



Longwalls 205 to 208

Built Features Management Plan

October 2020



DOCUMENT CONTROL

DOCUMENT DETAILS	Title	Longwalls 205 – 208 Built Features Management Plan		
	Reference	Ashton Longwalls 205 to 208 Extraction Plan		
	Document Status	Final		
APPROVAL DATE	Revision	Revision Details	Prepared	Date
	1	Final for Submission	ACOL	October 2020

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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.

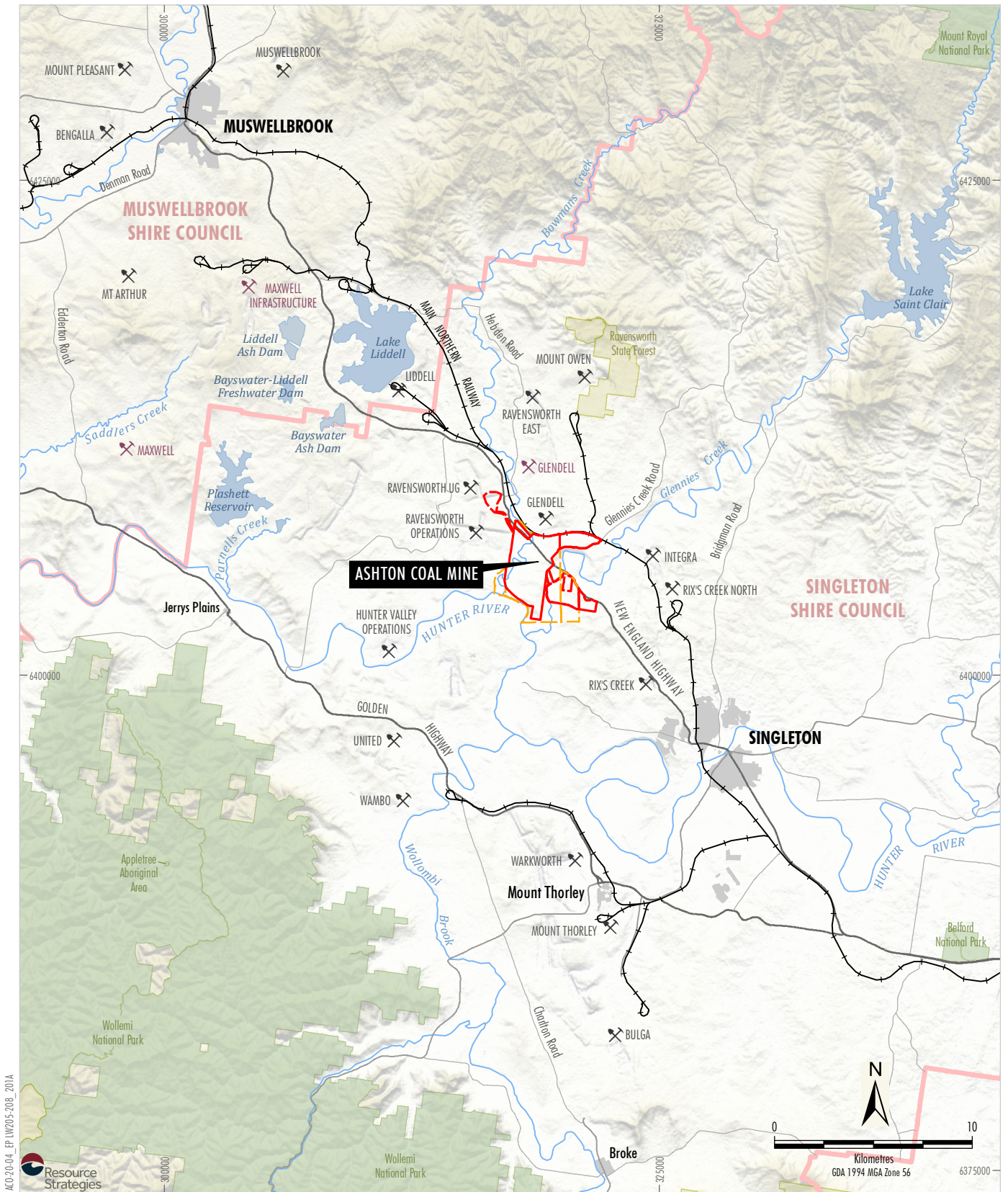
ACOL has subsequently prepared an Extraction Plan for mining of Longwalls 205 to 208 in the ULLD Seam of the Ashton Underground Coal Mine, varying between 185 metres and 255 metres below the surface. Proposed mining of Longwalls 205 to 208 (the **Extraction Plan Area** – refer **Figure 3**) is due to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

1.1 SCOPE & OBJECTIVE

The objective of this Built Features Management Plan (BFMP) is to identify the framework for management of subsidence induced impacts on built features within the Longwalls 205-208 Extraction Plan area as a result of the secondary extraction of Longwalls 205-208 within the ULLD Seam. The objective of the BFMP will be achieved by:

- identifying the built features within the Extraction Plan area and the associated owners/operators;
- identifying the predicted subsidence impacts and/or consequences for the built features within the Extraction Plan area in general terms (specific information for each built feature is available in the individual Asset Management Plans);
- identifying the management activities (including consultation, monitoring, and remediation methods) prepared to address the predicted subsidence impacts for built features; and
- identifying the review and reporting activities to allow for assessment of the performance of built features management measures by ACOL, and identification of areas where either continual improvement may be achieved, or management of unpredicted subsidence impacts can be managed.

This document will focus on the predicted consequences of subsidence on built features and how these consequences will be managed. Impact assessment information is available within the relevant Subsidence Assessment report prepared by Strata Control Technology (SCT) for Longwalls 205 to 208.



AKO-20-04-EP-LW2015-208_2014
Resource Strategies

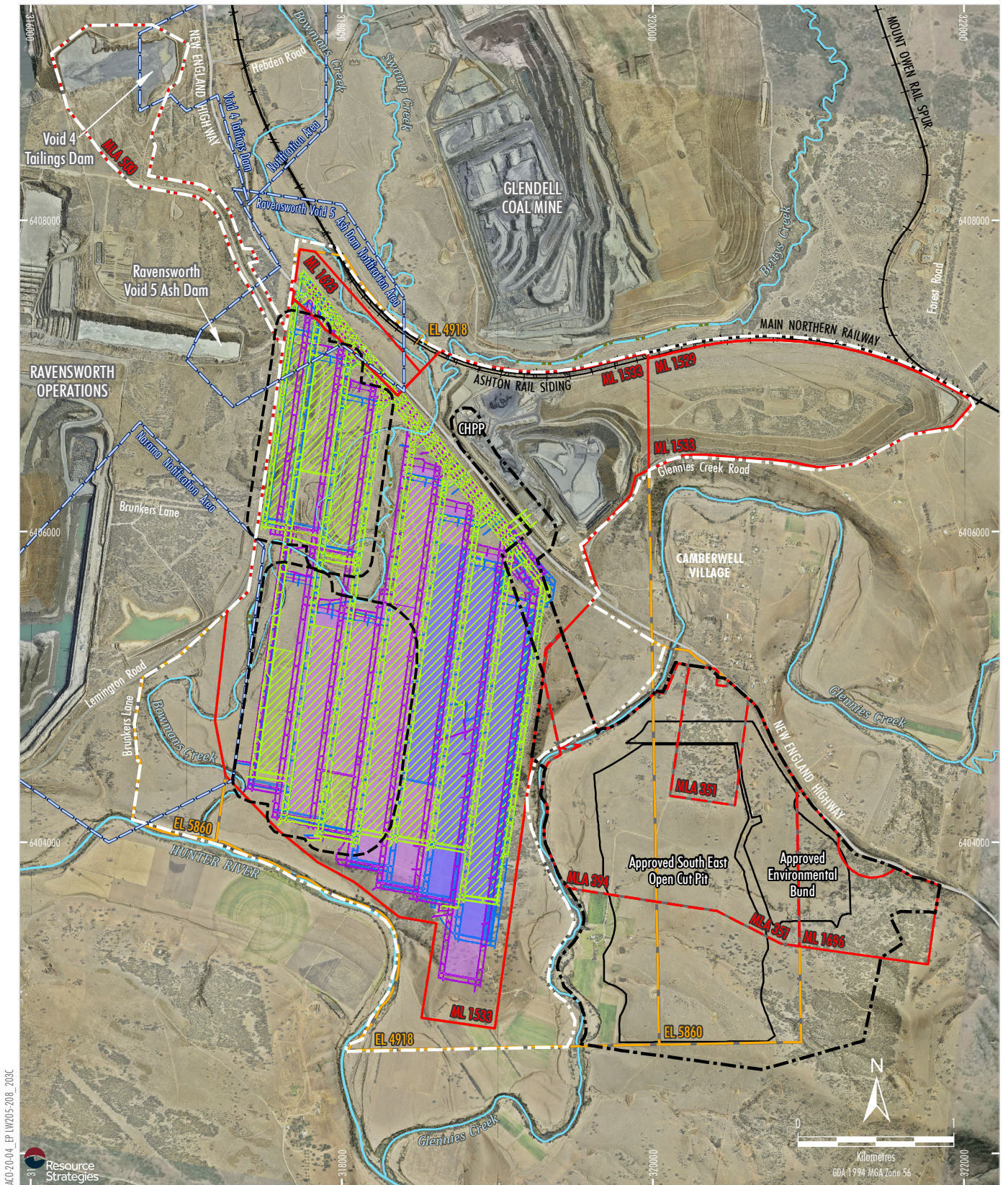
Source: NSW Spatial Services (2020)



- 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

YANCOAL
 宏业澳洲大矿业有限公司
ASHTON COAL MINE
 Regional Location

Figure 1



AKO20-04-EP-1W2015-208_203C

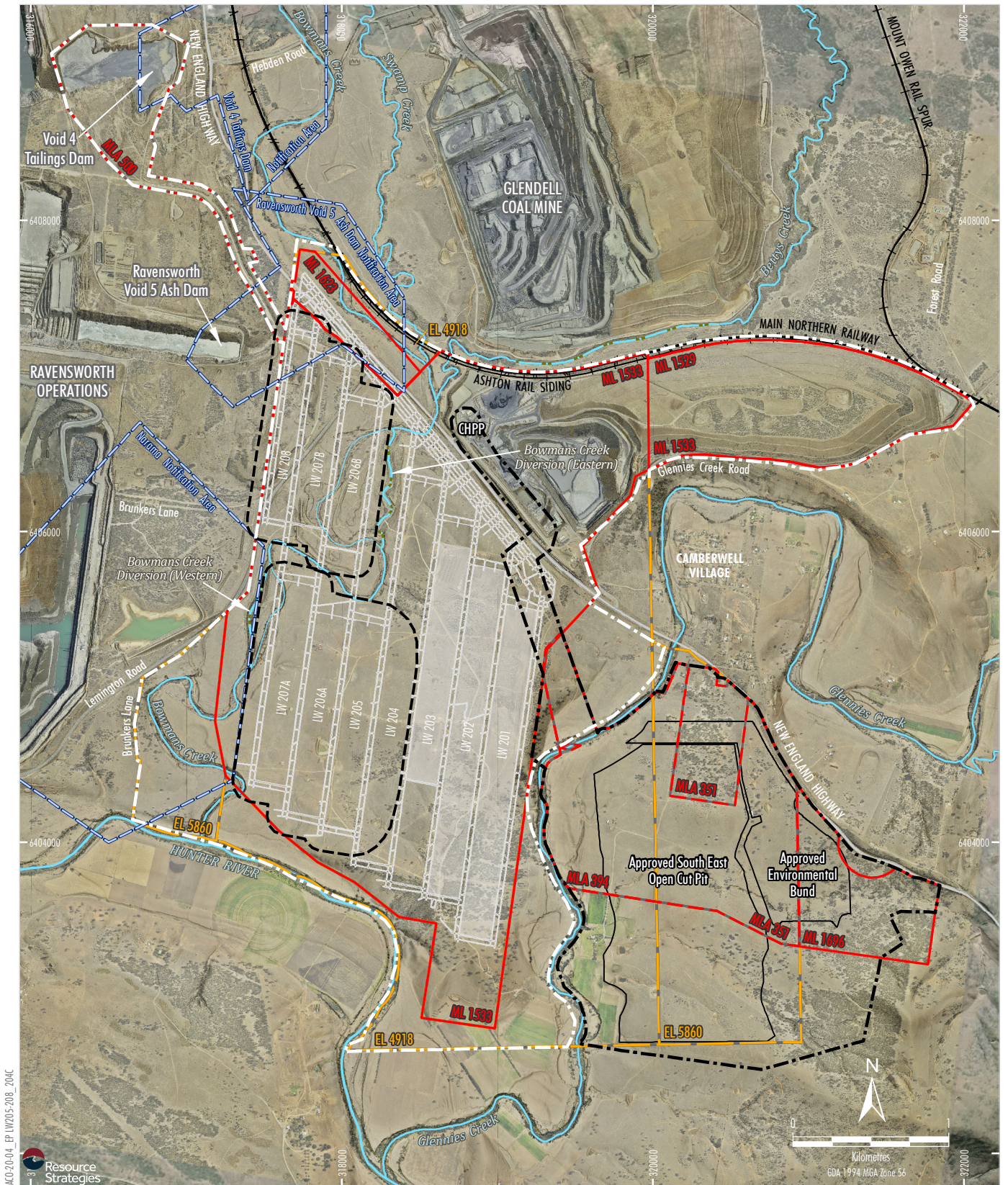


- LEGEND**
- Exploration Licence Boundary
 - Mining Lease Boundary
 - Mining Lease Application Boundary
 - Prescribed Dam Notification Area
 - Project Approval Boundary
 - South East Open Cut Approval Boundary
 - Pike's Gully Seam Longwall
 - Upper Liddell Seam Longwall
 - Upper Lower Liddell Seam Longwall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



- 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

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



ASHTON COAL MINE
 Upper Lower Liddell Seam Longwall Layout

Figure 3

2 LEGAL REQUIREMENTS AND GUIDELINES

2.1 DEVELOPMENT CONSENT REQUIREMENTS

This BFMP has been prepared to address Condition 32(g), Schedule 3 of DA 309-11-2001-i (MOD 5), and structured generally in accordance with draft *Guidelines for the Preparation of Extraction Plans*. The BFMP is a component plan to the overall Extraction Plan for Longwalls 205-208.

Performance objectives and rehabilitation objectives in relation to subsidence impacts in the Longwalls 205-208 Extraction Plan Area from DA 309-11-2001-i (MOD 5) are presented in **Table 1** and **Table 2**

Table 1. Performance Measures from DA 309-11-2001-i

Domain	Performance Measure
Built features	Always safe. Serviceability should be maintained wherever practicable. Loss of serviceability must be fully compensated. Damage must be fully repaired or replaced, or else fully compensated.
Biodiversity	Negligible impact.

Notes: compensation required under this condition includes any compensation payable under the *Mine Subsidence Compensation Act 1961* and/or the *Mining Act 1992*.

Table 2. Rehabilitation Objectives from DA 309-11-2001-i

Domain	Rehabilitation Objective
Built features affected by subsidence	Repair to pre-mining condition or equivalent unless: <ul style="list-style-type: none"> The owner agrees otherwise; or The damage is fully restored, repaired or compensated under the <i>Mine Subsidence Compensation Act 1961</i>.

2.2 EXTRACTION PLAN REQUIREMENTS

Table 3 outlines the requirements during the preparation of management plans which form part of the Extraction Plan. A large portion of conditions have been addressed in the owner/operator-specific Asset Management Plans (Appendices B-H to this BFMP).

Table 3. Management Plans – Extraction Plan Guideline Requirement

Requirement	Section Addressed in Document
Overview of all landscape features, heritage sites, environmental values, built features or other values to be managed under the component plan.	Ashton Environmental Management Plans (as part of the main Extraction Plan).
Outline all performance measures included in the consent or project approval relevant to the features or values to be managed under the component plan.	Tables 1 and 2.
Outline clear objectives to ensure the delivery of the performance measures and all other relevant statutory requirements (including the <i>Work Health and Safety [Mines] Act 2013</i>).	Asset Management Plans (Appendices B-H to this BFMP).
Proposing performance indicators to establish compliance with these performance measures and statutory requirements.	Asset Management Plans (Appendices B-H to this BFMP).
Describing the landscape features, heritage sites and environmental values to be managed under the component plan, and their significance.	Ashton Environmental Management Plans (as part of the main Extraction Plan).
Outline all currently-predicted subsidence impacts and environmental consequences relevant to the features, sites and values to be managed under the component plans.	Sections 4 and 5. Asset Management Plans (Appendices B-H to this BFMP).
Outline all measures planned to remediate subsidence impacts and/or consequences, including any measures proposed to ensure that impacts and/or consequences comply with performance measures and/or the mine's commitments.	Sections 4 and 5. Asset Management Plans (Appendices B-H to this BFMP).
Fully describing the proposed monitoring of subsidence impacts and environmental consequences.	Section 6. Asset Management Plans (Appendices B-H to this BFMP). <i>Also see Subsidence Monitoring Program.</i>
Describing the proposed monitoring of the success of remediation measures following implementation.	Section 6.
Fully describing adaptive management proposed to avoid repetition of unpredicted subsidence impacts and/or environmental consequences.	Section 6 and 7. Asset Management Plans (Appendices B-H to this BFMP).
Fully describing contingency plans proposed to prevent, mitigate or remediate unpredicted subsidence impacts and/or environmental consequences which substantially exceed predictions or which exceed performance measures.	Asset Management Plans (Appendices B-H to this BFMP).
Listing responsibilities for implementation of the plan.	Section 8.

3 RISK MANAGEMENT

A risk assessment was conducted on 5th May 2020 to review and identify subsidence-related hazards that may affect the environment and community as a result of resource extraction from Longwalls 205 – 208.

Risks were identified and assessed through the review of known surface and sub-surface features within the Extraction Plan Area. This risk assessment was facilitated by Kylie Hannigan (STAC Consulting) with contribution by the following Ashton workforce representatives and external content/technical experts:

- Tony Sutherland (ACOL – Technical Services Manager);
- Phil Brown (ACOL – Environmental and Community Relations Superintendent);
- Jeff Peck (ACOL – Mining Surveyor);
- David Cooke (ACOL – Operator/Site Safety and Health Representative);
- Lachlan Crawford (ACOL – Environment and Community Coordinator);
- Josh Peters (Resource Strategies – Senior Environmental Project Manager);
- Matthew Copeland (Resource Strategies – Environmental Project Manager);
- Dr Ken Mills (Principal Geotechnical Engineer/Director – SCT Operations Pty Ltd); and
- Andrew Durick (Director/Principal Modeller – AGE).

The risk assessment identified a total of:

- Low Risks – 18;
- Moderate Risks – 9;
- High Risks – 7; and
- Extreme Risks – 0.

A total of five built features were classified as having a potentially high risk of subsidence impacts with the consequences relating to damage to infrastructure resulting in impacts to the environment or potential safety concerns. The infrastructure identified with potentially high risks included:

- Lemington Road and two associated culverts;
- ACOL mine water pipeline;
- ACOL tailings pipelines;
- Glencore Mt Owen Water Supply Pipeline; and
- ACOL dewatering bores.

Specific controls and management measures for these built features (and all other relevant assets) are detailed in the relevant Asset Management Plans (Appendices B-H to this BFMP) and the risk assessment as part of the Extraction Plan.

4 BUILT FEATURES MANAGEMENT

4.1 MAXIMUM PREDICTED SUBSIDENCE

Table 4 below describes the maximum 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 (i.e. PG Seam and ULD Seam).

Table 4. 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	
Incremental Subsidence Parameters								
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	
Cumulative Subsidence Parameters								
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	

The incremental subsidence movements for Longwalls 205-208 in the ULLD Seam are additional to the movements that have already occurred as a result of previous mining in the PG and ULD Seams. These incremental values are added to the permanent values at the completion of mining in the ULD Seam to give estimates of the maximum movements that could occur during mining in the ULLD Seam.

4.2 ASSET MANAGEMENT PLANS

ACOL proposes to manage the built features using individual Asset Management Plans. Built features identified within the Longwalls 205-208 Extraction Plan area and the relevant owners are presented in **Table 5**. Further detail of the infrastructure and proposed management measures are available in the respective Asset Management Plan. Stakeholder contact details are provided in **Appendix A**.

Table 5. Asset Management Plan Summary

Asset	Description	Owner/Operator	Specific Management Plan
Electricity Transmission Lines	132 kV Transmission Line 11kV Transmission Line	Ausgrid	Ausgrid Asset Management Plan (Appendix B)
High Voltage Electricity Transmission Line	330 kV Transmission Line	TransGrid	TransGrid Asset Management Plan (Appendix C)
Mining Operation infrastructure and transmission lines.	33 kV transmission line Bayswater Pit (No.2) Ventilation Shaft (No.5) Void 5 Ash Dam Water Supply Pipeline	Glencore	Glencore Asset Management Plan (Appendix D)
Public Roads	New England Highway (sealed)	Transport for New South Wales	Transport for New South Wales Management Plan (Appendix E)
Mine Roads and Infrastructure	South Access Road Sediment Dams Fences Other minor infrastructure	AGL Macquarie	AGL Macquarie Asset Management Plan (Appendix F)
Telecommunications infrastructure	Underground Copper Cable Local Fibre Optic Cable	Telstra	Telstra Asset Management Plan (Appendix G)
Local Council Roads	Lemington Road Lemington Road Culverts	Singleton Council	Singleton Council Asset Management Plan (Appendix H)

The referenced Asset Management Plans are attached (Appendices B-H) and have been developed in consultation with each respective asset owner.

Clear objectives to ensure the delivery of the performance measures and all other relevant statutory requirements are described in the respective Asset Management Plan (AMP).

4.2.1 Stakeholder Consultation

This BFMP forms part of Ashton’s Extraction Plan. The following agencies have been or will be consulted with during the development of this BFMP and the associated AMPs:

- NSW Resources Regulator;
- Department of Planning, Industry and Environment; and
- Relevant asset owners/operators.

Contact information for each Asset Management Plan stakeholder is detailed in Appendix A.

4.2.2 Management of Public Safety Relating to Built Features

Public safety matters relating to built features have been identified in the individual Asset Management Plans and have also been incorporated into the Longwalls 205-208 Public Safety Management Plan.

5 ACOL BUILT FEATURES MANAGEMENT

5.1 PREDICTED IMPACTS

The potential subsidence impacts to ACOL owned built features are described in the following sections. The relevant ACOL built features within close proximity to Longwalls 205-208 are shown on **Figure 4**.

5.1.1 ACOL Tailings Disposal Pipeline

Figure 4 shows the route of several polylines delivering tailings from the Ashton CHPP to the ACP Tailings Dam and the decant return back to Ashton CHPP. These pipelines are laid in open trenches where they cross double stacked goaf edges along the northern end of Longwalls 208 and the corner of Longwall 207B and they are buried on ACOL land near the end of Longwall 206B. Plate 1 shows the pipelines in the open trench above the north eastern corner of Longwall 207B. No significant impacts are expected to these pipelines as they are located on the surface and are free to move independently of subsidence movements.



Plate 1: ACOL Tailings Disposal Pipelines in Open Trench

5.1.2 ACOL Water Supply Pipeline

The water supply for the ACP CHPP is pumped via a buried 200 mm diameter polyline from an intake at the Hunter River. **Figure 4** shows the pipeline route from the intake in the southwest corner of the Longwalls 205-208 Extraction Plan area, above Longwalls 206A and 205 and north across Longwall 4. There is potential for subsidence movements localised at pre-existing fractures and at compression overrides to cause damage to the pipeline with possible loss of water supply and minor environmental impacts. Potential impacts can be managed if they are found to be a recurring problem by exposing the pipeline.

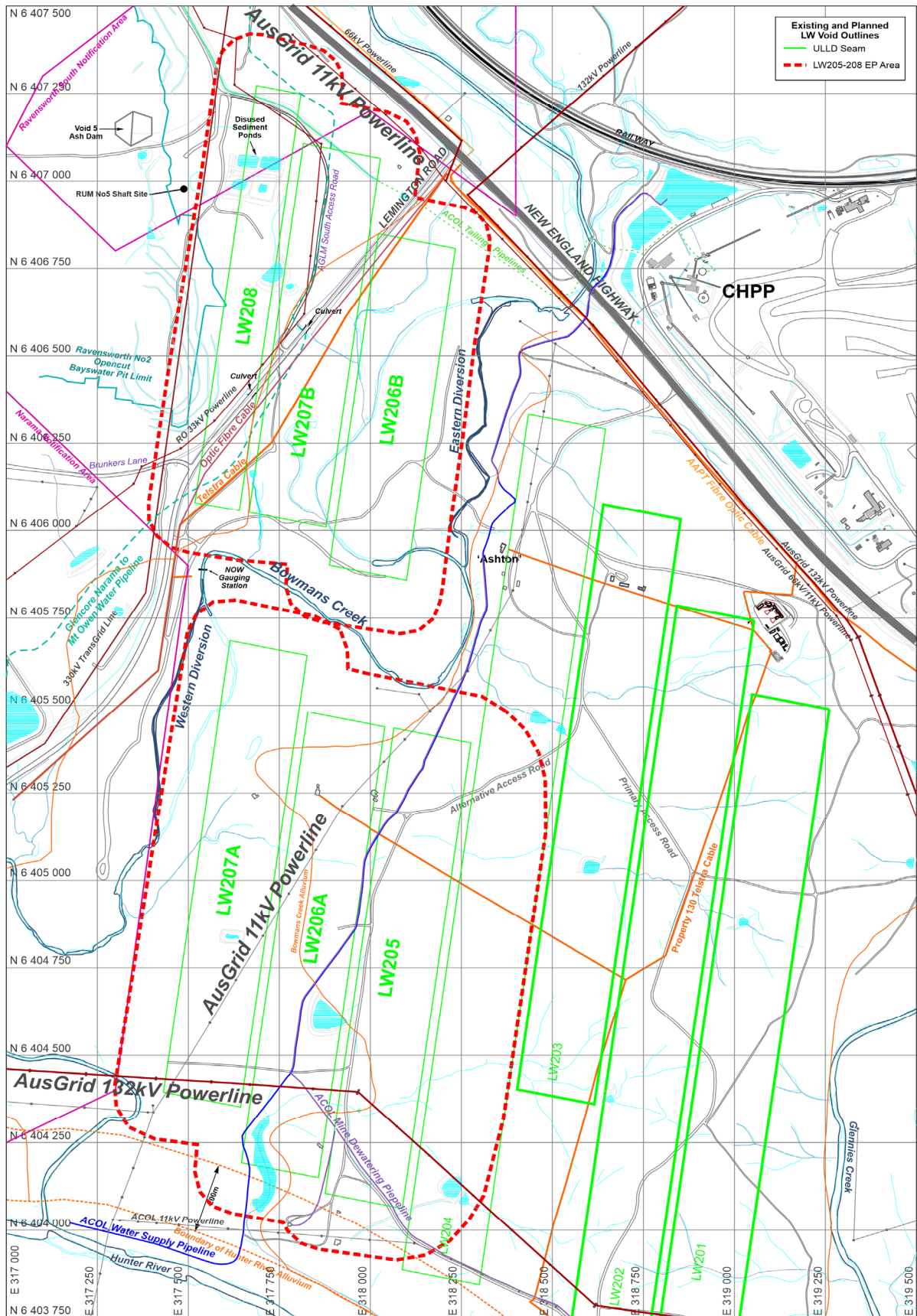


Figure 4. Plan Showing Location of ACOL Infrastructure in the Vicinity of Longwalls 205-208

Plate 2 shows a photograph of the pipeline where it is exposed near the pump.



Plate 2. ACOL Water Supply Pipeline

5.1.3 ACOL Mine Dewatering Equipment and Pipeline

ACOL pump water from the underground mine back to the ACP CHPP via a buried, 355 mm diameter polyline that crosses the Longwalls 205-208 Extraction Plan area. **Figure 4** shows the route of this pipeline from the back-road ventilation shaft area via the alternative right of way access road and then north beside the Hunter River water supply pipeline. Branch lines from other underground sump areas join the main pipeline. Potential impacts include rupture of the pipeline with environmental consequences.

Longwalls 205 and 206A would mine below the pipeline creating a double stacked goaf edge at the start and sides of Longwalls 205 and 206A, and an almost triple stacked goaf edge at the finish line of Longwall 205. This pipeline was mined under previously including a double stacked goaf edge at the start of Longwall 202.

Maximum strains of 110 mm/m are expected at the double stacked goaf edges and almost triple stacked goaf edge above the finish of Longwall 205. There is potential for these ground strains to exceed the nominal strain limits of this pipe, particularly in zones of high tensile strain at the stacked goaf edges and high compressive strains at compression overrides.

5.1.4 ACOL Gas Management Equipment and Pipelines

ACOL have a network of gas drainage collection pipelines in place across the Longwalls 205-208 Extraction Plan area as part of the gas management system for the underground mine. These pipelines have been designed to accommodate subsidence movements. Surface to seam boreholes with collar equipment installations are also included in this network.

SCT (2020) understands that further gas drainage boreholes are planned on AGL Macquarie land for areas above Longwalls 205-208.

5.1.5 ACOL 11 kV Transmission Line

A 11 kV transmission line that supplies the back-road ventilation fan/upcast shaft, BOC Nitrogen Plant, and several mine dewatering pumps crosses the southern part of the Longwalls 205-208 Extraction Plan area but outside the panel edges. **Figure 4** shows the location of this transmission line. No significant impacts are expected.

5.1.6 ACOL Farm Infrastructure

Farm infrastructure on ACOL land within the Longwalls 205-208 Extraction Plan area includes:

- a disused residential farm house with associated buildings or features including buried telecommunication (Telstra) cables located above Longwall 206A;
- access roads/tracks, and other minor farm infrastructure such as water reticulation systems, dams, fences, gates and cattle grids; and
- agricultural land.

Impacts to these built features are expected to be similar in nature and magnitude to those experienced from previous mining in the PG, ULD and ULLD Seams to date.

Many of the features are expected to experience the full range of subsidence effects forecast for mining of Longwalls 205-208.

Further impacts to the farmhouse, outbuildings and other built features at this site are expected. Most of this site has been mined under previously by Longwall 6A and Longwall 106A. Further impacts to brick walls, masonry structures such as fireplaces and large concrete slabs are expected to become evident.

These structures are not expected to remain safe or serviceable during the period of active mining directly beneath them. They should not be occupied during the period of active subsidence and until the structures have been adequately repaired.

Impacts to access tracks/roads are expected to include cracking, steps, compression humps, changes in grades and flooding. These impacts have all been observed previously at Ashton Underground Mine (AUM) and have been effectively managed via controls measures such as restricted access, warning signs, speed restrictions and supervised access. These actions coupled with regular inspections and remediation works have been able to maintain serviceability of the access tracks/roads and to minimise risk. Continuation of these actions is expected to be effective above Longwalls 205-208.

Experience of mining below farm dams at AUM and elsewhere indicates that some cracking may cause minor water loss in a small proportion of dams. These losses have not posed an operational risk to mining underground at AUM in the past and do not pose an inrush risk. Dams are typically restored to their original condition with a small amount of remediation work.

Impacts to fences are expected to include broken or loosened wires to the extent that fences become ineffective for stock control. These impacts are likely to occur most in areas of high strain and areas of active mining. Any impacts to fences, gates, cattle grids or stockyards are expected to be minor and repairable.

Impacts to the utilisation and suitability of the existing agricultural land are expected to be consistent with those from previous underground mining. Any impacts are expected to be able to be remediated using the strategies adopted over previous mining areas at AUM.

5.2 PROPOSED MANAGEMENT MEASURES

5.2.1 ACOL Tailings Disposal Pipeline

It is recommended that regular inspections during the period of active subsidence are undertaken to ensure that operations are maintained, and any potential environmental risk is minimised (SCT, 2020).

5.2.2 ACOL Water Supply Pipeline

Strategies to manage the potential impacts of subsidence to the ACOL water supply pipeline include (SCT, 2020):

- Uncovering the pipeline through areas of stacked goaf edges and at major changes of direction.
- Regular inspections in areas of active subsidence.
- Installing a monitoring system, if one doesn't already exist, that can detect a drop in water pressure as a means to identify potential damage.

These strategies are expected to be effective to maintain operations and minimise any possible environmental risk.

5.2.3 ACOL Mine Dewatering Equipment and Pipeline

Strategies to manage the potential for subsidence impacts include:

- Uncovering the pipeline through the areas of stacked goaf edges and at major changes of direction in the pipeline.
- Regular inspection and visual monitoring during the period of active subsidence to confirm that there is sufficient slack in the lines to accommodate the ground movements occurring.
- A system for monitoring pressure or flow that can detect a leak and shut down the pumping system.
- Isolating the line during the period of active subsidence and only returning it to service after it has been pressure tested.

5.2.4 ACOL Gas Management Equipment and Pipelines

Impacts to this infrastructure are expected to be similar to those already experienced and successfully managed above Longwalls 201-203. These pipelines have been designed to accommodate subsidence movements.

5.2.5 ACOL 11kV Transmission line

Poles are located where vertical and horizontal subsidence movements from mining of Longwalls 205-208 are expected to be less than 100 mm with corresponding low levels of tilt and strain. No significant impacts are expected.

5.2.6 ACOL Farm Infrastructure

A program of control measures, regular monitoring and appropriate remediation as required is considered an effective way to manage the expected impacts to farm infrastructure from the mining of Longwalls 205-208 (SCT, 2020).

The house and outbuildings are currently used as storage for drilling cores. These cores will be relocated during mining.

6 SUBSIDENCE MONITORING AND MANAGEMENT

The overall framework of subsidence monitoring and management for built features and other environmental consequences is described in the flowchart depicted in **Figure 5** (as taken from the **Extraction Plan**).

The management actions that ACOL undertakes to satisfy performance measures for all built features other than ACOL owned assets are described in **Table 6**.

EXTRACTION PLAN SUBSIDENCE MONITORING AND MANAGEMENT FLOWCHART – LONGWALLS 205 TO 208

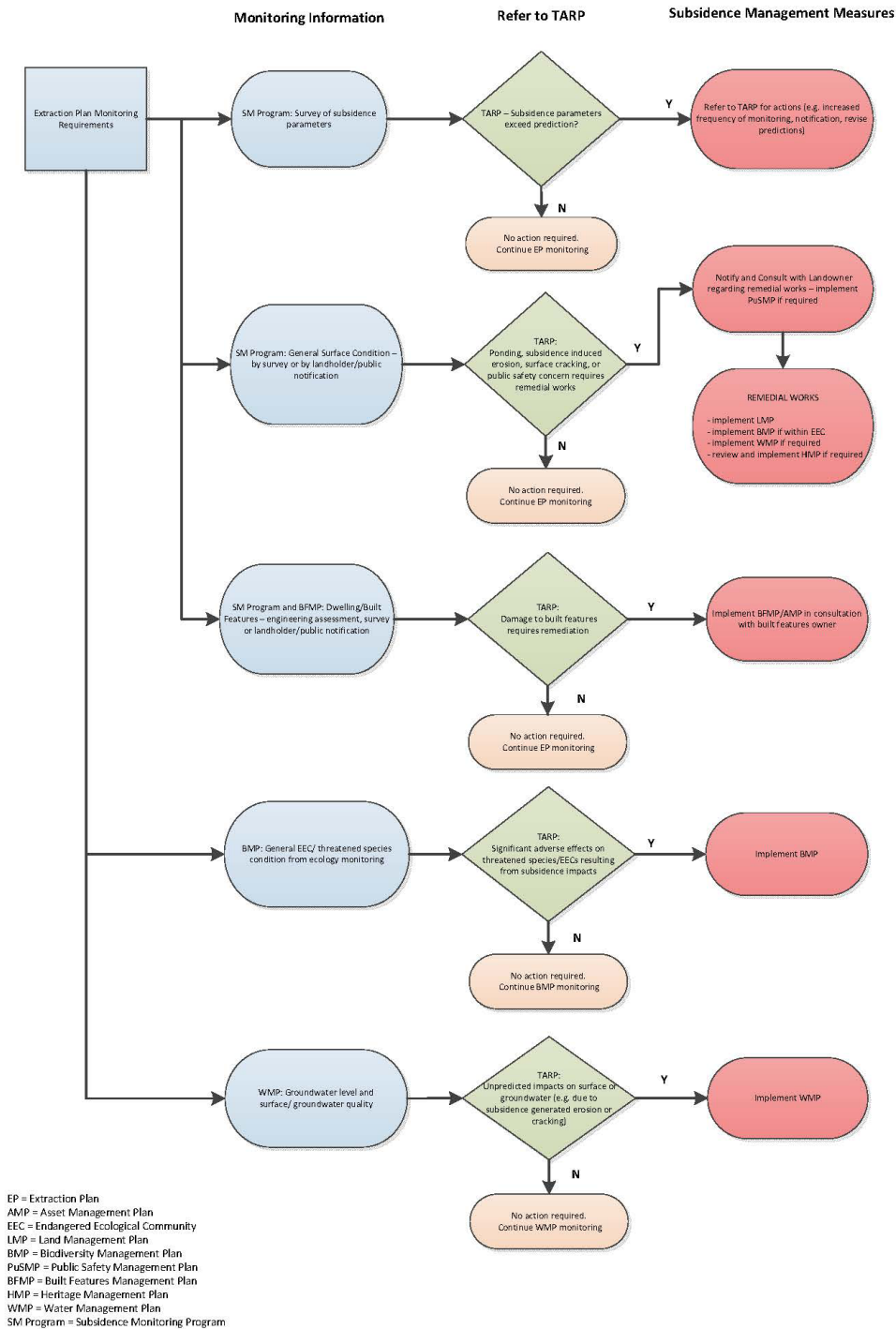


Figure 5. Extraction Plan Subsidence Monitoring and Management Flowchart

Table 6. Asset Monitoring and Management Summary Table

Asset Owner	Feature	Action/Response	Trigger/Timing
TransGrid	Monitoring		
	330 kV Transmission Line	<ul style="list-style-type: none"> Pre-subsidence survey of 330 kV tower bases to obtain xyz coordinates. The survey is to be undertaken in accordance with the approved Subsidence Effects Monitoring Program and the proposed methods therein. No power shortages occur due to subsidence induced damage to transmission lines. 	Prior to mining LW 207B.
		<ul style="list-style-type: none"> Assets to be monitored in accordance with the <i>Subsidence Effects Monitoring Program</i>. Visual inspections conducted during subsidence. Undertake final inspections and survey following completion of mining. 	<ul style="list-style-type: none"> During active subsidence; and Final inspection and survey following completion of mining.
	Management		
	330 kV Transmission Line	<ul style="list-style-type: none"> Monitoring as per requirements above. It should be noted that the 330 kV transmission line has been designed to tolerate subsidence. 	Monitoring as per timing above.
Ausgrid	Monitoring		
	132 kV Transmission Line and North/South 11 kV Transmission Line	<p>Pre-subsidence survey of 132 kV poles (top and base) to obtain xyz coordinates. The survey is to be undertaken in accordance with the approved <i>Subsidence Effects Monitoring Program</i> and the proposed methods therein.</p> <ul style="list-style-type: none"> Assets to be monitored in accordance with the <i>Subsidence Effects Monitoring Program</i>. Visual inspections conducted during subsidence. Undertake final inspections and survey following completion of mining. 	<p>Prior to mining Longwall 205.</p> <ul style="list-style-type: none"> During active subsidence; and Final inspection and survey following completion of mining.
	East/West 11 kV Transmission Line	No predicted subsidence impacts therefore no monitoring proposed.	No action.

Asset Owner	Feature	Action/Response	Trigger/Timing
	Management		
	132 kV Transmission Line and North/South 11 kV Transmission Line	<ul style="list-style-type: none"> Structural assessment of transmission lines and implement remedial works to transmission line, as required. For the 11 kV transmission line, sheaving of the conductors on poles located in areas of high tilt such as stacked goaf edge at the northern end of Longwall 205 and at changes in direction will be undertaken to ensure that insulators and supporting cross members do not become overloaded by changes in conductor tension. The remaining original structure (i.e. two timber poles) for the 132 kV transmission line over Longwall 207 will be upgraded prior to undermining. 	<ul style="list-style-type: none"> Assessment to be completed prior to subsidence. Mitigation measures (sheaving/upgrade) to be completed prior to impacts occurring.
	East/West 11 kV Transmission Line	No predicted subsidence impacts therefore no management actions proposed	No action.
Glencore	Monitoring		
	33 kV Transmission Line	Pre-subsidence survey of 33 kV poles (top and base) to obtain xyz coordinates. The survey is to be undertaken in accordance with the approved <i>Subsidence Effects Monitoring Program</i> and the proposed methods therein.	Prior to mining Longwall 207B.
		<ul style="list-style-type: none"> Assets to be monitored in accordance with the <i>Subsidence Effects Monitoring Program</i>. Subsidence monitoring and post subsidence inspection / structural assessment of poles and lines including visual inspections noting condition, line clearances and pole tilt. Undertake final inspections following completion of mining. 	<ul style="list-style-type: none"> During active subsidence; and Final inspection and survey following completion of mining.
Bayswater Pit (No. 2) and No. 5 Ventilation Shaft	<ul style="list-style-type: none"> Assets to be monitored in accordance with the <i>Subsidence Effects Monitoring Program</i>. Undertake visual inspections and survey of shaft centre following completion of mining. 	<ul style="list-style-type: none"> During active subsidence; and Final inspection and survey following completion of mining. 	

Asset Owner	Feature	Action/Response	Trigger/Timing
	Void 5 Ash Dam	Survey of subsidence monitoring pegs.	<ul style="list-style-type: none"> • Prior to mining Longwall 207B and Longwall 208; and • Following completion of mining Longwall 207B and 208.
	Water Supply Pipeline	<ul style="list-style-type: none"> • Visual inspection/monitoring of exposed sections of pipeline. • Glencore to continue monitoring of pipeline flows. 	<ul style="list-style-type: none"> • Prior to mining Longwall 207B; • During active subsidence; and • At completion of each longwall panel.
Management			
	33 kV Transmission Line	Structural assessment of the 33 kV transmission line and implement remedial works, if required.	<ul style="list-style-type: none"> • Assessment to be completed prior to subsidence. • Modifications to be completed prior to subsidence impacts occurring.
	Bayswater Pit (No. 2) and No. 5 Ventilation Shaft	Assets to be managed in consultation with Glencore if any subsidence impacts identified.	ACOL to consult Glencore if subsidence impacts have been identified.
	Void 5 Ash Dam	<ul style="list-style-type: none"> • Detailed assessment of potential subsidence impacts to Void 5 Ash Dam in accordance with <i>Dams Safety Act 1978</i>. • Obtain DSC approval to mine within notification area. 	Prior to commencement of secondary extraction of Longwall 206B.
	Water Supply Pipeline	Expose pipeline and place on surface to reduce subsidence impacts and/or provision for leak detection in predicted high strain areas.	Prior to subsidence if flow monitoring equipment is not installed.
		If required, ensure pumping is stopped and notify ACOL immediately so that potential damage to pipeline can be investigated.	If flow monitoring indicates a leak or failure of the pipeline.

Transport for NSW	Monitoring		
	New England Highway	<ul style="list-style-type: none"> • Visual monitoring of key features associated with the New England Highway. • Road monitoring as per the <i>Subsidence Effects Monitoring Program</i>. • Transport for NSW to continue the monitoring and maintenance program on the New England Highway as per Transport for NSW's nominated program. 	Subsidence monitoring to be undertaken as per the <i>Subsidence Effects Monitoring Program</i> .
	Management		
	New England Highway	Studies by ACOL have determined that the probability of a mining induced pothole on the New England highway is negligible.	ACOL to inform Transport for NSW if subsidence impacts have been identified.
AGL Macquarie	Monitoring		
	South Access Road	<ul style="list-style-type: none"> • Pre mining condition assessment. • During and post subsidence monitoring inspections. 	<ul style="list-style-type: none"> • Prior to Longwall 207B; and • During and following undermining.
	Sediment Dams	<ul style="list-style-type: none"> • Visual observation of dams. 	<ul style="list-style-type: none"> • Monthly inspection during active subsidence to dams. • Post-longwall extraction.
	Other Minor Infrastructure	<ul style="list-style-type: none"> • Pre mining condition assessment. • During and post subsidence monitoring inspections. 	<ul style="list-style-type: none"> • During active subsidence; and • Final inspection and survey following completion of mining.
	Management		
	South Access Road	Erection of signage property gates warning of potential subsidence impacts and providing ACOL contact number. Repair damaged roads.	Prior to commencement of longwall mining beneath affected property. Post-subsidence.
	Surface Cracking (all surfaces)	Repair permanent surface cracking on AGL Macquarie land (by filling or ripping) and revegetate in accordance with the MOP.	Post-subsidence.

Telstra	Monitoring		
	Underground Copper Cable	Subsidence monitoring within the Extraction Plan area will be undertaken.	Overall subsidence monitoring within the Extraction Plan area – pre, during and post active subsidence.
	Fibre Optic Cable	Subsidence monitoring within the Extraction Plan area will be undertaken.	Overall subsidence monitoring within the Extraction Plan area – pre, during and post active subsidence.
	Management		
	Fibre Optic Cable	It is not the responsibility of ACOL to undertake any repairs as a result of subsidence impacts on the fibre optic line as this was built as part of the Ravensworth North Project.	ACOL to inform Glencore if subsidence impacts have been identified.
Singleton Council	Monitoring		
	Lemington Road	Pre-mining condition assessment to document pre-subsidence condition of the road, including photographic records of any observed records of any observed existing pavement fatigue or failure or similar existing damage. Monitoring in accordance with the Deed.	Prior to commencement of mining in Longwall 206B.
		Visual inspection of the road to identify any subsidence impacts that could affect the safety of vehicles. Subsidence monitoring in accordance with the Subsidence Effects Monitoring Program and the Deed.	Daily during active subsidence.
		Post-mining condition assessment of the road to confirm that any perceptible subsidence impacts have ceased and document the post-subsidence status of the road.	Once active subsidence has ceased.
	Lemington Road Culvert	Pre, during and post mining subsidence monitoring. Regular inspections.	Pre, during and post subsidence.
	Management		
	Lemington Road	Erection of signage warning of potential subsidence impacts and providing ACOL contact number. Management as per the Deed.	Prior to commencement of longwall mining in Longwall 206B.

		Onsite road crew ready to make subsidence repairs to Lemington Road on a short term basis. Management as per the Deed.	<ul style="list-style-type: none"> • During active subsidence; and • Until no subsidence impacts are recorded.
		Maintain access to Lemington Road in accordance with the Deed in place between ACOL, Ravensworth Operations and Singleton Council.	Following subsidence impacts until permanent repairs of road are complete.
	Lemington Road Culverts	Maintain condition in accordance with the Deed in place between ACOL, Ravensworth Operations and Singleton Council.	Following subsidence impacts until permanent repairs of the culvert are complete.
	Traffic Management Plan	<p>A Traffic Management Plan will be prepared to cover Lemington Road. This management plan will include outlining the implementation of the following:</p> <ul style="list-style-type: none"> • community interface and notification protocols; • relevant contacts including ACOL, Ravensworth Operations, Singleton Council; and • responsibility/hand over milestones. 	To be completed in consultation with Singleton Council and signed off by Singleton Council prior to commencement of mining of Longwall 206B.

7 PLAN IMPLEMENTATION

7.1 REPORTING FRAMEWORK

7.1.1 Annual Review

The Annual Review details ACOL's environmental performance for the reporting year and is prepared in accordance with Schedule 5, Condition 10 of DA 309-11-2001-i and to satisfy Mining Lease conditions. Performance in accordance with this BFMP, as a key component plan of the Extraction Plan, will be reported using timings and protocols as described in the main Extraction Plan.

7.1.2 Regular Stakeholder Reporting

The results of monitoring undertaken in accordance with individual AMPs will be provided to the relevant asset owner at a frequency agreed in consultation with the relevant asset owner.

7.2 REVIEW OF THE BFMP

Review of the Extraction Plan (including the BFMP), and revision if necessary, shall occur where unpredicted impacts and/or environmental consequences are identified through the monitoring and management strategies proposed in the Extraction Plan.

Review of the Extraction Plan (including the BFMP) is also required following any modification to DA 309-11-2001-i, or if directed by the Secretary of the NSW Department of Planning, Industry and Environment (DPIE).

Any revision to the Extraction Plan (including the BFMP) must be completed to the satisfaction of the Secretary of DPIE.

8 RESPONSIBILITIES

8.1 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>.

8.2 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 relevant asset owners; and
- liaise with relevant asset owners and remediation consultants and contractors as required.

8.3 ASHTON ENVIRONMENT & COMMUNITY SUPERINTENDENT

The Environment & Community Superintendent must:

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

8.4 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 the Technical Services Manager and/or the Environment and Community Superintendent of any identified public safety issue.

8.5 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 the Technical Services Manager.

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
ASHTON		
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
GOVERNMENT		
Subsidence Advisory NSW	Newcastle Office	4908 4300
Resources Regulator	-	1300 814 609
ASSET OWNERS		
Ausgrid	John O'Brien Portfolio Manager, Muswellbrook	6542 9068
	Emergency	13 13 88
TransGrid	Emergency	1800 027 253
Telstra	Mark Schneider Project Specialist	8842 5185
Singleton Council	Mark Ihlien Director Planning and Infrastructure	-
	General Contact	6578 7290
AGL Macquarie	Summer Steward Environment Business Partner	6542 1508
Transport for NSW	Adam McKenzie Area Maintenance Manager	4294 0666
Glencore	Klay Marchant Environment and Community Manager (Ravensworth Complex)	6507 0684
LANDHOLDERS		
Refer to Ashton internal contacts register.		

Appendix B

Longwalls 205-208

Ausgrid

Asset Management Plan

Appendix C

Longwalls 205-208 TransGrid Asset Management Plan

Appendix D

Longwalls 205-208 Glencore Asset Management Plan

Appendix E

Longwalls 205-208 Transport for NSW Asset Management Plan

Appendix F

Longwalls 205-208 AGL Macquarie Asset Management Plan

Appendix G

Longwalls 205-208 Telstra Asset Management Plan

Appendix H

Longwalls 205-208 Singleton Council Asset Management Plan