WAMBO COAL PTY LIMITED

SOUTH BATES EXTENSION UNDERGROUND MINE

EXTRACTION PLAN
LONGWALLS 17 TO 20

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WAMBO COAL PTY LIMITED
SOUTH BATES EXTENSION UNDERGROUND MINE

EXTRACTION PLAN
LONGWALLS 17 - 20

PREPARED BY
WAMBO COAL PTY LIMITED AND
RESOURCE STRATEGIES PTY LTD

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Project No. WAM-09-15
Document No. 984411

DOCUMENT CONTROL

Applicant	Wambo Coal Pty Limited
Mine	Wambo Coal Mine – South Bates Extension Underground Mine
Document No.	EP 17-20
Title	Extraction Plan for South Bates Extension Underground Mine Longwalls 17 to 20
General Description	Management of potential subsidence effects, subsidence impacts and environmental consequences from mining of Longwalls 17 to 20 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

Revisions

Rev No	Date	Description	By	Checked
A	April 2018	Final for Submission	WCPL and Resource Strategies	-
B	February 2019	Change to Longwall Layout	WCPL and Resource Strategies	-
C	June 2019	Approved Version	WCPL and Resource Strategies	-

Approvals

	Name	Position	Signed	Date
Originator	P. Jaeger	~~A/~~Environment and Community Manager		17-06-19
Checked	M. Berry	Technical Services Manager		17/06/19
Confirmed	D. Gibson	Mining Engineering Manager (~~A/~~Underground Mine Manager)		17-6-19

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 17 to 20 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 there is no exceedance of 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. Negligible environmental consequences. Controlled release of excess site water only in accordance with Environment Protection Licence requirements.
Low level cliffs	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 within the South Bates Extension Area)
Wollemi National Park	Negligible subsidence impacts. Negligible environmental consequences.
Warkworth Sands Woodland Community	Minor cracking and ponding of the land surface or other impact. 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 impact. Negligible environmental consequences.
Central Hunter Valley Eucalypt Forest and Woodland Ecological Community	Minor cracking and ponding of the land surface or other impact. Negligible environmental consequences
Other species, populations or communities listed under the *Biodiversity Conservation Act 2016* or the *Environment Protection and Biodiversity Conservation Act 1999*	Minor cracking and ponding of the land surface or other impact. Negligible environmental consequences.
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	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	No additional risk.

Source: After Tables 14A and 14B of the Development Consent (DA 305-7-2003).

Summary of Monitoring, Management and Reporting Commitments

Component	Monitoring	Management	Reference
North Wambo Creek Diversion	• 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. • Daily visual inspections when extraction of Longwall 17 is occurring directly beneath the North Wambo Creek Diversion. • 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 remediation prior to extraction under the North Wambo Creek Diversion. • Remediation of all visible surface cracks in the low flow channel as soon as practicable (nominally within two weeks, pending weather conditions). • Installation of scour protection works in areas that may be vulnerable to scour following completion of subsidence. • Construction of a new batter chute~~s~~ to manage overland flow entry to the North Wambo Creek Diversion 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. • 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. • Construction of a new batter chute~~s~~ to manage overland flow entry to the North Wambo Creek Diversion following completion of subsidence. • Post-subsidence assessment of impacts to 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. • 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. • Repair of fences prior to allowing access for agistment grazing. • 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 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 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	• No monitoring required (less than 20 millimetres subsidence from Longwalls 17 to 20).	• The Whynot homestead and outbuildings have been archivally recorded in accordance with Condition 62A, Schedule 4 of the Development Consent (DA 305-7-2003).	**Section 3.4** and **Appendix D**
WCPL Assets	• Visual observations to record the general condition of WCPL assets, 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.	• 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). • 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 17 to 20 extraction. • 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. • 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. • 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. • 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**
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 17 to 20.

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

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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 South Bates Extension Underground Mine is a component of the approved Wambo Coal Mine. The South Bates Extension Underground Mine ~~is scheduled to~~ 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 and ML 1572 (**Figure 2**).

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).

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).

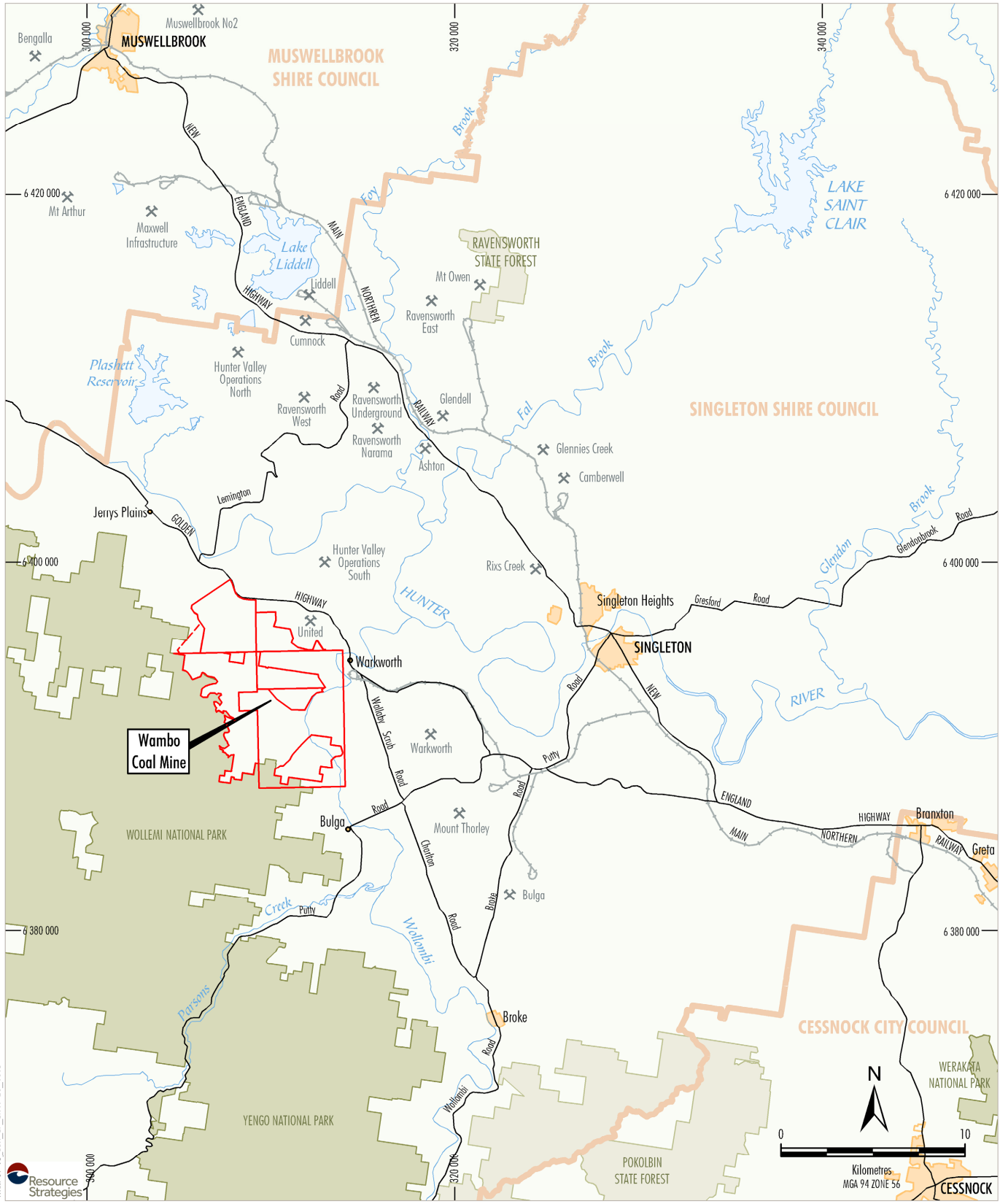
1.1 PURPOSE AND SCOPE

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 first four longwalls at the South Bates Extension Underground Mine (Longwalls 17 to 20). This Extraction Plan has been updated from the previous revision (Revision A) to incorporate a change to the layout of Longwalls 17 to 20. A summary of the predicted changes to potential subsidence effects, subsidence impacts and environmental consequences, as a result of the revised layout is provided in **Section 2.1**. No significant changes to the monitoring or management measures previously proposed are required as a result of these changes.

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 17 to 20;
- outline potential subsidence effects, subsidence impacts and environmental consequences of Longwalls 17 to 20;
- 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

Source: NSW Department of Resources & Energy (2018); Geoscience Australia (2009)

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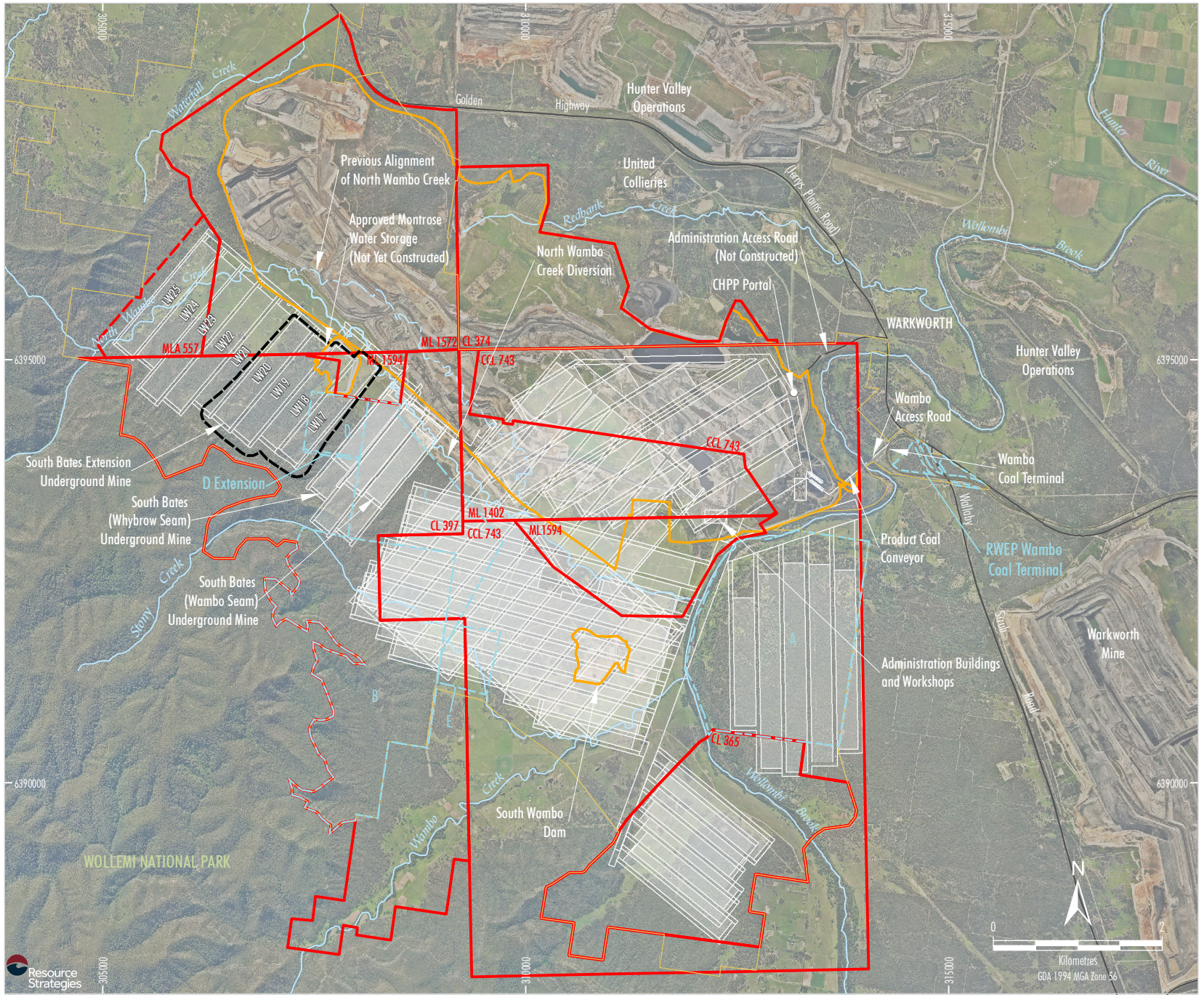
WAMBO COAL MINE

Regional Location

Figure 1



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WAMBO COAL MINE

Approved Wambo Coal Mine Layout

Figure 2

WAM-09-15_SBX_EP_LW17-20_202C

The South Bates Extension Underground Mine includes nine longwalls in the Whybrow Seam, the first four of which are Longwalls 17 to 20. The Extraction Plan Application Area for Longwalls 17 to 20 (Longwalls 17 to 20 Application Area) is based on a 26.5 degree (°) angle of draw and is shown on **Figure 3**. Secondary extraction of Longwalls 17 to 20 ~~is scheduled to~~ commenced in December 2018.

This Extraction Plan and its component plans have been prepared by WCPL, with assistance from Mine Subsidence Engineering Consultants (MSEC), HydroSimulations, 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 DP&E.

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)

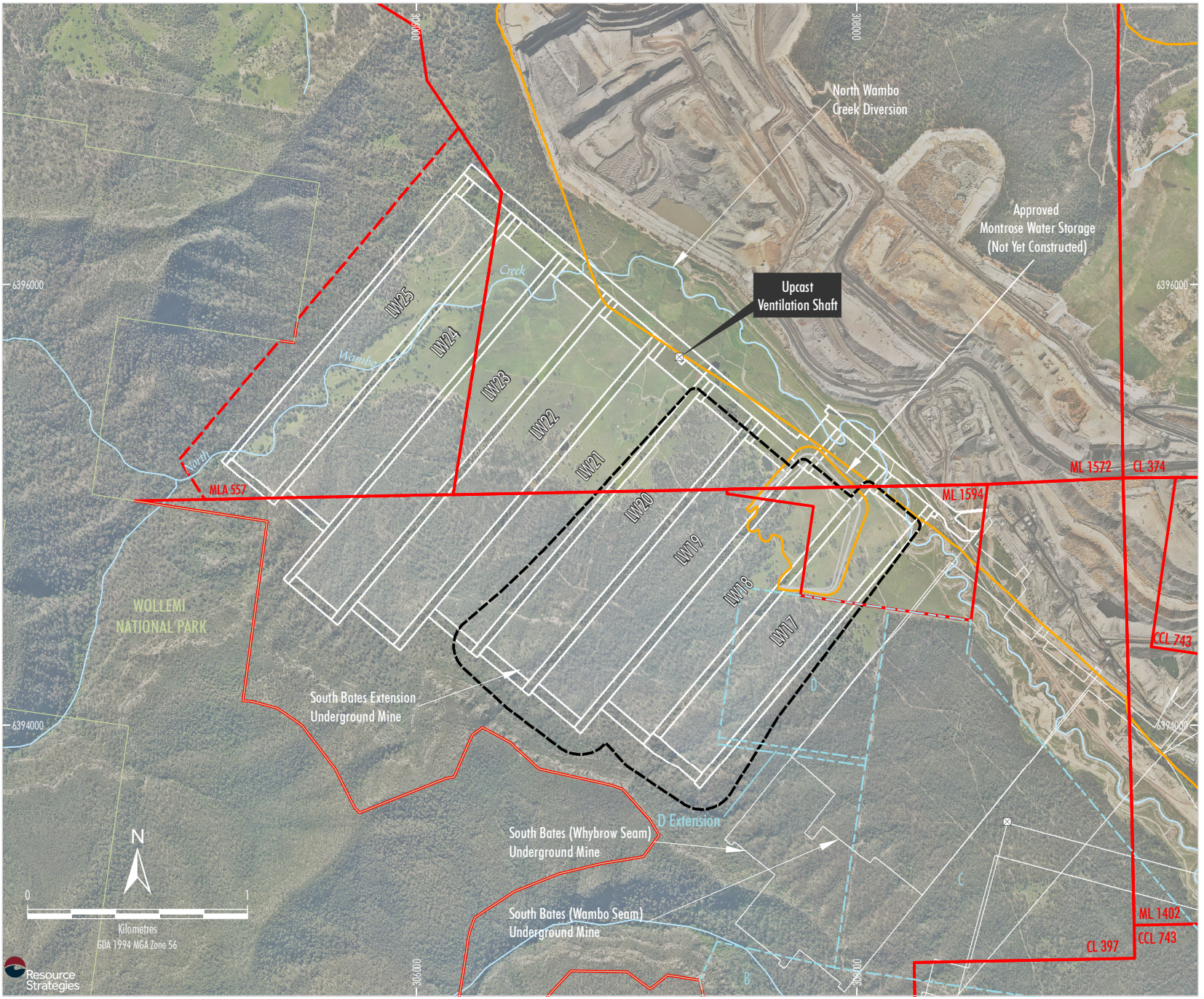
This Extraction Plan has been prepared in accordance with Condition 22C of Schedule 4 of the Development Consent (DA 305-7-2003). The requirements of Condition 22C of Schedule 4 are summarised in **Table 1**, along with the relevant section of this Extraction Plan in which the requirements are addressed.

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

Mining Lease Conditions

Longwalls 17 to 20 are located within CL 397, ML 1594 and ML 1572 (**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.

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

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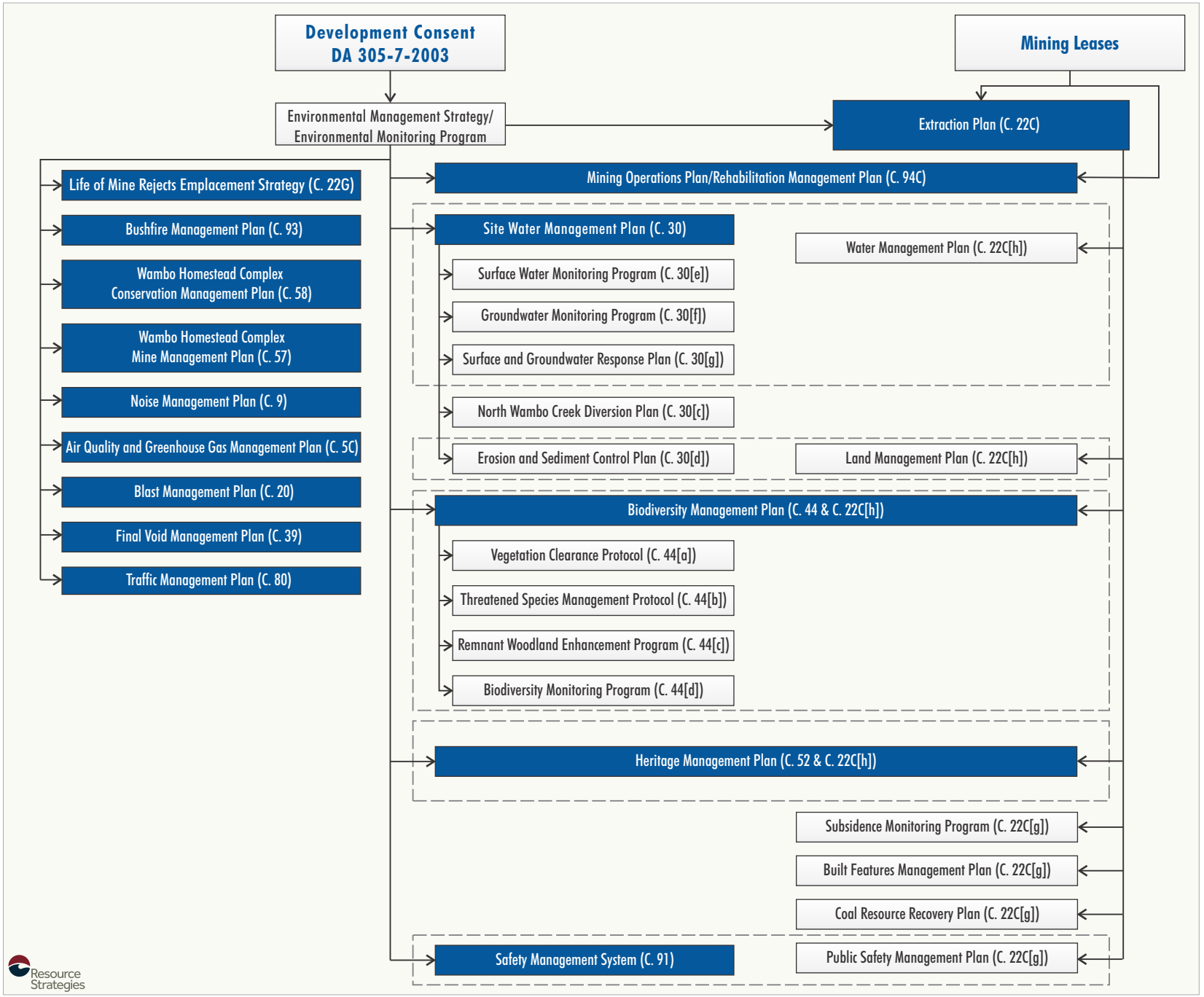
WAMBO COAL MINE

Aerial Photograph of Longwalls 17 to 20

Figure 3

WAM-09-15_SBX_EP_LW17-20_203E



Resource Strategies

WAM-09-15_SBX EP_LW17-20_001A

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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 22C of Schedule 4 22C. The Applicant must prepare and implement an Extraction Plan for the second workings within each seam to be mined to the satisfaction of the Secretary. Each Extraction Plan must:	This document
a) be prepared by a team of suitably qualified and experienced persons whose appointment has been endorsed by the Secretary;	**Section 1.1** and **Attachment 2**
b) be approved by the Secretary before the Applicant carries out any of the second workings covered by the plan;	
c) include detailed plans of the proposed first and second workings and any associated surface development;	**Section 1.3** and **Appendix G**
d) include detailed performance indicators for each of the performance measures in Tables 14A and 14B;	**Section 3** and **Appendices A, B, C, D, E and F**
e) provide revised predictions of potential subsidence effects, subsidence impacts and environmental consequences of the proposed second workings, incorporating any relevant information obtained since this consent;	**Section 2.1** and **Technical Reports 1 to 4**
f) describe the measures that would be implemented to ensure compliance with the performance measures in Tables 14A and 14B, and manage or remediate any impacts and/or environmental consequences;	**Section 3** and **Appendices A, B, C, D, E, F, H and I**
g) include the following to the satisfaction of DRG: • a coal resource recovery plan… • a subsidence monitoring program… • a Built Features Management Plan… • a Public Safety Management Plan… • appropriate revisions to the Rehabilitation Management Plan…	 **Appendix G** **Appendix H** **Appendix E** **Appendix F** **Section 3.7**
h) include a: • Water Management Plan… • Biodiversity Management Plan… • Land Management Plan… • Heritage Management Plan…	 **Appendix A** **Appendix C** **Appendix B** **Appendix D**
i) 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 2018 – 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 Permit (AHIP) #C0003213 issued under section 90 of the NSW *National Parks and Wildlife Act, 1974* (NPW Act) and any additional AHIP 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 ~~Division of Resources and Geoscience (DRG)~~ within DP&E 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. Provides a summary of the predicted changes due to the revised longwall layout.

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 17 to 20 (WMP).

Appendix B Land Management Plan for Longwalls 17 to 20 (LMP).

Appendix C WCPL complex-wide Biodiversity Management Plan (BMP) (addressing the requirement for a Biodiversity Management Plan for Longwalls 17 to 20).

Appendix D WCPL complex-wide Heritage Management Plan (HMP) (addressing the requirement for a Heritage Management Plan for Longwalls 17 to 20).

Appendix E Built Features Management Plan for Longwalls 17 to 20 (BFMP).

Appendix F Public Safety Management Plan for Longwalls 17 to 20 (PSMP).

Appendix G Coal Resource Recovery Plan for Longwalls 17 to 20 (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 EA (WCPL, 2017). ~~There has been no change to the layout of Longwalls 17 to 20 since the South Bates Extension Underground Mine was approved.~~ On 4 September 2018, WCPL provided DP&E 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 DP&E approve the Extraction Plan for Longwalls 17 to 20 for extraction of Longwall 17 only. On 7 September 2018, DP&E 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 12 April 2018, DP&E 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.

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

1.3.1 Mine Plan

Longwalls 17 to 20 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 17 to 20 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 17	Longwall 18	Longwall 19	Longwall 20
ROM Coal Extracted (Mt)	1.68	1.60	1.63	1.66
Gate Road Width (m)	5.4			
Gate Road Height (m)	2.5 to 2.8			
Maingate Chain Pillar Width (m)	31	30	31	26
Tailgate Chain Pillar Width (m)	25	31	30	31
Longwall Void Width (m)	261			
Longwall Void Length (m)	1,485	1,388	1,465	1,485
Extraction Height (m)	2.8 to 3.0	2.8 to 3.0	2.8	2.8
Depth of Cover (m)	50 to 300	50 to 300	60 to 330	60 to 310

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.

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 17 to 20 Application Area consists predominately of interbedded sandstone and siltstone layers, with minor claystone, mudstone, shale, tuffaceous and coal layers (**Technical Report 1**).

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).

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Resource Strategies

After: DMR (1993)

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WAMBO COAL MINE

Stratigraphy of the Wambo Coal Mine Area

Figure 5

Previous and Future Mining

Previous and future workings in the vicinity of Longwalls 17 to 20 are shown on **Figure 6**.

Longwalls 21 to 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 20 (**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 would allow integrated open cut mining at the United Coal Mine and Wambo Coal Mine.

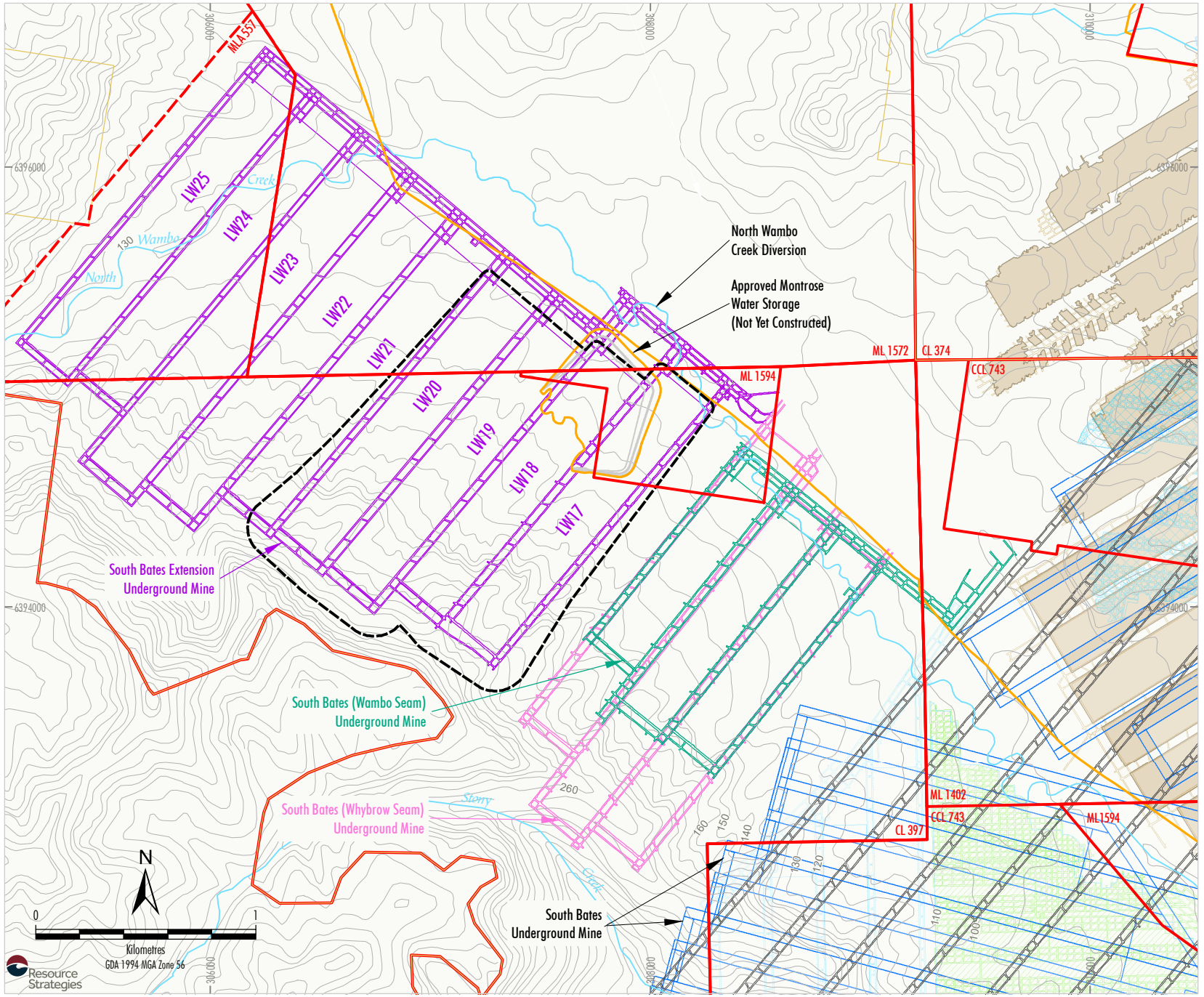
1.3.2 Mine Schedule

WCPL operates its mines seven days per week, 24 hours per day on a rotating shift basis. WCPL is currently mining Longwall 17 ~~15~~ at the South Bates Extension Underground Mine.

The proposed sequence of mining for Longwalls 17 to 20 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 17	December 2018	6 months	May 2019
Longwall 18	July 2019	5 months	November 2019
Longwall 19	December 2019	5 months	April 2020
Longwall 20	May 2020	5 months	September 2020



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: NSW Department of Lands (July 2017); WCPL (2019)

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WAMBO COAL MINE

Longwalls 17 to 20 Layout

Figure 6

WAM-09-15_SBX_EP_LW17-20_209C

1.4 SUBSIDENCE PREDICTIONS

Predictions of subsidence effects for Longwalls 17 to 20 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 (2018; 2019) for Longwalls 17 to 20 are summarised in **Table 4**. **Figure 7** provides subsidence contours for Longwalls 17 to 20 at the South Bates Extension Underground Mine.

Table 4
Maximum Predicted Total Subsidence, Tilt and Curvatures for Longwalls 17 to 20

Longwalls	Depth of Cover to the Whybrow Seam (m)	Subsidence (mm)	Tilt (mm/m)	Hogging Curvature (km^{-1})	Sagging Curvature (km^{-1})
Prediction Line 1	180 – 280	1,800	25	0.4	0.6
Prediction Line 2	110 – 150	1,900	45	2.5	2.5
~~Prediction Line 3~~	~~60 – 90~~	~~1,900~~	~~85~~	~~> 3.0~~	~~> 3.0~~
Anywhere above Longwalls 17 to 20	50 – 330	1,950	~~90~~ 70	> 3.0	> 3.0

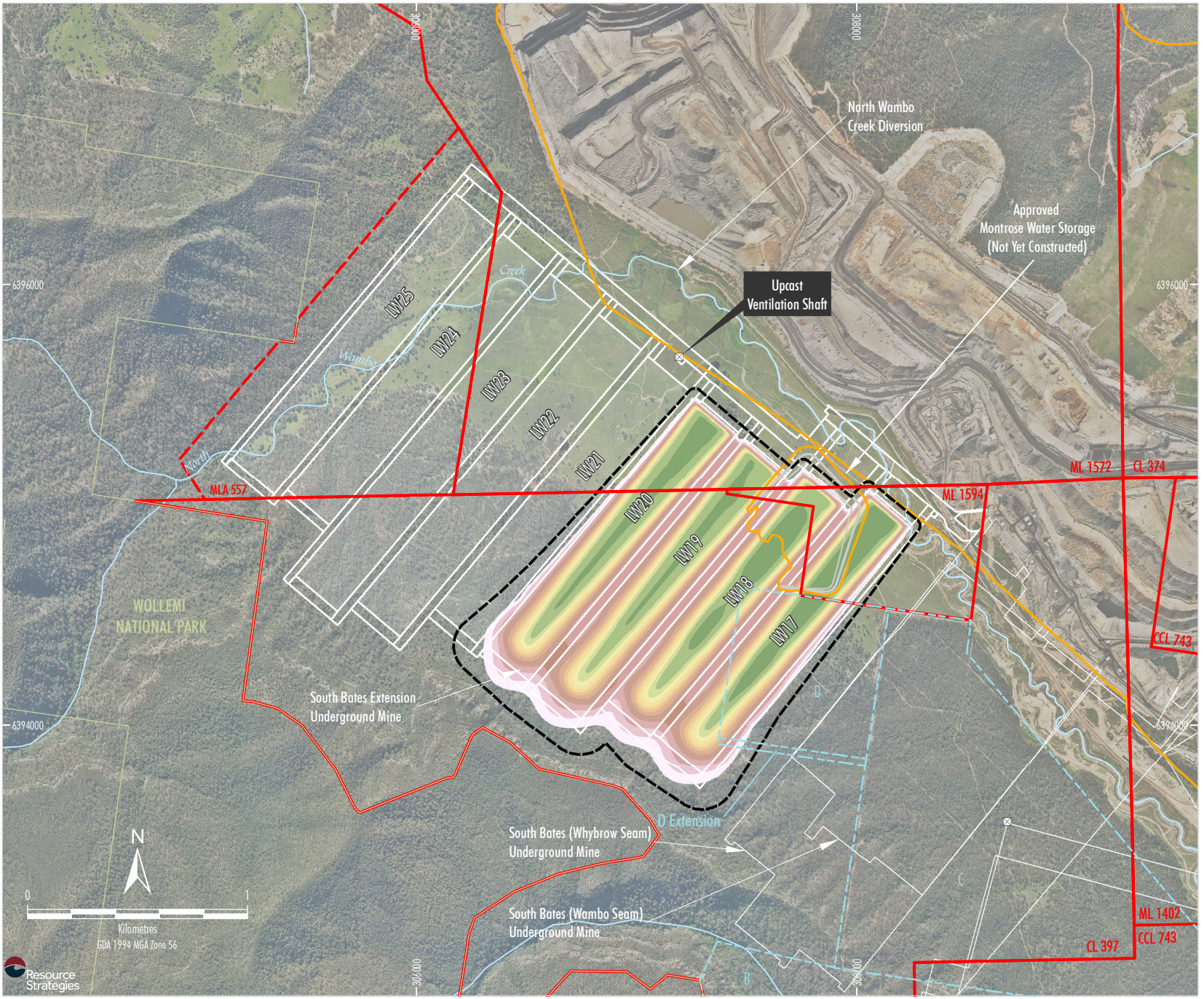
After: MSEC (2018; 2019).
mm = millimetres. mm/m = millimetres per metre. km^{-1} = per kilometre.

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 17 to 20 (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 17 to 20, the 95% confidence levels for maximum strains above areas with similar mining geometry was 12 mm/m tensile and 18 mm/m compressive (**Technical Report 1**).



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WAMBO COAL MINE

Predicted Subsidence from the South Bates Extension Underground Mine

Figure 7

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 20 (**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 17 to 20.

Timing and Duration of Subsidence Impacts

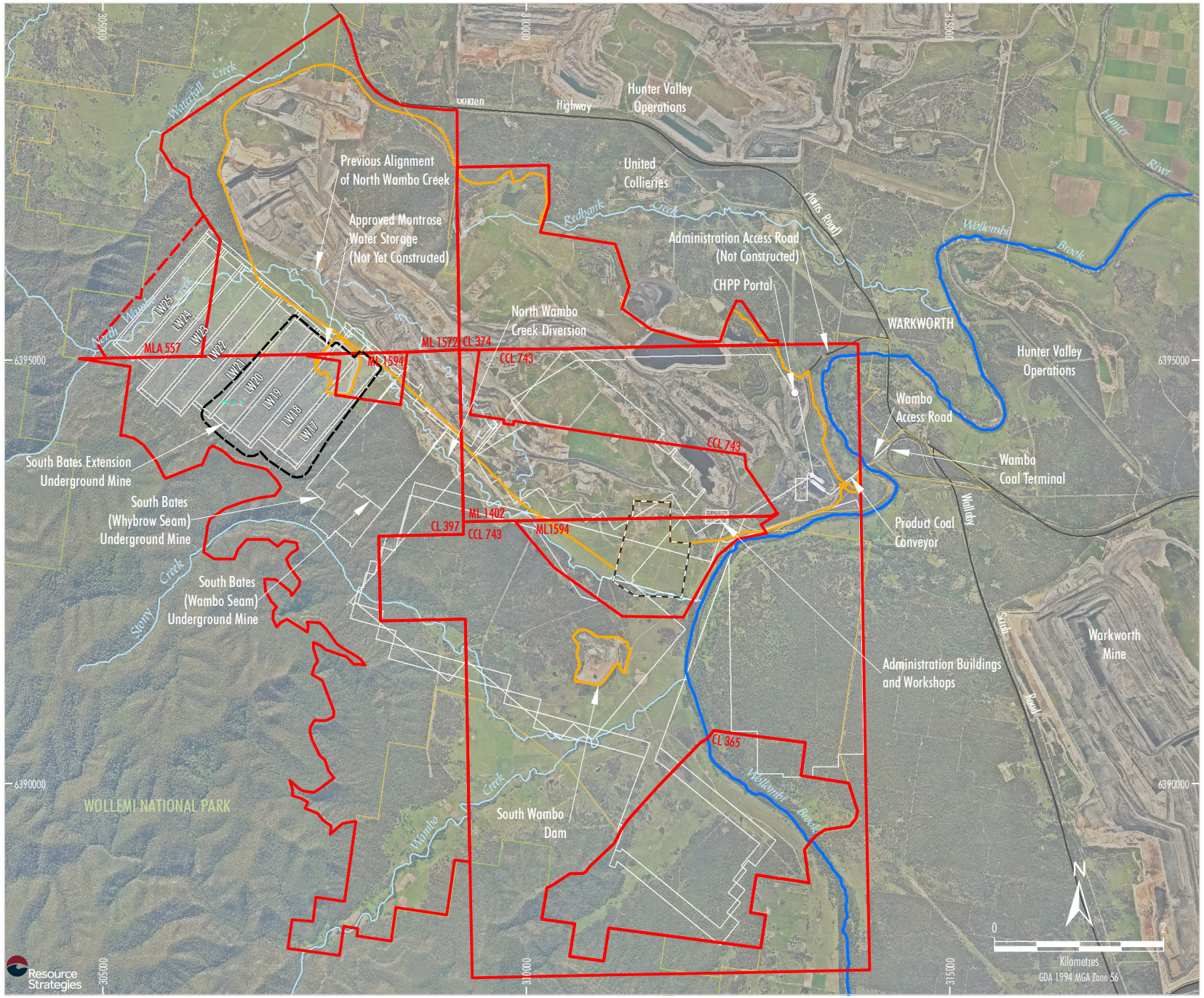
Surface cracking has been typically observed to close up as the longwall face retreats, and natural filling of minor remnant cracking usually occurs within 6 to 12 months. Conditions at the South Bates Extension Underground Mine in areas of high depth of cover are expected to be similar.

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 22 and 22A, Schedule 4), WCPL must ensure that there is no exceedance of 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 the Longwalls 17 to 20 Application Area (**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 17 to 20. Monitoring and management measures for the Wambo Homestead Complex were addressed in previous Extraction Plans for the North Wambo Underground Mine.



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: Department of Lands (2017); WCPL (2019); MSEC (2016)
Orthophoto: WCPL (May 2017)

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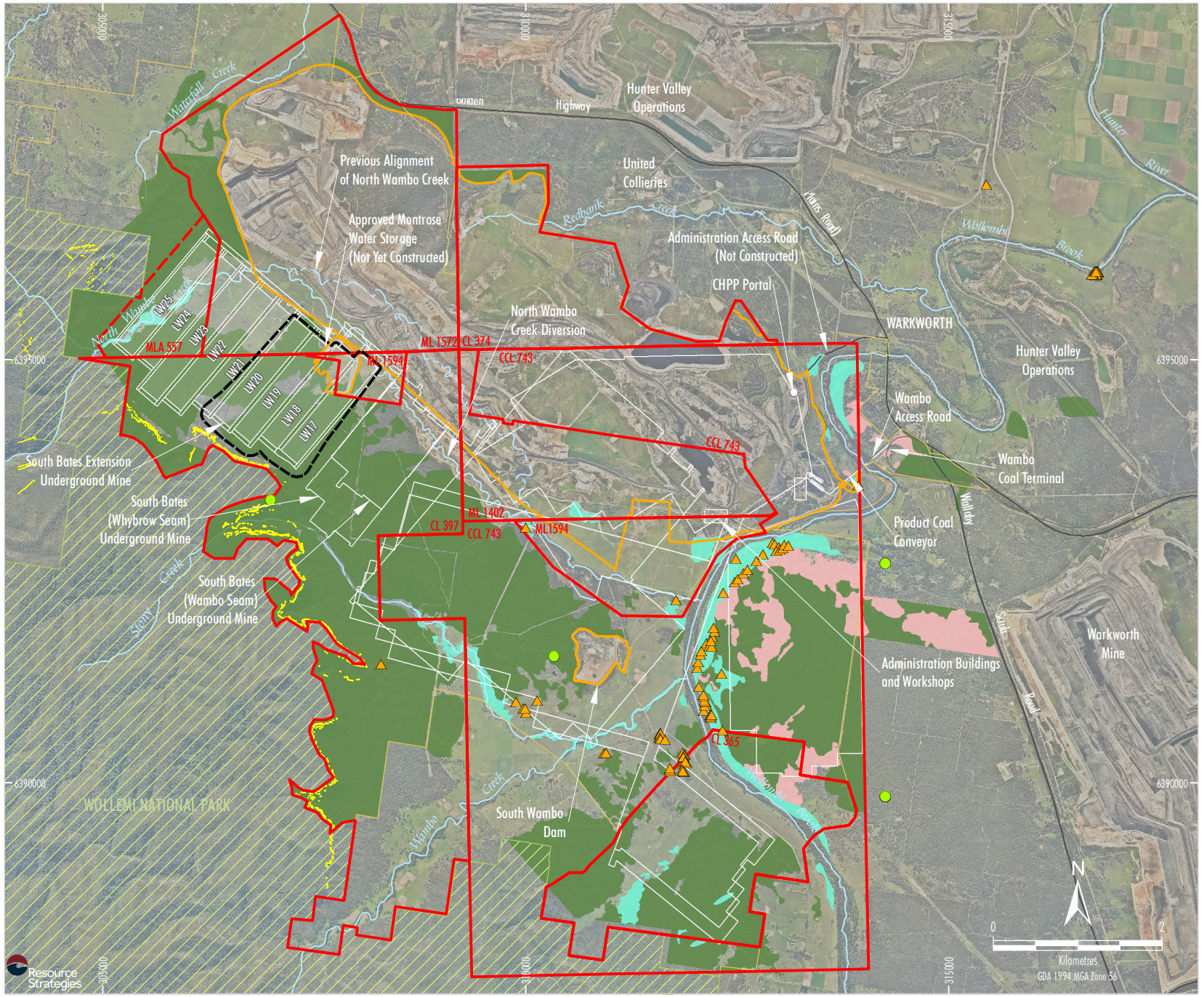
WAMBO COAL MINE

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

Figure 8a

WAM-09-15_SBX_EP_LW17-20_210E



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: Department of Lands (2017); WCPL (2019); MSEC (2016); FloraSearch (2016, 2017)
Orthophoto: WCPL (May 2017)

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WAMBO COAL MINE

Features with Subsidence Impact Performance Measures - Biodiversity

Figure 8b

WAM-09-15_SBX_EP_LW17-20_214C

Table 5
Subsidence Impact Performance Measures

Feature	Performance Measure
Wollombi Brook	Negligible subsidence impacts. Negligible environmental consequences. Controlled release of excess site water only in accordance with EPL requirements.
Low level cliffs	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 within the South Bates Extension Area)
Wollemi National Park	Negligible subsidence impacts. Negligible environmental consequences.
Warkworth Sands Woodland Community	Minor cracking and ponding of the land surface or other impact. 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 impact. Negligible environmental consequences.
Central Hunter Valley Eucalypt Forest and Woodland Ecological Community	Minor cracking and ponding of the land surface or other impact. Negligible environmental consequences
Other species, populations or communities listed under the *Biodiversity Conservation Act 2016* or the *Environment Protection and Biodiversity Conservation Act 1999*	Minor cracking and ponding of the land surface or other impact. Negligible environmental consequences.
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	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	No additional risk.

Source: After Tables 14A and 14B of the Development Consent (DA 305-7-2003).

1.6 SUBSIDENCE MANAGEMENT APPROACH

Potential environmental consequences from mining of Longwalls 17 to 20 will be managed in accordance with the relevant requirements of the Development Consent (DA 305-7-2003) and other approvals, through:

- **Mine Design** – Longwalls 17 to 20 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 17 to 20 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 17 to 20. Longwalls 17 to 20 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**). The predictions and assessed levels of potential impact for the cliffs do not change due to the revised longwall layout (**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 (2018; 2019), HydroSimulations (2018) and Alluvium (2019) (**Technical Reports 1 to 3**). This section describes the process of reviewing these predictions.

~~The layout of Longwalls 17 to 20 has not changed compared to the layout presented and assessed in the South Bates Extension Modification EA.~~ This Extraction Plan has been updated from the previous revision (Revision A) to incorporate a change to the layout of Longwalls 17 to 20. A summary of the predicted changes to potential subsidence effects, subsidence impacts and environmental consequences, as a result of the revised layout is provided in **Section 2.1**. No significant changes to the monitoring or management measures previously proposed are required as a result of these changes.

2.1.1 Predicted Subsidence Effects and Subsidence Impacts

A detailed subsidence assessment for Longwalls 17 to 20 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 Longwalls 11 to 13 at the South Bates Underground Mine, the North Wambo Underground Mine and from other nearby collieries in the Hunter Coalfield.

Ground movements measured along the 7XL-Line, CL11B-Line and C13B-Line above Longwalls 11 to 13 at the South Bates Underground Mine were also considered by MSEC (**Technical Report 1**). The observed profiles of subsidence, tilt and curvature along the 7XL-Line, CL11B-Line and CL13B-Line, due to the extraction of Longwalls 11 to 13 at the South Bates Underground Mine, reasonably match those predicted using the standard Incremental Profile Method for the Hunter Coalfield. Some small irregular ground movements can be observed in the monitoring data along the CL11B-Line and CL13B-Line, due to the shallow depths of cover at these locations.

The observed and back-predicted mine subsidence movements were compared by MSEC (2018) along a number of monitoring lines at the North Wambo Underground Mine and nearby collieries in the Hunter Coalfield. It was found that the observed profiles of subsidence, tilt and curvature for these monitoring lines reasonably matched those back-predicted using the standard Incremental Profile Method. However, there were small differences between the measured and predicted values in some locations, which demonstrate the difficulty in predicting tilts and curvatures at a specific point, especially at shallow depths of cover.

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**).

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 (2018) presents subsidence predictions based on Longwalls 17 to 20 only (**Technical Report 1**). There ~~has been~~ was no change to the longwall layout between MSEC (2017) and MSEC (2018), however MSEC (2019) has considered shortened finishing ends for Longwalls 17 to 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**) is ~~also the same as~~ less than the maxima presented in the South Bates Extension Modification EA (WCPL, 2017), at 70 mm/m (previously 90 mm/m).

Predicted Subsidence Impacts

Subsidence impacts predicted by MSEC (2017) above Longwalls 17 to 20 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.

As described in **Section 1**, on 4 September 2018, WCPL provided DP&E 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 DP&E approve the Extraction Plan for Longwalls 17 to 20 for extraction of Longwall 17 only. On 7 September 2018, DP&E approved the extraction of Longwall 17 only, on the basis that WCPL would prepare an amended Extraction Plan for Longwalls 18, 19 and 20. This Extraction Plan has been updated to address the shortening of Longwalls 17, 18, 19 and 20 (by 25 m, 140 m, 210 m and 210 m, respectively).

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 20. • 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 are now predicted to develop coinciding with an existing farm dam. • Increased connectivity between the workings and the North Wambo Creek Diversion no longer predicted.	Refer to the WMP and **Technical Report 3** for more detail
North Wambo Creek	• No change.	
Ephemeral Drainage Lines	• Direct subsidence impacts reduced in the areas no longer proposed for extraction above the previous finishing ends of Longwalls 17 to 20. • Existing drainage bund overlying Longwalls 17 to 20 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
Land		
Land Use	• Direct subsidence impacts reduced in the areas no longer proposed for extraction above the previous finishing ends of Longwalls 17 to 20.	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 20.	
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 20.	

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
Biodiversity		
Flora	• Direct subsidence impacts reduced in the areas no longer proposed for extraction above the previous finishing ends of Longwalls 17 to 20. • Based on the previous layout of Longwalls 17 to 20, 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 20.	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 HydroSimulations (2018) as part of the Extraction Plan for Longwalls 17 to 20 (**Technical Report 2**).

The groundwater assessment review considered the cumulative predicted impacts on groundwater during the period of extraction of Longwalls 17 to 20 (**Technical Report 2**).

Following a review of monitoring data, HydroSimulations (**Technical Report 2**) concluded that revision of the potential cumulative environmental consequences for groundwater is not required. Of note to Longwalls 17 to 20, HydroSimulations (**Technical Report 2**) concluded:

- Groundwater drawdowns of up to 200 m are expected in the Whybrow Seam, due to extraction of Longwalls 17 to 20.
- Extraction of Longwalls 17 to 20 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.
- Negligible loss of baseflow to the natural North Wambo Creek is expected due to extraction of Longwalls 17 to 20.
- There is an expectation of enhanced leakage from the North Wambo Creek diversion if the creek happens to flow during the period of extraction of Longwall 17 beneath the diversion.
- There are no additional 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 17 to 20.

The minor changes to the finishing ends of Longwalls 17 to 20 would not materially affect these conclusions.

Review of Potential Environmental Consequences to Surface Water

North Wambo Creek Diversion

Approximately 980 m of the North Wambo Creek Diversion has been undermined by Longwalls 11 to 13 at South Bates Underground Mine. An additional ~~120~~ 30 m will be undermined by Longwall 17.

Subsidence impacts on the North Wambo Creek Diversion as a result of the extraction of Longwall 17 are expected to be similar to those observed at the adjacent South Bates Underground Mine.

The potential environmental consequences to the North Wambo Creek Diversion described in the South Bates Extension Modification EA (WCPL, 2017) included:

- potential for minor increased ponding above Longwall 17;
- potential for surface cracking above Longwall 17 (similar to that observed above Longwall 11) and minor cracking along the section of the North Wambo Creek Diversion not located directly above the longwalls;
- potential for increased scour (and associated suspended solids) prior to the implementation of scour protection works; and
- potential for increased leakage from the North Wambo Creek Diversion prior to crack remediation works.

Potential environmental consequences to the North Wambo Creek Diversion were reviewed by MSEC (**Technical Report 1**) and Alluvium (**Technical Report 3**). Alluvium (2019) amended its previous report to address the updated longwall layout, including ~~(2018) undertook~~ the detailed modelling that was undertaken 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 (2018; 2019) concluded that the extraction of Longwalls 17 to 20 will have a negligible effect on in-channel storage when compared to existing conditions. The impact of subsidence of the extraction of Longwalls 17 to 20 on flow in North Wambo Creek is minimal. Longwalls 17 to 20 are estimated to result in a reduction in flow volume of 0.02% ~~0.86%~~ for a 1 in 2 year Annual Recurrence Interval rainfall event.

WCPL proposes to maintain ~~the predicted~~ 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 Diversion.

Alluvium (2019) considers that management measures can be put in place to reduce the risk of an increase in suspended sediments in the North Wambo Creek Diversion to negligible.

HydroSimulations (**Technical Report 2**) estimates that increased leakage from the North Wambo Creek Diversion to the underground workings could conservatively be up to 12.5 megalitres per day (ML/day) prior to remediation during periods of flow (reducing significantly following remediation). No increase in groundwater inflows to the workings in the Whybrow Seam following rainfall events has been observed as part of the experience to date.

Management and remediation measures to mitigate the risk of scour and leakage associated with Longwalls 17 to 20 are summarised in **Section 3.1**.

Ephemeral Drainage Lines

The unnamed ephemeral drainage lines above Longwalls 17 to 20 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**) amended its previous report to address the updated longwall layout, including the ~~undertook~~ detailed modelling undertaken 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.

Alluvium (2019) concluded that an additional batter chute~~s~~ will be required to manage the flows from ephemeral drainage lines into the North Wambo Creek Diversion. Erosion impacts and/or cracking will be managed using techniques developed and used elsewhere at the Wambo Coal Mine.

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

Potential subsidence impacts and environmental consequences on North Wambo Creek were assessed in the South Bates Extension Modification EA (WCPL, 2017).

North Wambo Creek is located more than 400 m to the north-west of Longwalls 17 to 20, and at this distance, it is unlikely that North Wambo Creek would experience adverse impacts due to the extraction of Longwalls 17 to 20 (MSEC, 2018).

Potential subsidence impacts and environmental consequences on the natural section of North Wambo Creek upstream of the Diversion will be the subject of a future Extraction Plan that includes Longwalls 23, 24 and/or 25.

2.2 RISK ASSESSMENT

A Subsidence Risk Assessment (Operational Risk Mentoring, 2018) for Longwalls 17 to 20 was undertaken to identify subsidence impacts with high risk levels and/or potentially severe consequences, including a workshop conducted in February 2018. 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 17 to 20 could be managed at a tolerable level of risk (**Technical Report 4**).

A summary of the key potential consequences/hazards associated with Longwalls 17 to 20, 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.

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 in late 2016 and in 2017 to obtain input on the proposed management approaches;
- consultation with registered Aboriginal parties in accordance with the 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 17 to 20 has not changed compared to the layout and timing presented and assessed in the South Bates Extension Modification EA.

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

Subject Area	Potential Consequence/Hazard	Extraction Plan Reference
Natural Features	North Wambo Creek Diversion damaged by subsidence resulting in reduced flow affecting downstream water quality.	**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 Diversion 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 17 to 20.	
	Reduced base flow to North Wambo Creek and the North Wambo Creek Diversion resulting from a lowering of the water table associated with the extraction of Longwalls 17 to 20.	
	Mine subsidence impacts resulting in impacts on vegetation along the North Wambo Creek Diversion.	**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 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 17 to 20 resulting in long-term loss of native vegetation.	
	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 buried power lines and communication cables.	
	Subsidence impact on proposed Montrose Water Storage Dam.	
	North Wambo Creek Diversion damaged by subsidence (surface cracking along diversion directly above Longwall 17) resulting in inflow to workings and delay to operations.	**Section 3.1** and WMP (**Appendix A**)
Other	Unanticipated subsidence remediation and/or rework of remediation required due to subsidence controls and/remediation implemented not meeting regulator expectations.	**Section 2.3** and MOP (**Appendix I**)
	Impacts on access for firefighting or fire management purposes over Longwalls 17 to 20.	**Section 3.6** and PSMP (**Appendix F**)

Source: After Operational Risk Mentoring (**Technical Report 4**).

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 17 to 20 Application Area, therefore the LMP was not distributed for comment.

Table 8
Summary of Consultation with Government Agencies

Agency	Consultation Conducted	Key Issues Raised
DP&E	• 29 January 2018 – endorsement of Extraction Plan team for Longwalls 17 to 20 and confirmation that an independent audit under Condition 37, Schedule 4 was not required prior to lodgement of the Extraction Plan. • April 2018 – provided with a copy of the Extraction Plan for Longwalls 17 to 20. • 4 September 2018 – notified by WCPL that changes to the layout for Longwalls 18 to 20 may be required as a result of geological structures. WCPL requested that the Extraction Plan be approved to allow extraction of Longwall 17 only. • 7 September 2018 – DP&E approved the extraction of Longwall 17 only, on the basis that WCPL would prepare an amended Extraction Plan for Longwalls 18, 19 and 20. • March 2019 – provided with a copy of the Extraction Plan for Longwalls 17 to 20 (Revision B).	• 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 a new 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 new MOP (2018-2020). • April 2018 – provided with a copy of the Extraction Plan for Longwalls 17 to 20. • September 2018 – consultation on first workings for Longwall 17. • March 2019 – provided with a copy of the Extraction Plan for Longwalls 17 to 20 (Revision B).	• 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. • 10 April 2018 – provided with draft revisions to the following plans: – Groundwater Monitoring Program. – Surface Water Monitoring Program. – Surface and Groundwater Response Plan. – Erosion and Sediment Control Plan. • April 2018 – provided with a copy of the Extraction Plan for Longwalls 17 to 20. • March 2019 – provided with a copy of the Extraction Plan for Longwalls 17 to 20 (Revision B).	• No issues raised to date.

Table 8 (Continued)
Summary of Consultation with Government Agencies

Agency	Consultation Conducted	Key Issues Raised
NSW Office of Environment and Heritage (OEH)	• 3 May 2017 – submission on the South Bates Extension Modification EA requested implementation of monitoring and management measures. • 23 March 2018 – draft revised BMP provided. • 23 March 2018 – OEH advised it would not be providing comments on the BMP. • 12 April 2018 – draft revised HMP provided. • April 2018 – provided with a copy of the Extraction Plan for Longwalls 17 to 20. • March 2019 – provided with a copy of the Extraction Plan for Longwalls 17 to 20 (Revision B).	• 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**).
Heritage Division, within OEH	• 2 May 2017 – submission on the South Bates Extension Modification EA requested a condition requiring archival recoding of the Whynot homestead and outbuildings. • April 2018 – provided with a copy of the Extraction Plan for Longwalls 17 to 20. • March 2019 – provided with a copy of the Extraction Plan for Longwalls 17 to 20 (Revision B).	• Archival recoding of the Whynot homestead and outbuildings (**Section 3.4**).
Department of Industry – Water (DI-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. • 19 December 2017 – comments provided on Water Management Plan for Longwalls 11 to 16. • 10 April 2018 – provided with draft revisions to the following plans: – Groundwater Monitoring Program. – Surface Water Monitoring Program. – Surface and Groundwater Response Plan. – Erosion and Sediment Control Plan. • April 2018 – provided with a copy of the Extraction Plan for Longwalls 17 to 20. • 5 June 2018 – NRAR provided comments on the GWMP and SGWRP (dated 30 May 2018). • 26 June 2018 – WCPL provided a response to the four comments raised by NRAR. No changes to the WMP, GWMP or SGWRP were considered necessary to address NRAR's comments. • 26 September 2018 – WCPL met with NRAR to discuss revised layout of Longwalls 17 to 20 and amendment of Extraction Plan. No specific requests for updates to the WMP, GWMP, SGWMP or SGWRP were made at the meeting.[1] • March 2019 – provided with a copy of the Extraction Plan for Longwalls 17 to 20 (Revision B).	• 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 (not relevant to this Extraction Plan – refer **Section 2.1.2** and **Attachment 3**). • Accounting of passive take of water against licences held/required (refer Section 1.4 of the GWMP in **Appendix A**).

Table 8 (Continued)
Summary of Consultation with Government Agencies

Agency	Consultation Conducted	Key Issues Raised
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. • April 2018 – provided with a copy of the Extraction Plan for Longwalls 17 to 20. • March 2019 – provided with a copy of the Extraction Plan for Longwalls 17 to 20 (Revision B).	• No issues raised to date.
Subsidence Advisory NSW	• 6 July 2017 – submission on South Bates Extension Modification EA raised no issues. • April 2018 – provided with a copy of the Extraction Plan for Longwalls 17 to 20. • March 2019 – provided with a copy of the Extraction Plan for Longwalls 17 to 20 (Revision B).	• 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. • April 2018 – provided with a copy of the Extraction Plan for Longwalls 17 to 20. • February 2019 – provided with a copy of the Extraction Plan for Longwalls 17 to 20 (Revision B).	• No issues raised to date.

[1] GWMP = Groundwater Monitoring Program; SWMP = Surface Water Monitoring Program; SGWRP = Surface and Groundwater Response Plan.

Table 9
Management Plans Distributed for Comment

Management Plan	Agencies	Date Distributed
Water Management Plan (WMP)	DI-Water, EPA	10 April 2018[1]
	DP&E, DI-Water, EPA	April 2018 (Longwalls 17 to 20)
	DP&E, DI-Water, EPA	February 2019 (Revision B)
Biodiversity Management Plan (BMP)	OEH	23 March 2018 (Longwalls 17 to 20)
	DP&E, OEH	April 2018 (Longwalls 17 to 20)
	DP&E, OEH	February 2019 (Revision B)
Heritage Management Plan (HMP)	Registered Aboriginal Parties	9 March 2018 (Longwalls 17 to 20)
	OEH	11 April 2018 (Longwalls 17 to 20)
	DP&E, OEH, Heritage Division (OEH)	April 2018 (Longwalls 17 to 20)
	DP&E, OEH, Heritage Division (OEH)	February 2019 (Revision B)
Subsidence Monitoring Program (SMP)	NSW Resources Regulator	April 2018 (Longwalls 17 to 20)
	NSW Resources Regulator	February 2019 (Revision B)

[1] On 10 April 2018, DI-Water and EPA were provided with draft revisions to the complex-wide Groundwater Monitoring Program, Surface Water Monitoring Program, Surface and Groundwater Response Plan and Erosion and Sediment Control Plan.

2.3.2 Infrastructure Owners

All infrastructure within the Longwalls 17 to 20 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 17 to 20 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 56A, Schedule 4 of the Development Consent (DA 305-7-2003).

A draft revision of the complex-wide HMP (incorporating management associated with Longwalls 17 to 20) was provided to Aboriginal parties registered at the Wambo Coal Mine in March 2018 for their review and comment (**Appendix D**). The HMP was also updated to address the conditions of AHIP #C0003213. No comments from Aboriginal parties were received.

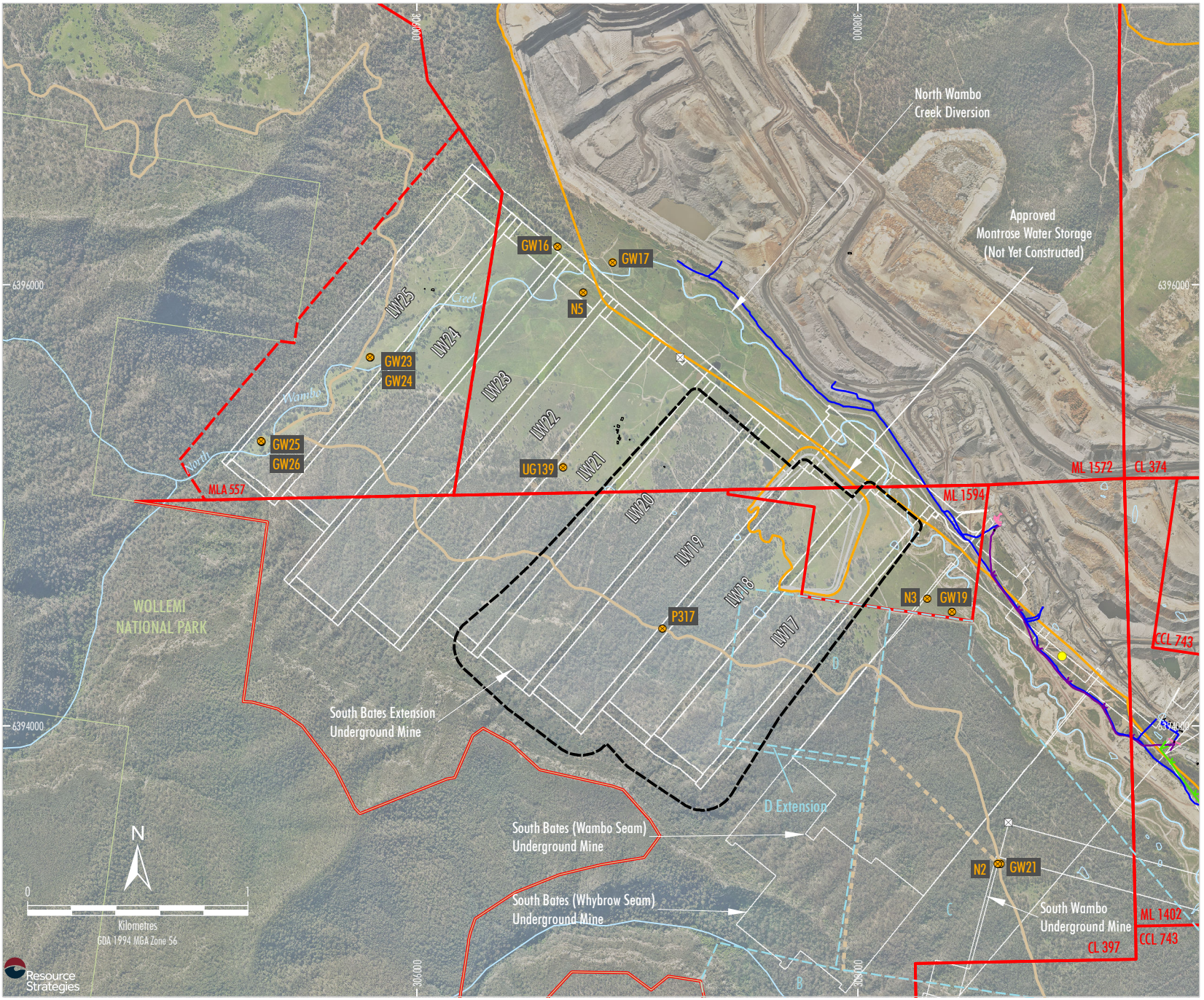
3 SUBSIDENCE MANAGEMENT AND MONITORING

Surface and sub-surface features within, or in the vicinity of, the Longwalls 17 to 20 Application Area are listed in **Table 10**. These features may be potentially impacted by the secondary extraction of Longwalls 17 to 20. 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**.

The Longwalls 17 to 20 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 17 to 20 Application Area known to have been constructed prior to the declaration of the Mine Subsidence District.

Table 10
Surface and Sub-surface Features

Feature	Section/Management Plan Reference
Natural Features	
Ephemeral drainage lines	**Section 3.1** and WMP (**Appendix A**)
Permian aquifers	
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**)
Buried 11 kilovolt (kV) powerlines, telecommunication and fibre optic cables	**Section 3.5** and BFMP (**Appendix E**)
Water supply pipelines and associated pumps and ancillary infrastructure	
Groundwater monitoring bore (P317)	
Montrose West Open Cut pit walls and emplacement areas	
Montrose Water Storage Dam	
Fences	
Exploration drill holes	
Unsealed roads/tracks	
Site access tracks/fire trails	
Farm dams	
Exploration plant that may be located in the area	
Drainage culverts	
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: NSW Department of Industry (2017); WCPL (2019, 2016)
Orthophoto: WCPL (May 2017)

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Location of Built Features

Figure 9

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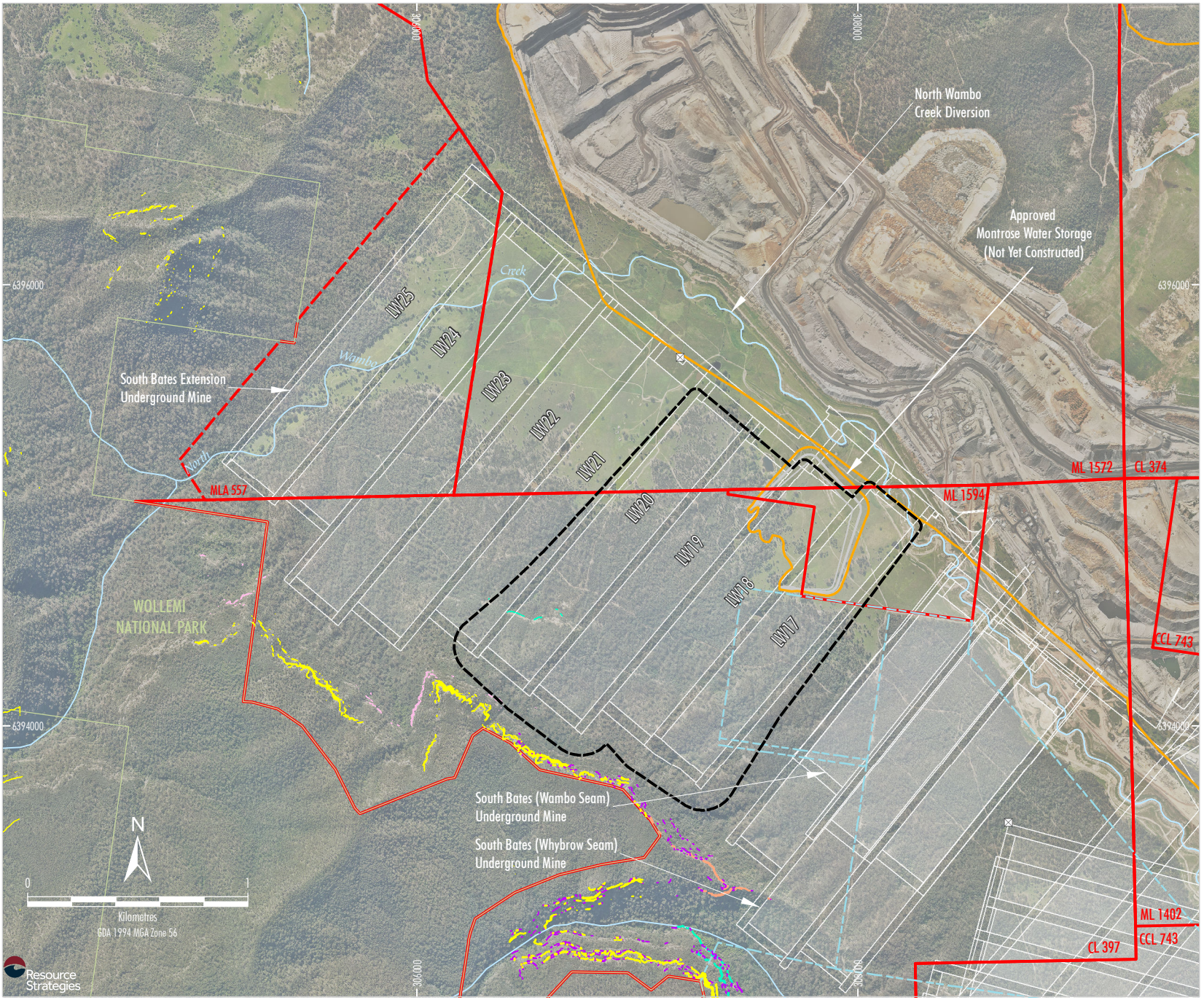

LEGEND

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

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Cliffs in the Vicinity of Longwalls 17 to 20

Figure 10

WAM-09-15_SBX_EP_LW17-20_208B

The approved location for the Montrose Water Storage Dam is above the north-eastern end of Longwalls 17 to 19. The Montrose Water Storage Dam will not be constructed until after the completion of Longwalls 17 to 20.

The Longwalls 17 to 20 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 17 to 20 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) (revisions to this plan proposed as part of this Extraction Plan revision) (Version 12);
  - Groundwater Monitoring Program (GWMP) (revisions to this plan proposed as part of this Extraction Plan revision) (Version 12);
  - Surface and Groundwater Response Plan (SGWRP) (revisions to this plan proposed as part of this Extraction Plan revision) (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 15).
- Heritage Management Plan (HMP) (complex-wide consolidated plan) (revisions to the plan proposed as part of this Extraction Plan revision) (Version 6).
- Health Safety Management System (HSMS) as summarised in the HSMS Overview.

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 17 to 20 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 17 to 20 Application Area.

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

The SWMP, GWMP and SGWRP (that form part of the Water Management Plan) incorporate a number of revisions to augment the monitoring programs to account for Longwall 17 to 20 and to address issues raised by DI-Water. These additional components of the monitoring program include:

- installation of an upstream flow gauge site on North Wambo Creek (US FM1);
- inclusion of two multi-level vibrating wire piezometers (VWPs) (sites P317 and UG139) to monitor depressurisation above the South Bates Extension Underground Mine; and
- installation of shallow monitoring bores adjacent to North Wambo Creek upstream of the North Wambo Creek Diversion (sites GW23, GW24, GW25 and GW26).

Alluvium (2018; 2019) reviewed the current subsidence and diversion monitoring program in the SWMP and concluded it provides appropriate and sufficient coverage for Longwalls 17 to 20.

As outlined in **Attachment 3**, the Extraction Plan that covers future Longwalls 23 to 25 will take into account the findings of the Groundwater Dependent Ecosystem Study required under Condition 36A, Schedule 4 of the Development Consent (DA 305-7-2003) and not less than 2 years of monitoring results obtained from GW23, GW24, GW25, GW26, P317 and UG139.

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 17 to 20 against these performance indicators is summarised in **Section 3.8** and **Appendix H**.

The procedure followed to assess the extraction of Longwalls 17 to 20 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 17 to 20

Issue	Approved Impact	Revised Impact	Monitoring	Management
Surface Water				
North Wambo Creek Diversion	• Minor increased ponding over Longwall 17.[1] • Potential for surface cracking above Longwall 17 (similar to that observed above Longwall 11) and minor cracking along the section of the North Wambo Creek Diversion not located directly above the longwalls.[1] • Potential for increased scour (and associated suspended solids) prior to the implementation of scour protection works.[1] • Potential for increased leakage from the North Wambo Creek Diversion prior to crack remediation works.[1]	• Minor cracking along the section of the North Wambo Creek Diversion not located directly above the longwalls.[2, 3] • Potential for increased scour (and associated suspended solids) prior to the implementation of scour protection works.[2, 3] ~~• Impacts resulting from the extraction of Longwalls 17 to 20 will be consistent with those presented in the South Bates Extension Modification EA.[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. • Daily visual inspections when extraction is occurring directly beneath North Wambo Creek Diversion. • 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 remediation prior to extraction under the North Wambo Creek Diversion. • Remediation of all visible surface cracks in the low flow channel as soon as practicable (nominally within two weeks, pending weather conditions). • Installation of scour protection works in areas that may be vulnerable to scour following completion of subsidence. • Construction of a new batter chute~~s~~ to manage overland flow entry to the North Wambo Creek Diversion 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. • Implementation of the SGWRP.

Table 11 (Continued)
Water Management Issues Associated with the Extraction of Longwalls 17 to 20

Issue	Approved Impact	Revised Impact	Monitoring	Management
Ephemeral Drainage Lines	• Localised increased ponding and surface cracking.[1]	• Impacts resulting from the extraction of Longwalls 17 to 20 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. • Construction of a new batter chute~~s~~ to manage overland flow entry to the North Wambo Creek Diversion following completion of subsidence. • Post-subsidence assessment of impacts to 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 17 to 20 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**).

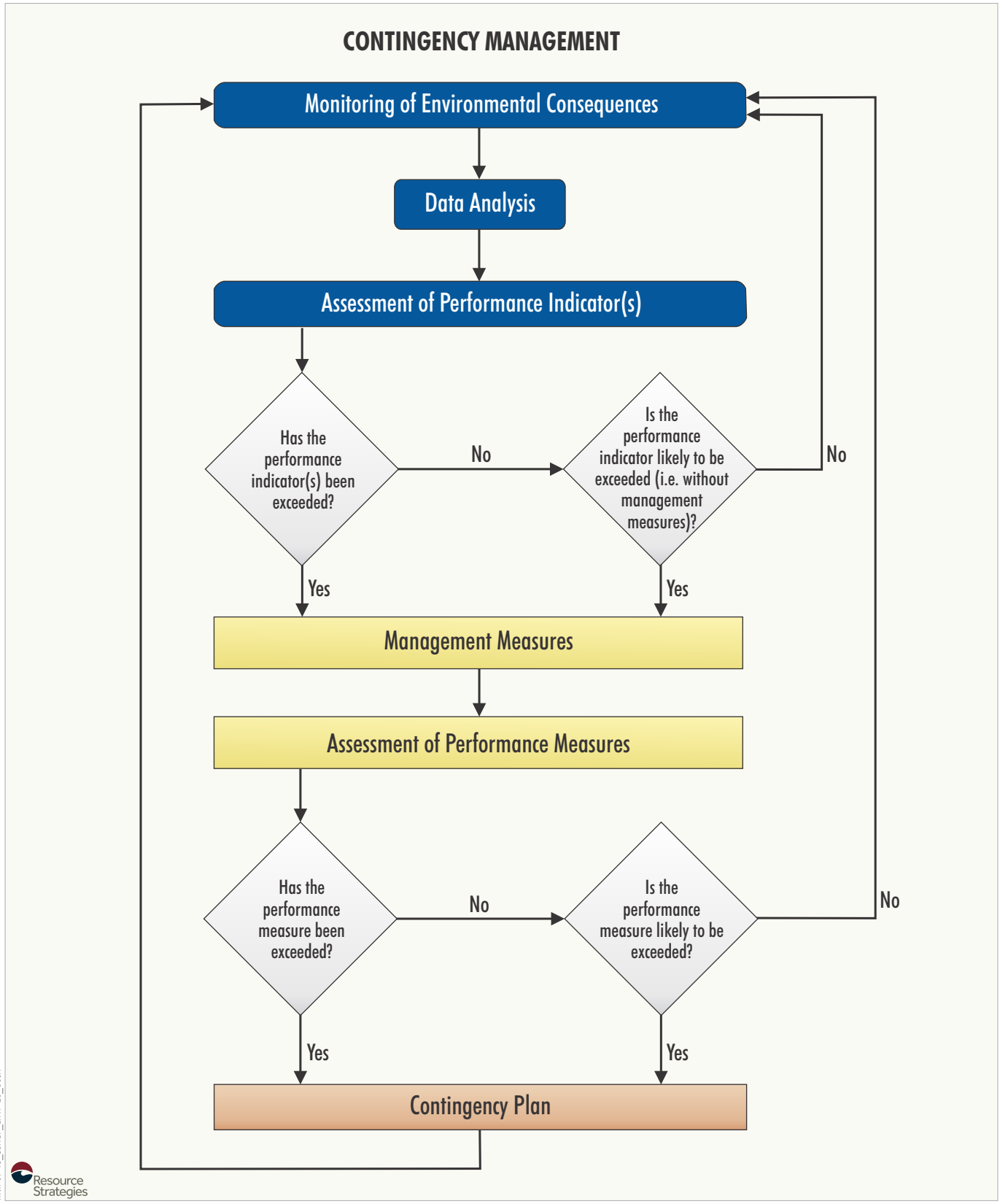
3 After MSEC (**Technical Report 1**).

4 After HydroSimulations (**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 17 to 20

Performance Measure	Performance Indicator(s)	Relevant Management and Contingency Measures
Wollombi Brook Negligible subsidence impacts. Negligible 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.



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Resource Strategies

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 17 to 20 Application Area and cliffs in the vicinity of the Longwalls 17 to 20 Application Area (**Figure 3**).

The LMP references components of the ESCP.

3.2.2 Key Land Issues, Monitoring and Management Measures

The Longwalls 17 to 20 Application Area is wholly located on WCPL-owned land and land uses include the North Wambo Creek Diversion, RWEP areas and, occasionally, the agistment of stock.

MSEC (**Technical Report 1**) identified cliffs near the Wollemi National Park escarpment and over the Longwalls 17 to 20 Application Area 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 Longwall 20 and the adjacent Longwall 21 could be impacted.[1]

Potential impacts on agricultural activities within the Longwalls 17 to 20 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**.

[1] The total length of the low level cliffs is approximately 150 m (MSEC, 2018). 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 17 to 20

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 17 to 20 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. • Visual observations of low lying areas (i.e. the North Wambo Creek Diversion) following significant rainfall events.	• 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 re-grading and re-compacting the surface. • 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. • Repair of fences prior to allowing access for agistment grazing. • Management measures in accordance with the ESCP.

Table 13 (Continued)
Land Management Issues Associated with the Extraction of Longwalls 17 to 20

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 17 to 20 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 Longwall 20 and the adjacent Longwall 21 could be impacted.[1]	• Impacts resulting from the extraction of Longwalls 17 to 20 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 DP&E and NSW Resources Regulator (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 the WMP (**Section 3.1**).	• Addressed in the WMP (**Section 3.1**).	• Addressed in the WMP (**Section 3.1**).	• Addressed in the WMP (**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 17 to 20 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 17 to 20.

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 to monitor.

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 17 to 20 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 17 to 20 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 17 to 20 are presented in the BMP and are summarised in **Table 15**. Monitoring conducted to inform the assessment of the extraction of Longwalls 17 to 20 against these performance indicators is summarised in **Section 3.8** and **Appendix H**.

The procedure followed to assess the extraction of Longwalls 17 to 20 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 17 to 20. Monitoring relevant to these communities will be addressed in subsequent Extraction Plans. Similarly, there are no "other threatened species, populations or communities" not covered by a performance measure that require consideration.

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 17 to 20 are outlined in **Table 15**.

Table 14
Biodiversity Management Issues Associated with the Extraction of Longwalls 17 to 20

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]	• No increase in ponding of surface water is predicted. Topographical depressions previously predicted to occur over the finishing ends of Longwalls 17 to 20 are now predicted to develop coinciding with an existing farm dam.[2] • As no increased ponding 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). • ~~Impacts resulting from the extraction of Longwalls 17 to 20 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 17 to 20 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]	• It is unlikely that North Wambo Creek would experience adverse impacts due to the extraction of Longwalls 17 to 20[2]. • Potential impacts on aquatic habitat along North Wambo Creek will be addressed in future Extraction Plan(s).		

Table 14 (Continued)
Biodiversity Management Issues Associated with the Extraction of Longwalls 17 to 20

Issue	Approved Impact	Revised Impact	Monitoring	Management
Wollemi National Park	• No material subsidence to the Wollemi National Park.[1]	• Impacts resulting from the extraction of Longwalls 17 to 20 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 17 to 20, 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 17 to 20

Performance Measure	Performance Indicator(s)	Relevant Management and Contingency Measures
Wollemi National Park Negligible subsidence impacts. Negligible 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 17 to 20 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).

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 17 to 20 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 17 to 20 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 outside of the Longwalls 17 to 20 Application Area and are predicted to experience less than 20 mm vertical subsidence due to the extraction of Longwalls 17 to 20. It is unlikely that the Whynot homestead and associated structures would experience adverse impacts due to the extraction of Longwalls 17 to 20.

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 the Longwalls 17 to 20 Application Area 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 17 to 20. 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 17 to 20 are presented in the HMP and are summarised in **Table 16**. Monitoring conducted to inform the assessment of the extraction of Longwalls 17 to 20 against the performance indicators is summarised in **Section 3.8** and **Appendix H**. The procedure followed to assess the extraction of Longwalls 17 to 20 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 17 to 20

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 17 to 20 will be consistent with those presented in the South Bates Extension Modification EA.[3] • Rock shelter Sites 500, 501, 502, 507 – very unlikely for adverse impacts from Longwalls 17 to 20 (<10% probability).[3] • Rock shelter Site 499 – very unlikely for adverse impacts from Longwalls 17 to 20 (<10% probability). Site 499 will be subject to further subsidence movements from a future approved longwall (Longwall 21).[3] • Potential scarred tree Site 324 – potential for adverse impacts is assessed as rare (i.e. less than 5 %). Site 324 will be subject to further subsidence movements from a future approved longwall (Longwall 21).[3] • Open Artefact Site 231 – reduced subsidence predictions and potential impacts.[3]	• 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 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 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 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 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 OEH when required.

Table 16 (Continued)
Heritage Management Issues Associated with the Extraction of Longwalls 17 to 20

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 17 to 20 will be consistent with those presented in the South Bates Extension Modification EA. • The Whynot homestead and associated structures are predicted to experience less than 20 mm vertical subsidence due to the extraction of Longwalls 17 to 20. It is unlikely that the Whynot homestead and associated structures would experience adverse impacts due to the extraction of Longwalls 17 to 20.[3] • The Whynot homestead will be subject to further subsidence movements from a future approved longwall (Longwall 21).[3] The impacts on the structures associated with Longwall 21 will be addressed in a future Extraction Plan.	• No monitoring required.	• The "Whynot" homestead and outbuildings have been archivally recorded in accordance with Condition 62A, Schedule 4 of the Development Consent (DA 305-7-2003). • Demolition of the structures may be considered by WCPL if the structure(s) present an ongoing safety concern.

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

2 Copies of these reports were provided to all Aboriginal parties registered at the Wambo Coal Mine and to the OEH.

3 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 17 to 20 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 17 to 20 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 17 to 20 Application Area does not intersect the Notification Area of any Prescribed Dam gazetted under the *Dams Safety Act, 1978*.

There is one State survey control mark ~~within~~ in the vicinity of the Longwalls 17 to 20 Application Area, located ~~above~~ to the north-west of the maingate of Longwall 20 (MSEC, 2018). WCPL will manage the impacts of mine subsidence on this survey mark 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 17 to 20 are presented in the WAMP and summarised in **Table 18**. Monitoring conducted to inform the assessment of the extraction of Longwalls 17 to 20 against these performance indicators is summarised in **Section 3.8** and **Appendix H**. The procedure followed to assess the extraction of Longwalls 17 to 20 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 17 to 20

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. • 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. • Assessment of water pipelines and provision of sufficient slack in pipelines for subsidence. • Assessment of bores and decommissioning and sealing prior to extraction if required (dependent on condition). • 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. • Provision of a 15 m separation barrier around the Montrose West Open Cut pit walls. • Structural assessment of WCPL assets post-Longwalls 17 to 20 extraction. • Repair of WCPL assets in accordance with associated standards and procedures.

Table 18
Built Feature Performance Measures, Performance Indicators and Contingency Measures for Longwalls 17 to 20

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 17 to 20.

Scope: Risks to public safety associated with extraction of Longwalls 17 to 20 at the South Bates Extension Underground Mine (**Figure 3**).

Hazards: The primary hazards associated with the extraction of Longwalls 17 to 20 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 17 to 20 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 17 to 20 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 17 to 20 (**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 17 to 20 against this performance indicator is summarised in **Section 3.8** and **Appendix H**.

The procedure followed to assess the extraction of Longwalls 17 to 20 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 17 to 20

Issue	Approved Impact	Revised Impact	Monitoring	Management
Agistees accessing the Longwalls 17 to 20 Application Area to manage stock. Unauthorised access to the Longwalls 17 to 20 Application Area (e.g. looking for firewood, hunting or horse riding). Members of the Rural Fire Service accessing the Longwalls 17 to 20 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 17 to 20 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.	• 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. • 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. • 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. • Management of surface cracking and areas of subsidence troughs in accordance with the LMP (**Table 13**). • Management of potential cliff or 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 2018 – 2020* (MOP) was approved by the DRG (now NSW Resources Regulator) on 1 February 2018, and incorporates Longwalls 17 to 20. The DRG (now NSW Resources Regulator) has 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).

Rehabilitation associated with subsidence impacts from the extraction of Longwalls 17 to 20 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).

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 17 to 20. 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.
- 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 17 to 20 Monitoring Program Summary

Management Plan	Monitoring Component	Parameter	Frequency
Water Management Plan	Bed and bank stability.	• Monitoring to distinguish between erosion from mine subsidence instability and erosion from other causes along North Wambo Creek Diversion and Stony Creek.	• In accordance with the SWMP.
	Monitoring of surface water quality and flow monitoring sites.	• Monitoring of surface water flow and quality along 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.	• Monitoring of groundwater level and quality 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 SWMP.
	Diversion and subsidence monitoring program for the North Wambo Creek Diversion.	• As outlined in the SWMP, including: monitoring of IDC; 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 Diversion.	• Inspections for surface cracking and/or surface ponding.	• Daily inspections when extraction is occurring directly beneath North Wambo Creek Diversion.
Land Management Plan	Fences.	• Visual observation to record the condition of fences.	• Prior to secondary extraction of Longwalls 17 to 20. • 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 17 to 20.

Table 20 (Continued)
Longwalls 17 to 20 Monitoring Program Summary

Management Plan	Monitoring Component	Parameter	Frequency
Land Management Plan (Cont.)	Ground surface.	• Visual observation 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 17 to 20. • Monthly inspections during secondary extraction of Longwalls 17 to 20, increased to weekly inspections during extraction within 100 m of the North Wambo Creek Diversion.
	Low lying areas.	• Visual observations of low lying areas (i.e. the North Wambo Creek Diversion) to identify potential surface ponding.	• Following a significant rainfall event (i.e. 40 mm within 24 hours).[1]
	Cliffs[2].	• Visual observations of cliffs[2] for signs of recent rock fall and/or instability (high definition video/photos recorded via an UAV).	• Prior to, and following completion of, secondary extraction of each of Longwalls 17 to 20.
	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.	• 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 17 to 20 and following completion of each longwall in accordance with the LMP.
Heritage Management Plan	Artefact scatters and isolated finds.	• 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 17 to 20 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 507.	• Following completion of secondary extraction of Longwall 20.

Table 20 (Continued)
Longwalls 17 to 20 Monitoring Program Summary

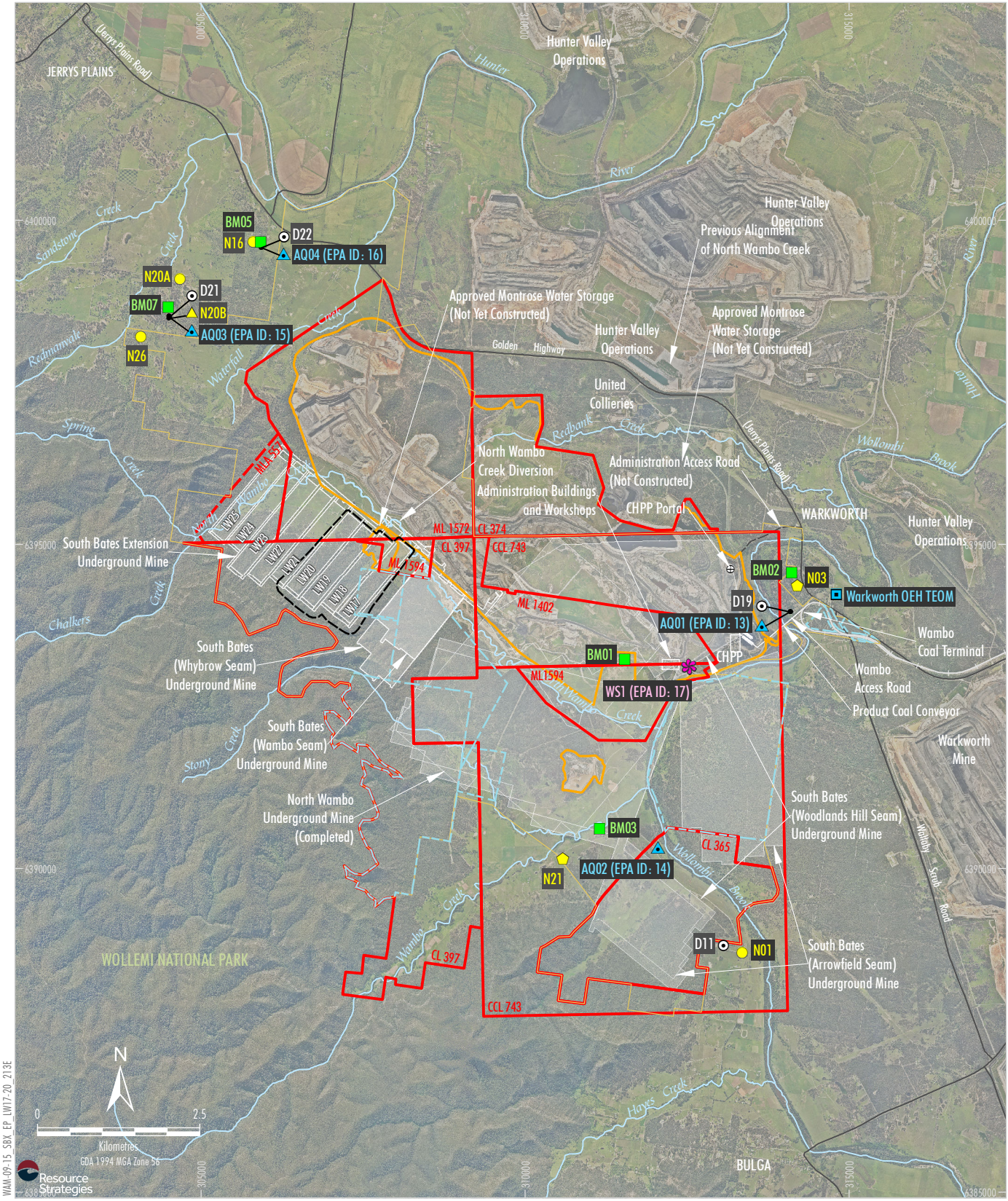
Management Plan	Monitoring Component	Parameter	Frequency
Built Features Management Plan – WCPL Asset Management Plan	All built features.	• Visual observations to record the general condition of WCPL assets including safety and serviceability.	• Prior to secondary extraction within 1,000 m of WCPL assets. • Monthly inspection during secondary extraction of Longwalls 17 to 20.
	Active service lines.	• Visual observations to record the general condition of WCPL active service lines including safety and serviceability.	• Daily inspections commencing when secondary extraction is within 100 m of WCPL active service lines and undertaken until the active mining face is 100 m past the line.
	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.
	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.
	Mine dewatering and water supply pipelines.	• Monitoring of pipeline integrity at fixed points. • Monitoring to detect abnormal changes in flow.	• Daily inspections commencing when secondary extraction is within 100 m of WCPL active service lines and undertaken until the active mining face is 100 m past the pipeline. • Continuous (SCADA) monitoring of pump and pipeline conditions.

Table 20 (Continued)
Longwalls 17 to 20 Monitoring Program Summary

Management Plan	Monitoring Component	Parameter	Frequency
Public Safety Management Plan	Fences.	• Visual observation to record the condition of fences.	• Prior to secondary extraction of Longwalls 17 to 20. • 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 17 to 20.
	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 17 to 20.	• Prior to secondary extraction of Longwalls 17 to 20. • Monthly inspections during secondary extraction of Longwalls 17 to 20.
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.	• Inspected 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 would 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 17 to 20.



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: Department of Lands (2017); WCPL (2019)
Orthophoto: WCPL (May 2017)

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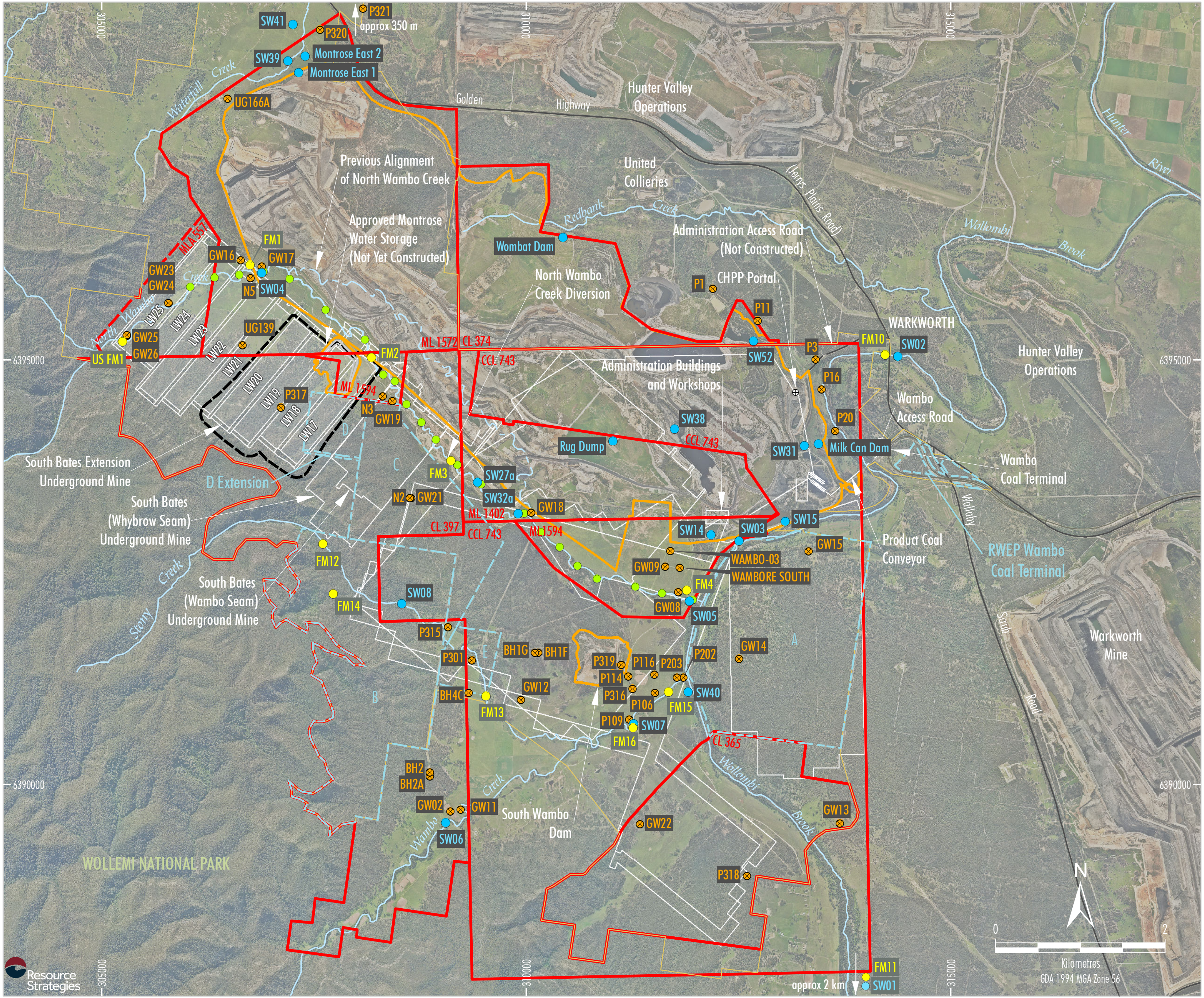
WAMBO COAL MINE

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
- IDC Monitoring Location

Source: Department of Lands (July 2017); WCPL (2019); Orthophoto: WCPL (May 2017)

N

0 — 2 Kilometres

GDA 1994 MGA Zone 56

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WAMBO COAL MINE

Locations of Surface Water and Groundwater Monitoring Sites

Figure 13

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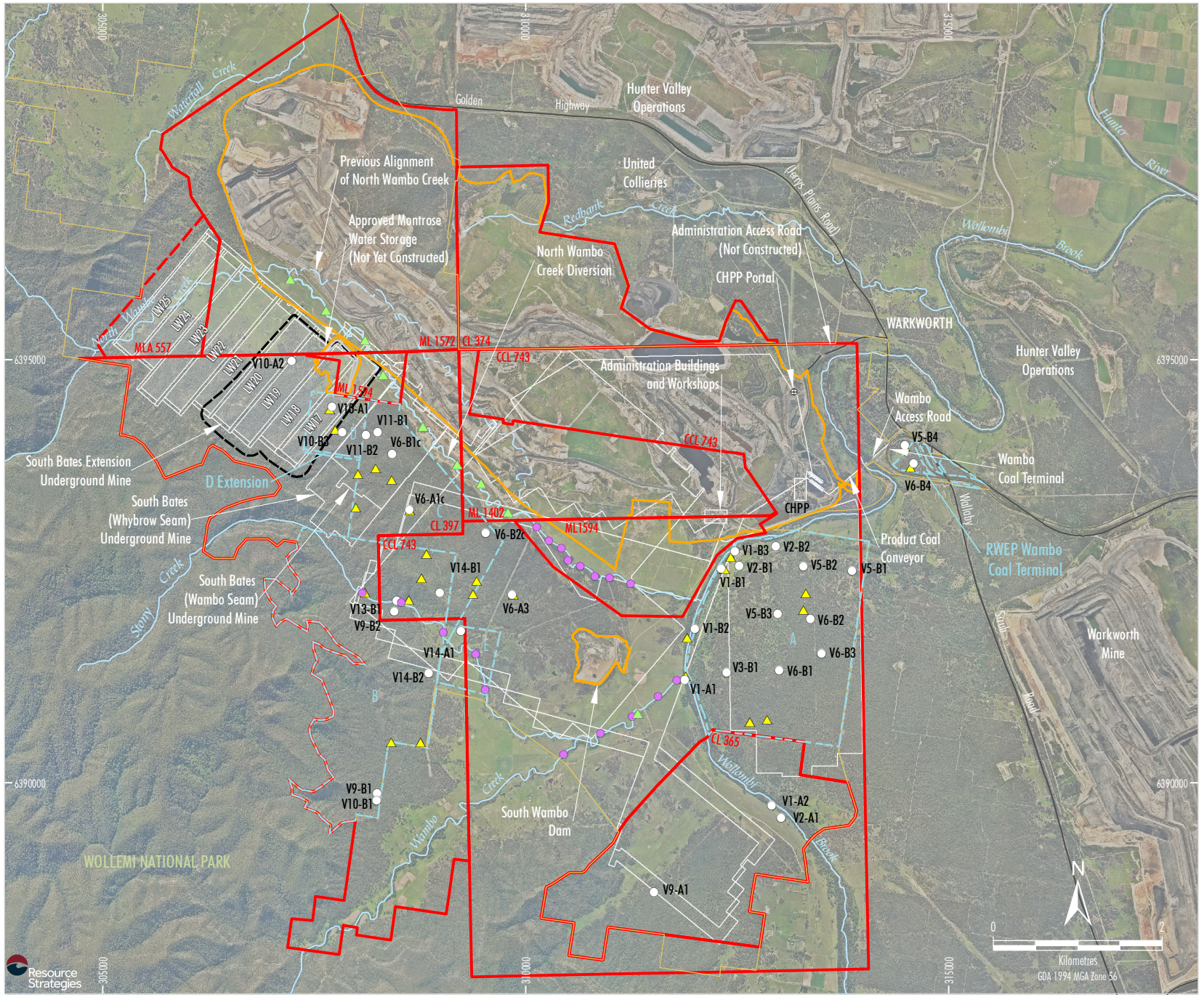

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Locations of Relevant Biodiversity Monitoring Sites

Figure 14

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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.

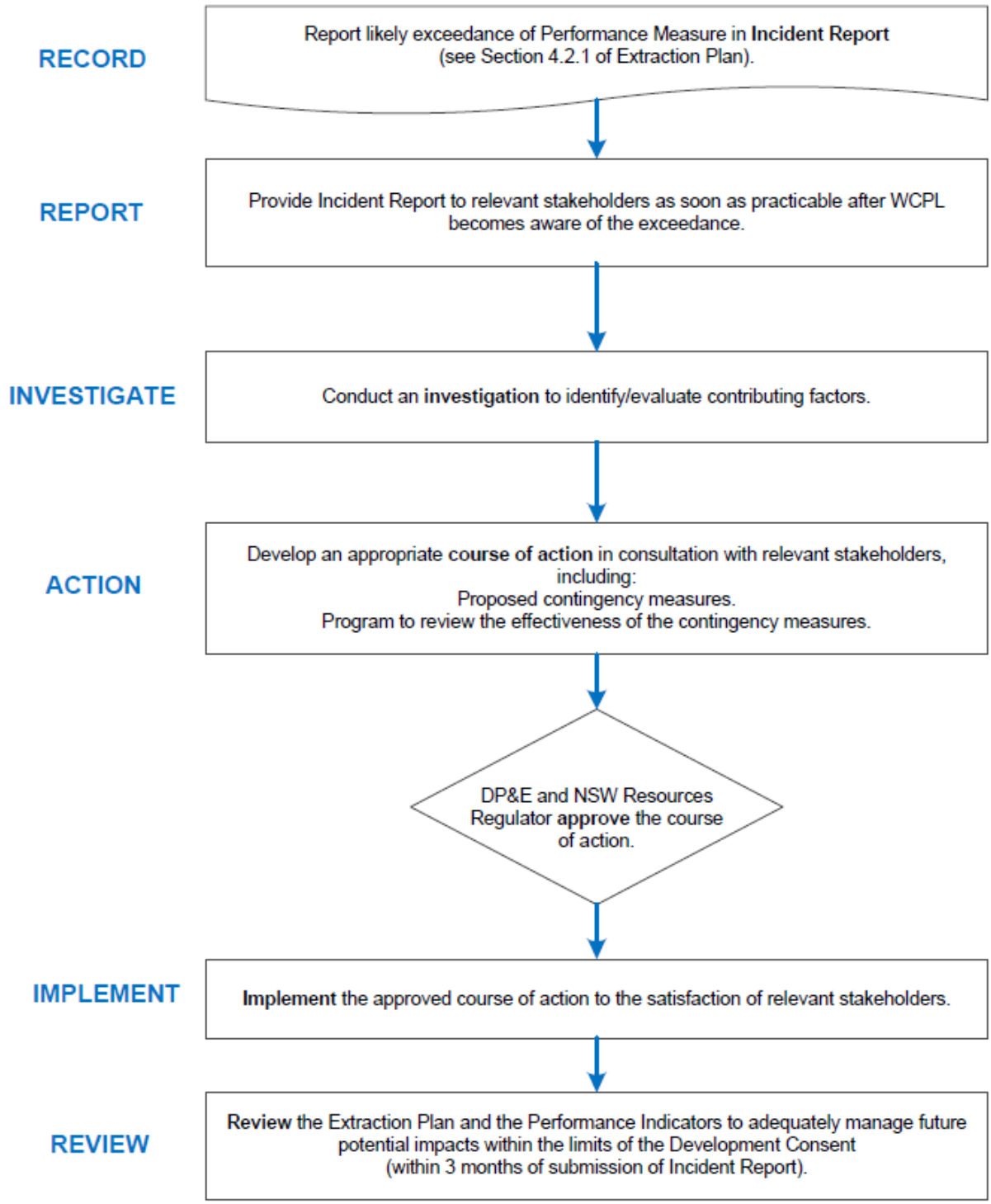
Changes to longwall geometry would be implemented through WCPL's internal Mine Plan Design Alteration procedure (SWP 9004) administered by the Mine Surveyor.

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 DP&E and relevant agencies (e.g. OEH, NSW Resources Regulator, DI-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 17 to 20 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**	DP&E (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 new impacts are identified or upon request.	DP&E (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)	DP&E (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)	DP&E (Manager, Mining Projects) NSW Resources Regulator (Subsidence Executive Officer) NSW Resources Regulator (Manager Environmental Sustainability) Subsidence Advisory NSW (District Manager) OEH/EPA (General Contact) DI-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 new impacts are identified or upon request from DP&E 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 5 of Schedule 6 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:

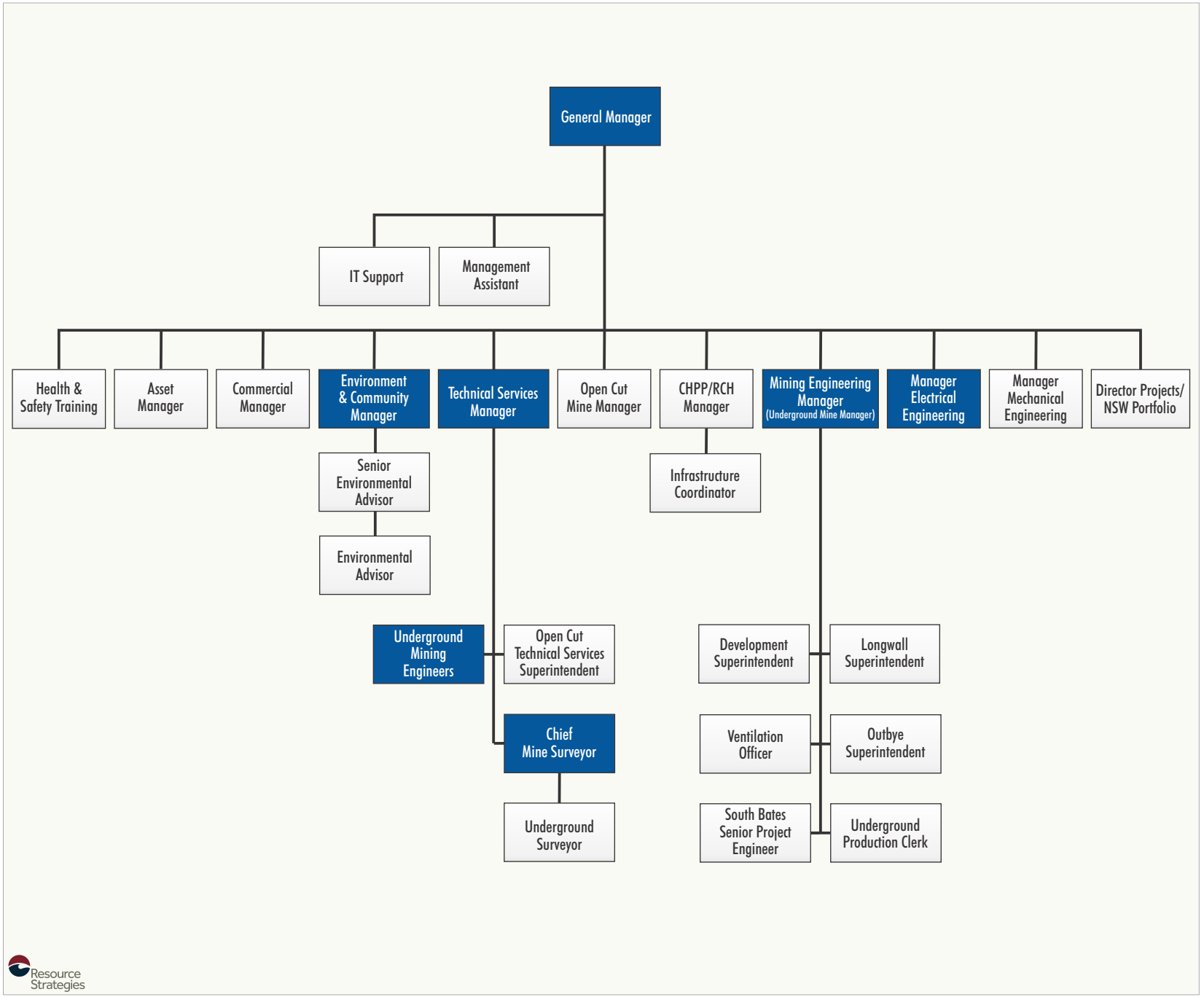
- SWMP (Version 12);
- GWMP (Version 12);
- SGWRP (Version 12); ~~and~~
- BMP (Version 15); and
- HMP (Version 6).

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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WCPL Organisation Structure

Resource Strategies

WAM-09-15_SBX EP_LW17-20_004A

Figure 15

5 REFERENCES

Alluvium (2018) *Surface Water Technical Report for South Bates Extension Underground Mine (Longwalls 17-20).* Report prepared for Wambo Coal Pty Limited.

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6 ABBREVIATIONS, ACRONYMS AND GLOSSARY

6.1 ABBREVIATIONS AND ACRONYMS

ACHA	Aboriginal Cultural Heritage Assessment
AHIP	Aboriginal Heritage Impact Permit
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
DECCW	NSW Department of Environment, Climate Change and Water
DI-Water	NSW Department of Industry – Water
DMR	NSW Department of Mineral Resources (now DRG)
DP&E	NSW Department of Planning and Environment
DPI	NSW Department of Primary Industries
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 DRG)
DRG	NSW Department of Planning and Environment – Division of Resources and Geoscience (now NSW Resources Regulator)
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
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 tonne
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	TARP	Trigger Action Response Plan
PAD	potential archaeological deposit	TSMP	Threatened Species Management Plan
PSMP	Public Safety Management Plan	UAV	unmanned aerial vehicle
ROM	Run-of-mine	VCP	Vegetation Clearance Protocol
RWEP	Remnant Woodland Enhancement Program	VWP	vibrating wire piezometer
SGWRP	Surface and Groundwater Response Plan	the Wambo Development Project EIS	*Wambo Development Project Environmental Impact Statement* (WCPL, 2003)
SMP	Subsidence Monitoring Program	WAMP	WCPL Asset Management Plan
South Bates Extension Modification EA	*South Bates Extension Modification Environmental Assessment* (WCPL, 2017)	WCPL	Wambo Coal Pty Limited
		WHC	Wambo Homestead Complex
		WMP	Water Management Plan
SWMP	Surface Water Monitoring Program	°	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 Aboriginal heritage sites; 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	Underground workings which establish access to the coal resource area.
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.
Mitigation	Activities associated with reducing the impacts of the development prior to or during those impacts occurring.
Low level cliffs	Low level cliffs as defined in the Subsidence Assessment (Appendix A) of the South Bates Extension Modification Environmental Assessment.
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 by longwall mining or pillar extraction that may result in surface subsidence.
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 upsidence 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.

ATTACHMENT 1

STATUTORY REQUIREMENTS

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) (DP&E and DRE [now DRG], 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 (Schedule 4)</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>22.</td><td>The Applicant must ensure that the development does not cause any exceedances of the performance measures in Table 14A, to the satisfaction of the Secretary.

Table 14A: Subsidence Impact Performance Measures
<table>
<tr><td colspan="2">Water</td></tr>
<tr><td>Wollombi Brook</td><td>Negligible subsidence impacts.
Negligible environmental consequences.
Controlled release of excess site water only in accordance with EPL requirements</td></tr>
<tr><td colspan="2">Cliffs</td></tr>
<tr><td>Low level cliffs</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 within the South Bates Extension Area)</td></tr>
<tr><td colspan="2">Biodiversity</td></tr>
<tr><td>Wollemi National Park</td><td>Negligible subsidence impacts.
Negligible environmental consequences</td></tr>
<tr><td>Warkworth Sands Woodland Community</td><td>Minor cracking and ponding of the land surface or other impact.
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 impact.
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 17 to 20.</td></tr>
</table>

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

<table>
<tr><th>Condition Number (Schedule 4)</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>22. (Cont.)</td><td>Table 14A: 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 impact.
Negligible environmental consequences</td></tr>
<tr><td>Other species, populations or communities listed under the Biodiversity Conservation Act 2016 or the Environment Protection and Biodiversity Conservation Act 1999</td><td>Minor cracking and ponding of the land surface or other impact.
Negligible environmental consequences</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).

Vegetation mapping has not identified any other threatened ecological communities or threatened populations or communities at the South Bates Extension Underground Mine in addition to those described above.

Section 3.4 and Appendix D (Heritage Management Plan).</td></tr>
</table>

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

<table>
<tr><th>Condition Number (Schedule 4)</th><th>Condition</th><th>Document Reference/Comment</th></tr>
<tr><td colspan="3">Performance Measures – Built Features</td></tr>
<tr><td>22A.</td><td>The Applicant must ensure that the development does not cause any exceedances of the performance measures in Table 14B, to the satisfaction of the DRG.

Table 14B: Subsidence Impact Performance Measures<table><tr><td colspan="2">Built Features</td></tr><tr><td>All built features</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>No 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>
<tr><td>22B.</td><td>Any dispute between the Applicant and the owner of any built feature over the interpretation, application or implementation of the performance measures in Table 14B is to be settled by DRG. DRG may seek the advice of the MSB on the matter. Any decision by DRG shall be final and not subject to further dispute resolution under this consent.</td><td>The Longwalls 17 to 20 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).</td></tr>
<tr><td colspan="3">Extraction Plan</td></tr>
<tr><td>22C.</td><td>The Applicant must prepare and implement an Extraction Plan for the second workings within each seam to be mined to the satisfaction of the Secretary. Each Extraction Plan must:
(a) be prepared by a team of suitably qualified and experienced persons whose appointment has been endorsed by the Secretary;
(b) be approved by the Secretary before the Applicant carries out any of the second workings covered by the plan;
(c) include detailed plans of the proposed first and second workings and any associated surface development;</td><td>Section 1.1 and Attachment 2.
This application.
Section 1.3 and Appendix G (Coal Resource Recovery Plan).</td></tr>
</table>

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

Condition Number (Schedule 4)	Condition	Document Reference/Comment
22C. (Cont.)	(d) include detailed performance indicators for each of the performance measures in Tables 14A and 14B;	Section 3 and Appendices A, B, C, E and F.
	(e) provide revised predictions of the potential subsidence effects, subsidence impacts and environmental consequences of the proposed second workings, incorporating any relevant information obtained since this consent;	Section 2.1 and Technical Reports 1 to 3.
	(f) describe the measures that would be implemented to ensure compliance with the performance measures in Tables 14A and 14B, and manage or remediate any impacts and/or environmental consequences;	Section 3 and Appendices A to F, H and I.
	(g) include the following to the satisfaction of DRG:	
	• a coal resource recovery plan that demonstrates effective recovery of the available resource;	Appendix G (Coal Resource Recovery Plan).
	• a subsidence monitoring program to: – provide data to assist with the management of the risks associated with subsidence; – validate the subsidence predictions; and – analyse the relationship between the subsidence effects and impacts under the plan and any ensuing environmental consequences;	Section 3.8 and Appendix H (Subsidence Monitoring Program).
	• a Built Features Management Plan to manage the potential subsidence impacts and/or environmental consequences of the proposed second workings, 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 17 to 20 Application Area.
	• a Public Safety Management Plan to ensure public safety in the mining area; and	Section 3.6 and Appendix F (Public Safety Management Plan).
	• appropriate revisions to the Rehabilitation Management Plan required under condition 94C; and	The Rehabilitation Management Plan, in the form of the approved Mining Operations Plan (MOP), is provided in Appendix I. The MOP was approved by the DRG on 1 February 2018 as addressing the requirements of a Rehabilitation Management Plan.

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

Condition Number (Schedule 4)	Condition	Document Reference/Comment
22C. (Cont.)	(h) include a:	
	• Water Management Plan, which has been prepared in consultation with EPA and CLWD, which provides for the management of the potential impacts and/or environmental consequences of the proposed second workings 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 or water quality; – a program to monitor and report groundwater inflows to underground workings; and – a program to manage and monitor impacts on groundwater bores on privately-owned land;	Section 3.1 and Appendix A (Water Management Plan). The Environment Protection Authority (EPA) and the Department of Industry – Water (DI-Water) 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 and the DI-Water on 10 April 2018. Neither agency has provided any comment to date. The NSW Natural Resources Access Regulator (NRAR) provided comments on the Groundwater Monitoring Program (GWMP) and Surface and Groundwater Response Plan (SGWRP) on 5 June 2018 (dated 30 May 2018). WCPL provided a response to the four comments raised by NRAR on 26 June 2018. These comments were addressed through the provision of additional information (such as bore logs and investigation reports) and no changes to this WMP, the GWMP or SGWRP were considered necessary to address NRAR's comments. WCPL met with NRAR on 26 September 2018. NRAR was briefed on the proposed revision to the layout of Longwalls 17 to 20 and the amendment of this Extraction Plan. The proposed investigations in support of the Groundwater Dependent Ecosystem Study and the results of the South Wambo Dam investigation were also discussed (neither issue is related to this Extraction Plan). No specific requests for updates to the Longwalls 17 to 20 Water Management Plan, the GWMP, the Surface Water Monitoring Program or the SGWRP were made at this meeting.

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

Condition Number (Schedule 4)	Condition	Document Reference/Comment
22C. (Cont.)	• Biodiversity Management Plan, which has been prepared in consultation with the OEH, which provides for the management of the potential impacts and/or environmental consequences of the proposed second workings on flora and fauna;	Section 3.3 and Appendix C (Biodiversity Management Plan). A draft of the Biodiversity Management Plan was provided to the Office of Environment and Heritage on 23 March 2018. The Office of Environment and Heritage indicated that it would not be providing comments on the Biodiversity Management Plan.
	• Land Management Plan, which has been prepared in consultation with any affected public authorities, to manage the potential impacts and/or environmental consequences of the proposed second workings on land in general;	Section 3.2 and Appendix B (Land Management Plan). There are no 'affected public authorities' relevant to the Longwalls 17 to 20 Application Area. Therefore, the Land Management Plan was not distributed for comment.
	• Heritage Management Plan, which has been prepared in consultation with OEH and relevant stakeholders for Aboriginal and non-Aboriginal heritage, to manage the potential environmental consequences of the proposed second workings on heritage sites or values; and	Section 3.4 and Appendix D (Heritage Management Plan). A draft of the Heritage Management Plan was provided to the Office of Environment and Heritage on 12 April 2018. 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 provided in March 2018.
	(i) include a program to collect sufficient baseline data for future Extraction Plans.	Attachment 3.
	The Applicant must implement the approved management plan as approved from time to time by the Secretary.	
22D.	The Applicant must ensure that the management plans required under condition 22C(h) above include: (a) an assessment of the potential environmental consequences of the Extraction Plan, incorporating any relevant information that has been obtained since this consent; (b) a detailed description of the measures that would be implemented to remediate predicted impacts; and (c) a contingency plan that expressly provides for adaptive management.	Appendices A to D.

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

Condition Number (Schedule 4)	Condition	Document Reference/Comment
First Workings		
22E.	The applicant may carry out first workings within the underground mining area, other than in accordance with an approved extraction plan, provided that DRG 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.	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), 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. On 4 September 2018, WCPL requested minor changes to the first workings relating to Longwall 17. Confirmation from the Division of Resources and Geoscience was provided on 11 September 2018 that the revised first workings for Longwall 17 satisfied the requirements of Condition 22E, Schedule 4 of the Development Consent (DA 305-7-2003), 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.

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; • 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 17 to 20 Application Area are WCPL-owned.
	Landowners (whether public or private) may also need to be consulted.	The Longwalls 17 to 20 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 (eg 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.	Technical Report 4 and reflected in Appendices A to F.
	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, 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 17 to 20 Application Area is located entirely within WCPL-owned land. All assets within the Longwalls 17 to 20 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 17 to 20.

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 17 to 20 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 17 to 20 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 17 to 20 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 17 to 20 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 17 to 20 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 17 to 20 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 17 to 20 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 17 to 20 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 17 to 20 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 17 to 20 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 17 to 20 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 17 to 20 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.

ATTACHMENT 2

RELEVANT CONSULTATION RECORDS

Planning Services
Resource Assessments
Contact: Melanie Hollis
Phone: 8217 2043
Email: melanie.hollis@planning.nsw.gov.au

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

Dear Mr Jaeger

South Bates Underground Mine
Extraction Plan Longwalls 17 – 20 (Revised Layout)

I refer to your correspondence of 1 March 2019 submitting a revised Extraction Plan (dated February 2019) and associated revised sub-plans for Longwalls 17 to 20 at the South Bates Underground Mine, submitted in accordance with conditions 22C and 22D of Schedule 4 of the Wambo Coal Mine development consent (DA 305-7-2003).

The Department has reviewed the revised Extraction Plan and its sub-plans as relevant to Longwalls 17 to 20 and consulted with a number of other relevant agencies regarding their content. The Department notes that the Extraction Plan seeks approval for a slightly modified layout of Longwalls 17 to 20 compared to the layout presented in the *South Bates Extension Modification Environmental Assessment* (EA), dated March 2017 for Modification 17. The Department is satisfied that the revised layout would result in similar or less subsidence related impacts to those approved as part of the EA layout, and can be characterised as being "generally in accordance with" the EA.

The Department also acknowledges that its Division of Resources & Geoscience has confirmed its satisfaction with the sub-plans submitted in accordance with condition 22C(g) of the consent.

Accordingly, I wish to advise that the Secretary approves the revised Extraction Plan for Longwalls 17 to 20, under conditions 22C and 22D of Schedule 4.

Prior to submitting a copy of the final Extraction Plan to the Department and uploading it to the Wambo Coal website, please update the plan to address the minor comments provided in **Attachment A**.

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

Yours sincerely

Howard Reed 4.6.19
Howard Reed
Director Resource Assessments
as the Secretary's nominee

Extraction Plan

Condition 22C, Schedule 4	**Satisfactory (Yes/No)**	**Comment**	**Action Required**
The Applicant must prepare an Extraction Plan for the second workings within each seam to be mined to the satisfaction of the Secretary. Each Extraction Plan must:	-	Extraction Plan (EP) is considered a well-structured and written document, which includes good quality figures. The EP includes clear summaries of subsidence predictions, impacts, monitoring, management and performance measures. The EP is based on a slightly modified layout for Longwalls 18 to 20, however the revised layout is predicted to result in similar or less subsidence related impacts to those approved as part of the MOD17 EA layout.	Nil
(a) be prepared by a team of suitably qualified and experienced persons whose appointment has been endorsed by the Secretary;	Yes	Section 1.1 indicates that the EP has been prepared by Wambo Coal Pty Ltd (WCPL) with assistance from five specialise sub-consultants who have been endorsed by the Department of Planning & Environment (DPE) (see letter dated 29/1/18).	Nil
(b) be approved by the Secretary before the Applicant carries out any of the second workings covered by the plan;	-	Previous approval for Longwall 17 included in Attachment 2.	Include a copy of the Secretary's approval letter in Attachment 2 to the EP, once approved.
(c) include detailed plans of the proposed first and second workings and any associated surface development;	Yes	Figures 2, 3 and 6 in the main EP document provide general figures of the revised longwall layout. More detailed figures comparing the proposed and existing workings, surface features, seam workings and geological sections are included in the Coal Resource Recovery Plan at Attachment G.	Nil
(d) include detailed performance indicators for each of the performance measures in Tables 14A and 14B;	Yes	Table 5 – lists subsidence impact performance measures Table 12 – Water Performance Measures Table 15 – Biodiversity Performance Measures Table 18 – Built Features Performance Measures Figures 8a and 8b show features with subsidence performance measures. Performance measures are also included in Appendix A, C, D, E and F of the EP. Performance measures generally reflect those listed in Tables 14A and 14B of the consent.	Nil
(e) provide revised predictions of the potential subsidence effects, subsidence impacts and environmental consequences of the proposed second workings, incorporating any relevant information obtained since this consent;	Yes	Section 2.1 of the main EP document provides a summary of the revised subsidence predictions, impacts and environmental consequences of the revised longwall layout, including a summary of comparisons with the previous predictions.	Nil

Condition 22C, Schedule 4	Satisfactory (Yes/No)	Comment	Action Required
		Table 6 details the predicted changes as a result of shortening Longwalls 18-20. Technical Report 1 provides a *Subsidence Predictions and Impact Assessment for The Effects of the Modified Finishing Ends of Whybrow Longwalls 17 to 20 on the Subsidence Predictions and Impact Assessments for the Natural and Built Features in Support of an Application to Amend the Extraction Plan*, prepared by Mine Subsidence Engineering Consultants (MSEC), February 2019 and *Subsidence Predictions and Impact Assessments for the Natural and Built Features in Support of the Extraction Plan Application for the South Bates Extension WYLW17 to WYLW20* prepared by MSEC, April 2018. It is noted that the subsidence predictions and impacts are for the revised longwall layout for Longwalls 17 to 20. The subsidence report is considered adequate.	
(f) describe the measures that would be implemented to ensure compliance with the performance measures in Tables 14A and 14B, and manage or remediate any impacts and/or environmental consequences;	Yes	Section 3 of the main EP document provides a summary of the management, monitoring, performance indicators and contingency measures for water, land, biodiversity, heritage, built features and public safety. These are included and expanded upon in the relevant Appendices to the EP and are considered adequate.	Nil
(g) include the following to the satisfaction of DRG:	-	DRG expressed satisfaction with the former EP for Longwalls 17-20 on 12 June 2018.	Include a copy of the DRG letter in Attachment 2 to the EP.
• a coal resource recovery plan that demonstrates effective recovery of the available resource;	Yes	Coal Resource Recovery Plan (CRRP) included in Appendix G. The CRRP has been updated to include the modified Longwalls 17 to 20 layout.	Nil
• a subsidence monitoring program to: - provide data to assist with the management of the risks associated with subsidence; - validate the subsidence predictions; and - analyse the relationship between the subsidence effects and impacts under the plan and any ensuing environmental consequences;	Yes	Subsidence Monitoring Program (SMP) included in Appendix H. The SMP has been updated to include the modified Longwalls 17 to 20 layout. The SMP details the subsidence monitoring to be undertaken and summarises the monitoring of environmental consequences (water, land, biodiversity, built features, etc). Monitoring is generally consistent with MSEC's (2018 & 2019) recommendations.	Nil
• a Built Features Management Plan to manage the potential subsidence impacts	Yes	Built Features Management Plan (BFMP) included in Appendix E. WCPL owns all assets within the Longwalls 17	Include consultation with SNSW Spatial Services in Attachment 2.

Condition 22C, Schedule 4	Satisfactory (Yes/No)	Comment	Action Required
and/or environmental consequences of the proposed second workings, 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;		to 20extraction plan area. Assets includes wells, fences, access tracks and gates. Management measures for the assets are considered adequate. There is a State survey control mark located to the north-west of the main gate of Longwall 20.	
• a Public Safety Management Plan to ensure public safety in the mining area; and	Yes	Public Safety Management Plan (PSMP) included in Appendix F. Longwalls 17 to 20 are located wholly within WCPL owned land, therefore risks to public safety are considered limited. Management measures to reduce public safety risks are considered adequate.	Nil
• appropriate revisions to the Rehabilitation Management Plan required under condition 94C; and	Yes	Rehabilitation Management Plan (RMP) included as a Mine Operations Plan (MOP) in Appendix I. This approach has been endorsed by the DP&E.	• References in the MOP that refer to this EP should be corrected to Longwalls 17 to 20 (not LWs17-21). • The MOP should be updated as recommended by the Resources Regulator. • MOP should include that Kikuyu is not planted within 50 metres of woodland restoration areas to enable plantings of woodland species to become established, as recommended by OEH.
(h) include a:			
• Water Management Plan, which has been prepared in consultation with EPA and DPI-Water, which provides for the management of the potential impacts and/or environmental consequences of the proposed second workings 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 or water quality;	No	Water Management Plan (WMP) included as Appendix A and includes a Trigger Action Response Plan (TARP) (Attachment 1), Surface Water Monitoring Program (SWMP) (Attachment 2), Groundwater Monitoring Program (GMP) (Attachment 3) and Surface and Groundwater Response Plan (SGWRP) (Attachment 4). Section 1.1 of the main WMP document indicates that the WMP draws on conclusions from Technical Report 2: *Groundwater Assessment Review* (Hydro Simulations, April 2018) and Technical Report 3: *Surface Water Assessment Review* (February 2019) which considers the revised longwall layout.	Nil

Condition 22C, Schedule 4	Satisfactory (Yes/No)	Comment	Action Required
- a program to monitor and report groundwater inflows to underground workings; and - a program to manage and monitor impacts on groundwater bores on privately-owned land;			
• Biodiversity Management Plan, which has been prepared in consultation with the OEH, which provides for the management of the potential impacts and/or environmental consequences of the proposed second workings on flora and fauna;	Yes	Biodiversity Management Plan (BMP) included in Appendix C. Section 1.2 indicates that comments on the BMP were received from OEH on 1 April 2019 and that these comments have been addressed in the BMP. Technical Report 1 advises that the predicted subsidence impacts that could potentially impact flora or fauna would be the same or less than previously predicted.	Nil
• Land Management Plan, which has been prepared in consultation with any affected public authorities, to manage the potential impacts and/or environmental consequences of the proposed second workings on land in general;	Yes	Land Management Plan (LMP) included in Appendix B. No privately owned land or public roads are located in the Longwalls 17-20 extraction plan area. All lands are owned by WCPL, so no external consultation is required. LMP adequately provides for monitoring of cliffs, fences, ground surfaces, etc. A Land Management Plan TARP and Erosion and Sediment Control Plan are appended to the LMP.	• Amend typographic error in Table 6 (10th row) to indicate visual cliff monitoring will be done for Longwalls 17 to 20 (not 19).
• Heritage Management Plan, which has been prepared in consultation with OEH and relevant stakeholders for Aboriginal and non-Aboriginal heritage, to manage the potential environmental consequences of the proposed second workings on heritage sites or values; and	Yes	Heritage Management Plan (HMP) included in Appendix D. HMP updated in February 2019 to include the modified layout for Longwalls 17 to 20. On 1 April 2019 OEH requested that the figures in the HMP are updated to show the revised longwall layout. The figures in the HMP show the revised longwall layout. Appendix C of HMP provides environmental consequences of subsidence impacts on Aboriginal sites within Longwalls 17 to 20 extraction area, and relevant management and monitoring. These are consistent with previous management and monitoring measures implemented on-site and are considered adequate.	Nil
(i) include a program to collect sufficient baseline data for future Extraction Plans.	Yes	A program to collect baseline data for future extraction plans is included in Attachment 3 and is considered adequate.	Nil
General comments			

Condition 22D, Schedule 4	Satisfactory (Yes/No)	Comment	Action Required
The Applicant must ensure that the management plans required under condition 22C(h) above include:			
(a) an assessment of the potential environmental consequences of the Extraction Plan, incorporating any relevant information that has been obtained since this consent;	Yes	Potential environmental consequences of Longwalls 17 to 20 mining are summarised in Section 2.1.1 of the main EP document and detailed in Appendices A to F.	Nil
(b) a detailed description of the measures that would be implemented to remediate predicted impacts; and	Yes	Management measures are summarised in Section 3 of the main EP document and detailed in in Appendices A to F.	Nil
(c) a contingency plan that expressly provides for adaptive management	Yes	Contingency measures are summarised in Section 3 of the main EP document and detailed in in Appendices A to F.	Nil
General comment			

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17 June 2019

NSW Spatial Services
PO Box 143
BATHURST NSW 2795

By email: Surveyor-General-Approvals@finance.nsw.gov.au

To whom it may concern,

RE: SOUTH BATES EXTENSION UNDERGROUND MINE

I am writing to you as the Manager: Environment & Community at the Wambo Coal Mine.

Wambo Coal Pty Limited (WCPL), a subsidiary of Peabody Energy Australia Pty Limited, is developing an extension to the existing Wambo Coal Mine, referred to as the South Bates Extension Underground Mine. The Wambo Coal Mine is located approximately 15 kilometres (km) west of Singleton, near the village of Warkworth, New South Wales (NSW) (**Figure 1**).

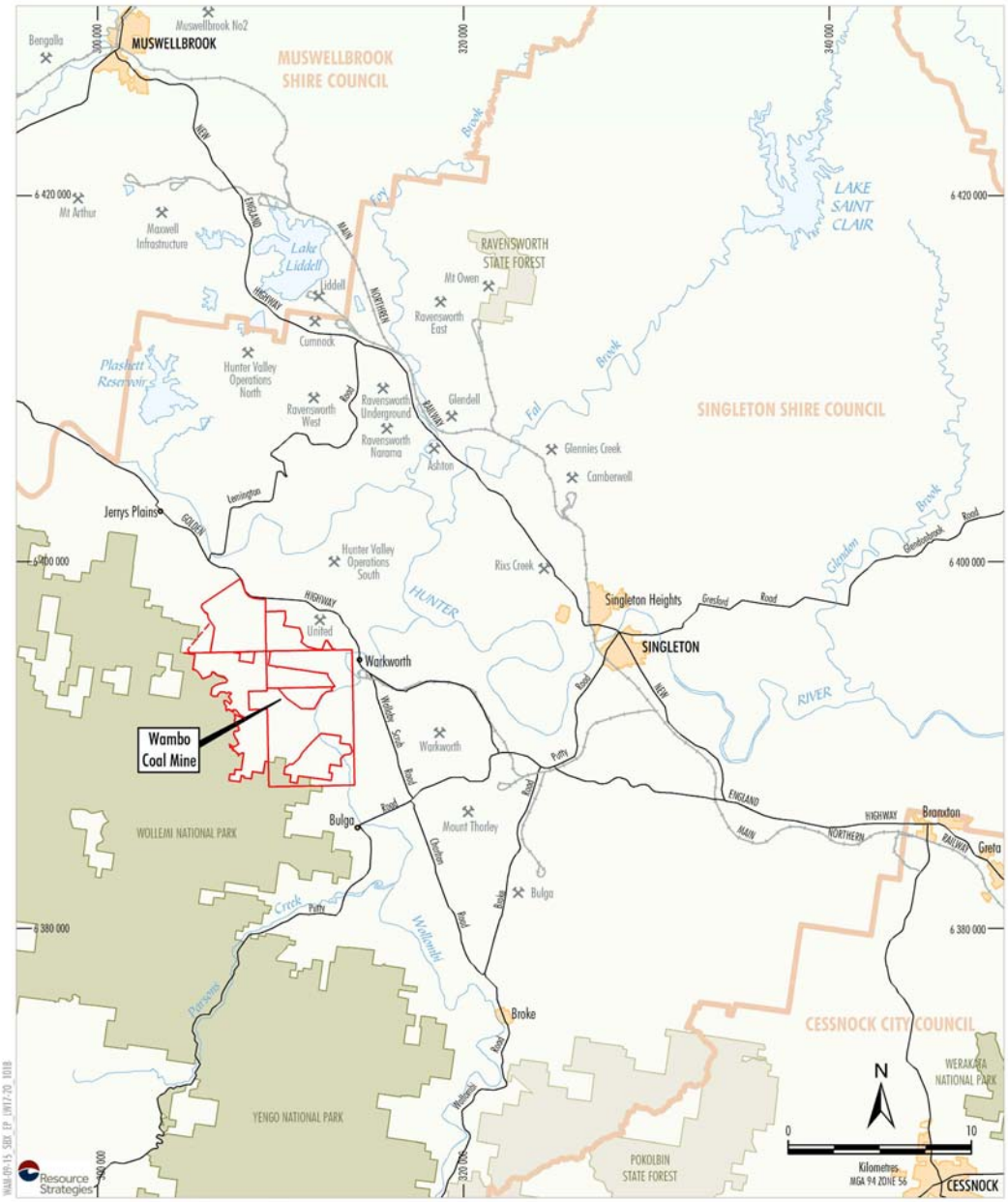
Overview of the South Bates Extension Underground Mine

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 has prepared an Extraction Plan for Longwalls 17 to 20 at the South Bates Extension Underground Mine and submitted it to the Department of Planning and Environment (the Department) on 27 April 2018 for approval.

On 4 September 2018, WCPL provided the Department 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 the Department approve the Extraction Plan for Longwalls 17 to 20 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 to 20 to the Department for approval. On 4 June 2019, the Department approved the amended Extraction Plan for Longwalls 17 to 20.



LEGEND
- Mining and Coal Lease Boundary
- Mining Lease Application Boundary
- Local Government Boundary
- Mining Operation

Source: NSW Department of Resources & Energy (2018); Geoscience Australia (2009)

Peabody

WAMBO COAL MINE

Regional Location

Figure 1

Potential for Impacts on Survey Control Mark

All freehold land within the South Bates Extension underground mining area is owned by WCPL.

There is a single State survey control mark in the vicinity of Longwalls 17-20 (located to the north-west of the maingate of Longwall 20) that would experience movements as a result of subsidence. The location of the survey control mark (TS12077) is provided in Enclosure 1 based on the SCIMS Online website.

Mining in Longwall 17 is complete. Subsidence impacts are regulated through the Wambo Coal Mine Development Consent and the NSW Government's Extraction Plan process.

WCPL will manage the impacts of subsidence on the survey mark in accordance with the *NSW Surveying and Spatial Information Regulation, 2017*, which would involve re-surveying of the survey mark, if required.

Consultation with NSW Spatial Services

WCPL would be happy to discuss the South Bates Extension Underground Mine with you further, should you have any questions.

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

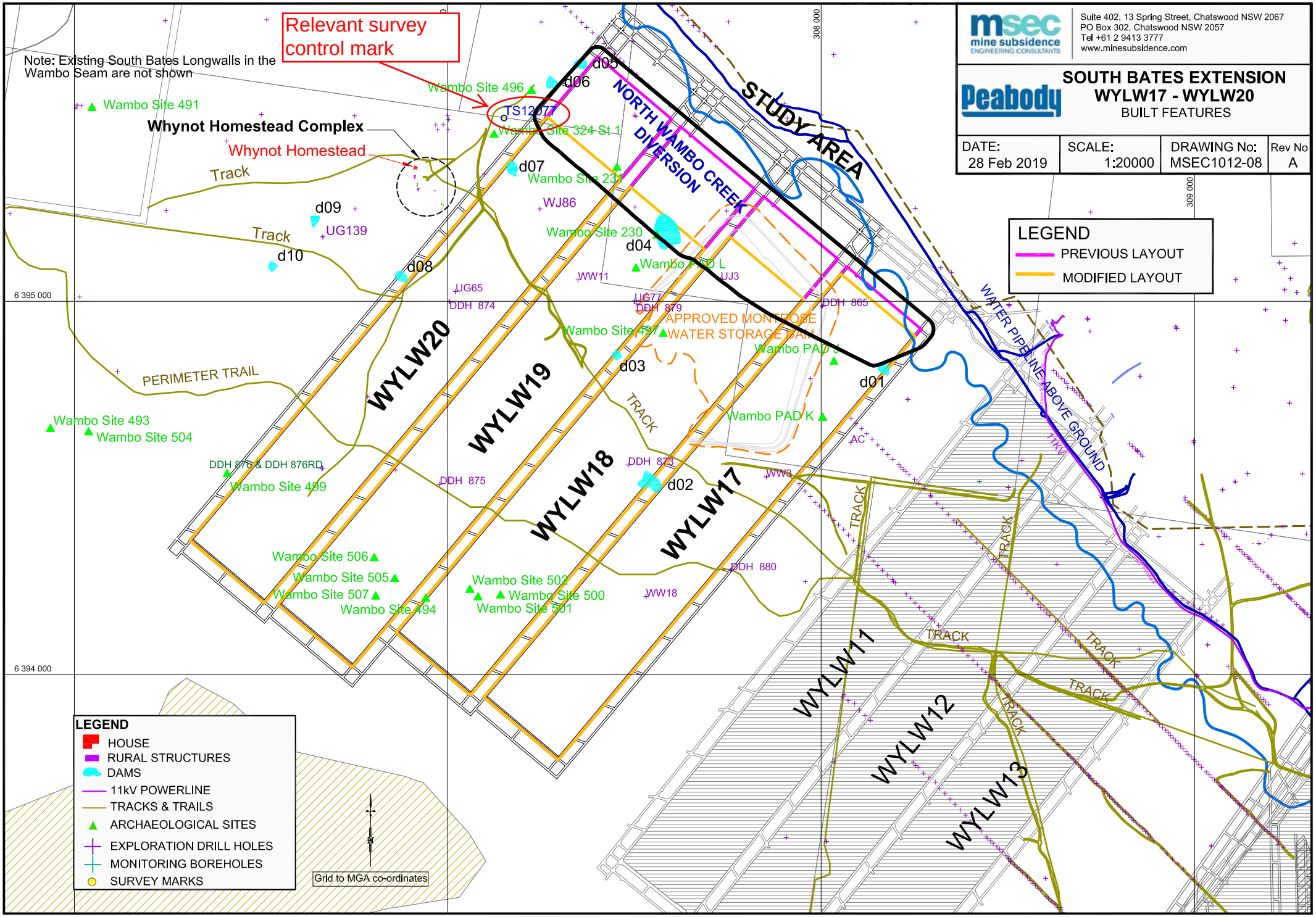
Yours faithfully,

Peter Jaeger
Manager: Environment & Community
WAMBO COAL PTY LTD

ENCLOSURE 1

SURVEY CONTROL MARK TS12077

I:\Projects\Wambo\MSEC848 - South Bates Extension Modification\AcadData\MSEC848-10.dwg



msec mine subsidence ENGINEERING CONSULTANTS
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PO Box 302, Chatswood NSW 2057
Tel +61 2 9413 3777
www.minesubsidence.com

Peabody

SOUTH BATES EXTENSION
WYLW17 - WYLW20
BUILT FEATURES

DATE:	SCALE:	DRAWING No:	Rev No
28 Feb 2019	1:20000	MSEC1012-08	A

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4 September 2018

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

Attention: Mr Oliver Holm, Executive Director, Resource Assessments and Compliance

Dear Mr Holm

RE: SOUTH BATES EXTENSION UNDERGROUND MINE LONGWALLS 17 TO 20

Wambo Coal Pty Limited (WCPL) lodged an Extraction Plan for Longwalls 17 to 20 at the South Bates Extension Underground Mine with the Department in April 2018 for review and approval.

Subsequent to the submission of the Extraction Plan, WCPL has encountered geological structures that may require changes to the main headings and the finishing ends of Longwalls 18, 19 and 20. Further investigations (e.g. in-seam drilling) and mine planning works are required to finalise the proposed amended layout of these longwalls.

The geological structures encountered will not result in any change to the proposed layout of Longwall 17 (the first longwall in the South Bates Extension domain).

It is noted that the following key correspondence has been received on the Extraction Plan to date:

- The Division of Resources and Geoscience (DRG) provided correspondence on 12 June 2018 stating that the relevant plans[1] meet the requirements of Condition 22C(g), Schedule 4 of the Development Consent (DA 305-7-2003).
- The Office of Environment and Heritage (OEH) wrote to WCPL on 23 April 2018 stating it was satisfied that the Heritage Management Plan adequately manages Aboriginal cultural heritage within the Wambo Mine Complex and the range of activities undertaken within the operational footprint of the mine.
- Comments on the Water Management Plan were provided by the Natural Resources Access Regulator (NRAR) on 5 June 2018 (dated 30 May 2018). WCPL responded to these comments on 26 June 2018.
- Comments on the Heritage Management Plan were provided by the Heritage Division on 5 July 2018. WCPL revised the Heritage Management Plan to address these comments and provided the revised plan on 25 July 2018.

[1] Coal Resource Recovery Plan, Subsidence Monitoring Program, Built Features Management Plan, Public Safety Management Plan and Rehabilitation Management Plan (Mining Operations Plan).

Planning Services
Resource Assessments
Contact: Jessie Evans
Phone: 9274 6419
Email: jessie.evans@planning.nsw.gov.au

Mr Peter Jaeger
A/Environment & Community Manager
Wambo Coal Pty Ltd
PMB 1
SINGLETON NSW 2330

Dear Mr Jaeger

South Bates Underground Mine
Extraction Plan Longwalls 17 - 20

I refer to your correspondence of 27 April 2018 submitting an Extraction Plan (dated April 2018) and associated sub-plans for Longwalls 17 to 20 at the South Bates Underground Mine, submitted in accordance with conditions 22C and 22D of Schedule 4 of the Wambo Coal Mine development consent (DA 305-7-2003).

The Department also notes correspondence received on 4 September 2018 advising the Department that further investigation of geological structures in the area may require changes to the main headings and the finishing ends of Longwalls 18, 19 and 20. It is noted that the geological structure encountered would not result in any change to the proposed layout of Longwall 17 as originally proposed under this Extraction Plan. It is understood that Wambo Coal Pty Ltd will prepare an amended Extraction Plan for Longwalls 18, 19 and 20 for submission later in the year.

The Department has reviewed the Extraction Plan and its sub-plans as relevant to Longwall 17 and is satisfied that they generally meet the requirements of the development consent. The Department is awaiting confirmation from Natural Resources Access Regulator that the Water Management Plan and subsequent information provided by Wambo Coal has satisfactorily addressed its concerns. The Department will further liaise with Wambo Coal, if necessary, once this information is received. Nevertheless, the Water Management Plan can be considered approved and should be implemented.

The Department also acknowledges that DRG has confirmed it is satisfied with the revised Extraction Plan in accordance with condition 22C(g) of Schedule 4. Accordingly, the Secretary approves the Extraction Plan for Longwall 17 only, under conditions 22C and 22D of Schedule 4.

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

Yours sincerely

Howard Reed 7.9.18
Howard Reed
Director Resource Assessments
as the Secretary's nominee

WCPL kindly requests that the Department complete its assessment of the Extraction Plan lodged in April 2018 as a matter of priority and, if satisfied, approve the Extraction Plan in relation to the extraction of Longwall 17 only.

Separately, and at a later date, WCPL will prepare an amended Extraction Plan that incorporates the revisions to the layout of Longwalls 18, 19 and 20. It is anticipated this will be lodged in Quarter 4 2018.

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
Acting/Environment and Community Manager
WAMBO COAL PTY LTD

N 6 394 000
N 6 395 000
N 6 396 000
E 305 000
E 306 000
E 307 000
E 308 000
E 309 000
N 6 393 000
N 6 392 000

0 250 500 750 1000 1250
All measurements are in metres

External Lease Boundary

APPROVED FIRST WORKINGS AREA

Longwall 21
Application Area
1.695km
Longwall 20
261m
1.674km
Longwall 19
261m
1.503km
Longwall 18
1420m
261m
1.484km
Longwall 17
261m

APPROVED FIRST WORKINGS AREA

Wambo Opencut Void
(Whynot Seam Floor)

Current Wambo Open Cut
Mined Extent - Generally mining to
Whynot Seam
(Active Mobarose Pit)
(partially backfilled with spoil)
Refer to Record Tracing No. 7284

Wambo Opencut Void
(Redbank Creek Seam Floor)

Current Wambo Open Cut
Mined Extent - This Bench only
to Redbank Creek Seam
(Backfilled with spoil)
Refer to Record Tracing No. 7284

Wambo Opencut Void
(Whynot Seam Floor)

Current Wambo Open Cut
Mined Extent - Whynot Seam
(Bates Pit)
(Backfilled with spoil)
Refer to Record Tracing No. 7284

Application Area
Approved Area LW11-16

South Bates Whybrow Seam
Existing Workings

Longwall 11
1.653km
Longwall 12
782.4m

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

Mining Engineering Manager ..... Date .....

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 .....

Current Open Cut Extraction Approval Area (MOP 2020)
Full Extraction Boundary Application Area
Approved Area LW11-16 - South Bates Underground Whybrow & Wambo Seams
South Bates Underground Existing Workings (Whybrow Seam)
South Bates Underground Proposed Workings (Whybrow Seam)
South Bates Underground Wambo Seam Workings (Underlying)
Wambo Opencut Void 5m Contours (AHD) (Whybrow - Whynot Seam)
United Collieries SIS Borehole (Blakefield Seam)

REVISIONS

REV.	DATE	BY	DESCRIPTION	CHK.	REV.	DATE	BY	DESCRIPTION	CHK.
A	31/03/2018	MJW	For LW17-LW20 Submission	MA,PJ					
B	23/8/2018	MJW	Main Headings Stepped around Weak roof and faulted area	MA,DG					

Peabody

WAMBO COAL PTY LIMITED
ABN 13 000 668 057

Jerry's Plains Rd, Warkworth Phone: 02 65 702200
Via Singleton, NSW, 2330 Fax: 02 65 702290

Prepared by NWU Survey Ph: 02 65 702318

South Bates Underground Mine (Whybrow Seam)
Extraction Plan - Longwalls 17 to 20
Plan 1 - Proposed and Existing Workings

Drawing No.	Revision No.
2406	B_23/8/2018

Date	Scale:	Drawn	Checked	Approved	Sheet Size
31/3/2018	1:4000	MJW	MAB	DG	A0

Planning & Environment
Resources & Geoscience

DOC18/366483

Peter Jaeger
A/Environmental and Community manager
Wambo Coal Pty. Limited
PMB 1, SINGLETON
NSW 2330

pjaeger@peabodyenergy.com

Dear Mr Jaeger

Wambo South Bates Extraction Plan Longwalls 17 to 20 - Condition 22C(g) Schedule 4 of Development Consent No. 305-7-2003 (MOD17)

Wambo Mine seeks the Division of Resources & Geoscience's (DRG) satisfaction consistent with Condition 22C(g) of Schedule 4 of Development Consent No. 305-7-2003.

Wambo Mine submitted the document *South Bates Extension Underground Mine Extraction Plan Longwalls 17 to 20 Revision A* as endorsed 20 April 2018 to the DRG on 27 April 2018.

DRG consider that the proposed Extraction Plan meets the requirement of Condition 22C(g) of Schedule 4 of the of Development Consent No. 305-7-2003. Please note that this comment is relevant only to:

- Coal Resource Recovery Plan
- Subsidence Monitoring Program
- Built Features Management Plan
- Public Safety Management Plan and
- Appropriate revision to a Rehabilitation manage Plan

that relate to the application subject to the following condition/limitations:
|

1. Wambo Mine must prepare and implement a Mining Operation Plan (MOP) to the satisfaction of the Director Compliance Operations. The MOP must:
    a. be prepared in consultation with the Resources Regulator and with relevant agencies and stakeholders to the relevant DRG Guidelines;
    b. be submitted and approved by the Director Compliance Operations prior to the commencement of activities;
    c. address all aspects of rehabilitation of subsidence impacts, including rehabilitation objectives, completion criteria and rehabilitation monitoring.
    d. include a detailed monitoring program

e. be reviewed in the Annual Environment Management Report

Specifically, the Trigger Action Response Plan is to be updated to include amendments to subsidence remediation as remediation develop. The triggers for further actions are to be quantitative and be linked to a monitoring schedule.

2. This expression does not include the *Work Health and Safety Laws*. WHS matters in relation to subsidence will be further assessed when Wambo Mine submits its high risk activity notification to the Resource Regulator.

Should you have any further questions in relation to this matter contact Mr Alex Love, Advisor Officer (02) 8275 1961.

Yours sincerely

Matt Gagan
A/Manager Assessment Coordination
Dated 12 June 2018

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27 April 2018

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

Attention: Mr Oliver Holm, Executive Director Resource Assessments

Dear Mr Holm

RE: SOUTH BATES EXTENSION UNDERGROUND MINE LONGWALLS 17 TO 20

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) has prepared an Extraction Plan for Longwalls 17 to 20 at the South Bates Extension Underground Mine. The Extraction Plan has been prepared in accordance with Condition 22C, Schedule 4 of Development Consent (DA 305-7-2003) granted for the Wambo Development Project and 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) .

Please find enclosed the following:

- two hard copies of the complete Extraction Plan; and
- two CD copies of the complete Extraction Plan.

This Extraction Plan has been prepared by Wambo Coal Pty Limited, with assistance from Mine Subsidence Engineering Consultants, HydroSimulations Pty Ltd, Alluvium and Resource Strategies.

Condition 22C(h), Schedule 4 requires a Water Management Plan, Biodiversity Management Plan and Heritage Management Plan to be prepared in consultation with relevant agencies. Records of consultation with these agencies are outlined in Section 2.3 of the Extraction Plan.

The Extraction Plan has been distributed to relevant stakeholders as indicated in the enclosed distribution list.

Secondary extraction of Longwall 17 is currently scheduled for **September 2018.**

WCPL is seeking approval from the Secretary for:

- the Extraction Plan under Condition 22C, Schedule 4 of Development Consent (DA 305-7-2003);
- revisions to the Surface Water Monitoring Program (Version 12) proposed as part of this Extraction Plan under Conditions 33 and 33A, Schedule 4 of Development Consent (DA 305-7-2003);
- revisions to the Groundwater Monitoring Program (Version 12) proposed as part of this Extraction Plan under Conditions 34 and 34B, Schedule 4 of Development Consent (DA 305-7-2003);
- revisions to the Surface and Groundwater Response Plan (Version 12) proposed as part of this Extraction Plan under Condition 35, Schedule 4 of Development Consent (DA 305-7-2003);
- the revised Erosion and Sediment Control Plan (Version 10) under Condition 32, Schedule 4 of Development Consent (DA 305-7-2003) submitted to the Department on 18 April 2018; and
- revisions to the Biodiversity Management Plan (Version 14) proposed as part of this Extraction Plan and addressing the requirements for a Flora and Fauna Management Plan under Condition 44, Schedule 4 of Development Consent (DA 305-7-2003).

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

Yours faithfully,

Peter Jaeger
Acting/Environment and Community Manager
WAMBO COAL PTY LTD

Enclosure 1
Distribution of Extraction Plan for Longwalls 17 to 20

Agency	Name/Title Attention	Copies Provided
Division of Resource and Geoscience	Matt Gagan A/Manager, Royalties and Advisory Services	2 CD Copies Complete Hard Copy 2 Copies of Signed A0 Plans
Department of Industry - Water	Water Regulation Newcastle	CD Copy Main Document Water Management Plan Technical Reports
Environment Protection Authority	Hunter Region	CD Copy Main Document Water Management Plan
Office of Environment and Heritage	Steven Cox Senior Team Leader Planning, Hunter Central Coast	CD Copy Main Document Biodiversity Management Plan Heritage Management Plan
Heritage Division NSW Office of Environment and Heritage	Siobhan Lavelle Acting Manager, Conservation	CD Copy Main Document Heritage Management Plan
Subsidence Advisory NSW	Newcastle District Office	CD Copy Main Document Built Features Management Plan
NSW Dams Safety Committee	Heather Middleton Mining Regulation Officer	CD Copy Main Document
Aquatic Habitat Protection Unit Department of Primary Industries	Scott Carter Senior Conservation Manager, Central Region	CD Copy Main Document
Singleton Shire Council	Jason Linnane General Manager	CD Copy Complete Hard Copy
Members of the Community Consultative Committee	Various	CD Copy

Planning Services
Resource Assessments and Compliance
Name: Melanie Hollis
Phone: (02) 8217 2043
Email: melanie.hollis@planning.nsw.gov.au

Mr Steve Peart
Environment and Community Manager
Wambo Coal Pty Ltd
PMB 1
Singleton NSW 2330

Dear Mr Steve Peart

Wambo Coal Mine (DA 305-7-2003)
Longwalls 17-20 Extraction Plan

I refer to your letter of 23 January 2018, requesting approval of a team to prepare the Extraction Plan for Longwalls 17-20 at the South Bates Extension Underground Mine, in accordance with condition 22C of Schedule 34 of the above consent.

The Department has reviewed the information you have provided and considers that the proposed experts are suitably qualified and experienced to prepare the Extraction Plan.

The Secretary has accordingly approved the following personnel to prepare the plan:

- 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 (HydroStimulations) – Groundwater; and
- Mr Peter Kuskie (South East Archaeology) – Aboriginal Cultural Heritage.

The Department has also reviewed the request to use existing Flora and Fauna studies in preparation of this Extraction Plan. These studies were prepared by Dr Colin Bower (FloraSearch) and Ms Kalya Abbey (EcoLogical) as part of the recent Environmental Assessment for Modification 17. The Secretary considers that these studies are suitable and therefore approves their use.

The Department also considers the independent audit established by condition 37, Schedule 4 is not required prior to lodgement of the Extraction Plans for the South Bates Extension. However, the Department does expect that all available subsidence monitoring results are included in the Extraction Plan and appropriately taken into account.

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

Yours sincerely

Howard Reed

Howard Reed 29.1.18
Director
Resource Assessments
As nominee of the Secretary

Mr Peter Jaeger
A/Environment and Community Manager
Wambo Coal Pty Limited
PMB1 Singleton
NSW 2330

Our ref: DOC18/669182

By email: pjaeger@peabodyenergy.com

Dear Mr Jaeger

Requirements under Schedule 4, Condition 22E Development Consent DA 305-7-2003 (MOD 12) South Bates Underground Extension First Workings LW 17

I refer to your letter to the Division of Resources and Geoscience (Division) dated 4 September 2018 subject Wambo Coal South Bates Underground Extended First Workings Update LW 17.

The Division 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 with respect to the variation to the *endorsed plan* depicted in the plan attached to your letter of 4 September 2018 with respect to Longwall 17.

The *endorsed plan* is the plan referred to in the Division's letter of 27 March 2018 namely the *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.*

A revised full plan of the mine workings has not been required with respect to this application however revised detailed plans will be required in the High Risk Activity notificaiton to the Resources Regulator for extraction of the Longwall.

For further enquiries regarding this matter please contact Alex Love, Advisory Officer Assessment Coordination, (02) 8275 1961 or advisory.services@planning.nsw.gov.au.

Yours sincerely

David Humphris
A/Director Titles Assessment
Resource Operations
Division of Resources and Geoscience

Dated: 11 September 2018

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4 September 2018

Mr Alex Love
Advisory Officer
Division of Resources and Geoscience
10 Valentine Avenue, Parramatta NSW 2150

RE: Wambo Coal South Bates Underground Extended First Workings Update LW 17

Dear Alex,

On 27 March 2018, Wambo Coal Pty Ltd (WCPL) received correspondence the Division of Resources and Energy were satisfied the Leasholder could achieve the required outcomes of the first workings condition of Development Consent DA 305-7-2003 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."*

The proposed mine workings shown in the 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 require minor changes to the first workings relating to longwall (LW) 17. The details of the required changes to the first workings relating to LW17 are provided below:

1. Ability to efficiently install the LW onto the LW face (realigning 15ct to the LW face for access);
2. Removing the step at the back of the perimeter road, this roadway will be life of mine access and will minimise hazards associated with transport movements;
3. Tail Gate (TG) mule stub added for LW18 recovery; and
4. Stubs added to workings to allow for water management devices to be installed.

Details of the proposed minor changes have been detailed in Attachment 1.

The first working changes will be designed to remain stable and non-subsiding in the long term as per the previously provided report *WAM37-01 Preliminary Coal Pillar Design Recommendation for the South Bates Underground Extension Project.*

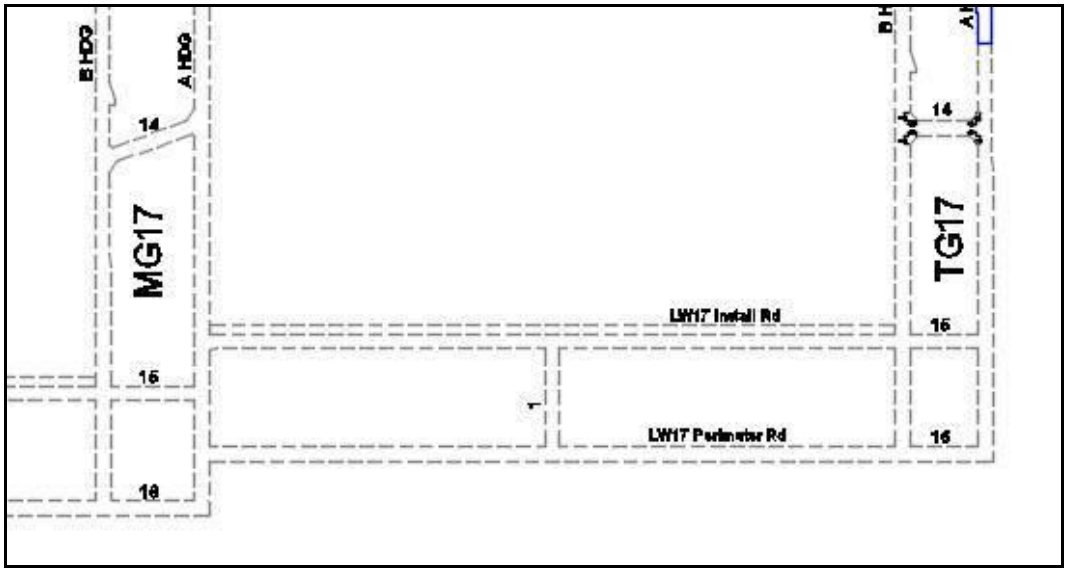
Please do not hesitate to contact me on (02) 6570 2206 if you have any queries in regard to the above or if you require additional information.

Yours faithfully,

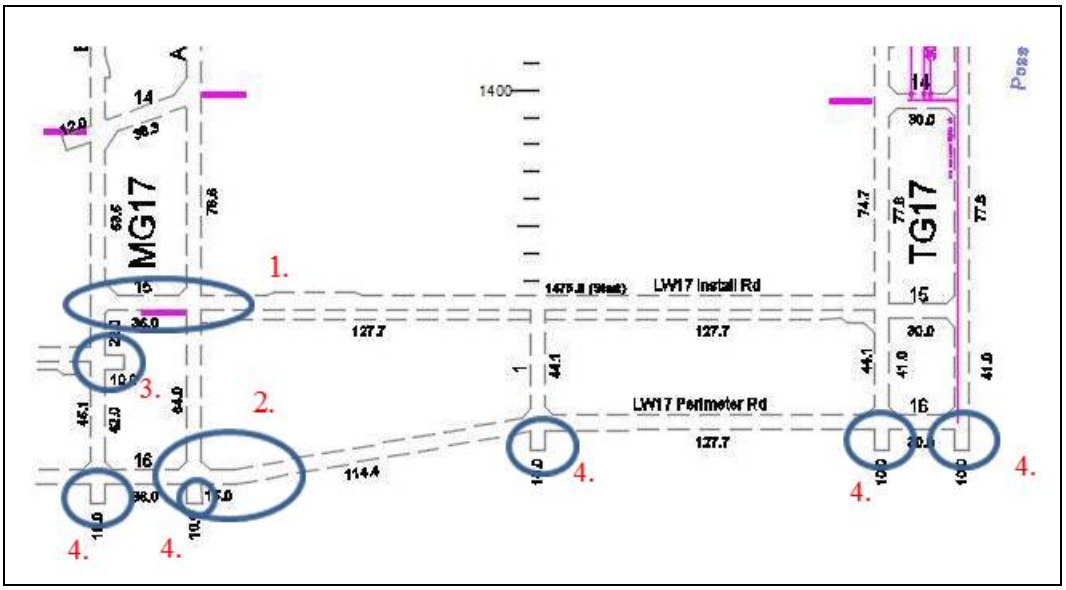
Peter Jaeger
Acting/Environment and Community Manager
WAMBO COAL PTY LTD

Attachment 1

Previous Plan



Required Plan



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 & Environment
Resources & Geoscience

Steven Peart
Wambo Coal Pty Limited
PMB 1
Singleton NSW 2330

Our ref: OUT18/6111

1 February 2018

Dear Steven

CL397 (*Mining Act 1973*), CCL743 (*Mining Act 1973*), CL374 (*Mining Act 1973*), CL365 (*Mining Act 1992*), ML1402 (*Mining Act 1992*), ML1594 (*Mining Act 1992*) and ML1572 (*Mining Act 1992*), Wambo Coal Pty Limited, Approval of Mining Operations Plan

NOTICE OF APPROVAL

Pursuant to Condition 3a of CL397 (*Mining Act 1973*), Condition 3 of CCL743 (*Mining Act 1973*), Condition 2 of CL374 (*Mining Act 1973*), Condition 3a of CL365 (*Mining Act 1992*), Condition 3a of ML1402 (*Mining Act 1992*), Condition 2 of ML1594 (*Mining Act 1992*) and Condition 2 of ML1572 (*Mining Act 1992*), the Mining Operations Plan (MOP) that was submitted to the Department of Planning and Environment – Division of Resources and Geoscience (the Department) on 22 December 2017 (Department Reference: INW18/26) is approved for the period from the date of this approval until 31 December 2020.

This MOP approved by the Department is limited to:

- the rehabilitation objectives and completion criteria; and,
- the schedule of rehabilitation activities proposed for the MOP period.

In addition, this approval is conditional upon the conditions set out below. These conditions relate to this approval and are in addition to those attached to Mining Authorisation Number CL397 (*Mining Act 1973*), CCL743 (*Mining Act 1973*), CL374 (*Mining Act 1973*), CL365 (*Mining Act 1992*), ML1402 (*Mining Act 1992*), ML1594 (*Mining Act 1992*) and ML1572 (*Mining Act 1992*). A breach of conditions is an offence under the *Mining Act 1992*.

- The Conceptual Mine Closure Plan is to be submitted to DRG, in consultation with other relevant stakeholders by the end of 2018. In addition to the commitments described in the MOP, the Conceptual Mine Closure Plan must provide a revised landform that is consistent with the Final Void Strategy, as required under 305-7-2003 condition 39; and
- The actions to develop the subsidence remediation must be approved by DRG prior to being undertaken.

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

As previously advised, approval of this MOP has triggered assessment of the security deposit required to secure funding for the fulfilment of obligations under CL397, CCL743, CL374, CL365, ML1402, ML1594, and ML1572.

The Assessed Deposit is determined to be $75,051,000 which equals the Security Deposit currently held by the Department. Accordingly, there will be no change to the Security Deposit at this time.

DEFINITIONS

In this letter, words have the meaning given to those terms in the *Mining Act 1992*, unless otherwise specified below.

Department means the NSW Department of Planning and Environment – Division of Resources and Geoscience.

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 2018-2020" prepared by Wambo Coal Pty Limited and dated December 2017, as amended by:

(a) MOP 2018-2020_Plan 4 - Final Rehab and Post Mining Land Use

If you have any questions about this Notice, please contact Neil McElhinney directly on 4931 6522.

Catherine Lewis
A/ Manager & Principal Inspector Environment
Division of Resources and Geoscience
NSW Department of Planning and Environment

Signed under delegation from the Minister for Resources
Signed under delegation from the Secretary of the NSW Department of Planning and Environment

WAMBO COAL PTY LTD

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100 Melbourne Street
South Brisbane Qld 4101

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

12 March 2018

NSW Office of Environment and Heritage
Locked Bag 1002
DANGAR NSW 2309

Attention: Steven Cox

Via email: rog.hcc@environment.nsw.gov.au

Dear Mr Cox

RE: WAMBO COAL MINE – ABORIGINAL HERITAGE IMPACT PERMIT #C0003213 NOTIFICATION REQUIREMENTS

As you are aware, an Aboriginal Heritage Impact Permit (AHIP) for Wambo Coal Pty Ltd (WCPL) was approved and issued under section 90D of the New South Wales (NSW) *National Parks and Wildlife Act, 1974* on 27 February 2018.

Copy of AHIP Provided to Registered Aboriginal Parties

In accordance with Condition 20 of AHIP #C0003213, WCPL is required to provide a copy of the AHIP to each Registered Aboriginal Party, within 14 days of receipt of the AHIP from the NSW Office of Environment and Heritage (OEH).

This correspondence is to inform you that consistent with the conditions of AHIP #C0003213, the attached notifications have been provided (via post) to each of the Registered Aboriginal Parties (Enclosure A).

Notification of Commencement of Actions

Condition 18 of AHIP #C0003213 requires written notice to be provided to the OEH prior to the commencement of actions authorised by the AHIP. In this regard, please note that works under AHIP #C0003213 are proposed to commence 19 March 2017.

Please do not hesitate to contact me should you have any queries.

Yours faithfully

Peter Jaeger
Senior Environmental Advisor
WAMBO COAL PTY LTD

Enclosure A: AHIP #C0003213 Notification Letters to Registered Aboriginal Parties

Example of correspondence sent to Registered Aboriginal Parties in relation to AHIP #C0003213 and the Heritage Management Plan

WAMBO COAL PTY LTD

ABN: 13 000 668 057

100 Melbourne Street
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Australia
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Fax+ 61 (0) 2 6570 2290

9 March 2018

Aboriginal Native Title Consultants
Margaret & John Matthews
4 Calgaroo Avenue
MUSWELLBROOK NSW 2333

Dear Margaret & John

RE: WAMBO COAL MINE – ABORIGINAL HERITAGE IMPACT PERMIT #C0003213 AND HERITAGE MANAGEMENT PLAN

The Wambo Coal Mine is situated approximately 15 kilometres west of Singleton, near the village of Warkworth, New South Wales (NSW). The Wambo Coal Mine is owned and operated by Wambo Coal Pty Limited (WCPL), a subsidiary of Peabody Energy Australia Pty Limited.

Aboriginal Heritage Impact Permit #C0003213

The South Bates Extension Modification (the Modification) Environmental Assessment was lodged by WCPL for assessment by the NSW Department of Planning and Environment in March 2017. The Modification was approved in December 2017.

Consistent with the Modification Aboriginal Cultural Heritage Assessment, which was provided for your review, WCPL submitted an application for a new AHIP to include any Aboriginal sites that may be impacted by the Modification that lie outside of the boundary of the approved AHIPs #C0002222, #C0001474 and #C0002000.

On 27 February 2018, the NSW Office of Environment and Heritage granted AHIP #C0003213 for the Wambo Coal Mine. A copy of AHIP #C0003213 is enclosed for your records.

Heritage Management Plan

Please also find enclosed for the purposes of consultation, a draft revised Heritage Management Plan for the Wambo Coal Mine. This Heritage Management Plan has been revised to address the relevant conditions of the Development Consent (DA 305-7-2003), as modified, and address the conditions of AHIP #C0003213.

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:

Peter Jaeger
Senior Environmental Advisor
Wambo Coal Pty Ltd
PMB1, SINGLETON NSW 2303
Phone: (02) 6570 2206
Email: pjaeger@peabodyenergy.com

Please submit any comments you may have on the Heritage Management Plan (either verbally or in writing) by **5.00pm Wednesday 4 April 2018.**

Please don't hesitate to contact the undersigned should you have any queries, or should you wish to discuss the Heritage Management Plan further.

Yours faithfully

Peter Jaeger
Senior Environmental Advisor
WAMBO COAL PTY LTD

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

11 April 2018

NSW Office of Environment and Heritage
Locked Bag 1002
DANGAR NSW 2309

Attention: Steven Cox

Also via email: rog.hcc@environment.nsw.gov.au

Dear Mr Cox

RE: WAMBO COAL MINE – HERITAGE MANAGEMENT PLAN VERSION 4

Please find enclosed a draft revision of the Wambo Coal Heritage Management Plan (Version 4) for the purposes of consultation.

The Heritage Management Plan has been revised to:

- address the conditions of Aboriginal Heritage Impact Permit (AHIP) (#C0003213) approved and issued under section 90D of the NSW *National Parks and Wildlife Act, 1974* on 27 February 2018;
- be suitable for inclusion as the Heritage Management Plan in the Extraction Plan for the Longwalls 17 to 20 at the South Bates Extension Underground Mine (as required under Condition 22C, Schedule 4 of the Development Consent DA 305-7-2003); and
- incorporate a management plan for Aboriginal cultural heritage in Remnant Woodland Enhancement Program (RWEP) Area A (as required under Condition 51, Schedule 4 of the Development Consent DA 305-7-2003 modified in December 2017).

A copy of the draft revised Wambo Coal Heritage Management Plan was provided to the Registered Aboriginal Parties on 9 March 2018 for review and comment with a 21 day review period in accordance with Section 8.2 of the Heritage Management Plan (refer to correspondence to the Office dated 12 March 2018).

No comments were received from the Registered Aboriginal Parties during the consultation period.

The Heritage Management Plan is being provided to the Office of Environment and Heritage for the purposes of consultation in accordance with Conditions 22C(h) and 51, Schedule 4 of the Development Consent DA 305-7-2003. These conditions are included in Attachment 1 to this letter for your reference.

WCPL would appreciate if you would kindly provide any comments on the draft revised Heritage Management Plan by **Thursday 26 April 2018**. We look forward to your input, and invite you to contact me if you have any queries or wish to discuss.

Yours faithfully

Peter Jaeger
Senior Environmental Advisor
WAMBO COAL PTY LTD

ATTACHMENT 1
RELEVANT CONDITIONS OF DA 305-7-2003

Conditions 22C(h) and 22D, Schedule 4 of the Development Consent (DA 305-7-2003)

22C. The Applicant must prepare and implement an Extraction Plan for the second workings within each seam to be mined to the satisfaction of the Secretary. Each Extraction Plan must:

…

(h) include a:

- *…*
- *Heritage Management Plan, which has been prepared in consultation with OEH and relevant stakeholders for Aboriginal and non-Aboriginal heritage, to manage the potential environmental consequences for the proposed second workings on heritage sites or values; and*

…

22D. The Applicant must ensure that the management plans required under condition 22C(h) above include:

(a) an assessment of the potential environmental consequences of the Extraction Plan, incorporating any relevant information that has been obtained since this consent;

(b) a detailed description of the measures that would be implemented to remediate predicted impacts; and

(c) a contingency plan that expressly provides for adaptive management.

Condition 51, Schedule 4 of the Development Consent (DA 305-7-2003)

51. The Applicant must develop a management plan to manage Aboriginal cultural heritage in Remnant Woodland Enhancement Area A (referred to in condition 41 above) within 12 months of entering into a conservation agreement over that Area, or as otherwise agreed by the Secretary. The management plan must be:

(a) prepared by suitably qualified and experienced person/s whose appointment has been endorsed by the Secretary;

(b) developed in consultation with OEH and Aboriginal communities; and

(c) approved by the Secretary.

The Applicant must implement the management plan as approved by the Secretary.

Subject: Biodiversity Management Plan

From: Bartlett, Merri [mailto:MBartlett@peabodyenergy.com]
Sent: Friday, 23 March 2018 8:59 AM
To: OEH ROD Hunter Central Coast Mailbox <rog.hcc@environment.nsw.gov.au>
Cc: Steven Cox <Steven.Cox@environment.nsw.gov.au>; Jaeger, Peter F <PJaeger@peabodyenergy.com>
Subject: Biodiversity Management Plan

To whom it may concern,

Wambo Coal Mine is situated approximately 15 kilometres west of Singleton, near the village of Warkworth, New South Wales (NSW). Wambo Coal Mine is owned and operated by Wambo Coal Pty Limited (WCPL), a subsidiary of Peabody Energy Australia Pty Limited.

WCPL received approval for the South Bates Extension Underground Mine (Longwalls 17 to 25) in December 2017 (MOD 17 of DA 305-7-2003). WCPL is currently preparing an Extraction Plan for the first four longwalls at the South Bates Extension (Longwalls 17 to 20).

Please find below a link to download a copy of the WCPL complex-wide Biodiversity Management Plan, which has been revised to be suitable for inclusion in the Extraction Plan for the approved Longwalls 17 to 20 at the South Bates Extension Underground Mine.

https://resourcestrategies.sharefile.com/d-s75b61a42d4d46c28

This Biodiversity Management Plan has been updated from the approved Biodiversity Management Plan to include consideration of the approved MOD 17 and Longwalls 17 to 20 of the South Bates Extension Underground Mine (changes shown as **blue text**). This Biodiversity Management Plan is considered to address Conditions 22C(h) and 22D, Schedule 4 of Development Consent (DA 305-7-2003), which state:

22C. The Applicant must prepare and implement an Extraction Plan for the second workings within each seam to be mined to the satisfaction of the Secretary. Each Extraction Plan must:

…

h. include a:

- *…*
- *Biodiversity Management Plan, which has been prepared in consultation with the OEH, which provides for the management of the potential impacts and/or environmental consequences of the proposed second workings on flora and fauna;*

…

22D. The Applicant must ensure that the management plans required under condition 22C(h) above include:

a. an assessment of the potential environmental consequences of the Extraction Plan, incorporating any relevant information that has been obtained since this consent;

b. a detailed description of the measures that would be implemented to remediate predicted impacts; and

c. a contingency plan that expressly provides for adaptive management.

WCPL would appreciate if you would kindly provide any comments on the attached Biodiversity Management Plan by **Friday 13 April 2018**. We look forward to your input, and invite you to contact us if you have any queries.

Please do not hesitate to contact me if you have any queries or wish to discuss.

Regards,

Merri Bartlett
Environmental Advisor
Peabody Australia
PMB 1, Singleton NSW 2330
Office Phone: +61 2 6570 2207 | Cell: +61 418 281 631
mbartlett@peabodyenergy.com

From: Steven Cox <Steven.Cox@environment.nsw.gov.au>
Sent: Friday, 23 March 2018 8:22 AM
To: Bartlett, Merri
Subject: RE: Biodiversity Management Plan

Hi Merri,

Unfortunately at the moment we don't have capacity to review and comment on management plans and therefore won't be providing comment on the Wambo Biodiversity Management Plan.

Please forward the management plan to the Department of Planning and Environment without our review.

Regards
Steven

Steven Cox
Senior Team Leader Planning
Hunter Central Coast Branch
Regional Operations Division
Office of Environment & Heritage

Level 4/26 Honeysuckle Drive Newcastle NSW 2300
Locked Bag 1002 Dangar NSW 2309
T 02 4927 3140
M 0472 800 088

From: Bartlett, Merri [mailto:MBartlett@peabodyenergy.com]
Sent: Friday, 23 March 2018 8:59 AM
To: OEH ROD Hunter Central Coast Mailbox <rog.hcc@environment.nsw.gov.au>
Cc: Steven Cox <Steven.Cox@environment.nsw.gov.au>; Jaeger, Peter F <PJaeger@peabodyenergy.com>
Subject: Biodiversity Management Plan

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Wambo Coal Mine is situated approximately 15 kilometres west of Singleton, near the village of Warkworth, New South Wales (NSW). Wambo Coal Mine is owned and operated by Wambo Coal Pty Limited (WCPL), a subsidiary of Peabody Energy Australia Pty Limited.

WCPL received approval for the South Bates Extension Underground Mine (Longwalls 17 to 25) in December 2017 (MOD 17 of DA 305-7-2003). WCPL is currently preparing an Extraction Plan for the first four longwalls at the South Bates Extension (Longwalls 17 to 20).

Please find below a link to download a copy of the WCPL complex-wide Biodiversity Management Plan, which has been revised to be suitable for inclusion in the Extraction Plan for the approved Longwalls 17 to 20 at the South Bates Extension Underground Mine.

https://resourcestrategies.sharefile.com/d-s75b61a42d4d46c28

This Biodiversity Management Plan has been updated from the approved Biodiversity Management Plan to include consideration of the approved MOD 17 and Longwalls 17 to 20 of the South Bates Extension Underground Mine (changes shown as **blue text**). This Biodiversity Management Plan is considered to address Conditions 22C(h) and 22D, Schedule 4 of Development Consent (DA 305-7-2003), which state:

22C. The Applicant must prepare and implement an Extraction Plan for the second workings within each seam to be mined to the satisfaction of the Secretary. Each Extraction Plan must:

…

h. include a:

- *…*
- *Biodiversity Management Plan, which has been prepared in consultation with the OEH, which provides for the management of the potential impacts and/or environmental consequences of the proposed second workings on flora and fauna;*

…

22D. The Applicant must ensure that the management plans required under condition 22C(h) above include:

a. an assessment of the potential environmental consequences of the Extraction Plan, incorporating any relevant information that has been obtained since this consent;

b. a detailed description of the measures that would be implemented to remediate predicted impacts; and

c. a contingency plan that expressly provides for adaptive management.

WCPL would appreciate if you would kindly provide any comments on the attached Biodiversity Management Plan by **Friday 13 April 2018**. We look forward to your input, and invite you to contact us if you have any queries.

Please do not hesitate to contact me if you have any queries or wish to discuss.

Regards,

Merri Bartlett
Environmental Advisor
Peabody Australia
PMB 1, Singleton NSW 2330
Office Phone: +61 2 6570 2207 | Cell: +61 418 281 631
mbartlett@peabodyenergy.com

WAMBO COAL PTY LTD

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Fax + 61 (0) 2 6570 2290

10 April 2018

Annika Lawrence
Water Regulation Officer
Department of Industry - Water
Level 3 26 Honeysuckle Drive
Newcastle NSW 2300
PO Box 2213 Dangar NSW 2309

cc: water.referrals@dpi.nsw.gov.au

RE: Wambo Water Management Plan Updates – Surface Water and Groundwater Monitoring Programs and Surface and Groundwater Response Plan

Dear Annika,

Further to our previous correspondence (dated 12 March 2018), advising that Wambo Coal's Water Management Plans are being revised following Modification 17 to DA 305-7-2003 (the Consent), the Department of Planning and Environment (DP&E) has agreed to an extension for the submission of the Water Management Plans to the 1 May 2018.

The following revised documents, which are all components of the WCPL Site Water Management Plan have been uploaded to the Peabody File Transfer system. An invitation has been sent to you for download:

- Groundwater Monitoring Program (GWMP);
- Surface Water Monitoring Program (SWMP);
- Surface and Groundwater Response Plan (SGWRP);
- Erosion and Sediment Control Plan (ESCP); and

The Site Water Balance is currently under review and will be submitted later in 2018.

Schedule 4, Condition 33A of the Consent requires:

33A. *Within 3 months of the approval of Modification 17, or as otherwise agreed with the Secretary, the Applicant must, in consultation with CLWD, revise the Surface Water Monitoring Program to:*
(a)..
(b) complete a geomorphic context statement of North Wambo Creek; and
(c) undertake a pre-subsidence survey and energy profile analysis and develop pre-subsidence channel profiles for both cross sections and long profiles.

The Alluvium report titled 'North Wambo Creek – Baseline assessment geomorphic context statement' addresses this requirement and has been uploaded to the Peabody File Transfer system.

Schedule 4, Condition 34B of the Consent states:

34B. *Within 3 months of the approval of Modification 17, or as otherwise agreed with the Secretary, the Applicant must revise the Groundwater Monitoring Program in consultation with CLWD to include the installation of:*

(a) *Clustered monitoring bores for the South Bates Extension Area, located in close proximity to the Hunter Lowland Redgum Forest along North Wambo Creek...; and*
(b) *Monitoring vibrating wire piezometers, located above the South Bates Extension Area, both within and beyond the areas with potential for connective cracking.*

In relation to Schedule 4, Condition 34B(a), a proposed drilling program was provided to CLWD 3 November 2017. Clustered bores were drilled and construction completed by SLR Consulting Australia Pty Ltd (SLR) in November 2017, (refer to Section 2.2.1 and Figure 7 of the GWMP). WCPL received correspondence from CLWD (dated 23 November 2017), outlining additional requirements for the clustered bores. The drilling program was complete prior to the correspondence being received. Four standpipes were installed as an outcome of the drilling program (two paired sites) and have been included in the monitoring program (sites GW23 to GW26).

Attached for your reference is the drilling report from SLR. The drilling identified limited to no groundwater in the alluvium other than after rainfall. The majority of the drill sites were unsaturated despite recent rainfall Given the limited extent of groundwater identified, WCPL does not propose to undertake any additional drilling in the vicinity of North Wambo Creek. However, your feedback on this proposal would be appreciated.

In relation to Schedule 4, Condition 34B(b), a new VWP (P317) has been established and augmented with United monitoring bore UG139 to monitor depressurisation above South Bates Extension.

Included for your reference in **Table 1** is a summary of the current status of each of the Water Management Plan components.

Table 1: Summary Status of Water Management Plan Components

Water Management Plan Component	Status
Surface Water Monitoring Program	Updated as required and submitted to DoI-Water and DP&E for consultation 12 March 2018. Resubmitted 10 April 2018 following correspondence from DoI-Water that all documents will be reviewed simultaneously, once GWMP is submitted. North Wambo Creek Geomorphic Context Statement and baseline assessment provided 10 April 2018. Will be submitted to DP&E by 1 May 2018.
Erosion and Sediment Control Plan	Previously submitted for approval in April 2016. Re-submitted to DoI-Water and DP&E for consultation 12 March 2018. Resubmitted to DoI-Water 10 April 2018, following correspondence from DoI-Water that all documents will be reviewed simultaneously. Comments received from DP&E 26 March 2018 are currently being addressed, with the document to be re- submitted to DP&E by 27 April 2018.
Groundwater Monitoring Program	DP&E approved an extension for submission. GWMP reviewed by external consultant (HydroSimulations) who assisted to restructure, review / check trigger values and update monitoring data. Submitted to DoI-Water for consultation 10 April 2018. Will be submitted to DP&E 1 May 2018.
Surface and Groundwater Response Plan	Revised to reflect changes to the Groundwater Monitoring Program and submitted 10 April 2018 to DoI-Water for consultation. Will be submitted to DP&E 1 May 2018.
Site Water Balance	Not re-submitted – Currently under review to incorporate future mine changes and a salinity balance. Will be submitted later in 2018.

If you could please review and provide timely comments on each of the components of the Site Water Management Plan, would be appreciated. DP&E is expecting to receive the revised documents by 1 May 2018.

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

Yours faithfully,

Peter Jaeger
Senior Environmental Advisor
Wambo Coal Pty Ltd
Phone: (02) 6570 2206
Mob: 0417527585
pjaeger@peabodyenergy.com

Attachments (Provided via the Peabody Large File Transfer System)

- **WCPL Groundwater Monitoring Program (GWMP);**
- **WCPL Surface Water Monitoring Program (SWMP);**
- **WCPL Surface and Groundwater Response Plan (SGWRP);**
- **WCPL Erosion and Sediment Control Plan (ESCP);**
- **North Wambo Creek – Baseline assessment geomorphic context statement Alluvium Consulting (February 2018)**
- **Wambo Drilling Program – Upper North Wambo Creek SLR Consulting Australia Pty Ltd (4 December 2017)**

WAMBO COAL PTY LTD

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10 April 2018

Natasha Ryan
Regional Operations Officer– Hunter Region
Environment and Protection Authority
PO Box 488G, NEWCASTLE
NSW, 2300

Dear Natasha

Re: Wambo Coal Water Management Plan Revisions

On December 20 2017, Wambo Coal Pty Ltd (WCPL) received approval for Modification 17 to DA 305-7-2003 (the Consent) for the South Bates Underground Extension. Conditions 33A and 33B were added to the Consent as follows:

33A. *Within 3 months of the approval of Modification 17, or as otherwise agreed with the Secretary, the Applicant must, in consultation with CLWD, revise the Surface Water Monitoring Program….*

and

34B. *Within 3 months of the approval of Modification 17, or as otherwise agreed with the Secretary, the Applicant must revise the Ground Water Monitoring Program, in consultation with CLWD…*

The Surface and Groundwater Monitoring Programs are components of the WCPL Site Water Management Plans (as outlined in Figure 1). The Department of Planning and Environment (DP&E) agreed to an extension for the review of the Management Plans and they are now due for submission to DP&E by 1 May 2018.

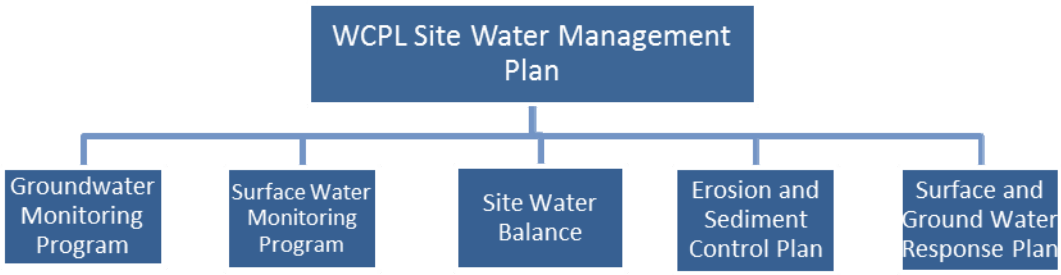

Figure 1: Structure of the WCPL Site Water Management Plan

The following revised documents, have been uploaded to the Peabody File Transfer system. An invitation has been sent to enable document download:

- Groundwater Monitoring Program (GWMP);
- Surface Water Monitoring Program (SWMP);
- Surface and Groundwater Response Plan (SGWRP); and
- Erosion and Sediment Control Plan (ESCP).

WCPL will submit the revised documents as required to DP&E by 1 May 2018. If you require anything further, or have any issues downloading the documents, please contact Nicole Dobbins on 0408969988 or myself at the contact details below.

Yours faithfully,

Peter Jaeger
Senior Environmental Advisor
Wambo Coal Pty Ltd
Phone: (02) 6570 2206
Mob: 0417527585
pjaeger@peabodyenergy.com

Attachments (Provided via the Peabody Large File Transfer System)

- **WCPL Groundwater Monitoring Program (GWMP);**
- **WCPL Surface Water Monitoring Program (SWMP);**
- **WCPL Surface and Groundwater Response Plan (SGWRP); and**
- **WCPL Erosion and Sediment Control Plan (ESCP).**

Dobbins, Nicole

From: Natasha Ryan <Natasha.Ryan@epa.nsw.gov.au>
Sent: Tuesday, 10 April 2018 11:42 AM
To: Dobbins, Nicole
Subject: RE: ndobbins@peabodyenergy.com Invited you to collaborate on files stored in: Wambo Coal - Water Management Plan Revisions EPA

Please see advice under my signature block in regard to file transfers and correspondence and resubmit

Natasha Ryan
Regional Operations Officer - Hunter
North Branch, NSW Environment Protection Authority
+61 2 49086833
natasha.ryan@epa.nsw.gov.au www.epa.nsw.gov.au @NSW_EPA
Report pollution and environmental incidents 131 555 (NSW only) or +61 2 9995 5555

All correspondence must be sent to hunter.region@epa.nsw.gov.au
If correspondence is too large to be sent to the email address it must be sent by mail as a paper version with a digital copy on CD, DVD or USB. The EPA will not accept any file transfer sites unless its One Drive for business or information can be downloaded from a publicly accessible site with no passwords.

From: Securefile@peabodyenergy.kiteworks.com [mailto:Securefile@peabodyenergy.kiteworks.com]
Sent: Tuesday, 10 April 2018 10:37 AM
To: Natasha Ryan <Natasha.Ryan@epa.nsw.gov.au>
Subject: ndobbins@peabodyenergy.com Invited you to collaborate on files stored in: Wambo Coal - Water Management Plan Revisions EPA

ndobbins@peabodyenergy.com has given you secure access to files in Wambo Coal - Water Management Plan Revisions EPA

To begin using the system, please activate your account by creating a password.

ACTIVATE

secured by kiteworks

Planning Services
Resource Assessments

Contact: Melanie Hollis
Phone: 8217 2043
Email: melanie.hollis@planning.nsw.gov.au

Peter Jaeger
Senior Environmental Advisor
Wambo Coal Pty Ltd
PMB 1
SINGLETON NSW 2330

Dear Mr Jaeger

South Bates Underground Mine
Variation to Longwall 16

I refer to your correspondence of 6 April 2018 seeking the Secretary's approval to reduce the length of South Bates Longwall 16 (Wambo Seam) by approximately 390 metres compared to the approved length in the approved Extraction Plan (EP), dated July 2017, without the need to further amend this EP. The Department understands that the reduction is being sought due to potential health and safety risks associated with difficulties reducing the gas content of the coal seam to safe working levels.

The Department accepts that this reduction is necessary.

The Department notes while there are minor surface features located above Longwall 16, the reduction in length would likely result in negligible changes to the 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 15.

Considering the above, the Secretary agrees that the proposed modified layout would still comply with condition 2 of Schedule 2 of the Wambo Coal Mine development consent (DA 305-7-2003), and the EP does not need to be amended. The Department considers the management and monitoring strategies of the approved EP remain appropriate to manage predicted subsidence effects.

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

Yours sincerely

Howard Reed

Howard Reed 12.4.18
Director Resource Assessments
as the Secretary's nominee

ATTACHMENT 3

PROGRAM TO COLLECT BASELINE DATA FOR FUTURE EXTRACTION PLANS

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) (~~current mining area~~ now completed);
- South Bates Extension Underground Mine (Whybrow Seam) (~~first workings commenced, next longwall~~ 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 the first four longwalls at the South Bates Extension Underground Mine (Longwalls 17 to 20).

Future Extraction Plans at the Wambo Coal Mine will include:

- Extraction Plan(s) for the remaining longwalls at the South Bates Extension Underground Mine (Longwalls 21 to 25); and
- Extraction Plans 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 20 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). • The revised GWMP included with this Extraction Plan (Version 12) has been revised to include the following monitoring to inform future Extraction Plans: – clustered monitoring bores in the South Bates Extension Underground Mine area, in proximity to the Hunter Lowland Redgum Forest along North Wambo Creek (GW23, GW24, GW25 and GW26) (required under Condition 34B(a), Schedule 4 of the Development Consent); – vibrating wire piezometers in the South Bates Extension Underground Mine area (P317 and UG139) (required under Condition 34B(a), Schedule 4 of the Development Consent); and – paired monitoring bores for the South Wambo Underground Mine (P316, P319 and P320). • 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 Longwalls 23 to 25 will take into account the findings of the Groundwater Dependent Ecosystem Study required under Condition 36A, Schedule 4 of the Development Consent and not less than 2 years of monitoring results obtained from GW23, GW24, GW25, GW26, P317 and UG139.

Table A3-1 (Continued)
Program to Collect Baseline Data for Future Extraction Plans

Aspect of Future Extraction Plan	Proposed Monitoring
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. • The revised SWMP included with this Extraction Plan (Version 12) has been revised to include the following to inform future Extraction Plans: – a new upstream flow gauge site on North Wambo Creek (US FM1); and – a pre-subsidence (baseline) survey, energy profile analysis and geomorphic context statement on 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.
Land	• Monitoring of impacts to land in general in accordance with the LMP, including high resolution photographic recording of cliffs. • The monitoring conducted in accordance with the LMP will be used in the review of observed subsidence impacts for future Extraction Plans.
Biodiversity	• Monitoring of biodiversity in accordance with the BMP (**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.

Table A3-1 (Continued)
Program to Collect Baseline Data for Future Extraction Plans

Aspect of Future Extraction Plan	Proposed Monitoring
Aboriginal Heritage	• Maintenance of an Aboriginal heritage sites database.
Non-Aboriginal Heritage	• In accordance with Condition 62A, Schedule 4 of the Development Consent, an Archival Recording has been completed of the Whynot homestead and outbuildings. • 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.
LMP refers to the Land Management Plan for Longwalls 17 to 20.
BMP refers to the Wambo Coal Pty Limited Biodiversity Management Plan.

ATTACHMENT 4

KEY CONTACT REGISTER

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
Environment and Community Manager ~~(Acting)~~	Peter Jaeger	(02) 6570 2209
Community Hotline	-	(02) 6570 2245
Control Room (24 hours)	-	(02) 6570 2240
Health and Safety Manager	Mark Cook	(02) 6570 2309
General Manager	Albert Scheepers	(02) 6570 2330
Technical Services Manager	Michael Berry	
Mining Engineering Manager (Underground Mine Manager) ~~(Acting)~~	David Gibson	

Table A4-3
Stakeholder Contact Details

Organisation	Position	Contact Name	Contact Phone Number/Email	Postal Address
Department of Planning & Environment	Director, Resources Assessment	Howard Reed	Howard.Reed@planning.nsw.gov.au	GPO Box 39 Sydney NSW 2001
NSW Resources Regulator, Department of Planning & Environment	Manager Northern Region, Environmental Sustainability Unit	Monique Meyer	monique.meyer@industry.nsw.gov.au	PO Box 344 Hunter Region MC NSW 2310
Division of Resources and Geoscience, Department of Planning & Environment	Manager Royalties and Advisory Services (Acting)	Matt Gagan	industry.coordination@industry.nsw.gov.au	
Subsidence Advisory NSW	Newcastle District Office	-	a-mail@finance.nsw.gov.au District Office – (02) 4908 4300	PO Box 488G Newcastle NSW 2300
Department of Industry – Water (Natural Resources Access Regulator)	A/Manager Regional Water Regulation (East)	Ryan Shepherd	ryan.shepherd@nrar.nsw.gov.au	PO Box 2213 Dangar NSW 2309
Office of Environment and Heritage	Senior Team Leader Planning, Hunter Central Coast	Steven Cox	rog.hcc@environment.nsw.gov.au Steven.Cox@environment.nsw.gov.au	Locked Bag 1002 Dangar NSW 2309
Environment Protection Authority	Hunter Region	-	hunter.region@epa.nsw.gov.au	PO Box 488G Newcastle NSW 2300
Heritage Branch, OEH	Acting Manager, Conservation	Siobhan Lavelle	heritagemailbox@environment.nsw.gov.au	Locked Bag 5020 Parramatta NSW 2124
Singleton Shire Council	General Manager	Jason Linnane	ssc@singleton.nsw.gov.au gm@singleton.nsw.gov.au	PO Box 314 Singleton NSW 2330