WAMBO COAL PTY LIMITED

SOUTH BATES EXTENSION UNDERGROUND MINE

EXTRACTION PLAN
LONGWALLS 21 TO 24

APPENDIX G
COAL RESOURCE RECOVERY PLAN

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WAMBO COAL PTY LIMITED
SOUTH BATES EXTENSION UNDERGROUND MINE

COAL RESOURCE RECOVERY PLAN
LONGWALLS 21 - 24

PREPARED BY
WAMBO COAL PTY LIMITED

JULY 2020
Project No. WAM-09-15
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DOCUMENT CONTROL

Document No.	CRRP LW21-24
Title	Coal Resource Recovery Plan for South Bates Extension Underground Mine Longwalls 21 to 24
General Description	A plan demonstrating the effective recovery of the available resource from the mining of Longwalls 21 to 24 at the South Bates Extension Underground Mine
Key Support Documents	Wambo Coal Extraction Plan for South Bates Extension Underground Mine Longwalls 21 to 24

Revisions

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

The nominated Coordinator for this document is	Technical Services Manager

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1 INTRODUCTION

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

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

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

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

1.1 PURPOSE AND SCOPE

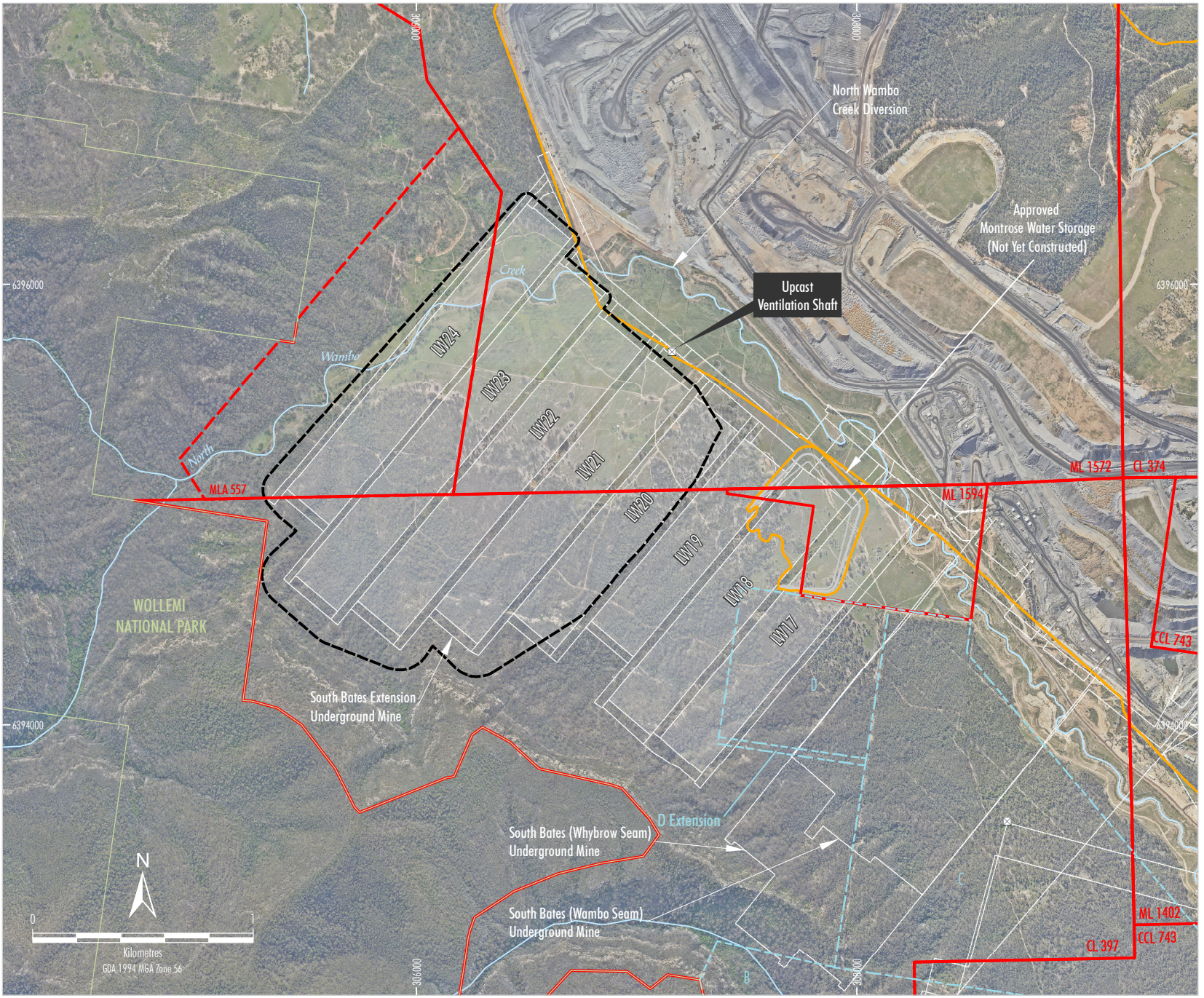
Purpose: This Coal Resource Recovery Plan (CRRP) for Longwalls 21 to 24 has been prepared to demonstrate the effective recovery of the available resource at the South Bates Extension Underground Mine.

Scope: This CRRP includes Longwalls 21 to 24 of the South Bates Extension Underground Mine.

This CRRP has been prepared in accordance with Condition B7(e) of Schedule 2 of the Development Consent (DA 305-7-2003) as a component of the South Bates Extension Underground Mine Longwalls 21 to 24 Extraction Plan.

Plans 1 to 7 as described in 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) (Department of Planning and Environment [now Department of Planning, Industry and Environment] and NSW Trade & Investment – Division of Resources and Energy [now Mining, Exploration and Geoscience (MEG)], 2015) are provided in **Attachment 1**. **Plan 1**, **Plan 2** and **Plan 7** (**Attachment 1**) present the approved mine plan, Longwalls 21 to 24 Application Area and surface features overlying Longwalls 21 to 24. **Plan 5** presents the current WCPL mining tenements and details land ownership.

This CRRP forms part of WCPL's Environmental Management System for the Wambo Coal Mine. The relationship of this CRRP to the Wambo Coal Mine Environmental Management System is described in Section 1.2 of the Extraction Plan.



LEGEND

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

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

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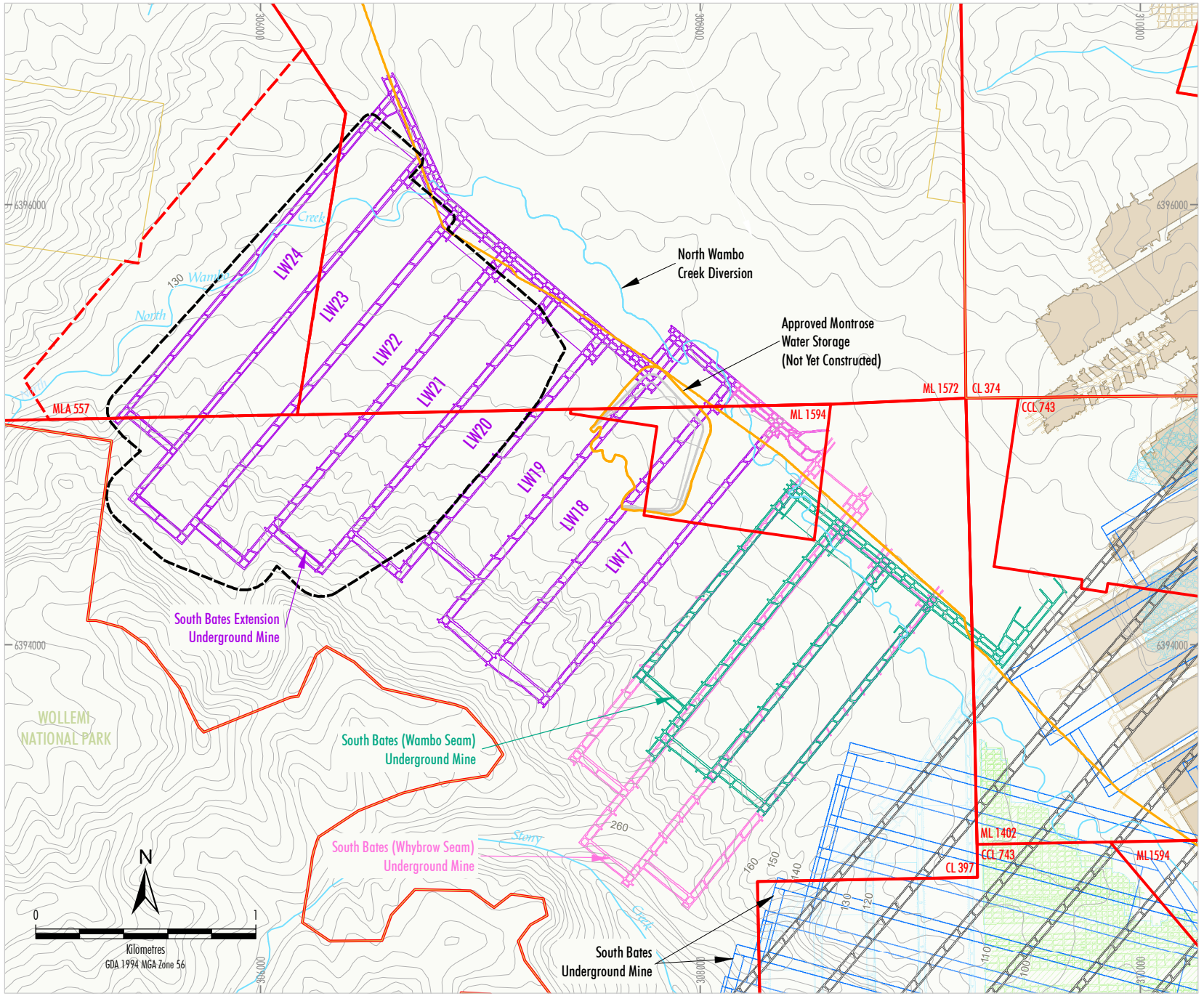
WAMBO COAL MINE

Aerial Photograph of Longwalls 21 to 24

Figure 1

WAM-09-15_SBX EP_LW21-24_MP_CRRP_201C



LEGEND

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

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

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WAMBO COAL MINE

Longwalls 21 to 24 Layout

Figure 2

WAM-09-15_SBX EP_LW21-24_MP_CRRP_202C

2 RESOURCE DESCRIPTION

2.1 SITE GEOLOGY OVERVIEW

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 (**Figure 3**). A summary of the coal measure stratigraphy underlying the Wambo Coal Mine area is provided in **Figure 3**.

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 metres (m) thick and generally consists of relatively coarse clastic sediments (Department of Mineral Resources, 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 3**):

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

These seams dip gently to the south-west at approximately 2 to 3 degrees, 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).

The South Bates Extension Underground Mine targets the Whybrow Seam, which produces a low ash thermal coal. Run-of-mine (ROM) coal will be crushed and washed at the Wambo Coal Mine Coal Handling and Preparation Plant. Product coal from the South Bates Extension Underground Mine will be considered suitable for export and domestic markets.

2.2 OVERBURDEN LITHOLOGICAL AND GEOTECHNICAL CHARACTERISTICS

The overburden of the Longwalls 21 to 24 Application Area consists predominately of interbedded sandstone and siltstone layers, with minor claystone, mudstone, shale, tuffaceous and coal layers (Mine Subsidence Engineering Consultants [MSEC], 2020).

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

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

WAM-09-15_SBX.EP_LW21-24_MP_CRP_001A

After: DMR (1993)

Peabody

WAMBO COAL MINE

Stratigraphy of the Wambo Coal Mine Area

Figure 3

There are no massive sandstone or conglomerate units within the overburden. The largest is a 17 m thick sandstone layer located approximately 30 m above the Whybrow Seam. Otherwise, the thicknesses of the formations within the overburden are typically less than 10 m. Other boreholes in the vicinity of the mining area indicate the presence of other larger sandstone units with thicknesses up to 20 m in the lower part of the overburden (MSEC, 2020).

No adjustment factors have been applied in the subsidence prediction model for any massive strata units or for softer floor conditions, as the longwalls are supercritical in width and therefore are predicted to achieve the maximum subsidence for single-seam mining conditions (MSEC, 2020).

Estimates of the range of material strength and stiffness properties present in the overburden materials are summarised in **Table 1**.

Table 1
Strength Property Estimates for Lithology in the Vicinity of the South Bates Extension Underground Mine

Unit Lithology	Unit Thickness Range (m)	UCS Range (MPa)	Laboratory Elastic Modulus* Range (GPa)	Poisson's Ratio
Roof Material above Whybrow Seam	10 – 13	24 – 43 [36 mean]	11.5 – 12.2	0.155

* Young's Modulus (E) derived from laboratory and sonic UCS data, E = 300 x UCS (units are in GPa).

Note: UCS = unconfined compressive strength. MPa = megapascal. GPa = gigapascal.

2.3 LITHOLOGICAL AND GEOTECHNICAL CHARACTERISTICS (ROOF AND FLOOR STRATA)

The overburden of the Whybrow Seam predominately comprises of interbedded sandstone and siltstone layers, with minor claystone, mudstone, shale, tuffaceous and coal layers throughout the overburden (MSEC, 2020). Longwalls 21 to 24 will mine the Whybrow Seam.

Historical workings are discussed in **Section 2.6**.

Estimates of the range of material strength and stiffness properties present in the roof of the mine workings coal seams are summarised in **Table 1**.

2.4 EXISTENCE AND CHARACTERISTICS OF GEOLOGICAL STRUCTURE

Regional geological structure in the Longwalls 21 to 24 Application Area consists of several faults. The largest structure in the area is the Redmanvale Fault which has a throw greater than 20 m and is located to the south-west of the longwalls.

The first longwall in the series (i.e. Longwall 21) is located at a distance of 540 m from the interpreted location of the Redmanvale Fault at seam level. The successive longwalls in the series (i.e. Longwalls 22 to 23) progressively approach the fault with the distance becoming greater again at Longwall 24. Longwall 23 is located closest to the fault at a distance of 110 m at seam level. The progressive mining towards the fault will allow the surface movements in the vicinity of the fault to be continually monitored and reviewed (MSEC, 2020).

There are no major faults that have been identified within the extents of the proposed Longwall 21 to Longwall 24. Minor faults have been identified within the mining area with throws typically up to 1 m. A series of faults cross the commencing (i.e. south-western) ends of Longwalls 19 and 20 and the finishing (i.e. north-eastern) ends of Longwalls 18 to 21. These faults could extend through Longwalls 21 to 24. The faults within the proposed mining area will be better defined through ongoing investigations and the development of first workings.

No adjustment factors have been applied in the subsidence prediction model for any potential minor faults within the mining area, as the proposed longwalls are generally supercritical in width and, therefore, they are predicted to achieve the maximum subsidence for single-seam mining conditions (MSEC, 2020).

2.5 STABILITY OF UNDERGROUND WORKINGS

The design intent of the workings and method of extraction is such that the first workings provide long-term stable access to the longwall blocks or pillar panels, and the second workings are mined such that the overburden collapses (i.e. "goafs") in a controlled manner as the coal is removed. All of the subsidence movements that occur at the surface are generally the result of a new equilibrium being achieved (i.e. chain pillars and overlying strata compress elastically and overburden caves and eventually ‘re-supports’ itself on bulked and broken ground).

On 27 March 2018, DRG (now Mining, Exploration and Geosciences) indicated it was satisfied that WCPL would achieve the required outcomes of the first workings condition of the Development Consent (DA 305-7-2003, Condition 22E of Schedule 4 [now Condition B6 of Schedule 2]) for Longwalls 17 to 21, 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).*

On 29 May 2020, WCPL submitted correspondence to the NSW Resources Regulator requesting confirmation that the first workings for Longwalls 22 to 24 were considered to be long-term stable and long-term non-subsiding. On 7 July 2020, the NSW Resources Regulator confirmed that it was satisfied that WCPL could achieve the required outcomes of the first workings condition of the Development Consent (DA 305-7-2003, Condition B6 of Schedule 2) for Longwalls 22 to 24 on 27 March 2018, subject to the following condition:

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

The longwall blocks are also designed with barrier pillars at the ends of the blocks to protect the adjacent first workings pillars and remnant pillars left between the augered areas from any abutment loading. Adequate set-back from highwall crests is also provided.

The chain pillars are designed to provide serviceable gate roads for access and ventilation and may yield or crush out after mining is completed.

2.6 HISTORICAL MINING

There are no other currently existing longwalls immediately above or below Longwalls 21 to 24. The closest extracted longwalls are Longwalls 17 to 20 in the South Bates Extension (Whybrow) Seam Underground Mine and in the adjacent South Bates (Whybrow and Wambo Seam) Underground Mine, which are to the south-east of Longwall 21. WCPL is currently extracting Longwalls 17 to 20 in the Whybrow Seam. Extraction in the Whybrow Seam (Longwalls 11 to 13) was completed in June 2017. Extraction in the Wambo Seam (Longwalls 14 to 16) was completed in November 2018.

3 RESOURCE RECOVERY

3.1 MINING GEOMETRY

The currently approved orientation and footprint of the South Bates Extension Underground Mine was assessed as part of the *South Bates Extension Modification Environmental Assessment* (WCPL, 2017).

Extraction of Longwalls 17 to 20 is in progress at the South Bates Extension Underground Mine.

The layout of Longwalls 21 to 24 is presented in **Plan 1** (**Attachment 1**), and key panel dimensions for Longwalls 21 to 24 are presented in **Table 2**.

Table 2
Key Longwall Panel Dimensions

Dimension	Longwall 21	Longwall 22	Longwall 23	Longwall 24
Gate Road Width (m)	5.4			
Gate Road Height (m)	2.5 to 2.8			
Maingate Chain Pillar Width (m)	37.2	36.2	26	27.7
Tailgate Chain Pillar Width (m)	26	30	29	21
Longwall Void Width (m)[1]	261	261	261	261
Longwall Void Length (m)[2]	1,505	1,705	1,870	1,705
Extraction Height (m)	2.3 to 2.7	2.3 to 2.8	2.3 to 2.9	2.3 to 3.0

[1] Including gate roads.

[2] Including installation headings.

3.2 COVER DEPTH

The depth of cover above Longwalls 21 to 24 ranges from a minimum of 60 m above the finishing (north-eastern) ends of the longwalls, up to a maximum of 290 m above the commencing (south-western) ends of the longwalls.

The cover depth increases to the south-west, consistent with the seam dip and topography.

3.3 MINING METHOD

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

3.4 MINING SCHEDULE

WCPL operates its mines seven days per week, 24 hours per day on a rotating shift basis. The proposed sequence of mining for Longwalls 21 to 24 at the South Bates Extension Underground Mine and anticipated/actual start and completion dates are summarised in **Table 3**.

Table 3
Proposed Mining Schedule (Secondary Extraction)

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

3.5 FUTURE MINING

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

In addition to the approved South Bates Extension Underground Mine, the Development Consent (DA 305-7-2003) provides consent for underground mining by longwall methods in the Arrowfield and Woodlands Hill Seams (**Figure 1**). The future workings in the Arrowfield and Woodlands Hill Seams are located to the south-east of Longwalls 21 to 24 (**Figures 1 and 2**). The approved future underground longwall workings are described in the Wambo Development Project EIS (WCPL, 2003) and *South Wambo Underground Mine Modification Environmental Assessment* (WCPL, 2016) and will be the subject of a future Extraction Plan.

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

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

Mining of the Whybrow Seam by open cut mining methods in the South Bates Extension Underground Mine area is not viable due to increasing depth of cover and the presence of Remnant Woodland Enhancement Program (RWEP) areas.

3.6 RESOURCE RECOVERY

Resource estimates and proposed recovery for Longwalls 21 to 24 are summarised in **Table 4**. The mining layout for Longwalls 21 to 24 maximises resource recovery, which is estimated to be approximately 84%.

Table 4
Estimated Resource Recovery from Longwalls 21 to 24

Aspect	Million Tonnes
Available Resource	7.91
Development ROM Coal	0.46
Longwall ROM Coal	6.20
Total ROM Coal Recovered	**6.66**

The extent of Longwalls 21 to 24 is constrained by the extent of the previous longwalls (i.e. Longwalls 17 to 20) in the South Bates Extension Underground Mine to the south-east, faults to the north-west of the longwalls (Section 2.4), the extent of the approved Montrose West open cut pit and geological structures to the north-east and the Wollemi National Park escarpment to the south-west.

3.7 MINE PLAN JUSTIFICATION

The sequence of underground mining at the Wambo Coal Mine has been adopted to minimise the potential for sterilisation of coal reserves. The **Approved Plan** (**Attachment 1**) presents the Longwalls 21 to 24 layout which has been developed in consideration of detailed exploration drilling and key environmental studies, as described in the *South Bates Extension Modification Environmental Assessment* (WCPL, 2017).

The monitoring of subsidence impacts associated with the extraction of Longwalls 21 to 24 is described in the Subsidence Monitoring Program for Longwalls 21 to 24 (Appendix H of the Extraction Plan) and the relevant management plans summarised in Section 3 of the Extraction Plan.

4 REFERENCES

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

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

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

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

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

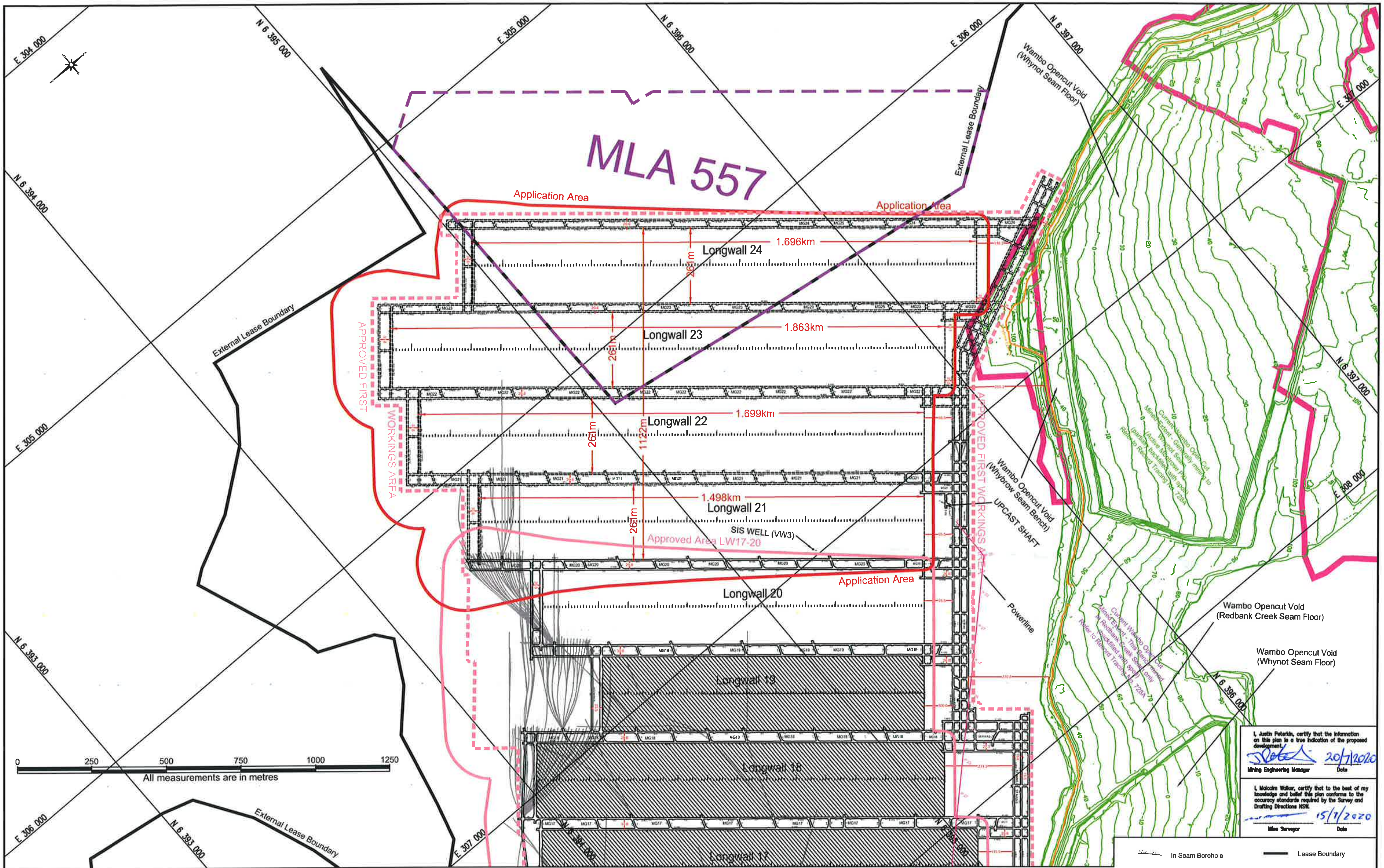
Wambo Coal Pty Limited (2016) *South Wambo Underground Mine Modification Environmental Assessment.*

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

ATTACHMENT 1

LONGWALLS 21 TO 24
PLANS 1 TO 7

Plan 1 – Proposed and Existing Workings
Plan 2 – Surface Features
Plan 2a – Surface Features (Aerial Photo)
Plan 3 –Whybrow Seam Structure
Plan 4 – Existing and Proposed Wambo Seam Workings
Plan 5 – Mining Titles and Land Ownership
Plan 6 – Geological Sections (Boreholes)
Plan 7 – Proposed and Existing Subsidence Monitoring



MLA 557
Application Area
Longwall 24
Longwall 23
Longwall 22
Longwall 21
Longwall 20
Longwall 19
Longwall 18
Longwall 17
1.696km
1.863km
1.699km
1.498km
261m
1122m
APPROVED FIRST WORKINGS AREA
Approved Area LW17-20
SIS WELL (VW3)
UPCAST SHAFT
Powerline
External Lease Boundary
Wambo Opencut Void (Whynot Seam Floor)
Wambo Opencut Void (Whybrow Seam Bench)
Wambo Opencut Void (Redbank Creek Seam Floor)
N 6 395 000
N 6 396 000
N 6 397 000
N 6 394 000
N 6 393 000
E 304 000
E 305 000
E 306 000
E 307 000
E 308 000
0
250
500
750
1000
1250
All measurements are in metres
I, Justin Peterkis, certify that the information on this plan is a true indication of the proposed development.
20/7/2020
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.
15/7/2020
Mine Surveyor
Date
In Seam Borehole
Lease Boundary

Legend	
Current Open Cut Extraction / Disturbance Approval Area (MOP 2020)	Longwall Extraction Appication Area (based on 26.5° angle of draw)
Approved Area LW17-20 South Bates Extension Underground Whybrow Seam	South Bates Extension Underground Existing Workings (Whybrow Seam)
South Bates Extension Underground Proposed Workings (Whybrow Seam)	Wambo Opencut Void 5m Contours (AHD) (Whybrow - Whynot Seam)
United Collieries SIS Borehole (Blakefield Seam)	Opencut Whybrow Seam Mined Extents
MLA 557 Approval Pending (ML1) (Whybrow Seam)	

REV.	DATE	BY	DESCRIPTION	CHK.
A	14/07/2020	MJW	For Longwall 21 to 24 Submission	ND

REVISIONS

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Prepared by NWU Survey Ph: 02 65 702318

South Bates Extension Underground Mine (Whybrow Seam)
Extraction Plan - Longwalls 21 to 24 (Revision A)
Plan 1 - Proposed and Existing Workings

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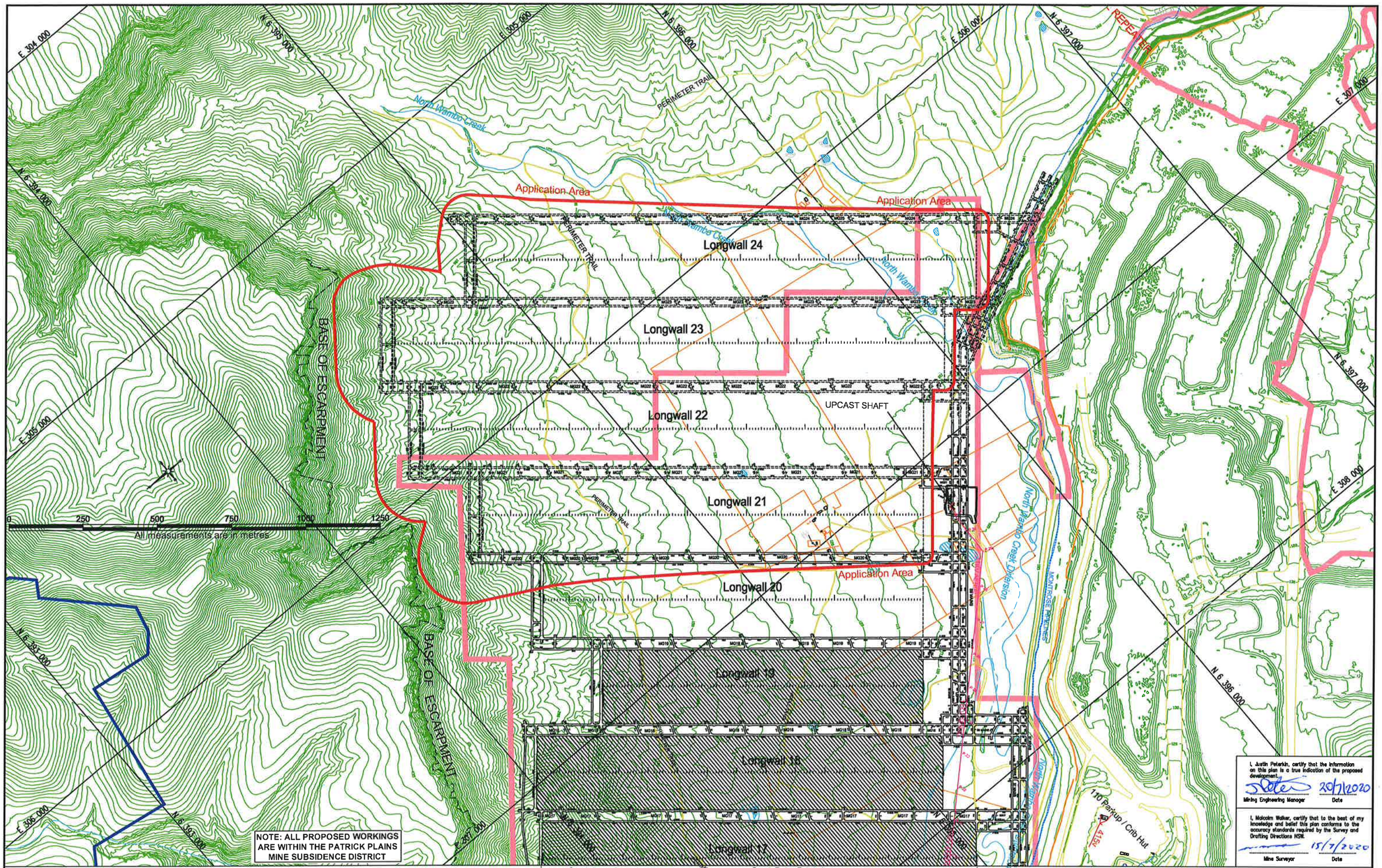
Revision No. A_14/07/2020



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

Mining Engineering Manager — Date 29/7/2020

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

Mine Surveyor — Date 15/7/2020

Current Opencut / Underground Approval Areas (MOP 2020)

Longwall Extraction Application Area (based on 26.5° angle of draw)

Patrick Plains Mine Subsidence District Western Extents

South Bates Extension Underground Existing Workings (Whybrow Seam)

South Bates Extension Underground Proposed Workings (Whybrow Seam)

85 Surface Contours

Opencut Whybrow Seam Mined Extents

Buildings

Water pipelines

Tracks

Fences

11kV Buried Cables

Powerlines

REVISIONS	REV.	DATE	BY	DESCRIPTION	CHK.
	A	14/07/2020	MJW	For Longwall 21 to 24 Submission	ND

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South Bates Extension Underground Mine (Whybrow Seam)
Extraction Plan - Longwalls 21 to 24 (Revision A)
Plan 2 - Surface Features

Drawing No.	Revision No.	Date	Scale	Drawn	Checked	Approved	Sheet Size
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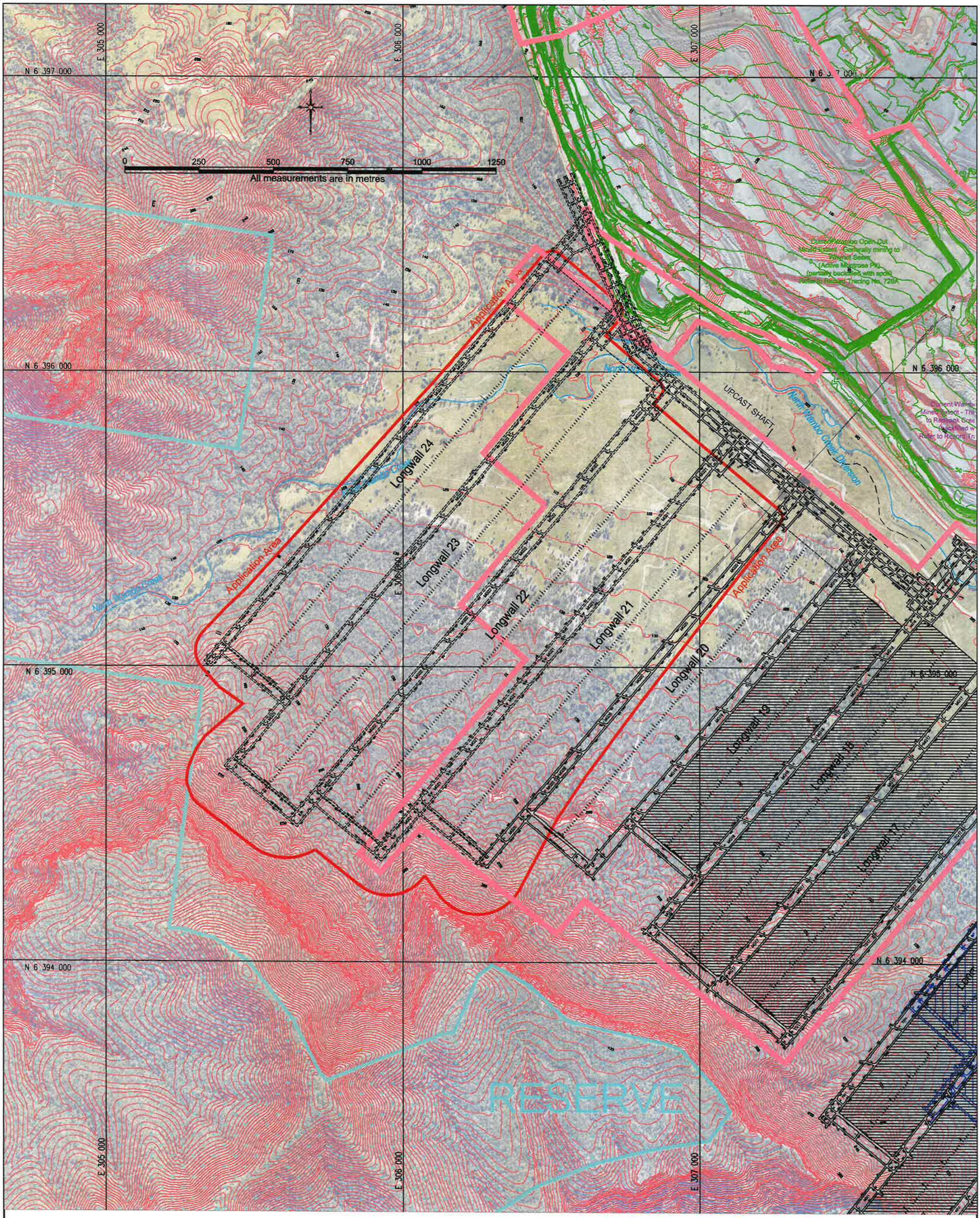

South Bates Extension Underground Existing Workings (Whybrow Seam)

South Bates Extension Underground Proposed Workings (Whybrow Seam)

South Bates Underground (Wambo Seam)

Longwall Extraction Application Area (based on 26.5° angle of draw)

Creeks

85 Surface Contours

30 Wambo Opencut Void Contours (Generally Whynot Seam Floor)

Current Opencut / Underground Approval Areas (MOP 2020)

Wollemi National Park Reserve

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

Mining Engineering Manager — Date 20/7/2020

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

Mine Surveyor — Date 15/7/2020

Rev.	Drawn	Description	Checked
A	MJW	For Longwall 21 to 24 Submission	ND

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South Bates Extension Underground Mine (Whybrow Seam)
Extraction Plan - Longwalls 21 to 24 (Revision A)
Plan 2a - Surface Features (Aerial Photo)

Drawing No. 2709

Revision No. A_14/07/2020

Date	Scale	Drawn	Checked	Approved	Sheet Size
25/06/2020	1: 4000	MJW	PJ	JP	A0

MLA 557

Application Area

External Lease Boundary

Longwall 24

Longwall 23

Longwall 22

Longwall 21

Longwall 20

Longwall 19

Longwall 18

Longwall 17

E 304 000 E 305 000 E 306 000 E 307 000 E 308 000

N 6 394 000 N 6 395 000 N 6 396 000 N 6 397 000 N 6 398 000 N 6 399 000

0 250 500 750 1000 1250

All measurements are in metres

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

Mining Engineering Manager — Date 20/7/2020

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

Mine Surveyor — Date 15/7/2020

Longwall Extraction Application Area (based on 26.5° angle of draw)

South Bates Extension Underground Existing Workings (Whybrow Seam)

South Bates Extension Underground Proposed Workings (Whybrow Seam)

Whybrow Seam Faults

Whybrow Seam Dykes

220 Whybrow Seam Overburden Thickness Isopach

3.0 Whybrow Seam Thickness Isopach

REVISIONS

REV.	DATE	BY	DESCRIPTION	CHK.	REV.	DATE	BY	DESCRIPTION	CHK.
A	14/07/2020	MJW	For Longwall 21 to 24 Submission	ND					

Peabody

WAMBO COAL PTY LIMITED
ABN 13 000 668 057

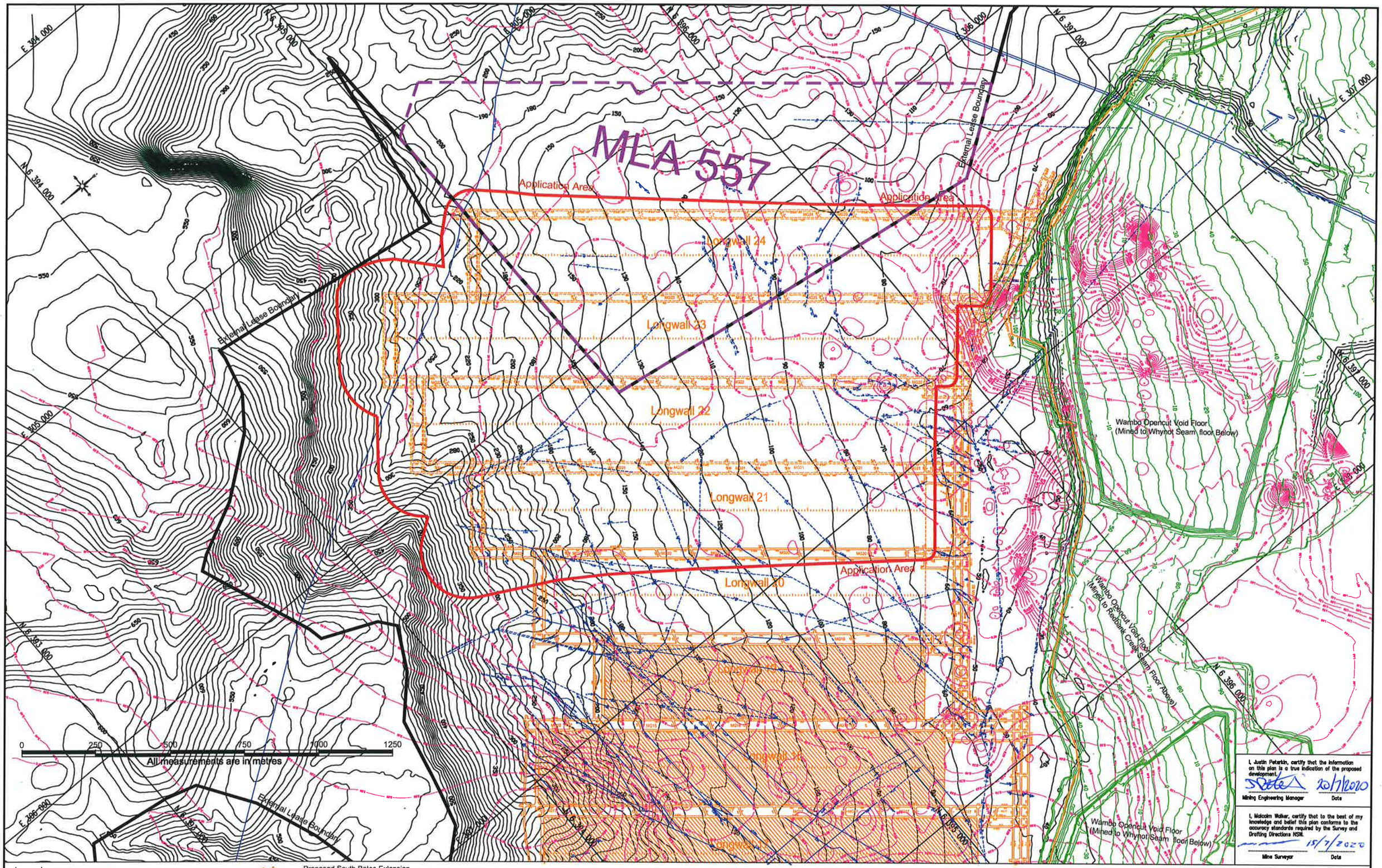
Jerry's Plains Rd, Warkworth
Via Singleton, NSW, 2330

Phone: 02 65 702200
Fax: 02 65 702290

Prepared by NWU Survey Ph: 02 65 702318

South Bates Extension Underground Mine (Whybrow Seam)
Extraction Plan - Longwalls 21 to 24 (Revision A)
Plan 3 - Whybrow Seam Structure

Drawing No.	Revision No.	Date	Scale	Drawn	Checked	Approved	Sheet Size
2710	A_14/07/2020	25/06/2020	1:4000	MJW	MB, PJ	JP	A0



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

Mining Engineering Manager — Date 20/7/2020

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Mine Surveyor — Date 15/7/2020

Legend

- Longwall Extraction Application Area (based on 26.5° angle of draw)
- Proposed South Bates Extension Underground Whybrow Seam Workings (MOD 17)
- —350— Whybrow Seam Overburden Thickness Isopach
- —3.2— Whybrow Seam Thickness Isopach
- Existing South Bates Extension Underground Workings (Whybrow Seam)
- —10— Wambo Opencut Void Contours (5m)
- Whybrow Seam Extents Wambo Opencut Void
- Lease Boundary

REVISIONS

REV.	DATE	BY	DESCRIPTION	CHK.	REV.	DATE	BY	DESCRIPTION	CHK.
A	14/07/2020	MJW	For Longwall 21 to 24 Submission	ND					

Peabody
WAMBO COAL PTY LIMITED
ABN 13 000 668 057
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Prepared by NWU Survey Ph: 02 65 702318

South Bates Extension Underground Mine (Whybrow Seam)
Extraction Plan - Longwalls 21 to 24 (Revision A)
Plan4 - Existing and Proposed Whybrow Seam Workings

Drawing No.	Revision No.	Date	Scale:	Drawn	Checked	Approved	Sheet Size
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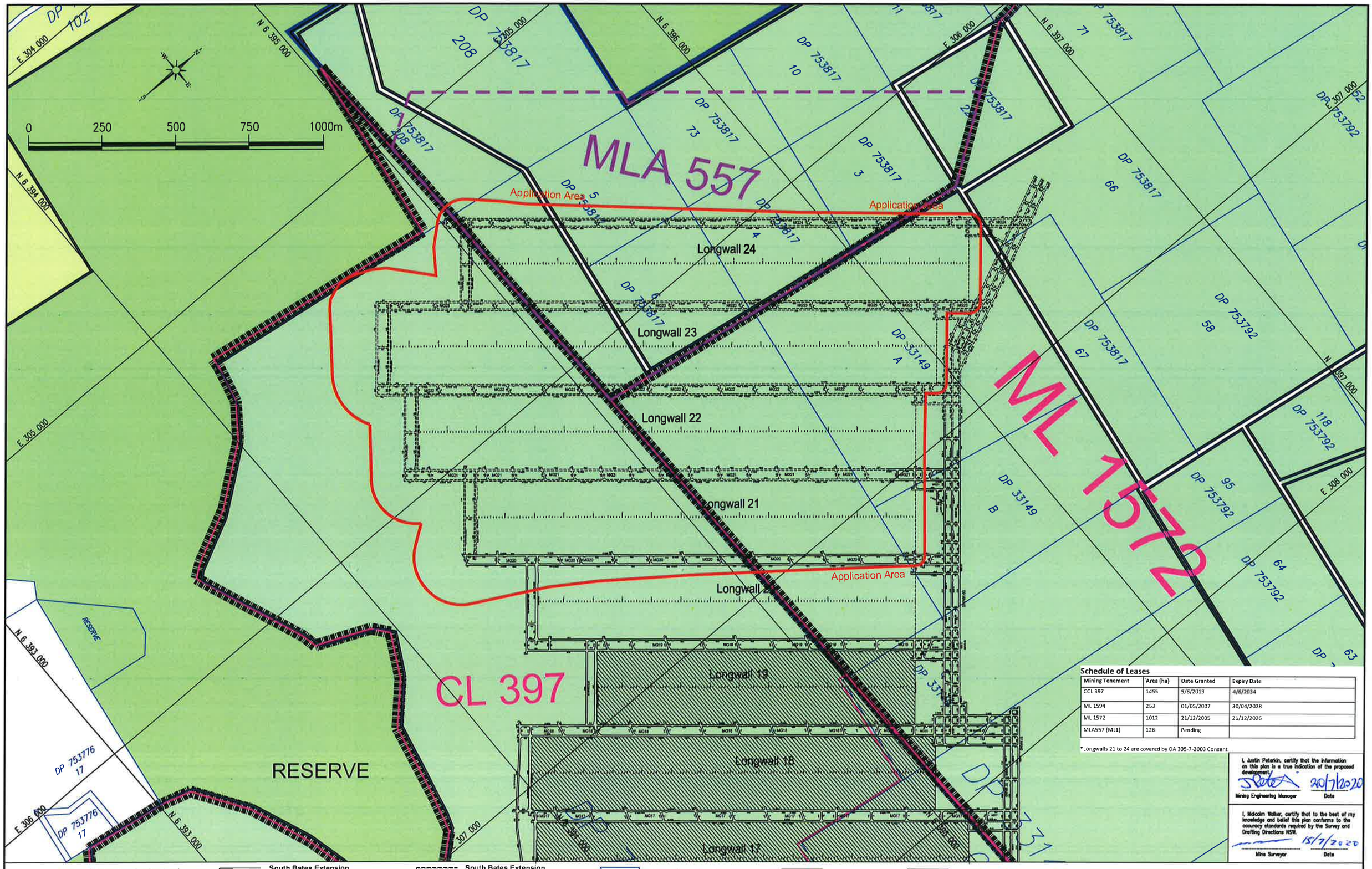

Schedule of Leases

Mining Tenement	Area (ha)	Date Granted	Expiry Date
CCL 397	1455	5/6/2013	4/6/2034
ML 1594	263	01/05/2007	30/04/2028
ML 1572	1012	21/12/2005	21/12/2026
MLA557 (ML1)	128	Pending	

* Longwalls 21 to 24 are covered by DA 305-7-2003 Consent

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Mining Engineering Manager — Date 20/7/2020

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Mine Surveyor — Date 15/7/2020

Longwall Extraction Application Area (based on 26.5° angle of draw)
South Bates Extension Underground Existing Workings (Whybrow Seam)
South Bates Extension Underground Proposed Workings (Whybrow Seam)
DP 73823 Digital Cadastral Database (DCDB)
Reserve
Wambo Coal Pty. Ltd
Wambo Mining Lease

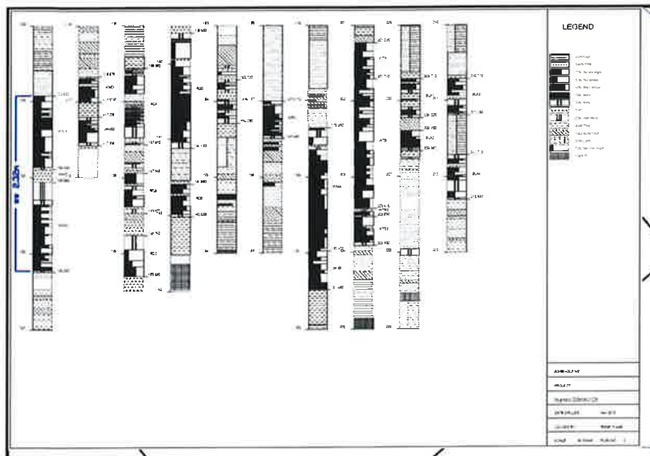
REVISIONS REV.	DATE	BY	DESCRIPTION	CHK.	REV.	DATE	BY	DESCRIPTION	CHK.
A	14/07/2020	MJW	For Longwall 21 to 24 Submission	ND					

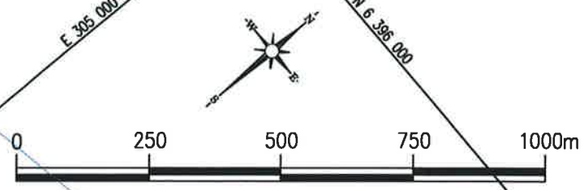
Peabody
WAMBO COAL PTY LIMITED
ABN 13 000 668 057
Jerry's Plains Rd, Warkworth Via Singleton, NSW, 2330
Phone: 02 65 702200 Fax: 02 65 702290
Prepared by NWU Survey Ph: 02 65 702318

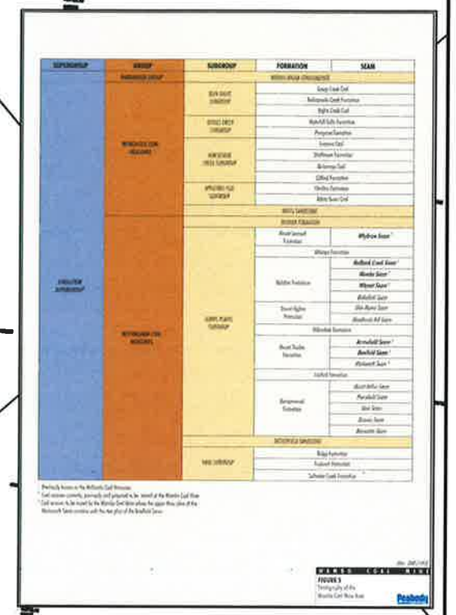
South Bates Extension Underground Mine (Whybrow Seam) Extraction Plan - Longwalls 21 to 24 (Revision A) Plan 5 - Mining Titles and Land Ownership

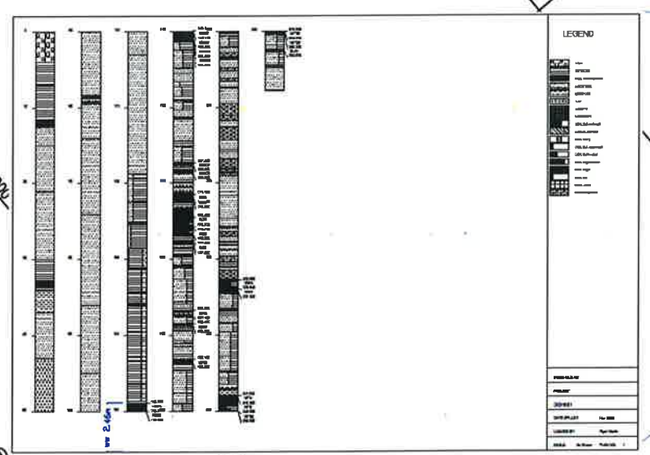
Date	Scale	Drawn	Checked	Approved	Sheet Size
25/06/2020	1: 4000	MJW	PJ	JP	A0

Drawing No. 2712
Revision No. A_14/07/2020









COAL SEAM DEVELOPMENT AND NOMENCLATURE APPLICATION IN WAMBO, UNITED, LEMINGTON & HUNTER VALLEY COLLIERIES

WAMBO	UNITED	LEMINGTON	H. VALLEY
Whybrow	Whybrow	Whybrow	Whybrow
Redbank Ck	Redbank Ck	Redbank Ck	Redbank Ck
Wambo	Wambo	Wambo	Wambo
Whynot	Whynot	Whynot	Whynot
Blakefield			Blakefield
Glen Munro	Blakefield	Blakefield	Glen Munro
Woodlands Hill	Glen Munro	Glen Munro	Woodlands Hill
Arrowfield	Woodlands Hill	Woodlands Hill	Arrowfield
Bowfield			Bowfield
Warkworth	Warkworth	Warkworth	Warkworth
Mt Arthur	Mt Arthur	Mt Arthur	Mt Arthur
Pikeafield	Pikeafield	Pikeafield	Pikeafield
Vaux	Vaux		Vaux
Bronze	Bronze	Vaux	Bronze
Bayswater	Bayswater	Bronze	Bayswater
		Bayswater	

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

Mining Engineering Manager — Date 20/7/2020

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Mine Surveyor — Date 15/7/2020

Longwall Extraction Application Area (based on 26.5° angle of draw)

South Bates Extension Underground Existing Workings (Whybrow Seam)

South Bates Extension Underground Proposed Workings (Whybrow Seam)

DDH864 ◉ Borehole

Whybrow Seam = WW

Redbank Creek Seam = RC

Wambo Seam = WMA

Whynot Seam = WTA

REVISIONS

REV.	DATE	BY	DESCRIPTION	CHK.	REV.	DATE	BY	DESCRIPTION	CHK.
A	14/07/2020	MW	For Longwall 21 to 24 Submission	ND					

Peabody

WAMBO COAL PTY LIMITED
ABN 13 000 668 057

Jerry's Plains Rd, Warkworth
Via Singleton, NSW, 2330

Phone: 02 65 702200
Fax: 02 65 702290

Prepared by NWU Survey Ph: 02 65 702318

South Bates Extension Underground Mine (Whybrow Seam)
Extraction Plan - Longwalls 21 to 24 (Revision A)
Plan 6 - Geological Sections (Boreholes)

Drawing No.	Revision No.	Date	Scale:	Drawn	Checked	Approved	Sheet Size
2713	A_14/07/2020	25/06/2020	1:4000	MJW	PJ	JP	A0

MLA 557

Application Area

PERIMETER TRAIL

North Wambo Creek

CL24A PRO (LiDAR)

CL23A PRO (LiDAR)

CL22A PRO (LiDAR)

CL21A PRO (LiDAR)

CL20A PRO (LiDAR)

CL19A PRO (LiDAR)

CL18A PRO (LiDAR)

Longwall 24

Longwall 23

Longwall 22

Longwall 21

Longwall 20

Longwall 19

Longwall 18

Longwall 17

PROPOSED SEAL

PROPOSED CL21B

PROPOSED CL22B

CL19B

CL18B

CL17B

HIGHWALL CREST

BASE OF ESCARPMENT

WAMBO OPENCUT (MONTROSE PIT)

DUMP REHAB

REPEATER

E 304 000 E 305 000 E 306 000 E 307 000 E 308 000

N 6 394 000 N 6 395 000 N 6 396 000 N 6 397 000 N 6 398 000 N 6 399 000

0 250 500 750 1000 1250

All measurements are in metres

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Mining Engineering Manager — Date 20/7/2020

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Mine Surveyor — Date 15/7/2020

Current Open Cut Extraction Approval Area

Longwall Extraction Application Area (based on 26.5° angle of draw)

South Bates Extension Underground Existing Workings (Whybrow Seam)

South Bates Extension Underground Proposed Workings (Whybrow Seam)

Depth of Cover Contours

Wambo Opencut Void 5m Contours (AHD) (Whybrow/Wambo Seam)

Proposed Subsidence Monitoring LiDAR Profile Locations

Proposed Subsidence Monitoring Marks for South Bates Extension Underground

Existing Subsidence Monitoring Marks for South Bates Extension Underground

Fences

REVISIONS	REV.	DATE	BY	DESCRIPTION	CHK.	REV.	DATE	BY	DESCRIPTION	CHK.
	A	14/07/2020	MJW	For Longwall 21 to 24 Submission	ND					

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

South Bates Extension Underground Mine (Whybrow Seam)
Extraction Plan - Longwalls 21 to 24 (Revision A)
Plan 7 - Proposed and Existing Subsidence Monitoring

Drawing No.	Revision No.
2714	A_14/07/2020

Date	Scale:	Drawn	Checked	Approved	Sheet Size
25/06/2020	1: 4000	MJW	PJ	JP	A0