



# Longwalls 205 to 208

## Transport for New South Wales Asset Management Plan

September 2020



**DOCUMENT CONTROL**

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<b>Reviewed</b>	Tony Sutherland	Position Technical Services Manager Ashton Coal Operations Ltd	Signed	Date
<b>Approved</b>	Joe Krsul	Position Senior Manager, Regional Infrastructure Transport for New South Wales	Signed	Date

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TABLE OF CONTENTS	Page
<b>1 INTRODUCTION .....</b>	<b>1</b>
<b>2 SCOPE &amp; OBJECTIVE.....</b>	<b>5</b>
<b>3 ASSETS AND IMPACTS .....</b>	<b>7</b>
3.1    SUBSIDENCE PARAMETER DEFINITIONS .....	7
3.2    MAXIMUM PREDICTED SUBSIDENCE .....	7
3.3    PREDICTED SUBSIDENCE IMPACTS .....	8
3.4    PROPOSED MONITORING/MANAGEMENT MEASURES .....	8
3.5    LONGWALL MINING RATE AND SEQUENCE.....	9
<b>4 PERFORMANCE MEASURES.....</b>	<b>10</b>
<b>5 MONITORING AND MANAGEMENT.....</b>	<b>11</b>
5.1    SUBSIDENCE INSPECTIONS.....	11
5.1.1    Scope of Inspections.....	12
5.1.2    Public Safety Issues Identified During Inspections .....	12
5.1.3    Remediation of Road Safety Issues .....	12
5.2    CONTINGENCY PLANS .....	12
5.3    REPORTING .....	13
<b>6 RESPONSIBILITIES.....</b>	<b>14</b>
6.1    ASHTON OPERATIONS MANAGER.....	14
6.2    TECHNICAL SERVICES MANAGER .....	14
6.3    ASHTON ENVIRONMENT & COMMUNITY SUPERINTENDENT .....	14
6.4    ASHTON REGISTERED MINING SURVEYOR .....	14
6.5    ASHTON TECHNICAL SERVICES TEAM .....	15
6.6    TRANSPORT FOR NSW .....	15
6.7    PAYMENT OF COSTS IN RELATION TO REPAIRS .....	15
<b>7 TRAINING.....</b>	<b>16</b>
<b>8 AUDIT AND REVIEW .....</b>	<b>17</b>
8.1    AUDIT .....	17
8.2    REVIEW.....	17
<b>9 REFERENCES.....</b>	<b>18</b>

**FIGURES**

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Figure 1: Regional Location

Figure 2: General Arrangement

Figure 3: Upper Lower Liddell Seam Longwall Layout

Figure 4: Plan Showing Location of Transport for NSW Infrastructure in the Vicinity of  
Longwalls 205 to 208

**APPENDICES**

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Appendix A Stakeholder Contact Details

Appendix B Subsidence Inspection Checklist

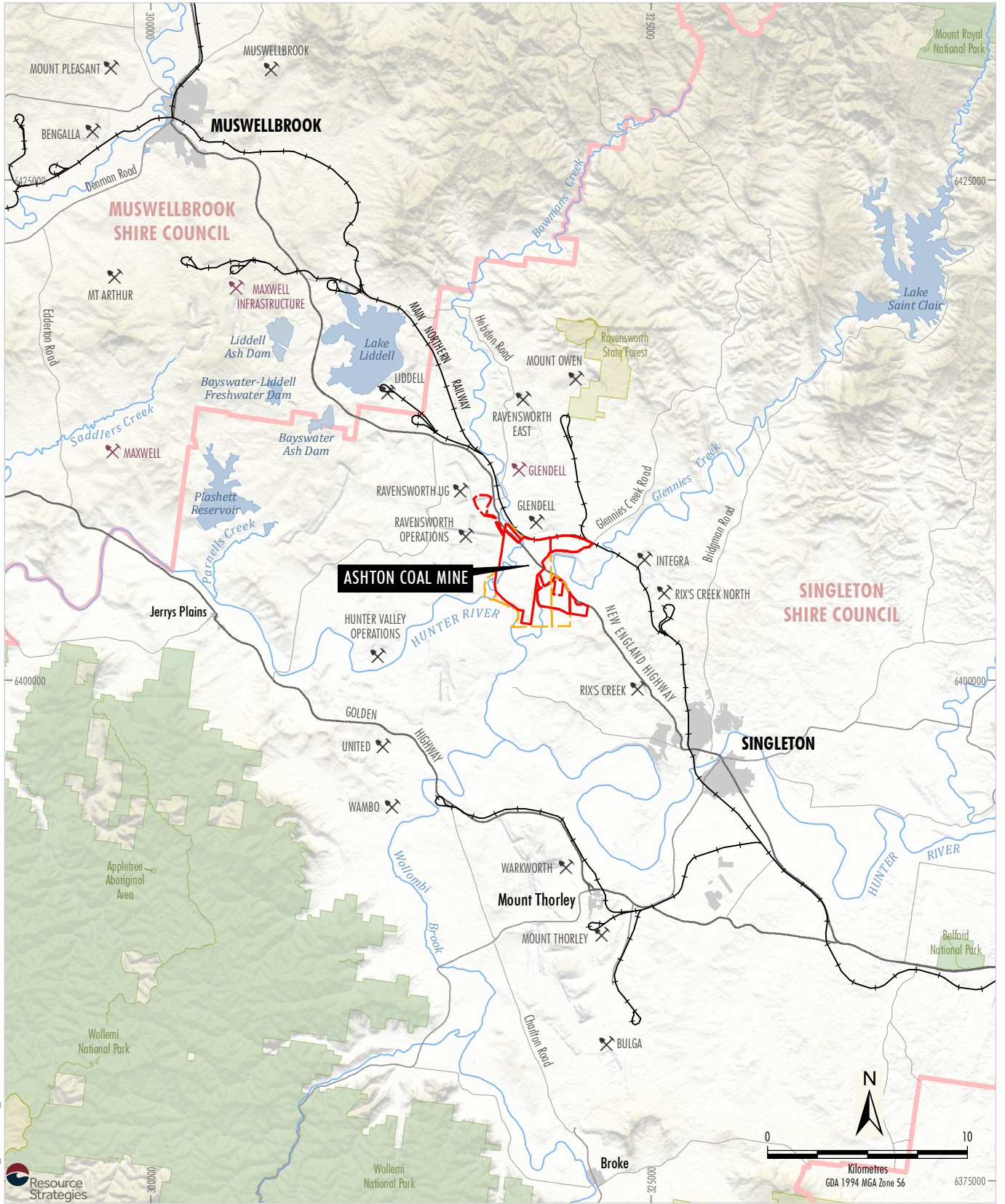
## 1 INTRODUCTION

Ashton Coal Operations Pty Ltd (ACOL), a subsidiary of Yancoal Australia Limited (Yancoal), owns the Ashton Coal Project (ACP), an underground coal mine located approximately 14 kilometres north-west of Singleton in the Hunter Valley in New South Wales (NSW) (**Figure 1**).

The ACP was granted consent on 11 October 2002 by the Minister of Planning pursuant to the provisions of the Environmental Planning and Assessment Act 1979 (DA 309-11-2001-i). The Mine is approved to produce up to 5.45 million tonnes per annum (Mtpa) of run of mine (ROM) coal and operate until 2024. The consolidated Development Consent has been modified on ten occasions, with the most recent amendment approved on 20 June 2016.

The underground mine is approved for multi-seam longwall extraction, targeting four coal seams in descending order (Pikes Gully (PG), Upper Liddell (ULD), Upper Lower Liddell (ULLD) and Lower Barrett (LB)) (**Figure 2**). Development of the underground mine commenced in December 2005 and is accessed through the southern wall of the Arties Pit under the New England Highway.

ACOL has subsequently prepared an Extraction Plan for mining of Longwalls 205 to 208 in the ULLD Seam of the Ashton Underground Coal Mine, varying between 185 metres and 255 metres below the surface. Proposed mining of Longwalls 205 to 208 (the **Extraction Plan Area** – refer **Figure 3**) is due to commence in March 2021 and is planned to take place over a three-year period.



AKO-20-04-EP LW2015-208\_2014



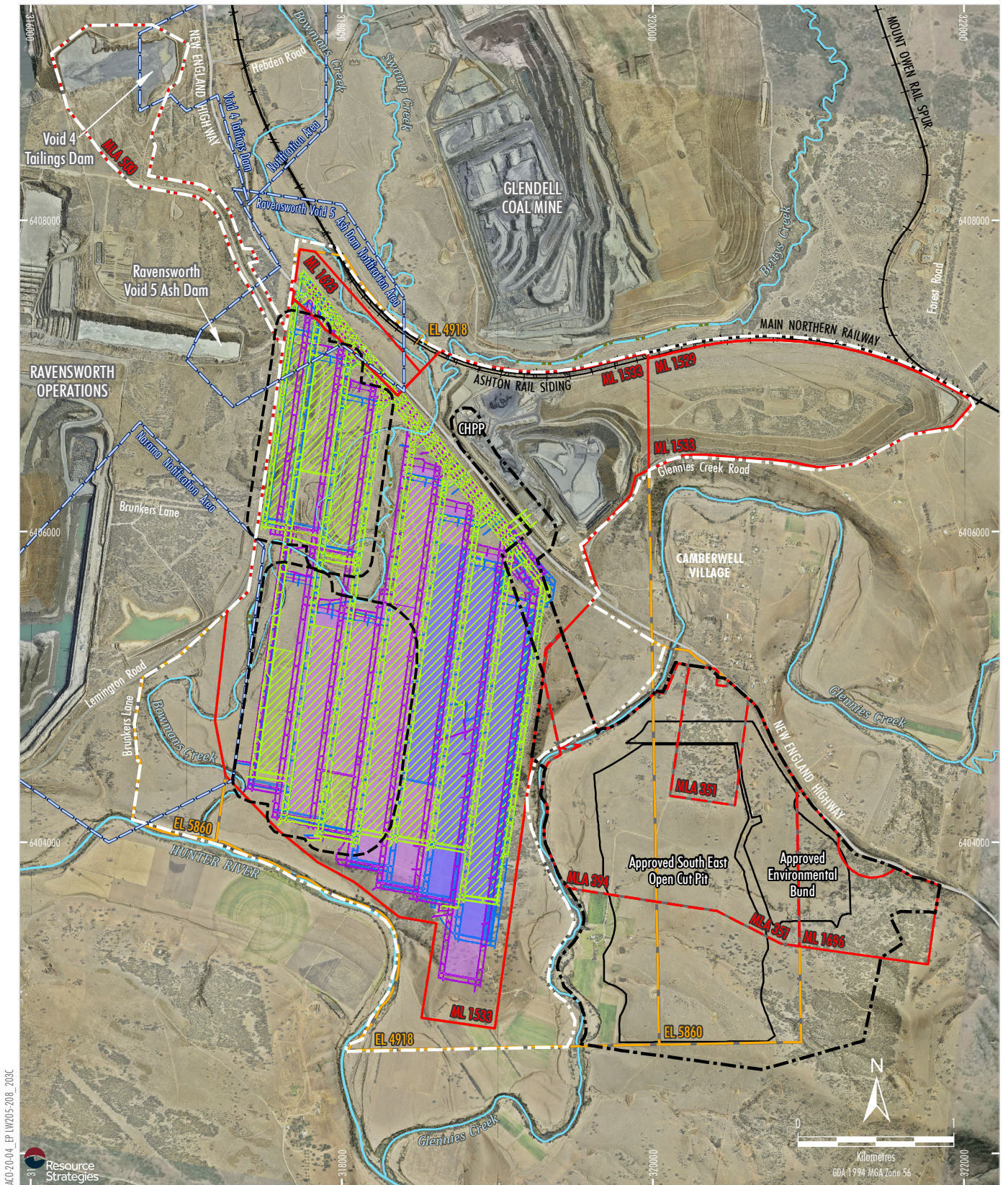
- LEGEND**
- Mining Operation
  - Proposed Mining Operations (Application Lodged)
  - Local Government Area
  - State Forest
  - National Parks and Wildlife Estate
  - Exploration License Boundary
  - Mining Lease Boundary
  - Mining Lease Application Boundary

Source: NSW Spatial Services (2020)



ASHTON COAL MINE  
Regional Location

Figure 1



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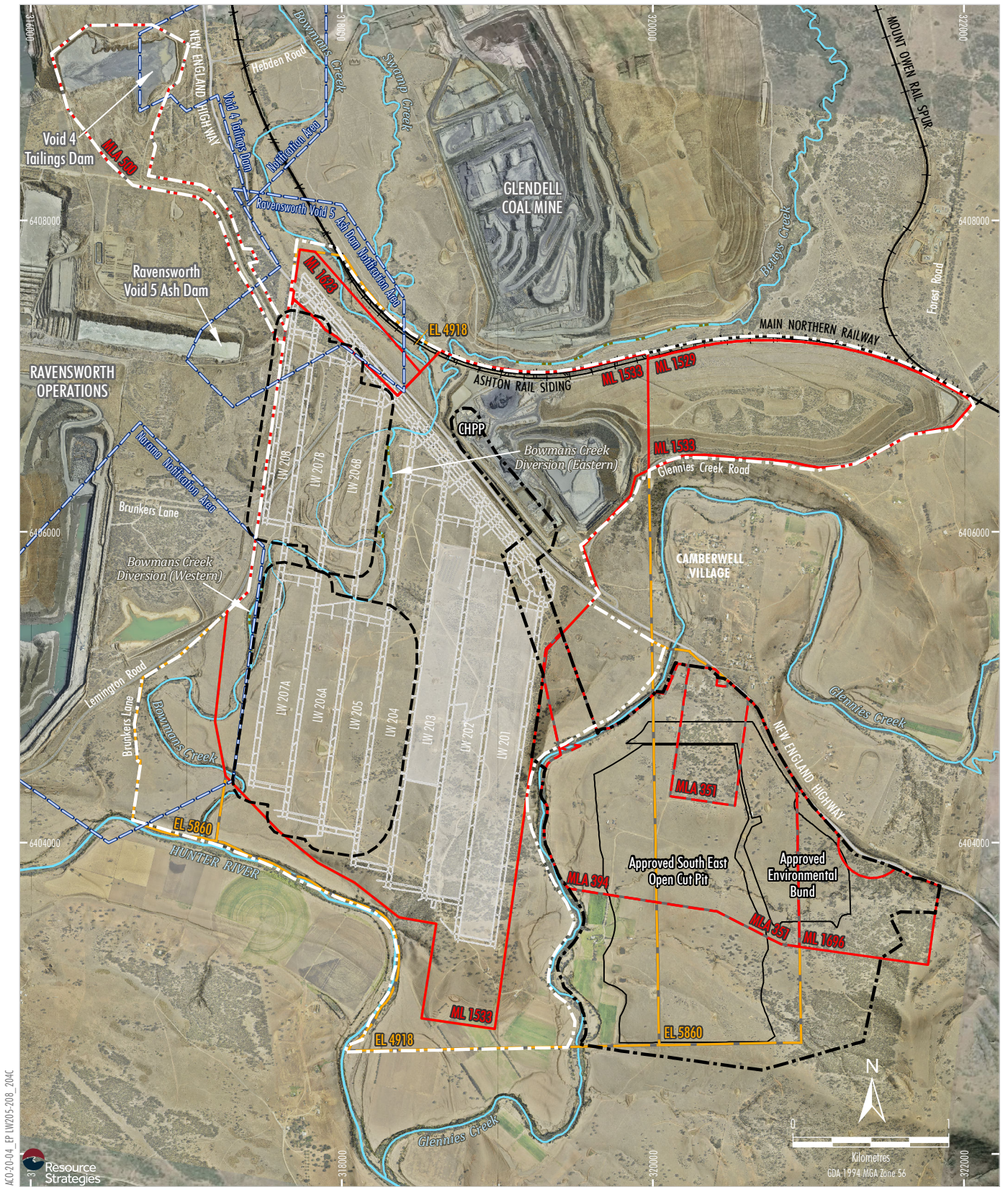


- LEGEND**
- Exploration Licence Boundary
  - Mining Lease Boundary
  - Mining Lease Application Boundary
  - Prescribed Dam Notification Area
  - Project Approval Boundary
  - South East Open Cut Approval Boundary
  - Pike's Gully Seam Longwall
  - Upper Liddell Seam Longwall
  - Upper Lower Liddell Seam Longwall
  - Extraction Plan Application Area

Source: NSW Spatial Services (2020)  
 Orthophoto: Ashton Coal (Dec 2019); NSW Spatial Services (2019)

ASHTON COAL MINE  
 General Arrangement

Figure 2



AKO20-04-EP LW205-208\_2014C



Source: NSW Spatial Services (2020)  
 Orthophoto: Ashton Coal (Dec 2019); NSW Spatial Services (2019)

- LEGEND**
- Exploration Licence Boundary
  - Mining Lease Boundary
  - Mining Lease Application Boundary
  - Prescribed Dam Notification Area
  - Project Approval Boundary
  - South East Open Cut Approval Boundary
  - Upper Lower Liddell Seam Longwall
  - Extraction Plan Application Area



ASHTON COAL MINE  
 Upper Lower Liddell Seam Longwall Layout

Figure 3



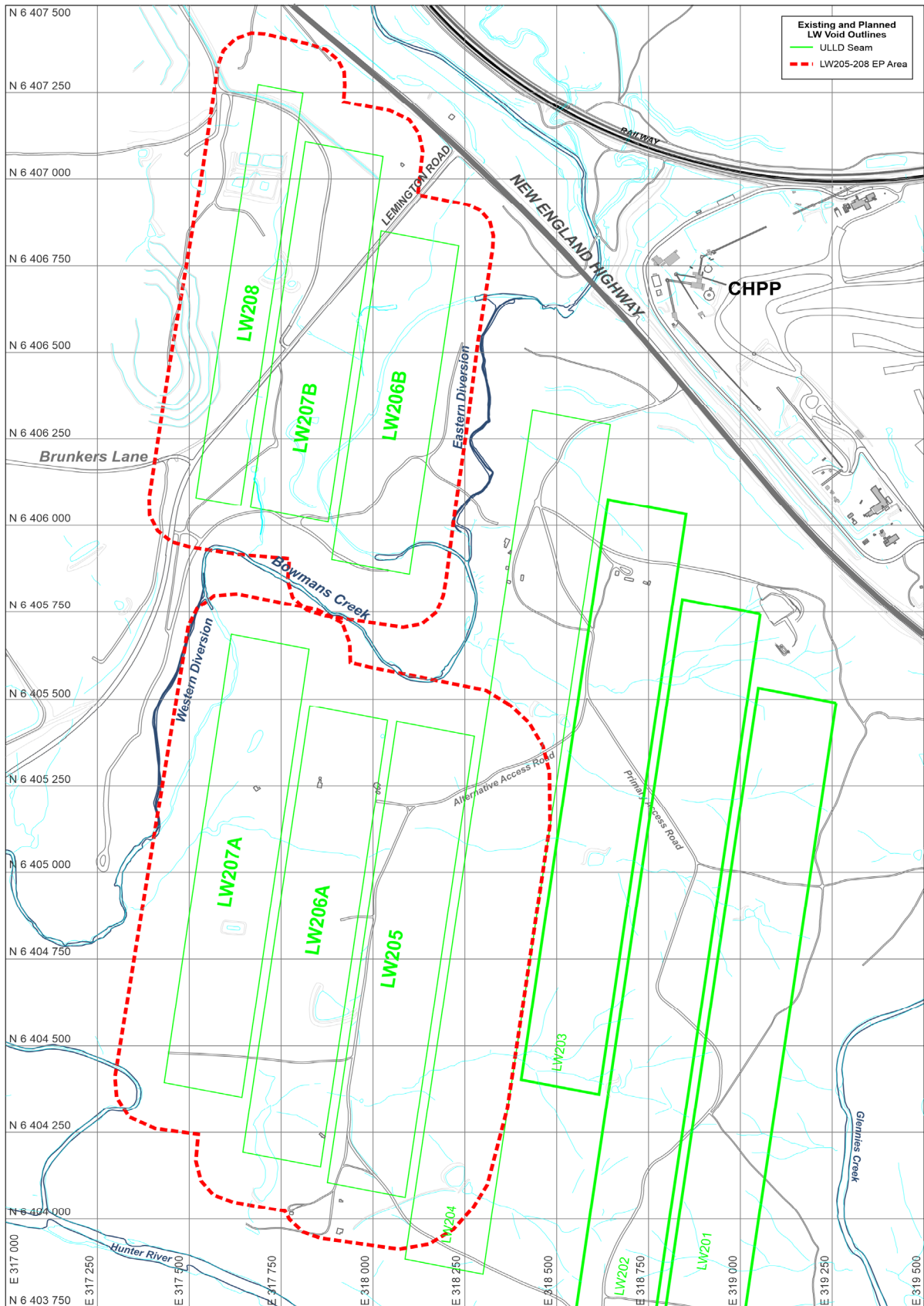
## 2 SCOPE & OBJECTIVE

This Asset Management Plan has been developed to manage risks associated with potential subsidence impacts on the Transport for NSW (TfNSW) infrastructure in the vicinity of the Longwalls 205-208 Extraction Plan area as a result of the secondary extraction of Longwalls 205-208 within the ULLD Seam.

This management plan provides a mechanism through which the potential subsidence impacts from longwall mining can be managed to maintain the safety and serviceability of the TfNSW infrastructure whilst mining is in progress.

The TfNSW infrastructure of relevance to the Extraction Plan area has been identified as the New England Highway. The New England Highway is to the north of the Extraction Plan area, with the exception of a small section of the associated easement (**Figure 4**).

This Asset Management Plan forms part of the Longwalls 205 to 208 Extraction Plan and should not be read in isolation.



**Figure 4: Plan Showing Location of TfNSW Infrastructure in the Vicinity of Longwalls 205 to 208**

### 3 ASSETS AND IMPACTS

The Extraction Plan Area includes a small section of the New England Highway road reserve, west of Lemington Road, but not the road itself. The section of the road reserve within the Extraction Plan Area is near the northern end of Longwall 208 where overburden depth is approximately 200 m (**Figure 4**).

#### 3.1 SUBSIDENCE PARAMETER DEFINITIONS

Subsidence, tilt and strain are the subsidence parameters commonly used to define the extent of surface movements that will occur as mining proceeds.

**Subsidence:** is the vertical distance (usually measured in millimetres) that the ground surface lowers as a result of mining, and depends on the depth of the coal seam, the thickness of the seam, the width of the extraction area and the characteristics of the overburden.

**Tilt:** is calculated as the change in subsidence between two points divided by the distance between those points (i.e. change in slope of the surface landform as a result of mining). The maximum tilt, or the steepest portion of the subsidence profile, occurs approximately 50 metres from the edge of the longwall panel. Tilt is usually expressed in millimetres per metre.

**Strain:** results from horizontal movements in the strata. Strain is determined from monitoring survey data by calculating the change in the horizontal length of a section of a subsidence profile and dividing this by the initial horizontal length of that section. If the section has been extended, the ground is in tension and the change in length and resulting strain are both positive. If the section has been shortened, the ground is in compression and the change in length and strain are both negative. Strain is usually expressed in millimetres per metre.

#### 3.2 MAXIMUM PREDICTED SUBSIDENCE

**Table 1** below describes the predicted subsidence estimates detailed in the subsidence assessment for Longwalls 205-208 (SCT Operations, 2020). Subsidence impacts have been categorised as:

- Incremental Subsidence: Subsidence as a direct result of mining in the ULLD Seam; and
- Cumulative subsidence: Combined subsidence as a result of mining the ULLD seam and previously mined seams e.g. ULD seam.

**Table 1. Maximum Predicted Subsidence Parameters for ULLD Seam Longwall Panels**

ULLD Seam Longwall Panels (depth range in brackets [m])		Longwalls 205-208 Forecast						
		ULLD Subs (m)	ULLD Strain (mm/m)			ULLD Tilt (mm/m)		
			General	Stacked Edges	Undercut Edges	General	Stacked Edges	Undercut Edges
<b>Incremental Subsidence Parameters</b>								
LW205	(185-225)	2.8	30	53	N/A	53	106	N/A
LW206A	(205-240)	2.8	27	48	N/A	48	96	N/A
LW206B	(175-210)	2.5	29	50	N/A	56	100	N/A
LW207A	(220-260)	2.6	24	41	47	45	83	95
LW207B	(190-225)	2.5	26	46	53	52	92	105
LW208	(210-240)	2.2	21	37	N/A	33	73	N/A
<b>Cumulative Subsidence Parameters</b>								
LW205	(185-225)	5.8	47	110	N/A	94	219	N/A
LW206A	(205-240)	5.8	42	99	N/A	85	198	N/A
LW206B	(175-210)	3.9	33	78	N/A	67	156	N/A
LW207A	(220-260)	4.4	30	70	80	60	140	160
LW207B	(190-225)	4.2	33	77	88	66	155	177
LW208	(210-240)	3.1	22	52	N/A	44	103	N/A

### 3.3 PREDICTED SUBSIDENCE IMPACTS

No perceptible impacts to the New England Highway are expected from the planned mining of Longwalls 205-208 (SCT, 2020).

Any subsidence effects in the vicinity of the road reserve are expected to be of a very low magnitude and imperceptible for all practical purposes.

Subsidence monitoring points for the road reserve run approximately parallel, and approximately 25 m offset to the southern edge of the road pavement and are generally spaced at 50 m intervals. Subsidence monitoring measurements from the northern ends of the previously extracted Pikes Gully Longwalls 6B, 7B and 8, indicates angle of draws, to the 20 mm vertical subsidence limit, of less than 10° in this area. Similar low angles of draw from the outermost panel edge are expected for the planned mining.

### 3.4 PROPOSED MONITORING/MANAGEMENT MEASURES

Any subsidence effects in the vicinity of the road reserve are expected to be of a very low magnitude and imperceptible for all practical purposes. Regular visual inspections of the highway will take place to confirm there are no perceptible impacts during the period of mining the last 100 m of each longwall panel.

### 3.5 LONGWALL MINING RATE AND SEQUENCE

The longwall mining sequence and estimated mining rate is outlined in **Table 2**.

**Table 2. Longwall Mining Rate and Sequence**

Panel	Start Date	End Date	Estimated Duration (days)
LW205	March 2021	October 2021	160
LW206A	November 2021	April 2022	150
LW206B	May 2022	August 2022	92
LW207A	September 2022	January 2023	124
LW207B	February 2023	May 2023	95
LW208	June 2023	October 2023	116

## 4 PERFORMANCE MEASURES

ACOL will aim to ensure that all built features owned by TfNSW affected by the subsidence area are always maintained as safe and serviceable. Any subsidence damage from ACOL's mining activities will be repaired.

The subsidence impact performance measures relevant to TfNSW assets under Schedule 3, Condition 29 of DA 309-11-2001-i are summarised in **Table 3**, while more specific objectives and performance measures developed by ACOL are listed in **Table 4** below.

**Table 3. Subsidence Impact Performance Measures**

Built Features	
New England Highway, including the bridge over Bowmans Creek	<ul style="list-style-type: none"> <li>• Always safe and serviceable.</li> <li>• Damage that does not affect safety or serviceability must be fully repairable and must be fully repaired.</li> </ul>
Public Safety	
Public safety.	No additional risk due to mining.

**Table 4. New England Highway Management Objectives**

Objective	Performance Measure
<ul style="list-style-type: none"> <li>• To prevent damage to the New England Highway.</li> <li>• To prevent public safety hazards resulting from subsidence damage to New England Highway.</li> <li>• To ensure the New England Highway is maintained as safe and serviceable (as it relates to impacts from subsidence).</li> <li>• To monitor and remediate subsidence induced impacts to roads.</li> <li>• Subsidence management as per the Development Consent.</li> </ul>	<ul style="list-style-type: none"> <li>• Mine plan is designed to provide sufficient barriers and controls to prevent subsidence related impacts to the New England Highway.</li> <li>• First workings are designed to remain long-term stable and non-subsiding.</li> <li>• Subsidence monitoring of the New England Highway to confirm negligible subsidence related movement.</li> <li>• No road hazards or disruptions to traffic along the New England Highway to occur as a result of subsidence impacts.</li> <li>• Any subsidence related damage is identified and remediated as soon as practicable.</li> </ul>

## 5 MONITORING AND MANAGEMENT

The management actions that ACOL undertakes to satisfy the performance measures outlined in Section 4 are outlined in **Table 5**. These actions include monitoring, management and incident reporting.

**Table 5. Transport for NSW Asset Monitoring and Management**

Item	Feature	Action/Response	Trigger/Timing
<b>1.0</b>	<b>Monitoring</b>		
1.01	New England Highway	<ul style="list-style-type: none"> <li>Visual monitoring of key features associated with the New England Highway.</li> <li>Road monitoring as per the <i>Subsidence Monitoring Program</i>.</li> <li>TfNSW to continue the monitoring and maintenance program on the New England Highway as per TfNSW's nominated program.</li> </ul>	Subsidence monitoring to be undertaken as per the <i>Subsidence Monitoring Program</i> .
<b>2.0</b>	<b>Management</b>		
2.01	New England Highway	No specific management measures are proposed as studies have determined that the probability of impacts to the New England highway are negligible.	If damage is caused to New England Highway by subsidence from longwall mining.
<b>3.0</b>	<b>Incident Response</b>		
3.01	New England Highway	Notify TfNSW on 13 27 01 of any damage to the road take appropriate measures to prevent potential injury (e.g. signage, fencing).	If damage is caused to New England Highway by subsidence from longwall mining.
<b>4.0</b>	<b>Reporting</b>		
4.01	Item 1.01	Notify TfNSW and provide copies of monitoring results.	If subsidence monitoring results are greater than predicted or if potential impacts are identified.
4.02	Item 3.01	Notify stakeholders. Notify Resources Regulator if deemed a reportable incident.	Reporting as per Extraction Plan requirements.

### 5.1 SUBSIDENCE INSPECTIONS

Visual monitoring of key features associated with the New England Highway will take place in accordance with the *Subsidence Monitoring Program* and would include visual survey (photo monitoring) of the road reserve, pavement, cutting and fill embankments which are within the area of influence of the project subsidence. The inspection checklist for this task is shown in **Appendix B**.

### 5.1.1 Scope of Inspections

Regular surface inspections will cover a zone defined as being 200 metres behind and 100 metres in front of the current face position. The inspections will cover the full subsidence bowl out to the 45 degree angle of draw. Inspections will be carried out by trained persons and will follow the inspection checklist. Inspections will identify the following subsidence impacts:

- surface cracking - edges of extraction void and start and travelling abutments particularly in rock outcrop areas;
- surface humps (compression) - near centre of extracted panels and travelling abutment;
- step change in land surface - associated with cracking;
- damage to towers, conductors, powerlines, pipelines and cables;
- reduce ground clearances of conductors;
- tilting of towers, increased/decreased tension in conductors; and
- bent crossarms or insulators.

### 5.1.2 Public Safety Issues Identified During Inspections

If any public safety issue is identified during inspections the person conducting the inspection shall:

- immediately notify the Technical Services Manager and/or Environment & Community Superintendent;
- erect “NO ROAD” or barrier tape and warning signs if immediate remediation is not possible; and
- the Operations Manager shall immediately notify the NSW Resources Regulator, Landholder and the infrastructure owner (contact details in Appendix A).

### 5.1.3 Remediation of Road Safety Issues

If any public safety issue is identified during inspections or other public safety issue is identified during assessment of monitoring or inspection results that person shall:

- immediately contact TfNSW and advise the identified impact;
- arrange for TfNSW to implement immediate repairs if necessary; and
- liaise with Mine Management and Subsidence Advisory NSW to arrange long term repairs.

## 5.2 CONTINGENCY PLANS

Should vehicle movements be interrupted on New England Highway as a result of subsidence impacts, ACOI will implement appropriate road management actions to ensure the road remains safe and functioning.



### **5.3 REPORTING**

The results of inspections will be recorded and filed. Monitoring results will be reported annually in the Annual Review (AR) where relevant. Other communications will be as detailed in the Public Safety Management Plan.

## **6 RESPONSIBILITIES**

### **6.1 ASHTON OPERATIONS MANAGER**

The Operations Manager must:

- promptly notify the Resources Regulator of any identified public safety issue via telephone to the central reporting number 1300 814 609; and
- complete a written notification using the online incident notification form via the Regulator Portal at <https://www.resourcesregulator.nsw.gov.au/safety-and-health/notifications/incident-or-injury>.

### **6.2 TECHNICAL SERVICES MANAGER**

The Technical Services Manager must:

- authorise the Plan and any amendments;
- ensure that the required personnel and equipment are provided to enable this Plan to be implemented effectively;
- inform the Operations Manager of impacts requiring notification to the NSW Resources Regulator and/or TfNSW; and
- liaise with officers of TfNSW and remediation consultants and contractors as required.

### **6.3 ASHTON ENVIRONMENT & COMMUNITY SUPERINTENDENT**

The Environment & Community Superintendent must:

- inform the landholders of impacts requiring remediation; and
- report monitoring results in the AR.

### **6.4 ASHTON REGISTERED MINING SURVEYOR**

The Registered Mining Surveyor must:

- ensure that subsidence inspections are conducted to the required schedule and that the persons conducting the inspection are trained in the requirements of this plan and understand their obligations;
- review and assess subsidence monitoring results and inspection checklists; and
- promptly notify Technical Services Manager and/or the Environment and Community Superintendent of any identified public safety issue.

## **6.5 ASHTON TECHNICAL SERVICES TEAM**

The Ashton Technical Services Team members must:

- conduct the subsidence inspection within the applicable subsidence zone to the standard required and using the subsidence inspection checklist;
- take actions to remediate any public safety issue identified during inspections; and
- where actions are beyond their capabilities immediately attempt to notify the landowner or infrastructure owner and Technical Services Manager.

## **6.6 TRANSPORT FOR NSW**

TfNSW must arrange repairs as necessary through consultation between TfNSW and ACOL.

## **6.7 PAYMENT OF COSTS IN RELATION TO REPAIRS**

ACOL will liaise with Subsidence Advisory NSW in relation to payment for any necessary repairs such that no cost will be borne by TfNSW.

## 7 TRAINING

All personnel who conduct inspections will be trained in the requirements of the Ashton Longwalls 205-208 Built Features Management Plan, Longwalls 205-208 Subsidence Monitoring Program and the Longwalls 205-208 Transport for NSW Asset Management Plan.

Training will be conducted on the identification of the various subsidence impacts detailed in the Public Safety Management Plan and will include any safety aspects of those inspections.

## **8 AUDIT AND REVIEW**

### **8.1 AUDIT**

The requirements of the Longwalls 205 to 208 Transport for NSW Asset Management Plan are to be audited as required.

### **8.2 REVIEW**

A review of this plan will be undertaken:

- if the mine design criteria are changed;
- if subsidence impacts are greater than predicted;
- if required by TfNSW; and
- following each audit.

## 9 REFERENCES

Strata Control Technology (2020) *Subsidence Assessment for the Extraction Plan for Longwalls 205 – 208 in the Upper Lower Liddell Seam*, Report Number ASH4927.

# Appendices

# Appendix A

## Stakeholder Contact Details



**Longwalls 205-208 Extraction Plan Stakeholder List**

Position	Name	Phone
<b>ASHTON</b>		
Operations Manager	Aaron McGuigan	6570 9104
Technical Services Manager	Tony Sutherland	6570 9110
Environment and Community Superintendent	Phillip Brown	6570 9219
Mine Surveyor	Jeff Peck	6570 9125
Senior Mining Engineer	Ben Tockuss	6570 9124
After Hours	Ashton Control Room	6570 9166
<b>GOVERNMENT</b>		
Subsidence Advisory NSW	Newcastle Office	4908 4300
Resources Regulator		1300 814 609
<b>TRANSPORT FOR NSW</b>		
Senior Manager, Regional Infrastructure	Joe Krsul	4294 0357
Roads General Enquiries	General Enquiries	13 22 13
24 hour Traffic Enquiry Line	-	13 27 01
<b>LANDHOLDERS</b>		
Refer to Ashton internal contact register		

# **Appendix B**

# **Subsidence Inspection Checklist**

<b>SUBSIDENCE INSPECTION CHECKLIST</b>		
<b>Longwall Panel</b>		
<b>Date</b>		
<b>Face Position</b>		
<b>Subsided Inspection Zone</b>		
<b>Pre-Subsidence Inspection Zone</b>		
<b>Area Inspected by (Print Name and sign)</b>		
<b>INSPECTION ITEM</b>	<b>CHECKED</b>	<b>COMMENTS</b>
Surface cracking		
Surface humps (compression)		
Hunter River, Mine Water and Gas drainage pipelines		
Access roads and tracks		
Fences, gates, cattle grids		
Damage to Power-poles, Cross-arms, Insulators and Conductors e.g. leaning poles, increased sag in conductors, reduced ground clearance		
Dams		
Structures (houses, outbuildings)		
Other (den and/or nest trees)		

## SUBSIDENCE INSPECTION CHECKLIST

### Where to Inspect:

200 metres behind and 100 metres in front of the current face position.

Cover the full subsidence bowl out to the 45 degree angle of draw.

### What to look for:

- surface cracking - edges of extraction void and start and travelling abutments particularly in rock outcrop areas and topographic high;
- surface humps (compression) - near centre of extracted panels, the travelling abutment and topographic lows if adjacent to steep terrain;
- step change in land surface - associated with cracking;
- slope, boulder and tree instability;
- surface slumping, erosion;
- serviceability of access tracks;
- changes to creeks, ponding, sediment load;
- general vegetation condition (in particular dieback of vegetation);
- change in conditions of 'right-of-way' access track or surrounding verges including drainage culverts and water flows as well as road cutting stability; and
- power poles and wires – adverse tilts on poles and ground clearances for wires, especially when crossing access tracks.

### Actions if there is damage to non-ACOL infrastructure:

Immediately notify the:

- Operations Manager;
- Technical Services Manager and/or Environment & Community Superintendent;
- relevant infrastructure owner/operator.

If repairs or remediation work are required these will be undertaken by TfNSW.