

Our Ref: 4004_R31_Final_Consideration of MSC Mine Affected Road Network Plan for MCCO Project

27 July 2020

Matthew Sprott
Director
Resource Assessments
Department of Planning, Industry and Environment
E | matthew.sprott@planning.nsw.gov.au

Dear Matthew

Re: Mangoola Coal Continued Operations Project (SSD 8642) - Consideration of Muswellbrook Shire Council Mine Affected Road Network Plan for the MCCO Project as Road Authority for the Closure Wybong Post Office Road

1. Introduction

Mangoola Coal Operations Pty Limited (Mangoola) is seeking approval (SSD 8642) to extract further coal resources to the north of the existing Mangoola Coal Mine and Wybong Road by continuing the existing mine into this new mining area. The Mangoola Coal Continued Operations (MCCO) Project would provide access to approximately 52 Million tonnes (Mt) of additional coal resources which represents approximately eight years of mining in the additional resource.

As outlined in the MCCO Project Environmental Impact Statement (EIS), the Project includes the proposed closure and realignment of a portion of Wybong Post Office Road, to enable operations in the new mining area to proceed. The EIS was placed on public exhibition in July and August 2019 with a Response to Submissions (RTS) subsequently prepared to address the issues raised in agency, community and interest group submissions. In their submission to the MCCO Project EIS Muswellbrook Shire Council (MSC) stated *'...Council's current policy is that it will not approve any closures to public roads and or changes to the Shire's road network until the 'Mine Affected Roads Network Plan (2015)' has been reviewed and updated.'* MSC reiterated this statement in their later submission on the MCCO Project RTS.

MSC has completed a review and update of the 2015 Mine Affected Road Strategy (MARS) and has prepared the Mine Affected Road Network Plan Review (MARNP) (Bitzios Consulting & Northrop 2020). MSC placed the MARNP on public exhibition from 18 April 2020 to 15 May 2020 before it was finalised and adopted by MSC on 26 May 2020.

Mangoola has continued to consult with MSC as the Road Authority for Wybong Post Office Road and in regard to the MARNP. Mangoola has indicated to MSC that it is amenable to further consideration of the recommendations of the MARNP, to the extent of the interactions with the MCCO Project, as outlined in this correspondence.

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In this regard, and as recommended by the MARNP, instead of realigning the portion of Wybong Post Office Road as proposed in the MCCO Project EIS, Mangoola has indicated to MSC that it is willing to apply to close the affected section of Wybong Post Office Road permanently and contribute the equivalent funds, that would otherwise have been spent on the realignment, to MSC to assist with the realisation of the MARNP. Mangoola has also indicated to MSC that any agreement regarding directing funds towards the realisation of the MARNP would be contingent on MSC, as the relevant roads authority, closing the affected section of Wybong Post Office Road necessary to enable the MCCO Project to proceed and provide for the continuity of the mining operations. Should the MARNP not be realised or the recommendations not perused by MSC, Mangoola propose to construct the Wybong Post Office Road realignment as currently presented and assessed in the MCCO Project EIS.

Given MSC's position in regard to future road closure applications and in response to the development of the MARNP, Mangoola is seeking approval for both of these options, consisting of either:

- **Option 1** - Closure of the affected section of Wybong Post Office Road and the construction of the Wybong Post Office Road Realignment as proposed in the MCCO Project EIS; or
- **Option 2** - Closure of the affected section of Wybong Post Office Road and Mangoola to make a contribution towards the realisation of the MARNP.

The purpose of this letter is to outline how Mangoola has considered the relevant recommendations of the MARNP in relation to the MCCO Project and to provide a review of the predicted changes to impacts assessed in the MCCO Project EIS if the affected section of Wybong Post Office Road is closed and not realigned.

2. MSC's Mine Affected Road Network Plan Implications for Wybong Post Office Road

Mangoola has been in discussions with MSC regarding the recommendations in the MARNP. Through these discussions it is understood that MSC's position is to pursue the recommendations of the MARNP. Relevant to Mangoola, this would result in the recommended closure of Wybong Post Office Road and an upgrade to part of Yarraman Road. The MARNP as adopted by MSC is available on the MSC Website. The local road network and the alternate travel routes discussed in this letter and the MARNP is provided on **Figure 1**.

The MCCO Project is not predicted to directly impact Yarraman Road or substantially change existing local traffic conditions along Yarraman Road. No material change is predicted should Option 2 be implemented. Option 2 would result in the small number of vehicles currently using Wybong Post Office Road (i.e. during peak period up to six (bi-directional) vehicles per hour) instead using:

- the existing Yarraman Road and Wybong Road, or
- the existing Yarraman Road and Ridglands Road when travelling east (return) towards Muswellbrook.

An assessment of this change in traffic arrangements is provided in **Attachment 1**, concluding that *even when considering conservative growth rates for traffic volumes the closure of Wybong Post Office Road is expected to have a negligible impact on the existing road network, including the operation of Yarraman Road and Ridglands Road and their intersections with Wybong Road.*

Any works required to realise the MARNP proposed by MSC, as the local Road Authority, do not form part of Mangoola's development application or the MCCO Project. Due to the existing capacity of Yarraman and Ridgeland Roads and the very small traffic numbers associated with this change, any upgrade works to these roads, as part of the MARNP, are not required for the MCCO Project. The MCCO Project EIS fully assessed the potential impacts associated with Option 1. It did not, however, pre-empt Option 2 to close Wybong Post Office Road rather than relocate it as now preferred by MSC. As noted earlier, MSC has undertaken public consultation associated with the preparation of the MARNP as part of reaching its preferred position, to close the road.

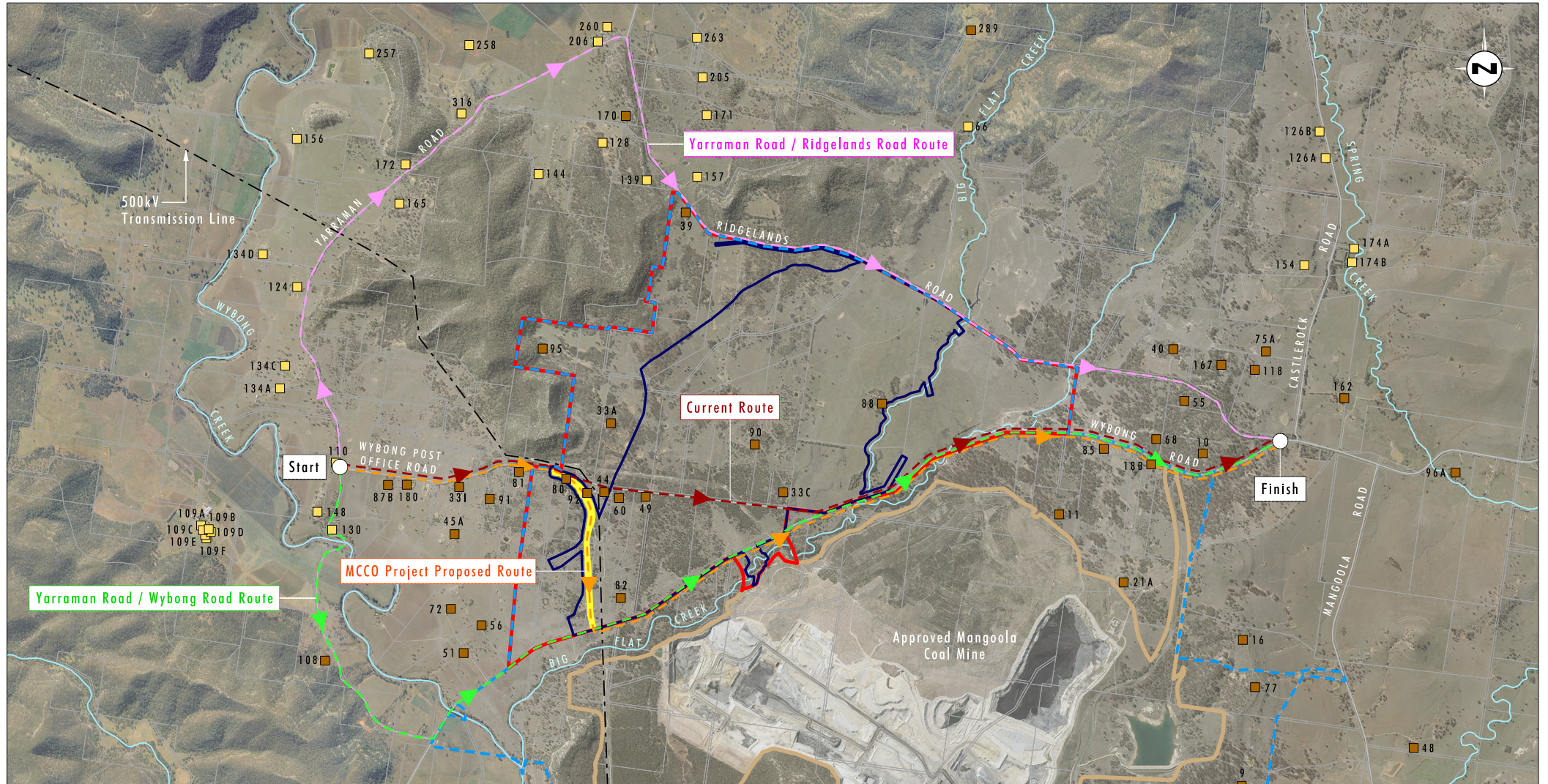


Image Source: Glencore (April 2018)
Data Source: Glencore (2019)

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Legend

- | | | |
|--|--|---|
| --- MCCO Project Area | --- Current Route - 8.9km | ■ Private Residence |
| --- Approved Mangoola Coal Mine Disturbance Area | --- MCCO Project Proposed Route - 10.5km | ■ Mangoola Owned Residence |
| --- MCCO Additional Project Area | --- Yarraman Road / Wybong Road Route - 11.9km | |
| --- MCCO Additional Disturbance Area | --- Yarraman Road / Ridgelands Road Route - 13.2km | |
| --- Wybong Post Office Road Realignment | | |

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FIGURE 1

Comparison of Alternate Travel Routes

3. Assessment Changes for MCCO Project

The MCCO Project EIS included the assessment of the proposed realignment of a section of Wybong Post Office Road. The realignment was planned to occur during the construction phase of the MCCO Project and was timed to ensure continuity of the existing mining operation and its resources (staffing and equipment), and this was fully assessed in the EIS.

As discussed in **Section 2**, the MARNP instead proposes to close Wybong Post Office Road. This section provides a review of the predicted changes to impacts assessed in the MCCO Project EIS if the affected section of Wybong Post Office Road is closed and not realigned. A summary of the predicted changes to the impacts that were assessed in the MCCO Project EIS is provided in **Table 1**.

Table 1 Assessment of Change to Impacts in the MCCO Project EIS if the Wybong Post Office Road Realignment is Not Constructed

Aspect	Impacts as Described in the MCCO Project EIS for Wybong Post Office Road Realignment	Changes to Assessed Impacts if Wybong Post Office Road Realignment is Not Constructed
Disturbance	Approximately 20 ha of land would be disturbed for the construction of the Wybong Post Office Road realignment including a construction corridor and laydown area. The total disturbance area for the MCCO Additional Disturbance Area is 623 ha.	Reduction in Disturbance Area. There would be no disturbance of land associated with the Wybong Post Office Road realignment. Approximately 20 ha of land would no longer be disturbed and the overall MCCO Additional Disturbance Area would be reduced. The total disturbance area for the revised MCCO Additional Disturbance Area would be 603 ha.
	Post mining - Approximately 7 ha of land would remain as permanent road infrastructure following completion of the Wybong Post Office Road realignment.	There would be no disturbance of land associated with the Wybong Post Office Road realignment.
Transport	The travel distance for the proposed realignment would be approximately 1.6 km longer when travelling towards Muswellbrook.	No significant impact on road network capacity. An assessment of the closure of Wybong Post Office Road on local traffic arrangements is provided in Attachment 1 . It concludes that <i>even when considering conservative growth rates for traffic volumes the closure of Wybong Post Office Road is expected to have a negligible impact on the existing road network, including the operation of Yarraman Road and Ridglands Road and their intersections with Wybong Road.</i> Increase in travel distances and time. Wybong Post Office Road would become a no through road and alternative transport routes using varying lengths of either Yarraman Road, Ridglands Road or Wybong Road would be required. This would lead to an increase in travel distances for some road users. This increase for some road users was acknowledged in MSC's MARNP. Based on the location of existing residences along Yarraman Road, and in consideration of distance travelled, it is anticipated that six private residences

Aspect	Impacts as Described in the MCCO Project EIS for Wybong Post Office Road Realignment	Changes to Assessed Impacts if Wybong Post Office Road Realignment is Not Constructed
		<p>(inclusive) between Residence ID 134D in the north and 130 in the south would no longer utilise Wybong Post Office Road as they may currently do when heading east to Muswellbrook and instead travel north connecting to Ridglands Road or utilise the southern length of Yarraman Road resulting in an increased travel distance of up to approximately 3km.</p>
	<p>The change in travel time associated with the increased length of Wybong Post Office Road is approximately 55 seconds at the signposted (100 km/h) speed limit. It was noted that travel time heading west along Wybong Road towards Sandy Hollow is decreased.</p>	<p>The Wybong Post Office Road would become a no through road and alternative transport routes via varying lengths of either Yarraman Road, Ridglands Road or Wybong Road would be required, causing an increase in travel time for road users that currently use Wybong Post Office Road. It is noted that the residences currently on Wybong Post Office Road are mine owned.</p> <p>This increase for some road users was acknowledged in the MARNP.</p>
	<p>The proposed realigned portion provides an opportunity to improve the road condition and safety for road users.</p>	<p>The remaining portion of Wybong Post Office Road would become a no through road and the portion of road directly affected by the MCCO Project would be permanently closed. Use of the remaining portion of Wybong Post Office Road would be mainly limited to remaining residents residing along this road (all residences are owned by Mangoola) and for access to the Wybong Community Hall.</p>
Traffic	<p>Traffic counts only recorded up to six (bi-directional) vehicles in an hour for the Wybong Post Office Road. It is noted, that with the exception of Wybong Hall, all residences along Wybong Post Office Road are owned by Mangoola and approximately six of these residences would be required to be vacated due to the MCCO Project, further reducing the traffic levels on this road, post construction.</p>	<p>No significant impact to surrounding road network.</p> <p>The Wybong Post Office Road would become a no through road and the road users would be limited primarily to local residences, further reducing traffic levels on this road. Due to the existing low traffic counts for the Wybong Post Office Road, the diversion of traffic from using Wybong Post Office Road to alternative routes is not predicted to impact the surrounding local road network (refer to Attachment 1). It concludes that <i>even when considering conservative growth rates for traffic volumes the closure of Wybong Post Office Road is expected to have a negligible impact on the existing road network, including the operation of Yarraman Road and Ridglands Road and their intersections with Wybong Road.</i></p> <p>The issue of impacts on the road network was considered by MSC in preparing and adopting the MARNP with the closure of Wybong Post Office Road identified as the recommended outcome.</p>
	<p>The crash data indicates that there have been two crashes recorded in proximity to the Wybong Road/Wybong Post Office Road intersection in the last five years.</p>	<p>No Change</p> <p>The Wybong Post Office Road would become a no through road.</p>

Aspect	Impacts as Described in the MCCO Project EIS for Wybong Post Office Road Realignment	Changes to Assessed Impacts if Wybong Post Office Road Realignment is Not Constructed
	<p>It is proposed that the existing intersection Wybong Road/Wybong Post Office Road would be used for access to the MCCO Additional Project Area for construction and other ongoing operational needs such as emergency services, environmental monitoring and property management.</p>	
Biodiversity	<p>Approximately 20 ha of land would be disturbed for the construction of the Wybong Post Office Road realignment resulting in impacts to the following biodiversity values:</p> <ul style="list-style-type: none"> - 5.6 ha (295.25 ha Project total) of HU817/PCT1603 Narrow-leaved Ironbark - Bull Oak - Grey Box shrub - grass open forest of the central and lower Hunter - Moderate to Good - 12.2 ha (197.49 ha Project total) of HU817/PCT1603 Moderate to Good - Derived Native Grassland - 78 individuals (1,326 Project total) of <i>Diuris tricolor</i> (871 biodiversity credits) - 67 individuals (691 Project total) of <i>Prasophyllum petilum</i> (1014 biodiversity credits) – - 2.1 ha (2.1 ha Project total) of habitat for large-eared pied bat 	<p>Reduced impacts to biodiversity.</p> <p>There would be no disturbance of land associated with the Wybong Post Office Road realignment. Approximately 20 ha of land would no longer be disturbed and there would be no impacts on biodiversity values within this area. This would reduce the MCCO Projects offsetting requirements.</p> <p>For the large-eared pied bat it removes the requirements for offset under the MCCO Project as all areas of impact to habitat are now removed.</p> <p>For other species noted it would reduce the impacts to them and subsequently reduce the biodiversity offset credits required.</p>
Aboriginal Archaeology	<p>No sites were identified within the disturbance area associated with the Wybong Post Office Road realignment</p>	<p>No change.</p>
Economics	<p>Over a year the realignment would increase travel times for all road users (conservatively assuming they all travel to/from Muswellbrook) by a total of 190 hours, at a cost of \$38.20 per hour, and generate an annual total cost of travel time of \$7,238.</p> <p>The realignment is expected to be completed in 2022 and would be operational for the life of the MCCO Project and beyond. For the purposes of the economic</p>	<p>No significant change to MCCO Project EIA outcomes.</p> <p>The Wybong Post Office Road would become a no through road and alternative transport routes either using Yarraman Road or Ridgeland Road would be required. The annual total cost of travel time for road users who previously used the Wybong Post Office Road would increase slightly when travelling to/from Muswellbrook. This difference would not be material to what has been assessed in the MCCO Project EIS.</p>

Aspect	Impacts as Described in the MCCO Project EIS for Wybong Post Office Road Realignment	Changes to Assessed Impacts if Wybong Post Office Road Realignment is Not Constructed
	assessment we have estimated the delay from 2022 to 2050. Over this period of 28 years, it is expected that the MCCO Project would generate \$0.067 million of travel time costs.	
Social	Landholders held further concerns in relation to the design of realigned portion of Wybong Post Office Road, suggesting that they would prefer to keep these routes as straight as possible and limit bends/curves in the road.	<p>Increase in travel distances and time.</p> <p>The Wybong Post Office Road would become a no through road and the small number of road users who currently use it would use either Yarraman Road or Ridglands Road.</p> <p>The option to close Wybong Post Office Road is proposed as the preferred option in the MARNP and this has been publicly exhibited and adopted by MSC. No further social assessment is proposed or required by the MCCO Project as this option, should it be required, would be the decision of the roads authority (MSC).</p>
Surface Water	As part of the water management system, two upslope clean water diversions would be required to be constructed within the MCCO Additional Project Area. The proposed south-western diversion would include a culvert crossing under the realigned portion of Wybong Post Office Road with discharge to an existing natural drainage line.	<p>No change.</p> <p>The culvert crossing under the Wybong Post Office Road realignment would no longer be required for the south-western clean water diversion. Otherwise the drain would still be constructed as planned.</p>
Blasting	The proposed realigned portion of Wybong Post Office Road would be located approximately 95 - 145 m from the edge of the Proposed Additional Mining Area. The modelling shows that the ground vibration impact can be managed effectively to a level below the applicable vibration limit criterion of 100 mm/s via the application of lower charge masses, i.e. up to 362 kg for 95 m distance and up to 659 kg for 145 m.	<p>Reduction in blast management requirements.</p> <p>The blast management measures proposed in the MCCO Project EIS to maintain applicable vibration limit criterion for the realigned portion of Wybong Post Office Road would no longer be required.</p>
Air Quality	Air quality impacts from the Wybong Post Office Road realignment would largely result from dust generated during earthworks and other engineering activities associated with construction works.	<p>Reduction in construction air quality impacts.</p> <p>There would be a reduction in localised air quality impacts during the construction phase due to the Wybong Post Office Road realignment not being constructed.</p>

Aspect	Impacts as Described in the MCCO Project EIS for Wybong Post Office Road Realignment	Changes to Assessed Impacts if Wybong Post Office Road Realignment is Not Constructed
Noise	The primary noise generating activities associated with realignment of the Wybong Post Office Road are associated with construction works. All receptors where construction noise predictions exceed PNTL are entitled to voluntary mitigation or acquisition rights due to predicted operational noise impacts.	Reduction in construction noise impacts. Duration of construction would reduce and there would be a reduction in construction noise sources. There would be a reduction in localised construction noise impacts due to the Wybong Post Office Road realignment not being constructed.
Visual Amenity	The MCCO Additional Project Area would be visible to road users on the realigned portion of the Wybong Post Office Road.	Reduced visibility impact from public roads. The Wybong Post Office Road would become a no through road and the portion of road directly impacted by the MCCO Project would be permanently closed. As it would not be constructed, there would be no visual impacts to road users associated with the realigned portion of the Wybong Post Office Road.
Waste	Construction activities associated with the realignment of the Wybong Post Office Road are likely to generate inert waste such as concrete, steel and electrical cabling.	Reduction in construction waste volumes. Reduction in total inert wastes during the construction phase due to the Wybong Post Office Road not being constructed.
Greenhouse Gas Emissions	The construction of the MCCO Project is forecast to be associated with approximately 6,400 t CO ₂ -e Scope 3 greenhouse gas (GHG) emissions. Scope 3 emissions would be generated by third parties combusting energy and generating industrial emissions in the process of producing and transporting construction materials. Scope 3 emissions would also be generated by contractors consuming energy during the construction process.	Reduction in construction related GHG emissions. There would be reduced Scope 3 emissions during construction of the MCCO Project due to the Wybong Post Office Road realignment not being constructed however, this is considered negligible in regard to the wider Scope 3 emissions associated with the MCCO Project construction phase.
Final Land Use/Landform	The realigned Wybong Post Office Road to remain as part of the landform.	No change to the existing landform in the proposed realignment corridor. As no realignment would occur, the area of land that would have been occupied by the realigned road is available for other post mining land uses. Access to houses along Wybong Post Office Road post mining would be via Yarraman Road and the remaining portion of Wybong Post Office Road resulting in a longer travel distance to Muswellbrook from these houses.

4. Summary and Conclusion

MSC has prepared and adopted the MARNP. MSC has indicated that those recommendations in the MARNP will form the basis of their assessment of future road closure applications for which they are the relevant roads authority.

The MCCO Project proposed completing the realignment of a portion of Wybong Post Office Road as identified in the MCCO Project EIS. The MARNP has recommended to close Wybong Post Office Road and to reallocate the funds that Mangoola would have spent on the realignment to contribute to the realisation of the MARNP. As noted earlier in this letter, Mangoola has indicated to MSC that it is amenable to this position and is willing to apply to close the affected section of Wybong Post Office Road permanently and contribute the equivalent funds, that would otherwise have been spent on the realignment, to MSC to assist with the realisation of the MARNP.

Section 3 provides an assessment of the changes to the impacts described in the MCCO Project EIS if the Wybong Post Office Road realignment is not constructed. It identifies there would be some increased travel distances and times for a small number of road users associated with using alternative routes due to the closure of Wybong Post Office Road to through traffic. However, in most cases closing the road would result in reduced environmental impacts when compared to the option of realigning it as assessed in the MCCO Project EIS including:

- reduced disturbance area (20ha)
- reduced impacts to biodiversity
- reduction in blast management requirements
- reduced construction related air quality impacts
- reduced construction related noise impacts
- reduced visual impacts from public roads.

Mangoola is seeking approval for two options consisting of either:

- **Option 1** - Closure of the affected section of Wybong Post Office Road and the construction of the Wybong Post Office Road Realignment as proposed in the MCCO Project EIS; or
- **Option 2** - Closure of the affected section of Wybong Post Office Road and Mangoola to make a contribution towards the realisation of the MARNP.

This letter has outlined the potential changes that not proceeding with the realignment works (Option 2) would present to the MCCO Project. We trust this information meets with your requirements and provides sufficient information to progress the assessment of this matter. Please don't hesitate to contact Daniel Sullivan or myself on 1300 793 267 should you require clarification or further information.

Yours sincerely



John Merrell
Executive Manager Environment NSW & ACT

Attachment 1

GHD Traffic Assessment of the Closure of Wybong PO Road



Memorandum

23 July 2020

To	Umwelt (Australia) Pty Ltd		
Copy to	Daniel Sullivan		
From	Mark Lucas	Tel	+61 2 92397141
Subject	Assessment of the Closure of Wybong PO Road	Job no.	2219171

1 Introduction

In April 2019, GHD prepared the Mangoola Coal Continued Operation Project (MCCO Project) Traffic and Transport Impact Assessment (TTIA).

The MCCO Project will allow for the continuation of mining at the Mangoola Coal Mine into a new mining area to the immediate north of the existing operations to enable mining to continue to 2030. The analysis undertaken in the TTIA indicated that the intersections of interest ¹are expected to operate with a good level of service through to the 2022 horizon year accounting for the vehicle activity associated with the construction of the MCCO Project.

At the time of writing the TTIA, it was noted that a part of the MCCO Project would include realigning a portion of the existing Wybong Post Office Road (Wybong PO Road).

Muswellbrook Shire Council (MSC) has completed a review and update of the 2015 Mine Affected Road Strategy (MARS) and has prepared the Mine Affected Road Network Plan Review (MARNP) (Bitzios Consulting & Northrop 2020). Relevant to the MCCO Project one of the recommendations made in the MARNP as an alternative to the realignment of Wybong PO Road is to close Wybong PO Road and upgrade Yarraman Road (between Wybong PO Road and Wybong Road).

GHD have been commissioned by Umwelt to undertake a review of the traffic impacts associated with the closure of Wybong PO Road, on the operation of Yarraman Road, Ridgeland Road and the surrounding road network.

2 Subject Site

The key roads included in the analysis are displayed in Figure 1. It is noted that the entrance to the Mangoola Coal Mine is located on Wybong Road approximately 3.5 km to the east of the current intersection of Wybong Road and Wybong PO Road.

Wybong PO Road, Yarraman Road and Ridgeland Road have road reserves with a width of approximately 4.5 m and provide bi-directional traffic flows.

¹ Intersection analysis was undertaken using SIDRA software for the intersections of Golden Highway/Wybong Road, Denman Road/Bengalla Road, Denman Road/Thomas Mitchell Drive and Wybong Road/Mangoola Mine Access Road.



Memorandum

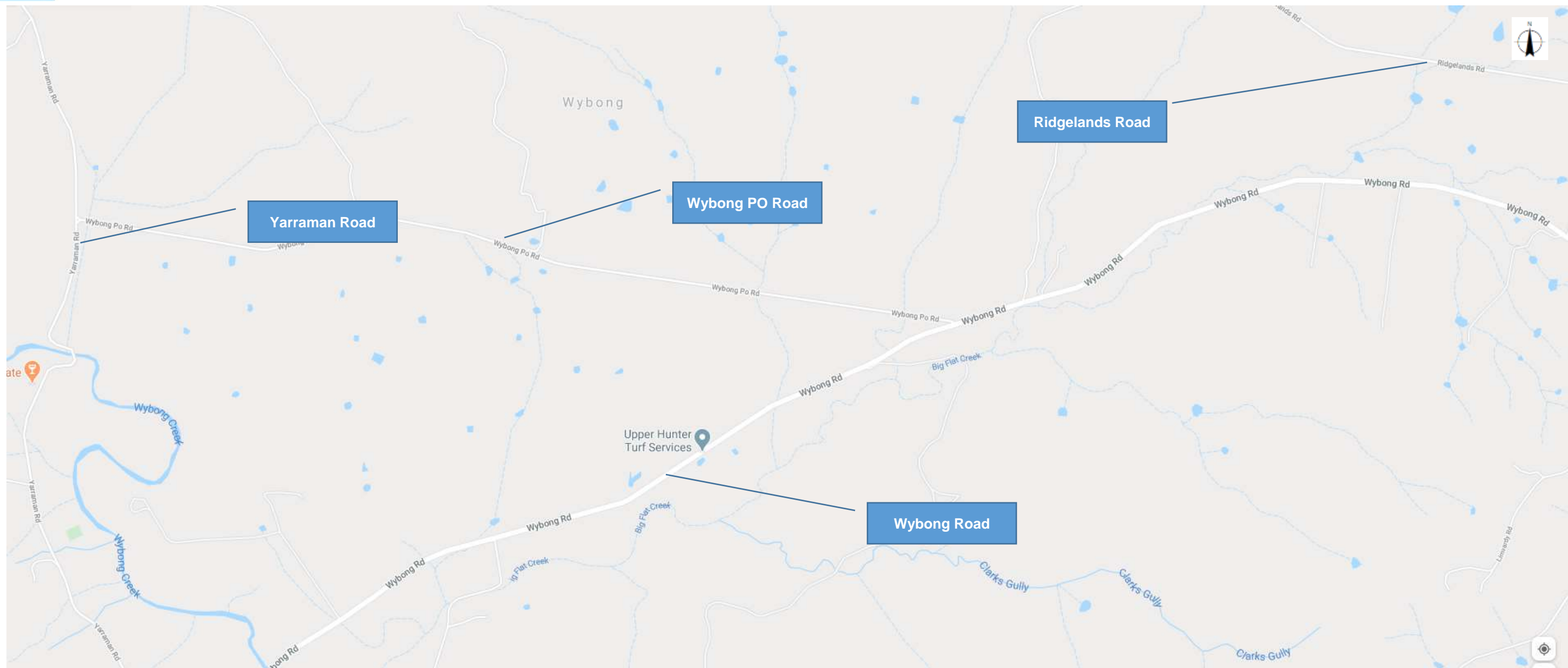


Figure 1 Key Roads



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3 Background Data

As part of GHD's previous work on the MCCO Project, classified week-long "tube" traffic counts were undertaken at the following locations:

- Wybong PO Road, 500 m to the east of Yarraman Road between 30 November 2017 and 6 December 2017.
- Yarraman Road, 300 m to the south of Wybong PO Road, between 31 January 2018 and 6 February 2018.
- Ridgeland Road, 300 m to the west of Wybong Road between 10 November 2017 and 16 November 2017.

The observed average weekday traffic volumes on Wybong PO Road are displayed in Figure 2.

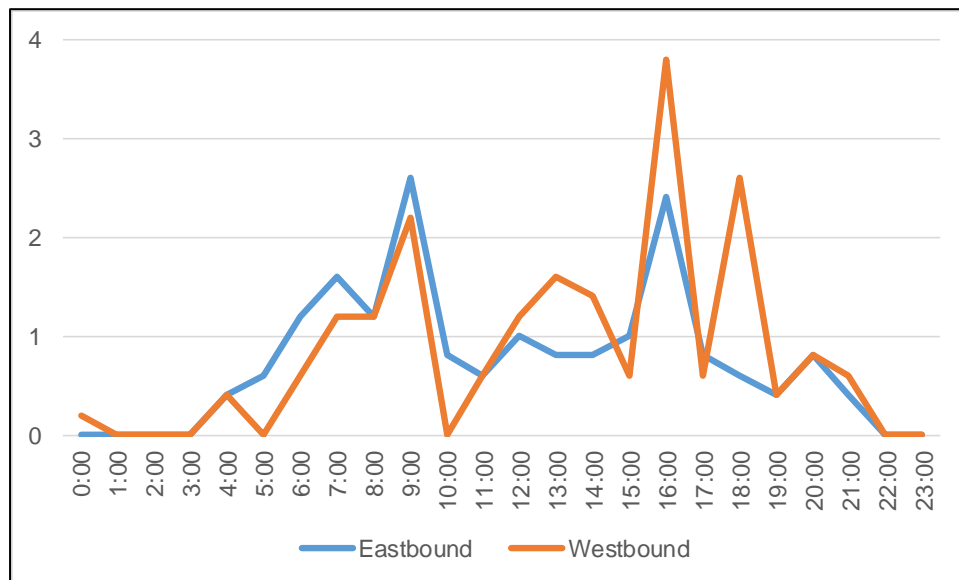


Figure 2 Wybong PO Road - Average Weekday Traffic Volumes (30/11/17 – 06/12/2017)

The data in Figure 2 indicates:

- The weekday traffic volumes on Wybong PO Road are low, with approximately 40 (bi-directional) vehicles per day.
- During peak periods, there was observed to be up to six (bi-directional) vehicles per hour on Wybong PO Road.

The observed average weekday traffic volumes on Yarraman Road are displayed in Figure 3.



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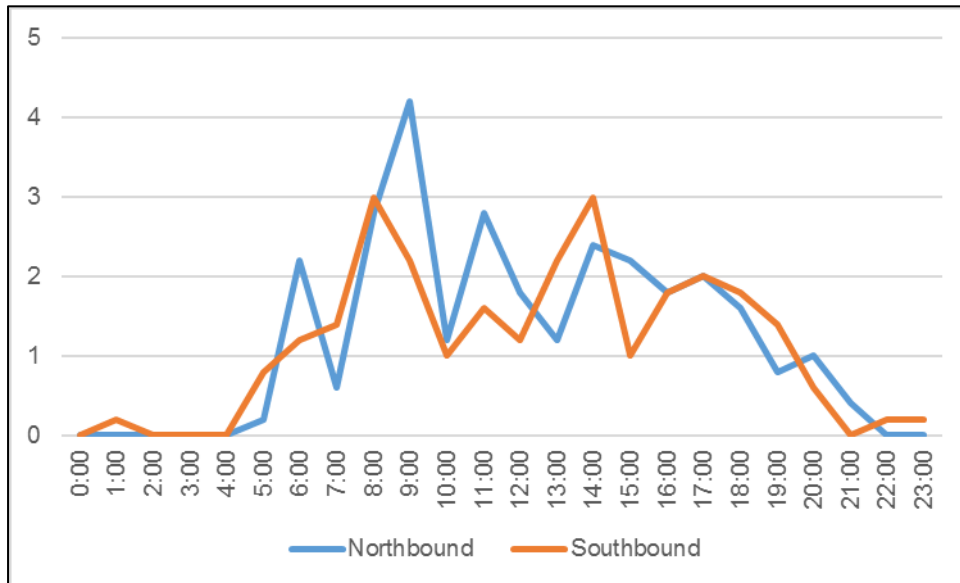


Figure 3 Yarraman Road - Average Weekday Traffic Volumes (31/01/18 – 06/02/2018)

The data in Figure 3 indicates:

- The weekday traffic volumes on Yarraman Road are low, with approximately 55 (bi-directional) vehicles per day.
- During peak periods, there was observed to be up to six (bi-directional) vehicles per hour on Yarraman Road.

The observed average weekday traffic volumes on Ridglands Road are displayed in Figure 4.



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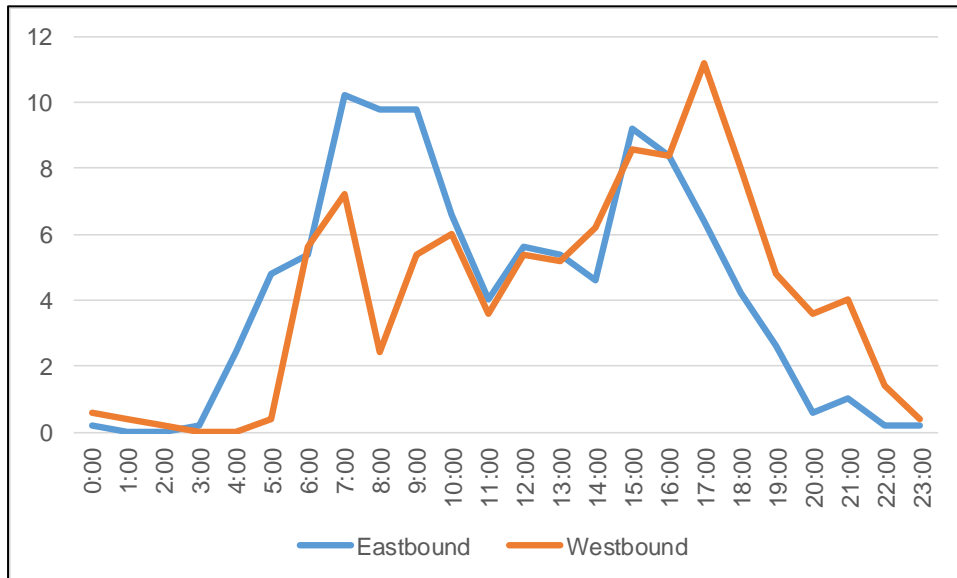


Figure 4 Ridgелands Road - Average Weekday Traffic Volumes (10/11/2017– 16/11/2017)

The data in Figure 4 indicates:

- The weekday traffic volumes on Ridgелands Road are relatively low, with approximately 200 (bi-directional) vehicles per day.
- During peak periods, there was observed to be up to 18 (bi-directional) vehicles per hour on Ridgелands Road.

4 Travel Time Analysis

Under the existing road network, vehicles travelling south on Yarraman Road seeking to head east would undertake a left turn onto Wybong PO Road and a left turn onto Wybong Road (see Figure 5).

Under the alternative arrangement, as recommended by the MARNP (assuming Wybong PO Road is closed), vehicles would continue south on Yarraman Road and turn left onto Wybong Road (see Figure 6).



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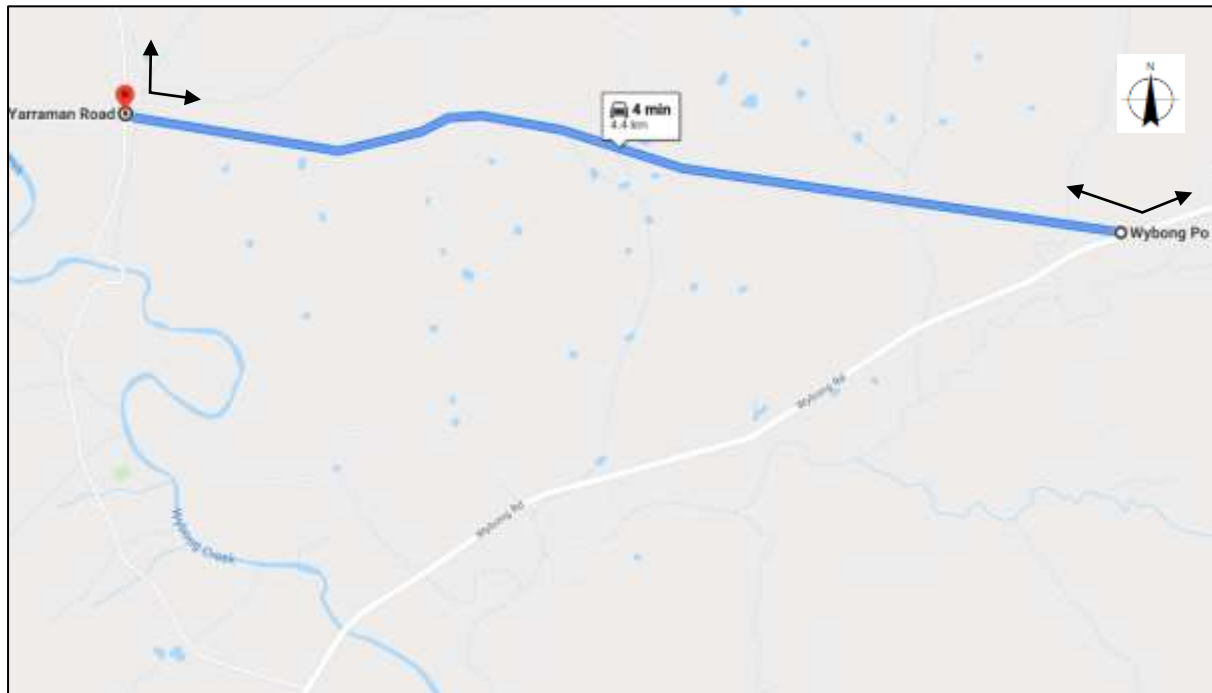


Figure 5 Current Arrangement via Wybong PO Road

Source Google maps, modified by GHD.

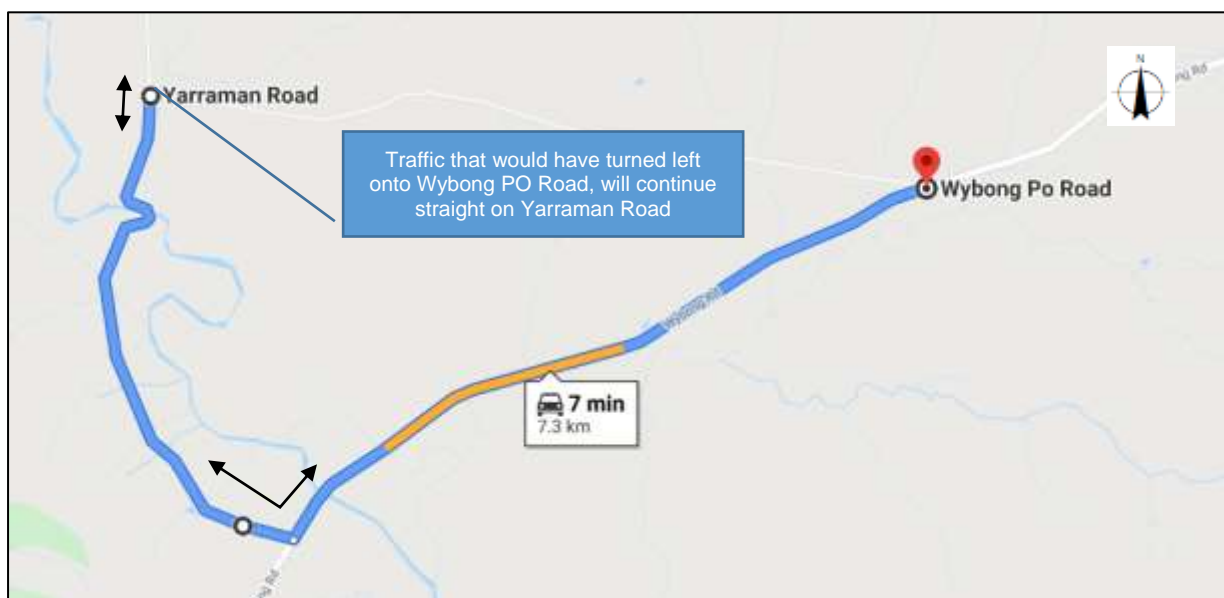


Figure 6 Alternative Arrangement via Yarraman Road

Source Google maps, modified by GHD.



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A review of the alternative arrangements, as shown in Figure 6 indicates that the closure of Wybong PO Road would increase the journey distance by approximately 3 km, and the journey time by approximately three minutes.

For a small number of existing residents that live on Yarraman Road to the north of Wybong PO Road, they may find it quicker to use Ridgeland Road when travelling east as opposed to coming down Yarraman and turning onto Wybong Road.

As part of the works in the TTIA, GHD was provided with the key residential locations of the Mangoola Coal Mine employees, as displayed in Table 1.

Table 1 Residential Location of Mine Employees

Residential Location	Proportion of Employees
Muswellbrook	47%
Singleton	14%
Denman	13%
Scone	13%
Merriwa	7%
Aberdeen	6%
Total	100%

The analysis for each of these locations indicates that employees are not expected to use Wybong PO Road, Yarraman Road or Ridgeland Road to access/egress the Mangoola Coal Mine.

Additionally, as displayed in Figure 3 and Figure 4, the volume of vehicles on Yarraman Road and Ridgeland Road are negligible. In this regard, the MCCO Project is not anticipated to have any impact on Yarraman Road or Ridgeland Road.

The closure of Wybong PO Road as recommended by the MARNP would result in a minor increase in travel time, for a small number of road users.

5 Traffic Impacts

5.1 Mid-block Assessment

The results of the tube counts indicate that:

- Wybong PO Road – experiences five bi-directional vehicles in the AM peak (8:00 am – 9:00 am) and six bi-directional vehicles in the PM peak (4:00 pm – 5:00 pm).
- Yarraman Road – experiences six bi-directional vehicles in the AM peak (8:00 am – 9:00 am) and four bi-directional vehicles in the PM peak (4:00 pm – 5:00 pm).



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- Ridgелands Road – experiences 17 bi-directional vehicles in the AM peak (7:00 am – 8:00 am) and 18 bi-directional vehicles in the PM peak (4:00 pm – 5:00 pm).

If Wybong PO Road is closed, it is most likely that current traffic volumes would be re-directed onto Yarraman Road, resulting in combined volumes of approximately 11 vehicles in the AM peak and ten vehicles in the PM peak.

However, as noted above some existing residents that live on Yarraman Road to the north of Wybong PO Road may find it quicker to use Ridgелands Road. In order to provide a robust analysis, as a separate scenario, it has been assumed that the traffic volumes on Wybong PO Road will be re-directed onto Ridgелands Road, resulting in combined volumes of 22 vehicles in the AM peak and 24 vehicles in the PM peak.

To account for a ten-year horizon, a three percent annual growth rate has been applied to the tube data to determine the expected 2030 horizon year traffic volumes on Yarraman Road and Ridgелands Road.

It is noted that in the analysis undertaken in the TTIA, an annual growth rate of 1.5 percent was applied to the surveyed traffic volumes to determine the horizon-year traffic volumes. This traffic growth rate is consistent with information included in the Muswellbrook Mine Affected Roads Stage 1 – Road Network Plan report (Cardno, 2015). Thus, a three percent annual growth rate for traffic volumes in this current assessment for Yarraman Road and Ridgелands Road is considered to be conservative.

In 2030 (accounting for the potential closure of Wybong PO Road) Yarraman Road is expected to accommodate:

- Approximately 16 bi-directional vehicles in the AM peak
- Approximately 17 bi-directional vehicles in the PM peak.

Under the scenario where the vehicles on Wybong PO Road are directed onto Ridgелands Road, in 2030 Ridgелands Road is expected to accommodate:

- Approximately 35 bi-directional vehicles in the AM peak
- Approximately 36 bi-directional vehicles in the PM peak.

The Roads and Maritime's Guide to Traffic Generating Developments specifies that rural roads with a speed limit of 100 km/h, a single travel lane in each direction, level terrain and 10 percent heavy vehicles have a mid-block capacity (to a Level of Service D) of 1,480 vehicles per hour (bi-directional traffic).

Yarraman Road and Ridgелands Road have relatively narrow road reserves, and a capacity of 1,480 vehicles per hour may not be achieved.

However, in accordance with the minor traffic volumes expected to traverse Yarraman Road and Ridgелands Road, it is expected they will operate significantly within its mid-block capacities.



Memorandum

5.2 Intersection Assessment

The closure of Wybong PO Road may result in additional vehicles traversing the intersection of Wybong Road/Yarraman Road and Wybong Road/Ridgelands Road.

Applying the three percent growth rate to the Wybong PO Road traffic volumes, in the 2030 horizon year, its closure would likely result in approximately ten additional vehicles (during AM and PM peak hours) at the intersection of Wybong Road/Yarraman Road and Wybong Road/Ridgelands Road.

At an average of one vehicle every six minutes, this would have a negligible impact on the peak hour operation of the intersections of Wybong Road/Yarraman Road and Wybong Road/Ridgelands Road.

6 Conclusion

In terms of travel time and traffic impact, even when considering conservative growth rates for traffic volumes the closure of Wybong PO Road is expected to have a negligible impact on the existing road network, including the operation of Yarraman Road and Ridgelands Road and their intersections with Wybong Road.