23 October 2020

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Panel Chair of the Maxwell Underground Coal Mine Project (SSD 9526)
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c/- Casey Joshua via Casey.Joshua@planning.nsw.gov.au

Dear Commissioner,

RE: MAXWELL PROJECT (SSD 9526) – MANAGEMENT OF EDDERTON ROAD

Thank you for the opportunity to discuss the Maxwell Underground Project (the Project) with you and Commissioner Hann on 15th October 2020. At our meeting, we undertook to provide additional information regarding the management of Edderton Road during extraction of the longwall panels in the Woodlands Hill seam.

Mine Subsidence Engineering Consultants (MSEC) completed a subsidence assessment for the Project. Extracts from that the Subsidence Assessment are provided in Enclosure 1.

MSEC (2019) describes that the subsidence impacts to Edderton Road (under the assessed multi-seam mining conditions) would have been similar to the impacts observed along the Broke and Charlton Roads following extraction of the Blakefield South longwalls. Further information regarding the subsidence impacts observed at the Broke and Charlton Roads is provided in Enclosure 2.

In light of the observed impacts to Broke and Charlton Roads and the management measures implemented by the operators of the Blakefield South longwalls, MSEC (2109) concluded (Enclosure 1):

> *The potential impacts on Edderton Road could be managed using visual monitoring and undertaking remediation of the road pavement during active subsidence. These strategies may require temporary lane closures to undertake the repairs and temporary speed restrictions along the section of the road that is impacted by mining.*

As you are aware, Malabar has subsequently committed to realigning Edderton Road prior to secondary extraction in the Arrowfield Seam. Accordingly, longwall extraction beneath Edderton Road would only be undertaken in one seam (Woodlands Hill) rather than the multi-seam conditions assessed by MSEC.

An indication of the road management and monitoring measures, that would form part of a Built Features Management Plan prepared in accordance with Conditions C8(g)(ii) and C11 of the draft Development Consent, is provided in Enclosure 3. These measures will be finalised after consultation with the relevant parties described in the Development Consent.

Please do not hesitate to contact the undersigned should you wish to discuss.

Yours sincerely,

Wayne Seabrook
Director

Maxwell Ventures (Management) Pty Ltd

Enclosure 1 – Extracts from Maxwell Project Subsidence Assessment (MSEC, 2019)

Enclosure 2 – Subsidence Case Study – Broke and Charlton Roads

Enclosure 3 – Indicative Road Subsidence Monitoring, Management and Remediation Measures

Enclosure 1

Extracts from Maxwell Project Subsidence Assessment (MSEC, 2019)

The 95 % confidence levels have been determined from the empirical data using the fitted GPDs. In the cases where survey bays or marks were measured multiple times during a longwall extraction, the maximum opening, maximum closure and maximum mid-ordinate deviations were used in the analysis (i.e. single opening and single closure measurements per survey bay and single mid-ordinate deviation per survey mark).

The maximum predicted incremental differential longitudinal movements for the survey bays, at a distance of 800 m from active the longwall, are +5 mm opening and -5 mm closure based on the 95 % confidence levels. The maximum predicted incremental horizontal mid-ordinate deviation for the survey marks, at a distance of 800 m from the active longwall, is ±7 mm based on the 95 % confidence level. It is noted that a large proportion of these movements comprise the survey tolerance, which is around ±3 mm.

6.2.3. Impact assessments for the bridge at Bowmans Crossing

The maximum predicted differential incremental horizontal movements between the adjacent headstocks of the bridge are between ±5 mm to ±7 mm based on the 95 % confidence levels. It is again noted that these movements comprise large proportions of survey tolerance, which is around ±3 mm. It is likely, therefore, that the differential horizontal movements due to the proposed mining will be very small and, in some cases, may not be measurable.

Differential horizontal movements between the concrete deck and the supports normally occur due to variations in the temperature of the structure. Typical horizontal movements due to temperature changes, based on a 90 m span (i.e. distance between the expansion joints), a coefficient of thermal expansion of $12x10^{-6}$/ºC and a temperature variation of 20ºC, is around 20 mm.

The predicted mining-induced differential horizontal movements for the bridge, therefore, are less than the movements that normally occur due to the variation in ambient temperature. It is likely, therefore, that the bridge could tolerate the potential movements due to the proposed mining, without adverse impacts, provided that the expansion joints have sufficient redundant capacities. The structural engineers should assess the capacity of the bridge to accommodate the predicted mining-induced movements.

6.2.4. Recommendations for the bridge at Bowmans Crossing

Malabar has commenced consultation with RMS on the bridge at Bowmans Crossing. It is recommended that structural engineers should assess the capacity of the bridge to accommodate the predicted mining-induced movements.

It is also recommended, that a BFMP is developed in consultation with RMS prior to mining within 1200 m of the bridge. The management strategies could include 3D monitoring points on the bridge structure, tell-tales across the expansion joints and periodic visual inspections during the extraction of the proposed longwalls closest to it.

6.3. Edderton Road

6.3.1. Description of Edderton Road

The locations of the roads are shown in Drawing No. MSEC986-24.

Edderton Road crosses the western part of the Study Area and it is located directly above the proposed longwalls in the Woodlands Hill, Arrowfield and Bowfield Seams. A summary of the longwalls that are proposed to be extracted directly beneath the current alignment of Edderton Road is provided in Table 6.2.

Table 6.2 Longwalls proposed to be extracted directly beneath Edderton Road

Seam	Longwalls proposed to be extracted beneath the road	Length of road above the proposed mining areas (km)
Woodlands Hill Seam	WHLW1 to WHLW6	2.3
Arrowfield Seam	AFLW1 to AFLW6	2.6
Bowfield Seam	BFLW1 to BFLW6	2.2
All seams	As above	2.6

The section of Edderton Road within the Study Area comprises a two lane single-carriageway with a bitumen seal and grass verges with no kerb or guttering. The gross load limit is 14 tonnes.

There are circular concrete drainage culverts (Refs. ER-C1 to ER-C5) where the road crosses the drainage lines. The locations of the drainage culverts are shown in Drawing No. MSEC986-24. The causeway where Edderton Road crosses Saddlers Creek is outside of the Study Area. The causeway is located more than 500 m north-west of the proposed mining area.

Photographs of Edderton Road are provided in Fig. 6.8.

Fig. 6.8 Edderton Road

Edderton Road is owned and maintained by the Muswellbrook Shire Council.

6.3.2. Predictions for the current alignment of Edderton Road

The predicted profiles of vertical subsidence, tilt and curvature along the current alignment of Edderton Road are shown in Fig. C.07, in Appendix C. The predicted profiles are shown after the completion of the Whynot Seam (red lines), Woodlands Hill Seam (green lines), Arrowfield Seam (cyan lines) and Bowfield Seam (blue lines). The maximum predicted tilts and curvatures after any panel or longwall in any seam are shown as the grey lines.

A summary of the maximum predicted values of total vertical subsidence, tilt and curvature for Edderton Road is provided in Table 6.3. The values are the maxima anywhere along the current alignment of the road within the Study Area.

Table 6.3 Maximum predicted total vertical subsidence, tilt and curvature for the current alignment of Edderton Road

After completion of seam	Maximum predicted total vertical subsidence (mm)	Maximum predicted total tilt (mm/m)	Maximum predicted total hogging curvature (km^{-1})	Maximum predicted total sagging curvature (km^{-1})
Whynot Seam	< 20	< 0.5	< 0.01	< 0.01
Woodlands Hill Seam	2300	35	1.4	0.90
Arrowfield Seam	4300	45	1.6	0.90
Bowfield Seam	5100	45	1.6	0.90

The maximum predicted tilt for Edderton Road is 45 mm/m (i.e. 4.5 %, or 1 in 22). The maximum predicted curvatures for the road are 1.6 km^{-1} hogging and 0.90 km^{-1} sagging, which represent minimum radii of curvatures of 0.6 km and 1.1 km, respectively.

The maximum predicted conventional strains for Edderton Road, based on applying a factor of 10 to the maximum predicted conventional curvatures, are 16 mm/m tensile and 9 mm/m compressive. The distribution of the predicted strains due to the extraction of the proposed longwalls is described in Section 4.3. The predicted strains directly above the multi-seam longwalls are 8 mm/m tensile and 9 mm/m compressive based on the 95 % confidence levels.

Non-conventional movements can also occur and have occurred in the NSW coalfields as a result of, amongst other things, anomalous movements. The analysis of strains provided in Chapter 4 includes those resulting from both conventional and non-conventional anomalous movements.

A summary of the maximum predicted values of total vertical subsidence, tilt and curvature for the drainage culverts is provided in Table 6.4. The values are the maxima within 20 m of the mapped locations of each of the culverts due to the proposed mining in all seams.

Table 6.4 Maximum predicted total subsidence, tilt and curvature for the drainage culverts

Reference	Maximum predicted total vertical subsidence (mm)	Maximum predicted total tilt (mm/m)	Maximum predicted total hogging curvature (km^{-1})	Maximum predicted total sagging curvature (km^{-1})
ER-C1	40	1	0.02	< 0.01
ER-C2	3500	17	0.20	0.15
ER-C3	4250	19	0.12	0.30
ER-C4	4950	20	0.04	0.15
ER-C5	150	5	0.05	< 0.01

The maximum predicted tilt for the drainage culverts is 20 mm/m (i.e. 2.0 %, or 1 in 50). The maximum predicted curvatures for the culverts are 0.20 km^{-1} hogging and 0.30 km^{-1} sagging, which represent minimum radii of curvatures of 5 km and 3.3 km, respectively.

The causeway where Edderton Road crosses Saddlers Creek is predicted to experience less than 20 mm vertical subsidence due to the proposed mining. Whilst the causeway could experience very low levels of vertical subsidence, it is not expected to experience measurable tilts, curvatures or strains.

6.3.3. Impact assessments for Edderton Road based on its current alignment

The maximum predicted vertical subsidence along the current alignment of Edderton Road is 5100 mm. The predicted subsidence varies along the length of the road, with greater subsidence developing above the longwall voids (especially where they coincide) and lesser subsidence developing near to the chain pillars.

The maximum predicted change in grade (i.e. tilt) along the alignment of Edderton Road is 45 mm/m (i.e. 4.5 %, or 1 in 22). The greater tilts occur towards the northern part of the proposed mining area, where the depths of cover are shallower.

The existing and predicted post-mining surface levels and grades along the alignment of Edderton Road are illustrated in Fig. 6.9.

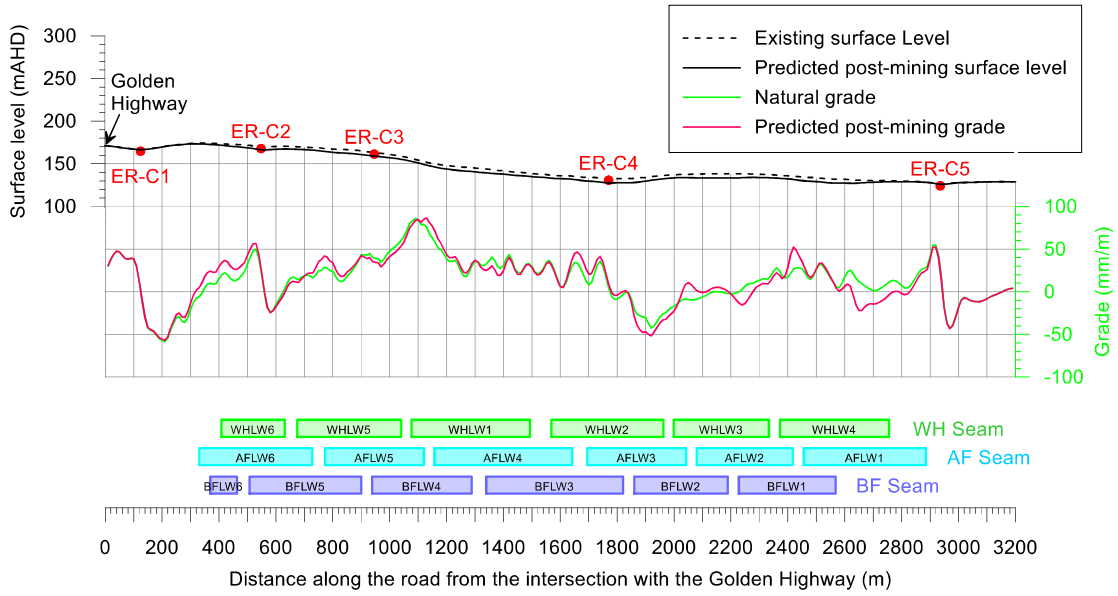

Fig. 6.9 Existing and predicted post-mining surface levels and grades along the current alignment of Edderton Road

The predicted post-mining grades along the current alignment of Edderton Road are reasonably similar to the existing grades. It is unlikely, therefore, that there would be large-scale changes in the surface drainage of the road due to the proposed mining. There is potential for increased ponding near the low-point along the road above the proposed mining area (i.e. near culvert ER-C4) due to the locally increased subsidence in that location.

The maximum predicted curvatures for Edderton Road are 1.6 km^{-1} hogging and 0.90 km^{-1} sagging, which represent minimum radii of curvatures of 0.6 km and 1.1 km, respectively. The road could also experience strains typically between 10 mm/m and 20 mm/m, with some isolated strains greater than 20 mm/m. It is expected that cracking, heaving and possibly stepping of the road pavement would occur based on these levels of predicted curvature and strain.

The maximum predicted curvatures for Edderton Road are of similar orders of magnitude to, but, less than the maxima predicted where Blakefield South Longwalls 2 to 4 were extracted directly beneath Broke Road, which varied between 1.0 km^{-1} and 1.5 km^{-1}. These longwalls were extracted beneath the existing South Bulga longwalls in the Whybrow Seam and, therefore, were also multi-seam mining conditions. The maximum predicted curvatures for Edderton Road are also less than those predicted where Blakefield South Longwalls 1 to 4 were extracted beneath Charlton Road (also multi-seam conditions) and where the Beltana No. 1 Underground Mine Longwalls 1 to 10 were extracted beneath this road (shallow single-seam conditions), which were greater than 3.0 km^{-1}.

The impacts observed along Broke and Charlton Road should, therefore, provide a reasonable guide to the potential impacts that could along Edderton Road, due to the proposed mining, if the road were not to be realigned.

Blakefield South Longwalls 1 to 4 had void widths of 330 m to 400 m and were extracted from the Blakefield Seam at depths of cover ranging between 150 m and 250 m beneath Broke Road and Charlton Roads. The longwalls were extracted beneath the existing South Bulga longwalls in the Whybrow Seam where the interburden thickness typically varied between 70 m and 90 m.

The crack widths observed along Broke and Charlton Roads at the Blakefield South Mine typically varied between 10 mm and 50 mm, with a maximum width of 220 mm. The compression heaving and step heights observed along these roads were typically less than 25 mm, with a maximum height of 50 mm. Examples of the impacts observed at the Blakefield South Mine are provided in Fig. 6.10 for Broke Road and in Fig. 6.11 for Charlton Road.

Fig. 6.10 Impacts observed along Broke Road at the Blakefield South Mine

Fig. 6.11 Impacts observed along Charlton Road at the Blakefield South Mine

Beltana Longwalls 1 to 10 had void widths of 275 m and were extracted from the Whybrow Seam at depths of cover ranging between 80 m and 115 m beneath Charlton Road. The crack widths observed along the road typically varied between 50 mm and 100 mm, with a maximum observed crack width around 380 mm. The heave and step heights observed along the road were typically in the order of 25 mm. Examples of the impacts observed along Charlton Road at the Beltana No. 1 Underground Mine are provided in Fig. 6.12.

Fig. 6.12 Impacts observed along Charlton Road at the Beltana No. 1 Underground Mine

The impacts on Broke and Charlton Roads were managed using visual monitoring and undertaking temporary repairs of the road pavement during active subsidence. The management strategies required some temporary lane closures and speed restrictions whilst repairs were being undertaken. The final remediation of the road pavement was undertaken after the completion of active subsidence.

It is anticipated that the crack widths along the current alignment of Edderton Road would be typically between 25 mm and 50 mm, with isolated cracks greater than 300 mm, due to the proposed mining. Stepping of the road pavement could also occur in the order of 25 mm to 50 mm, with isolated steps with heights greater than 100 mm. The potential impacts on Edderton Road could result in it becoming unsafe or unserviceable if preventive or remediation measures were not to be implemented.

The potential impacts on Edderton Road could be managed using visual monitoring and undertaking remediation of the road pavement during active subsidence. These strategies may require temporary lane closures to undertake the repairs and temporary speed restrictions along the section of the road that is impacted by mining.

Experience of mining beneath roads in the NSW coalfields indicates that the impacts on unbound pavements develop progressively, where the onset of impacts can be identified early by visual monitoring which, in most cases, allows for the remediation measures to be scheduled outside of peak traffic times. It is still possible that more rapidly developing impacts could occur, as a result of compressive buckling of the near surface bedrock, which may require temporary repairs to be undertaken during peak traffic times.

Alternatively, the potential impacts on Edderton Road could be avoided by realigning the road outside of the proposed mining area. Discussions on the potential realignment of the road are provided in the following section.

6.3.4. Predictions and impact assessments for the potential realignment of Edderton Road

An indicative location for the potential realignment of Edderton Road is shown in Fig. 6.13. The section of road located within the Study Area is proposed to be realigned to the west of the proposed mining area.

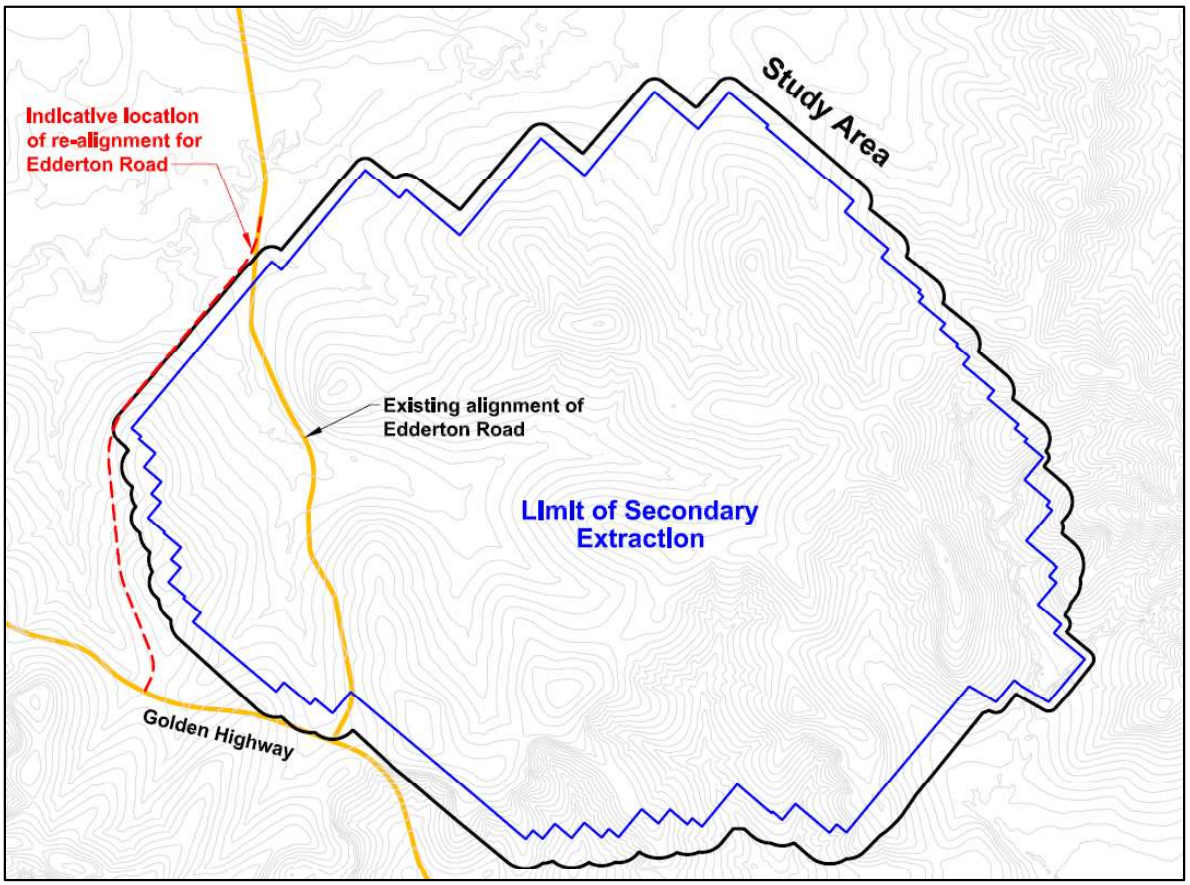

Fig. 6.13 Indicative location for the potential realignment of Edderton Road

The indicative road realignment is predicted to experience less than 20 mm vertical subsidence. Whilst the road realignment could experience very low levels of vertical subsidence, it is not expected to experience measurable tilts, curvatures or strains. It is unlikely, therefore, that the indicative realignment of Edderton Road would experience adverse impacts due to the proposed mining.

If the realignment option is not adopted, then the impacts along the existing alignment of the road could be managed during active subsidence, similarly to Broke and Charlton Roads at Blakefield South Mine, as outlined in Section 6.3.3.

6.3.5. Recommendations for Edderton Road

It is recommended that a BFMP be developed for Edderton Road in consultation with the Muswellbrook Shire Council.

In the case that Edderton Road is realigned, ground monitoring and visual inspections of the road realignment should be carried out during the extraction of WHLW4, AFLW1 and BFLW2, to confirm the predicted low levels of vertical subsidence.

Alternatively, if Edderton Road is maintained in its current alignment, the BFMP could include strategies similar to those used to maintain Broke and Charlton Roads in safe and serviceable conditions during active subsidence at the Blakefield South Mine.

Enclosure 2
Subsidence Case Study – Broke and Charlton Roads

The Blakefield South Mine (Blakefield South), part of the Bulga Coal Complex, is located approximately 5 km north of the township of Broke in the Upper Hunter Valley of NSW.

Bulga Coal Management (BCM) operated Blakefield South from approximately 2008 to 2018. Blakefield South involved longwall extraction from the Blakefield Seam beneath the existing Bulga South longwalls in the Whybrow Seam (i.e. multi-seam mining conditions).

Blakefield South Longwall Panels 1 to 4 were mined beneath the Broke and Charlton Roads. Both roads were managed *in situ* for the duration of longwall mining. During extraction, BCM measured mine subsidence ground movements along various survey monitoring lines, including along Broke and Charlton Roads (refer Drawing MSEC702-01 reproduced as Figure 1).

End-of-panel monitoring undertaken for Blakefield South Longwall Panels 1 to 4 demonstrated that actual mine subsidence ground movements were typically less than the maximum predicted to occur in the relevant pre-mining subsidence assessment (Table 1). This highlights the conservatism inherent in the approach to subsidence assessment used in NSW.

The Blakefield South Public Roads Safety Subsidence Management Plan (SMP) was developed to manage the impacts along Broke and Charlton Roads, so that they were maintained in safe and serviceable conditions at all times. The strategies implemented by BMC included:

- regular updates to the public of the longwall face position;
- traffic control and speed restrictions;
- 24/7 visual monitoring in the area of active subsidence;
- road maintenance equipment on standby to repair impacts during active subsidence before any adverse impacts on road safety, and
- final repair by the MSB (Mine Subsidence Board) of the section of road after active subsidence.

A comparison of the key subsidence parameters for the proposed Maxwell Underground longwall panels beneath Edderton Road (Woodlands Hill Seam only) and the Blakefield South longwall panels beneath the Broke and Charlton Roads is provided in Table 2. Consistent with the findings in MSEC (2019), Table 2 indicates that the subsidence predicted for Edderton Road due to the Project is similar to and typically less than the maximum subsidence observed at Broke and Charlton Roads due to mining at Blakefield South. Accordingly, MSEC (2019) concluded:

> *The impacts observed along Broke and Charlton Road should, therefore, provide a reasonable guide to the potential impacts that could along Edderton Road, due to the proposed mining, if the road were not to be realigned.*
>
> *…*
>
> *The potential impacts on Edderton Road could be managed using visual monitoring and undertaking remediation of the road pavement during active subsidence. These strategies may require temporary lane closures to undertake the repairs and temporary speed restrictions along the section of the road that is impacted by mining.*

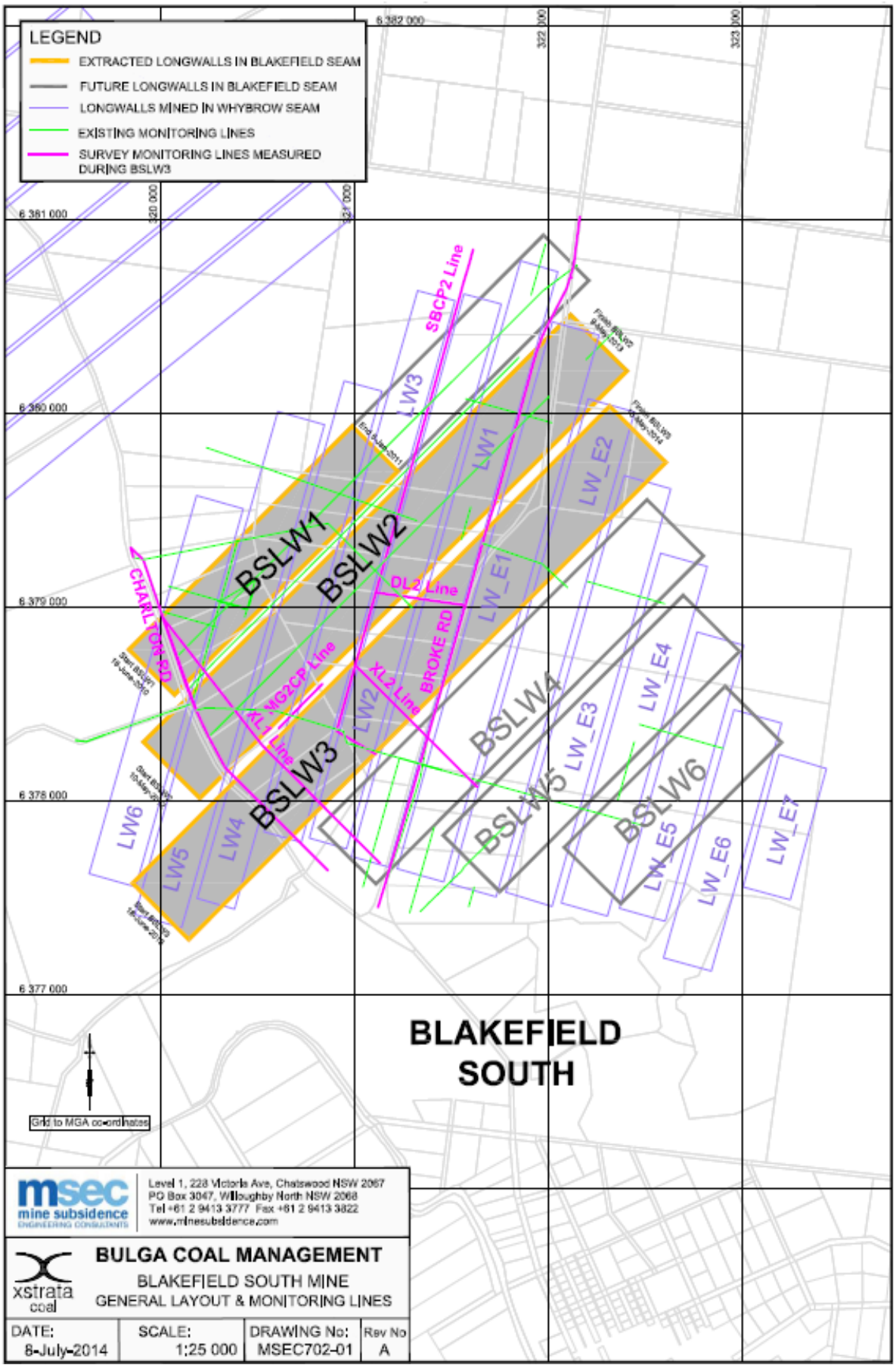

Figure 1 – Subsidence Monitoring at Blakefield South (End of Panel 3) (MSEC, 2014)

Table 1

Comparison of Observed and Predicted Subsidence at Blakefield South

Blakefield South Longwall	Type	Maximum Total Vertical Subsidence (mm)	Maximum Total Tilt (mm/m)	Maximum Total Tensile Strain (mm/m)	Maximum Total Compressive Strain (mm/m)
Broke Road					
Longwall 2	Observed	1,895	37	12	37
	Predicted	3,175	60	25	40
Longwall 3	Observed	2,025	28	7	35
	Predicted	3,050	55	20	20
Longwall 4	Observed	2,229	23	12	8
	Predicted	3,250	60	20	20
Charlton Road					
Longwall 1	Observed	2,453	48	13	13
	Predicted	2,800	100	55	50
Longwall 2	Observed	2,701	72	22	16
	Predicted	3,125	100	55	65
Longwall 3	Observed	2,794	89	13	16
	Predicted	3,150	95	55	65

Source: MSEC (2013), MSEC (2014) and MSEC (2015).

Table 2

Summary of Subsidence Parameters

Road	Maximum Total Vertical Subsidence (mm)	Maximum Total Tilt (mm/m)	Maximum Total Tensile Strain (mm/m)	Maximum Total Compressive Strain (mm/m)
Maxwell Underground – Woodlands Hill Seam Only (Predicted Subsidence Parameters)				
Edderton Road	2,300	35	14	9
Bulga Mine – Blakefield South and Beltana No. 1 Multi-seam Mining (Observed Subsidence Parameters)				
Broke Road	2,229	37	12	37
Charlton Road	2,794	89	22	16

Source: MSEC (2013), MSEC (2014), MSEC (2015) and MSEC (2019).

References

MSEC (2013) *Bulga Coal Continued Underground Operations: Blakefield South Longwalls 1 and 2 – Comparison between the Observed and Predicted Mine Subsidence Movements for the Monitoring Lines due to the Mining of Blakefield South Longwalls 1 and 2*. Accessed from: https://www.bulgacoal.com.au/en/publications/monitoring-results/SubsidenceMonitoringReports/Blakefield-South-Longwalls-1-and-2-Comparison-between-Observed-and-Predicted-Mine-Subsidence-Movements.pdf

MSEC (2014) *Bulga Coal Continued Underground Operations: Blakefield South – BSLW3 End of Panel Subsidence Monitoring Review Report for Blakefield South Longwall 3.* Accessed from: https://www.bulgacoal.com.au/en/publications/monitoring-results/SubsidenceMonitoringReports/Blakefield-South-Longwall-3-End-of-Panel-Report.pdf

MSEC (2015) *Bulga Coal Continued Underground Operations: Blakefield South – BSLW4 End of Panel Subsidence Monitoring Review Report for Blakefield South Longwall 4.* Accessed from: https://www.bulgacoal.com.au/en/publications/monitoring-results/SubsidenceMonitoringReports/Blakefield-South-Longwall-4-End-of-Panel-Report.pdf

Enclosure 3
Indicative Subsidence Monitoring, Management and Remediation Measures for Edderton Road

Timing	Action
Prior to Mining under Edderton Road ("Road")	
Prior to commencement of each longwall panel	Notify the Muswellbrook Shire Council (Council), Transport for NSW (TfNSW) and key users of the Road (including the Coolmore and Godolphin Woodlands thoroughbred studs) of the expected timings for subsidence interactions with the Road.
	Establish subsidence monitoring (survey marks and monitoring lines) to allow collection of data on subsidence movements as they occur.
Prior to longwall mining within 500 m of the Road	Approval of Built Features Management Plan for the Road by the Planning Secretary. This plan will: (a) be prepared in consultation with Council, TfNSW and key users of the Road (including the Coolmore and Godolphin Woodlands thoroughbred studs); (b) be prepared by a suitably qualified and experienced person/s whose appointment has been endorsed by the Planning Secretary; (c) provide predictions of the potential subsidence effects, subsidence impacts and environmental consequences, incorporating any relevant recent information (e.g. subsidence monitoring results will be available for a substantial proportion of the first panel prior to mining under the Road); (d) include a 24-hour surveillance and monitoring program to identify and repair damage as soon as practicable; (e) describe measures to be implemented to: (i) notify key Road users of the commencement of longwall mining in the vicinity of the Road; and (ii) minimise potential disruption to Road users; (f) describe in detail the performance indicators to be implemented to ensure compliance with the performance measures (e.g. always safe and serviceable); and (g) include commitments to fully repair any damage at Malabar's cost.
4 weeks prior to longwall mining underneath the Road	Notify Council that the longwall is approaching the Road reserve.
	Publish notices in local newspapers and on the Malabar website that a subsidence event is pending.
	Notify Emergency Services and key users of Edderton Road (including the Coolmore and Godolphin Woodlands thoroughbred studs) of expected timing.
	Advise Council on the progress of mining in relation to the Road through a weekly report.
	Review the Road risk assessment.
	Finalise the Traffic Control Plan in conjunction with Council.
	Establish Road signage and traffic management protocols in accordance with the Traffic Control Plan to provide notification to Road users that a subsidence event is pending.
	Conduct pre-mining inspection of the Road and associated infrastructure within the Road reserve (e.g. drainage culverts, fences) and prepare a condition log (including noting existing defects).
	Arrange Section 138 Road Occupancy Licence.
	Engage a suitable contractor to undertake monitoring and repairs to the Road.
	Distribute final plans and drawings to Council, civil consultant, and contractor with the forecast progression of longwall face position and location of road chainage markers.
	Establish a site compound including all weather access and areas to accommodate facilities, materials and plant.
1 week prior to longwall mining underneath the Road	Mobilise earthmoving equipment and materials to site, ready to respond, in sufficient quantities as per approved Built Features Management Plan.
	Locate lighting plants so that they do not affect traffic or surrounding receivers.
At least 2 days prior to longwall mining underneath the Road	Establish chainage markers at 25 m intervals.
	Commence 24-hour surface monitoring of the Road. *(This will continue until movement on the Road is deemed to be negligible, usually when the longwall is approximately 300 m beyond the Road.)*

Timing	Action
During Longwall Mining under the Road	
Continuous while longwall face is travelling under Road	Hourly monitoring of Road surface for cracks. Log any impacts utilising forms presented in the Built Features Management Plan.
	Monitor condition of culverts, signs, delineators and fences.
	Complete a report log at the end of each shift (signed by shift supervisor).
	Formal handover between shift supervisors to provide continuity between shifts.
	Review of daily shift reports by Malabar and the civil consultant.
As required	On identification of cracks, immediately carry out repairs in accordance with the approved design in the Built Features Management Plan.
	Repair culverts, signs, delineators and fences.
	Notify Council, key road users, civil consultant and the Resources Regulator – Principal Subsidence Engineer of any repairs.
Weekly during mining	Email updates to Council, including summary of report logs.
Post-mining	
Mining has moved 300 m beyond the Road	If no active cracking, demobilise the contractor.
Up to 6 months after mining	Minimum of weekly inspections.
No further deformation	Assess and, where required, complete permanent repairs.
Complaints	
Always	Include complaints hotline numbers on signage and notifications.
As required	Carry out any actions or works required to address or rectify complaint as soon as practicable.
	Prepare formal response and log.
	Inform Council to the nature of the complaint and the action/works implemented.