine Revised Biodiversity Management Plan

ATTN – Mr STEVEN COX
Senior Team Leader Planning

Dear Mr Cox,

The South Bates Extension Underground Mine is a component of the approved Wambo Coal Mine. The South Bates Extension Underground Mine was approved in December 2017 and involves extraction of coal by longwall mining methods from the Whybrow Seam. The approved South Bates Extension Underground Mine comprises Longwalls 17 to 25.

Wambo Coal Pty Limited (WCPL) is preparing an Extraction Plan for Longwalls 21 to 24 at the South Bates Extension Underground Mine. The Extraction Plan has been prepared in accordance with Condition B7(f), Schedule 2 of Development Consent (DA 305-7-2003) granted for the Wambo Development Project.

Following approval of the United Wambo Joint Venture Project (Modification 16) in August 2019, the Department of Planning, Industry and Environment updated the entirety of the Development Consent (DA 305-7-2003). To avoid administrative complications, WCPL has prepared a new iteration of the Biodiversity Management Plan (Version 0) (BioMP) and undertaken a full review and update. This iteration of the BioMP builds upon the content in, and consultation undertaken for, the previous iteration of the BioMP.

In accordance with Conditions B75 and B7(f), Schedule 2 of DA305-7-2003, WCPL is required to prepare the BioMP in consultation with relevant agencies. Please see below a sharefile link to download the following documents:

- a complete copy of the BioMP (including all appendices); and
- a tracked change version of the BioMP, identifying the updates made in this iteration.

Link to download the revised Biodiversity Management Plan: https://resourcestrategies.sharefile.com/d-s731b5f4e98b453ba

Please provide any comments on the enclosed documentation to the undersigned at your earliest convenience.

Kind regards,

Nicole Dobbins
Senior Environmental Advisor
Contract
Peabody Australia
PMB 1, Singleton NSW 2330
Office: +61 (02) 6570 2209
ndobbins@peabodyenergy.com

Peabody

Subject: FW: Wambo Coal Mine - Longwalls 21 to 24 Water Management Plan

From: Dobbins, Nicole <NDobbins@peabodyenergy.com>
Sent: Friday, 20 March 2020 3:54 PM
To: NRAR ServiceDesk <nrar.servicedesk@industry.nsw.gov.au>; water.enquiries@dpi.nsw.gov.au; EPA RSD Hunter Region Mailbox <hunter.region@epa.nsw.gov.au>
Cc: Ellie Randall <ellie.randall@dpi.nsw.gov.au>; 'Natasha Ryan' <Natasha.Ryan@epa.nsw.gov.au>
Subject: Wambo Coal Mine - Longwalls 21 to 24 Water Management Plan

Good afternoon,

The South Bates Extension Underground Mine is a component of the approved Wambo Coal Mine. The South Bates Extension Underground Mine was approved in December 2017 and involves extraction of coal by longwall mining methods from the Whybrow Seam. The approved South Bates Extension Underground Mine comprises Longwalls 17 to 25.

Wambo Coal Pty Limited (WCPL) is preparing an Extraction Plan for Longwalls 21 to 24 at the South Bates Extension Underground Mine. The Extraction Plan has been prepared in accordance with Condition B7(f), Schedule 2 of Development Consent (DA 305-7-2003) granted for the Wambo Development Project.

In accordance with Condition B7(f), Schedule 2 of DA305-7-2003, WCPL is required to prepare a Water Management Plan for the Longwalls 21 to 24 Extraction Plan in consultation with relevant agencies. Please see below a sharefile link to download the following documents:

- a complete copy of the Longwalls 21 to 24 Water Management Plan (including all appendices); and
- a tracked change version of the Longwalls 21 to 24 Water Management Plan, identifying the updates made from the preceding Longwalls 17 to 20 Water Management Plan.

Link to download Longwalls 21 to 24 Water Management Plan: https://aresourcestrategies.sharefile.com/d-s2e4ddc10b90428fa

Please provide any comments on the enclosed documentation to the undersigned at your earliest convenience.

Kind regards,

Nicole Dobbins
Senior Environmental Advisor
Contract
Peabody Australia
PMB 1, Singleton NSW 2330
Office: +61 (02) 6570 2209
ndobbins@peabodyenergy.com

11 November 2019

Peter Jaeger
Wambo Coal Pty Limited
PMB 1
Singleton NSW 2330

Our ref: RR19/249680

By email: pjaeger@peabody.com

Dear Peter

CL 365 (1973), CL 374 (1973), CL 397 (1973), CCL 743 (1973), ML 1402 (1992), ML 1572 (1992), and ML 1594 (1992), Wambo Coal Pty Limited, Approval of Mining Operations Plan

NOTICE OF APPROVAL

Pursuant to Condition 2 of ML1572 and ML1594 and Condition 3 of CL365, CL374, CL397 and CCL743, the Mining Operations Plan (MOP) that was submitted to the Resources Regulator within the Department of Planning, Industry & Environment (Resources Regulator) on 23 October 2020 (Department Reference: RR19/948702) is approved for the period from the date of this approval until 31 December 2020.

It is the responsibility of the Authorisation Holder to ensure that all mining and mining related operations described in this MOP are as approved within the relevant Project Approval or Development Consent and all necessary approvals, consents or permits required under the relevant NSW or Commonwealth regulations have been obtained prior to carrying out the operations.

It is the responsibility of the Authorisation Holder to fulfil their obligations and commitments to the rehabilitation outcomes and performance standards as approved by the relevant consent authority to ensure the rehabilitation outcomes identified are achieved.

ASSESSED DEPOSIT

Approval of this MOP has triggered a review of the assessment of the security deposit required to secure funding for the fulfilment of rehabilitation obligations under **Coal Lease 365 (*Mining Act 1973*), Coal Lease 374 (*Mining Act 1973*), Coal Lease 397 (*Mining Act 1973*), Consolidated Coal Lease 743 (*Mining Act 1973*), Mining Lease 1402 (*Mining Act 1992*), Mining Lease 1572 (*Mining Act 1992*), and Mining Lease 1594 (*Mining Act 1992*)**.

Notice of the change in the security deposit condition related to this MOP approval will be provided separately.

DEFINITIONS

In this letter, words have the meaning given to those terms in the *Mining Act 1992*, unless otherwise specified below.

Authorisation Holder means the holder of the relevant authorisation(s).

Mining Operations Plan means the project, mining and mining related operations described in the "Wambo Coal Mining Operations Plan Name September 2019 – 31 December 2020 prepared by Wambo Coal Pty Limited, dated 23 September 2020, and submitted 23 October 2019 (RR19/948702).

If you have any questions about this Notice, please contact the Resources Regulator by email: nswresourcesregulator@service-now.com, referencing MAAG0004471 in the subject line.

Yours sincerely,

MONIQUE MEYER
Manager Environmental Operations
Mining Act Inspectorate
Resources Regulator
NSW Department of Planning, Industry & Environment
Signed under delegation from the Minister for Resources.
Signed under delegation from the Secretary of the NSW Department of Planning, Industry & Environment.

WAMBO COAL PTY LIMITED

SOUTH BATES EXTENSION UNDERGROUND MINE

EXTRACTION PLAN
LONGWALLS 21 TO 24

ATTACHMENT 3
PROGRAM TO COLLECT BASELINE DATA FOR FUTURE EXTRACTION PLANS

Peabody

Attachment 3
Program to Collect Baseline Data for Future Extraction Plans

The following underground mines at the Wambo Coal Mine are approved:

- North Wambo Underground Mine (Wambo Seam) (now completed);
- South Bates Underground Mine (Whybrow and Wambo Seams) (now completed);
- South Bates Extension Underground Mine (Whybrow Seam) (current mining area); and
- South Wambo Underground Mine (Woodlands Hill and Arrowfield Seams) (not yet commenced).

The development of the South Bates Extension Underground Mine (Longwalls 17 to 25) was approved in December 2017 via a modification to the Development Consent (DA 305-7-2003 MOD 17).

This Extraction Plan covers Longwalls 21 to 24 at the South Bates Extension Underground Mine.

Future Extraction Plans at the Wambo Coal Mine will include:

- Extraction Plan(s) for the remaining longwalls at the South Bates Extension Underground Mine (Longwall 25); and
- Extraction Plan(s) for the South Wambo Underground Mine.

The monitoring proposed to be undertaken to collect baseline data for future Extraction Plans is summarised in **Table A3-1**. WCPL considers that the current monitoring with the augmentations described below is adequate to collect sufficient baseline data for use in future Extraction Plans.

Table A3-1
Program to Collect Baseline Data for Future Extraction Plans

Aspect of Future Extraction Plan	Proposed Monitoring
Subsidence	• Subsidence monitoring undertaken in accordance with the Subsidence Monitoring Program. • The subsidence monitoring data collected during extraction of Longwalls 17 to 24 will be used to validate revised single-seam subsidence predictions for future Extraction Plans. • It is considered that the proposed subsidence monitoring is adequate to collect sufficient subsidence data for use in future Extraction Plans.
Groundwater	• Groundwater monitoring (groundwater level and quality) undertaken in accordance with the GWMP (**Figure 12** of the Extraction Plan), including nine additional groundwater monitoring sites (GW27 to GW35) installed along North Wambo Creek. • The groundwater monitoring data collected will be used to validate predicted environmental consequences on groundwater resources for future Extraction Plans. If this validation finds environmental consequences have exceeded those predicted, the groundwater monitoring data will be used to provide revised predictions of environmental consequences. • The Extraction Plan that covers Longwall 25 will take into account the findings of the Groundwater Dependent Ecosystem Study required under Condition B64, Schedule 2 of the Development Consent and not less than 2 years of monitoring results obtained from GW23, GW24, GW25, GW26, P317 and UG139. • The Groundwater Management Plan will adequately capture and incorporate the above commitments.
Surface Water	• Surface water monitoring (flow, quality and bed and bank stability) undertaken in accordance with the SWMP (Figure 12 of the Extraction Plan) along North Wambo Creek, Wambo Creek and Stony Creek, including six additional subsidence and diversion monitoring points to be implemented along North Wambo Creek. • The surface water monitoring data collected will be used to validate predicted environmental consequences on surface water resources for future Extraction Plans. If this validation finds environmental consequences have exceeded those predicted, the surface water monitoring data will be used to provide revised predictions of environmental consequences. • It is considered that the proposed surface water monitoring is adequate to collect sufficient baseline surface water data for use in future Extraction Plans. • The Surface Water Management Plan in preparation will adequately capture and incorporate the above commitments.

Table A3-1 (Continued)
Program to Collect Baseline Data for Future Extraction Plans

Aspect of Future Extraction Plan	Proposed Monitoring
Land	• Monitoring of impacts to land in general in accordance with the Longwalls 21 to 24 Land Management Plan, including high resolution photographic recording of cliffs. • The monitoring conducted in accordance with the Longwalls 21 to 24 Land Management Plan will be used in the review of observed subsidence impacts for future Extraction Plans.
Biodiversity	• Monitoring of biodiversity in accordance with the Biodiversity Management Plan (**Figure 13** of the Extraction Plan), including: – annual vegetation monitoring in the Remnant Woodland Enhancement Program areas; – annual riparian monitoring (including transects along the North Wambo Creek Diversion, North Wambo Creek, Wambo Creek and Stony Creek); and – annual bird surveys including specific surveys for Swift Parrot and Regent Honeyeater. • Biodiversity monitoring data collected will be used to validate predicted environmental consequences on biodiversity for future Extraction Plans. If this validation finds environmental consequences have exceeded those predicted, the monitoring data would be used to provide revised predictions of environmental consequences.
Aboriginal Heritage	• Maintenance of an Aboriginal heritage sites database.
Non-Aboriginal Heritage	• In accordance with Condition 62A, Schedule 4 of the Development Consent (now removed from the Development Consent as it has been addressed), an Archival Recording has been completed of the Whynot Homestead and outbuildings. • Structural assessment of the Whynot Homestead will be undertaken post-mining to assess if demolition is required. • Monitoring data associated with subsidence near the Wambo Homestead Complex has been collected in accordance with previous Extraction Plans. This monitoring data would be used to predict impacts to the Wambo Homestead Complex for future Extraction Plans.

Note: GWMP refers to the Wambo Coal Pty Limited Groundwater Monitoring Program.
SWMP refers to the Wambo Coal Pty Limited Surface Water Monitoring Program.

WAMBO COAL PTY LIMITED

SOUTH BATES EXTENSION UNDERGROUND MINE

EXTRACTION PLAN
LONGWALLS 21 TO 24

ATTACHMENT 4
KEY CONTACT REGISTER

Peabody

Attachment 4
Key Contact Register

Contact Details to be Reviewed Annually by the Environment and Community Manager

Table A4-1
Emergency Contacts

Organisation	Phone Number
Emergency Services (Police, Fire, Ambulance)	000
Environment Protection Authority	131 555
State Emergency Services	132 500
SafeWork NSW	13 10 50
Subsidence Advisory NSW (24 Hour Emergency Hotline)	1800 248 083
Singleton Shire Council	(02) 6578 7290

Table A4-2
Internal WCPL Contact Details

Position	Contact Name	Phone Number
Manager: Environment and Community	Peter Jaeger	(02) 6570 2206
Community Hotline	-	(02) 6570 2245
Control Room (24 hours)	-	(02) 6570 2240
Manager: Health Safety and Training	Victoria Hellyer	(02) 6570 2309
General Manager	Albert Scheepers	(02) 6570 2330
Technical Services Manager	Michael Berry	
Mining Engineering Manager (Underground Mine Manager)	Justin Peterkin	

Table A4-3
Stakeholder Contact Details

Organisation	Name/Position	Contact Phone Number/Email	Postal Address
NSW Department of Planning, Industry and Environment	Mike Young, Executive Director, Energy and Resources Assessments	mike.young@planning.nsw.gov.au	GPO Box 39 Sydney NSW 2001
NSW Mining, Exploration and Geosciences	-	minres.environment@planning.nsw.gov.au	PO Box 344 Hunter Region MC NSW 2310
NSW Resources Regulator	-	nswresourcesregulator@service-now.com 1300 814 609	PO Box 344 Hunter Region MC NSW 2310
Subsidence Advisory NSW	Newcastle District Office	subsidenceadvisory@customerservice.nsw.gov.au District Office – (02) 4908 4300	PO Box 488G Newcastle NSW 2300
NSW Natural Resources Access Regulator	-	nrar.enquiries@nrar.nsw.gov.au 1800 633 362	Locked Bag 5022 Parramatta 2124
Biodiversity and Conservation Division (BCD)	-	info@environment.nsw.gov.au 1300 361 967	Locked Bag 5022 Parramatta 2124
Environment Protection Authority	Hunter Region	hunter.region@epa.nsw.gov.au	PO Box 488G Newcastle NSW 2300
Heritage NSW, Department of Premier and Cabinet	Hunter Region	heritagemailbox@environment.nsw.gov.au	Locked Bag 5020 Parramatta 2124
Singleton Shire Council	-	council@singleton.nsw.gov.au (02) 6578 7290	PO Box 314 Singleton NSW 2330