MALABAR COAL

MAXWELL PROJECT

SUBMISSIONS REPORT

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1 INTRODUCTION

The Maxwell Project (the Project) is in the Upper Hunter Valley of New South Wales (NSW), east-southeast of Denman and south-southwest of Muswellbrook (Figure 1), within the Muswellbrook Local Government Area (LGA).

The Project would involve an underground mining operation that would produce high-quality coals over a period of approximately 26 years.

Maxwell Ventures (Management) Pty Ltd, a wholly owned subsidiary of Malabar Coal Limited (Malabar), is seeking consent to develop the Project. Malabar (2019a) prepared the *Maxwell Project Environmental Impact Statement* (the EIS) for the Project to support the assessment process under the NSW *Environmental Planning and Assessment Act, 1979* (EP&A Act).

The EIS was placed on public exhibition by the Department of Planning, Industry and Environment (DPIE) from 14 August 2019 to 24 September 2019. During this period, government agencies, organisations and members of the public were invited to provide submissions on the EIS to the DPIE.

On 26 September 2019, the DPIE requested that Malabar prepare and submit a Submissions Report for the Project (herein referred to as the Submissions Report) in accordance with clause 85A(2) of the EP&A Act.

Additional submissions were provided by the DPIE subsequent to the exhibition period closing, including comments from Muswellbrook Shire Council (MSC), NSW Environment Protection Authority (EPA), Heritage NSW, Department of Planning, Industry and Environment – Water (DPIE – Water), NSW Natural Resources Access Regulator (NRAR) and NSW Roads and Maritime Services (RMS). These additional submissions have been considered in this Submissions Report.

The Submissions Report has been prepared in consideration of the Draft *Guideline 4: Guidance for State Significant Projects - Preparing a Submissions Report June 2019* (DPIE, 2019), and the structure of the document is as follows:

Section 1 Provides an introduction to the Project and overview of the planning process to date.

Section 2 Provides an overview of the Project.

Section 3 Provides an analysis of the submissions received by DPIE during the public exhibition period.

Section 4 Summarises the actions taken since lodgement of the EIS.

Section 5 Outlines changes to proposed mitigation measures for the Project since lodgement of the EIS.

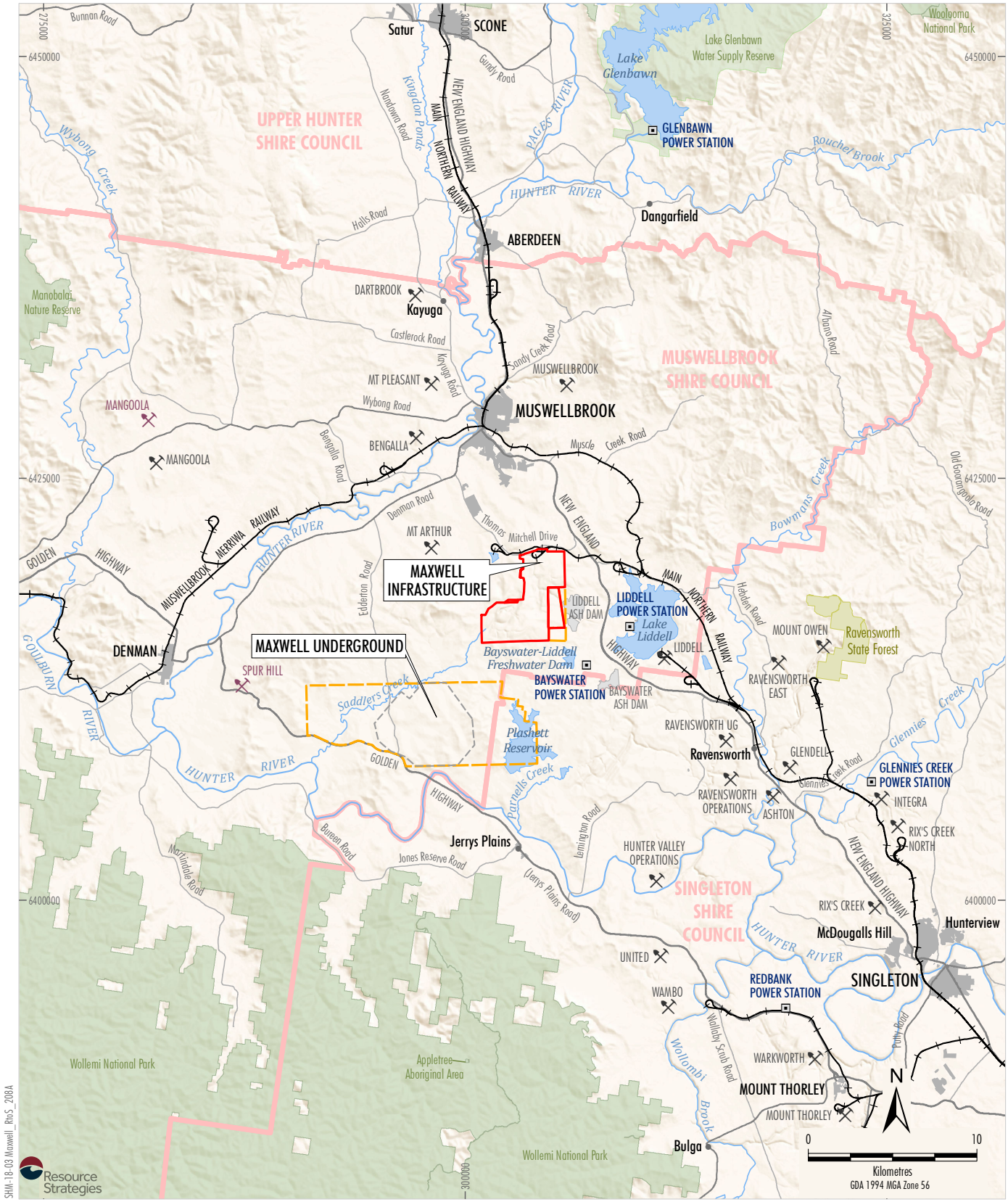
Section 6 Provides response to submissions, structured as follows:

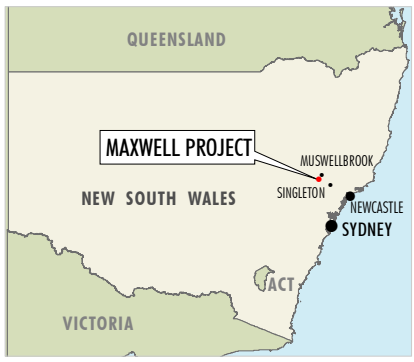
- Section 6.1 Responses to Government Agency Submissions.
- Section 6.2 Responses to Organisation and Public Submissions.

Section 7 Provides an updated evaluation of the Project merits.

Section 8 Lists the documents referenced in the Submissions Report.

It is noted that a number of organisations and members of the public supported the Project (approximately 75% of total submissions). In the interest of brevity, these submissions have not been reproduced in this document. However, a summary of the key positive factors raised in these submissions is provided in Section 3.4.





LEGEND

- Mining Operation
- Proposed Mining Operation
- Railway
- Local Government Boundary
- State Forest
- National Parks and Wildlife Service Estate
- Maxwell Project Exploration Licence Boundary
- Maxwell Project Mining and Coal Lease Boundary
- Indicative Extent of Underground Development

Source: © NSW Department of Planning and Environment (2019); NSW Department of Finance, Services and Innovation (2019); Office of Environment and Heritage NSW (2019)

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MAXWELL PROJECT

Regional Location

Figure 1

2 OVERVIEW OF THE PROJECT

The Project would involve extraction of run-of-mine (ROM) coal from four seams within the Wittingham Coal Measures, using the following underground mining methods:

- underground bord and pillar mining with partial pillar extraction in the Whynot Seam; and
- underground longwall extraction in the Woodlands Hill Seam, Arrowfield Seam and Bowfield Seam.

The substantial existing Maxwell Infrastructure would be used for handling, processing and transportation of coal for the life of the Project. The Maxwell Infrastructure includes the existing coal handling and preparation plant (CHPP), train load-out facilities and other infrastructure and services (including water management infrastructure, administration buildings, workshops and services).

A mine entry area (MEA) would be developed for the Project in a natural valley in the north of Exploration Licence (EL) 5460 to support underground mining and coal handling activities and provide for personnel and materials access.

ROM coal brought to the surface at the MEA would be transported to the Maxwell Infrastructure area. Early ROM coal would be transported via internal roads during the construction and commissioning of a covered, overland conveyor system. Subsequently, ROM coal would be transported via the covered, overland conveyor system.

The Project would support continued rehabilitation of previously mined areas and overburden emplacement areas within Coal Lease (CL) 229, Mining Lease (ML) 1531 and CL 395. The volume of the East Void would be reduced through the emplacement of reject material generated from processing activities, and would be capped and rehabilitated at the completion of mining.

The Project area comprises the following main domains:

- Maxwell Underground – comprising the proposed area of underground mining operations and the MEA within EL 5460.
- Maxwell Infrastructure – the area within existing mining leases comprising the substantial existing infrastructure (including the CHPP) and previous mining areas.
- The transport and services corridor between the Maxwell Underground and Maxwell Infrastructure – comprising the proposed site access road, a covered, overland conveyor, power supply and other ancillary infrastructure and services.
- A potential realignment of Edderton Road.

Table 1 provides a tabulated summary of the key characteristics of the Project.

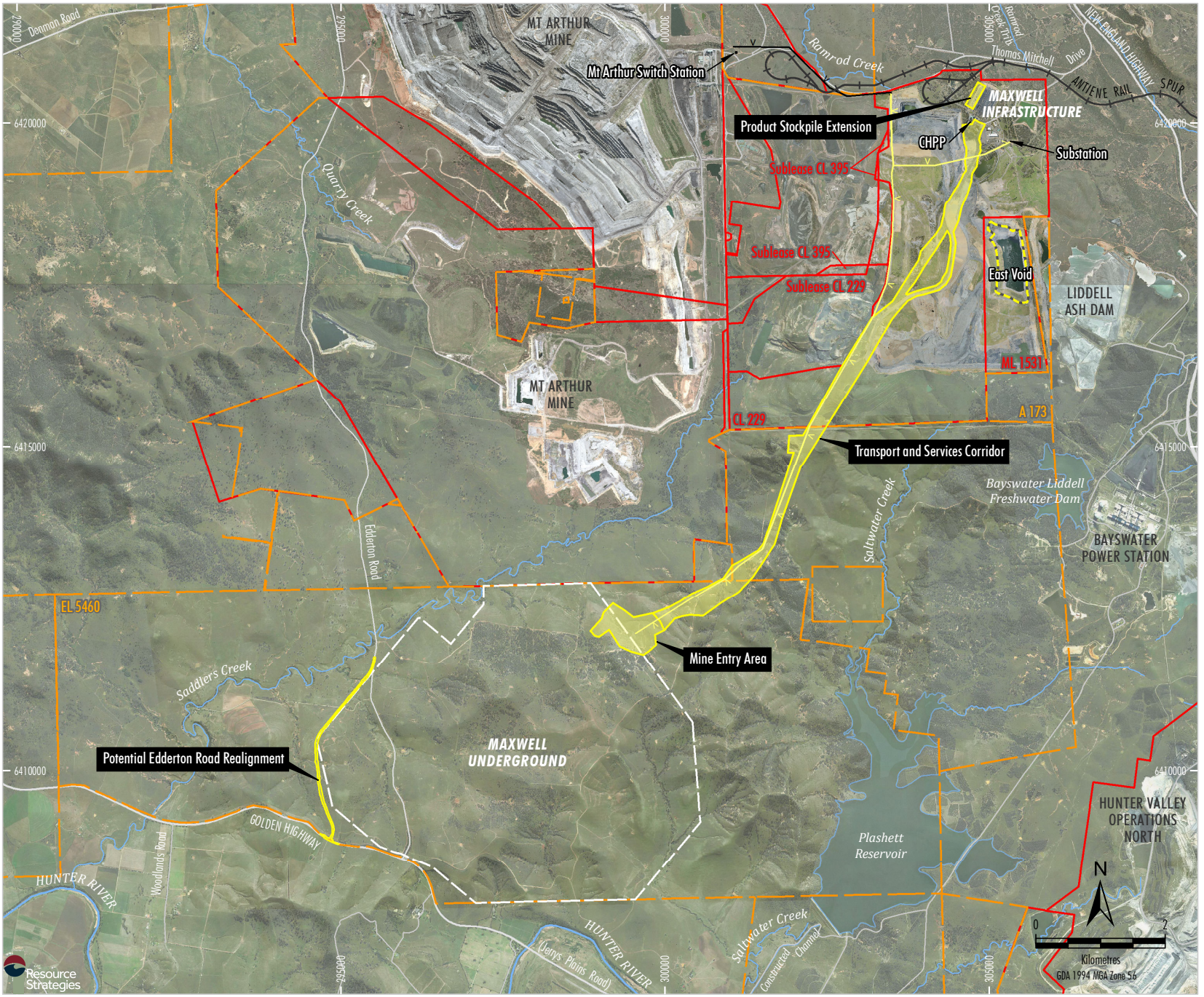
An indicative Project general arrangement showing the key components of the Project is provided in Figure 2.

Malabar is seeking Development Consent under the State Significant Development (SSD) provisions (Division 4.7) under Part 4 of the EP&A Act. If granted, the Development Consent would incorporate the development authorised under the existing approval for the Maxwell Infrastructure, Project Approval 06_0202. As such, Project Approval 06_0202 would be surrendered following the grant of Development Consent.

Table 1
Overview of the Project

Component	Description
Mining Method	Underground extraction using “bord and pillar” and “longwall” mining methods.
Resource	Coal seams in the Wittingham Coal Measures within EL 5460 (Whynot Seam, Woodlands Hill Seam, Arrowfield Seam and Bowfield Seam).
Annual Production	Up to 8 million tonnes of ROM coal per annum. At least 75% of product coal produced by the Project would be capable of being used in the making of steel (coking coals). The balance would be export thermal coals suitable for the new-generation High Efficiency, Low Emissions power generators.
Mine Life	26 years of coal extraction.
Total Resource Recovered	Approximately 148 million tonnes of ROM coal (i.e. an annual average of approximately 5.7 million tonnes of ROM coal, yielding an annual average of approximately 4.8 million tonnes of product coal).
Coal Handling and Preparation	Handling and processing of up to 8 million tonnes of ROM coal per annum. Transport of coal from underground faces to the MEA (mine entry area) via an underground conveyor network. Use of a surge stockpile and coal sizing facilities at the underground MEA prior to transporting ROM coal to the Maxwell Infrastructure CHPP. Transportation of early ROM coal via internal roads to the Maxwell Infrastructure CHPP, while a covered, overland conveyor is constructed and commissioned. Subsequently, ROM coal would be transported via the covered, overland conveyor system. Use of the existing Maxwell Infrastructure CHPP with upgrades to coal handling and processing infrastructure.
Management of Reject Material (i.e. Stone-derived Material)	Emplacement of coarse rejects and tailings (collectively “Rejects”) primarily within the existing “East Void” in ML 1531 at the Maxwell Infrastructure precinct.
General Infrastructure	Use of the existing Maxwell Infrastructure with upgrades. Development of an underground MEA and associated facilities that support the underground mining activities and provide for personnel and materials access to the underground mine. Development of infrastructure for power supply, ventilation and gas management for the underground mine.
Product Transport	Transport of product coal to market or to the Port of Newcastle for export via the existing Antiene Rail Spur and Main Northern Railway or via conveyor to the Bayswater and/or Liddell Power Stations.[1] Transport of up to 7 million tonnes of product coal per annum along the rail loop (up to 12 train movements per day).
Water Management	On-site water management system, including: recycling of water on-site; storage of water on-site (including in voids); water treatment; irrigation; and sharing of water with Mt Arthur Mine and other users. Augmentations and extensions to existing water management infrastructure and development of new water management storages, sumps, pumps, pipelines, sediment control, mine dewatering, water treatment and wastewater treatment infrastructure.
Workforce	During operation, the Project would directly employ approximately 350 personnel. Initial construction activities would require an average of approximately 90 personnel, and a maximum of approximately 250 personnel. Additional contractors would also be required during short periods over the life of the Project; for example, during longwall change-outs, periods of higher underground development activities, scheduled plant shutdowns or other maintenance programs. These activities may require up to approximately 80 additional personnel.
Hours of Operation	Operated on a continuous basis, 24 hours per day, seven days per week.
Capital Investment Value	$509,000,000.

1 Consistent with the current approval for the Antiene Rail Spur (DA 106-04-00), coal may be hauled on public roads under emergency or special situations with the prior written permission of the Secretary of the DPIE, RMS and MSC.



LEGEND

- Railway
- Exploration Licence Boundary
- Mining and Coal Lease Boundary
- Indicative Extent of Underground Development
- Indicative Surface Development Area
- CHPP Reject Emplacement Area
- Proposed 66 kV Power Supply
- Proposed Ausgrid 66 kV Power Supply Extension#

Subject to separate assessment and approval.

Source: © NSW Department of Planning and Environment (2019); NSW Department of Finance, Services & Innovation (2019)
Orthophoto Mosaic: 2018, 2016, 2011

MALABAR COAL

MAXWELL PROJECT

Project General Arrangement

Figure 2

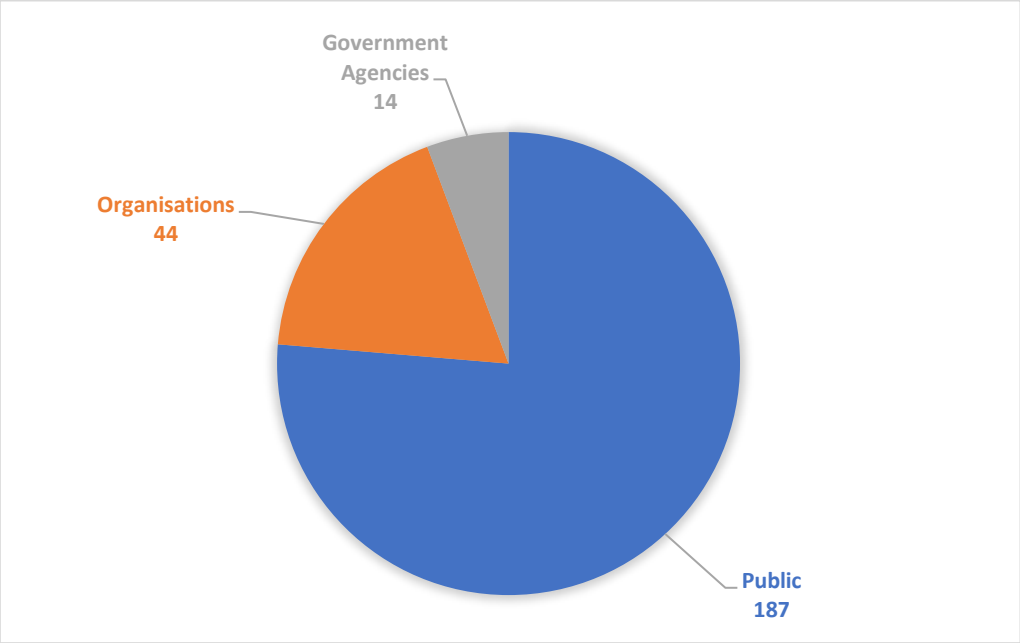
SHM-18-03 Maxwell_RtoS_209A

3 ANALYSIS OF SUBMISSIONS

3.1 NUMBER OF SUBMISSIONS

A total of 245 submissions on the Project were received from government agencies, organisations and members of the public. Chart 1 presents a summary of the number of submissions by submitter category.

Chart 1
Summary of All Submissions



A summary of the submissions received during the public exhibition period and a register of submitters are provided in Attachments 1 and 2, respectively.

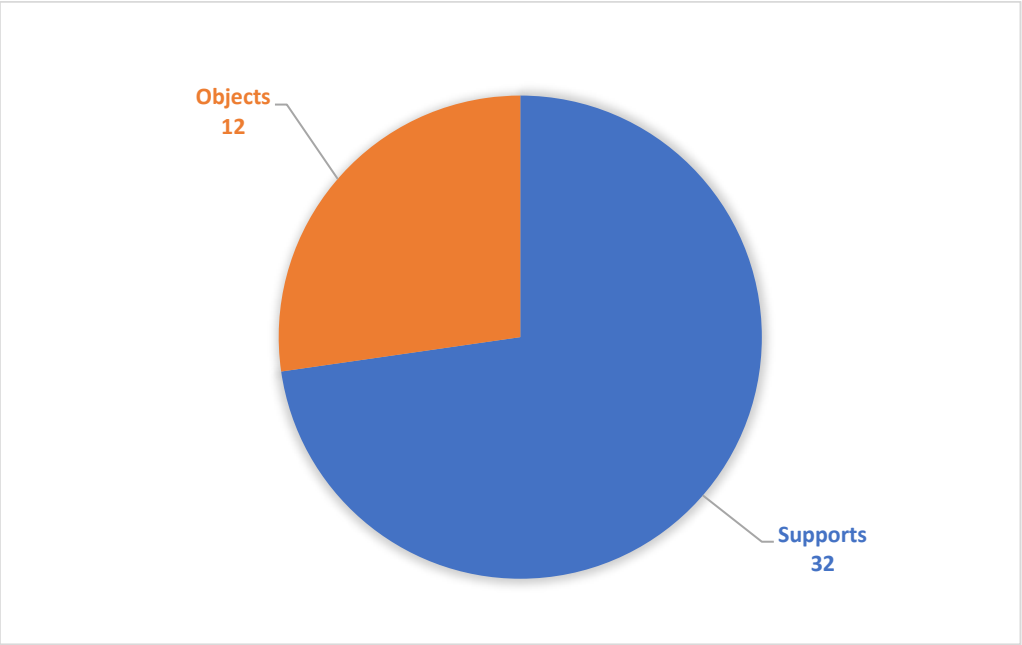
3.2 GOVERNMENT AGENCY SUBMISSIONS

A total of 14 submissions were received from NSW Government agencies and local councils. These submissions were in the form of comments or suggested conditions, with the exception of a submission from the Upper Hunter Shire Council, which was in the form of an objection. It is noted that the Project is located outside of the Upper Hunter Shire Council LGA. Muswellbrook Shire Council (MSC) did not object to the Project.

3.3 ORGANISATION AND PUBLIC SUBMISSIONS

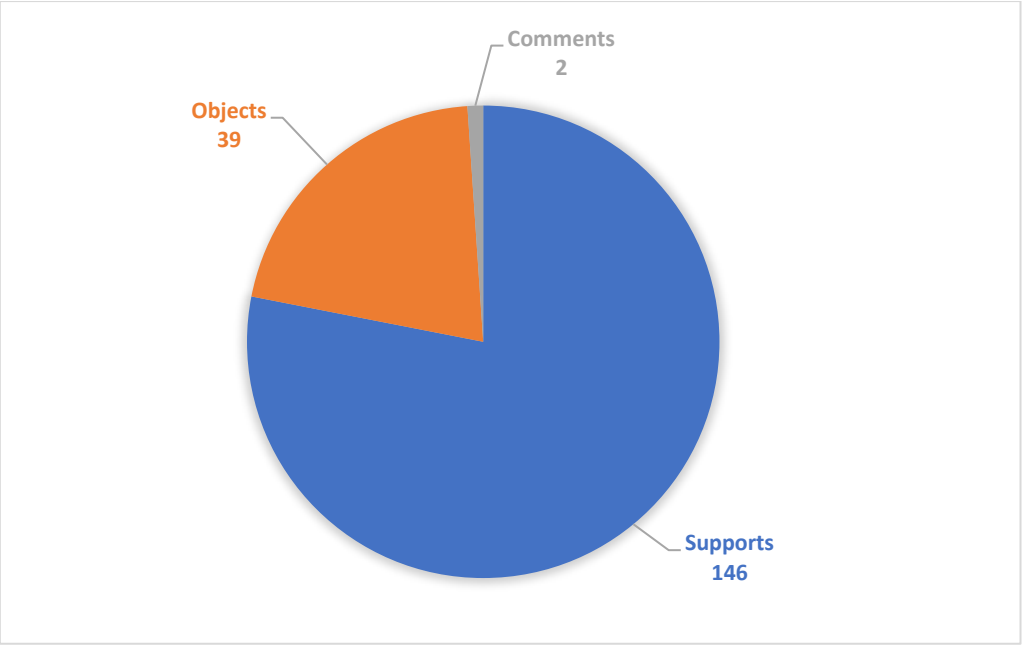
A total of 44 submissions were received from organisations. Thirty-two of the organisations supported the Project and 12 objected to the Project (Chart 2).

Chart 2
Summary of Organisation Submissions

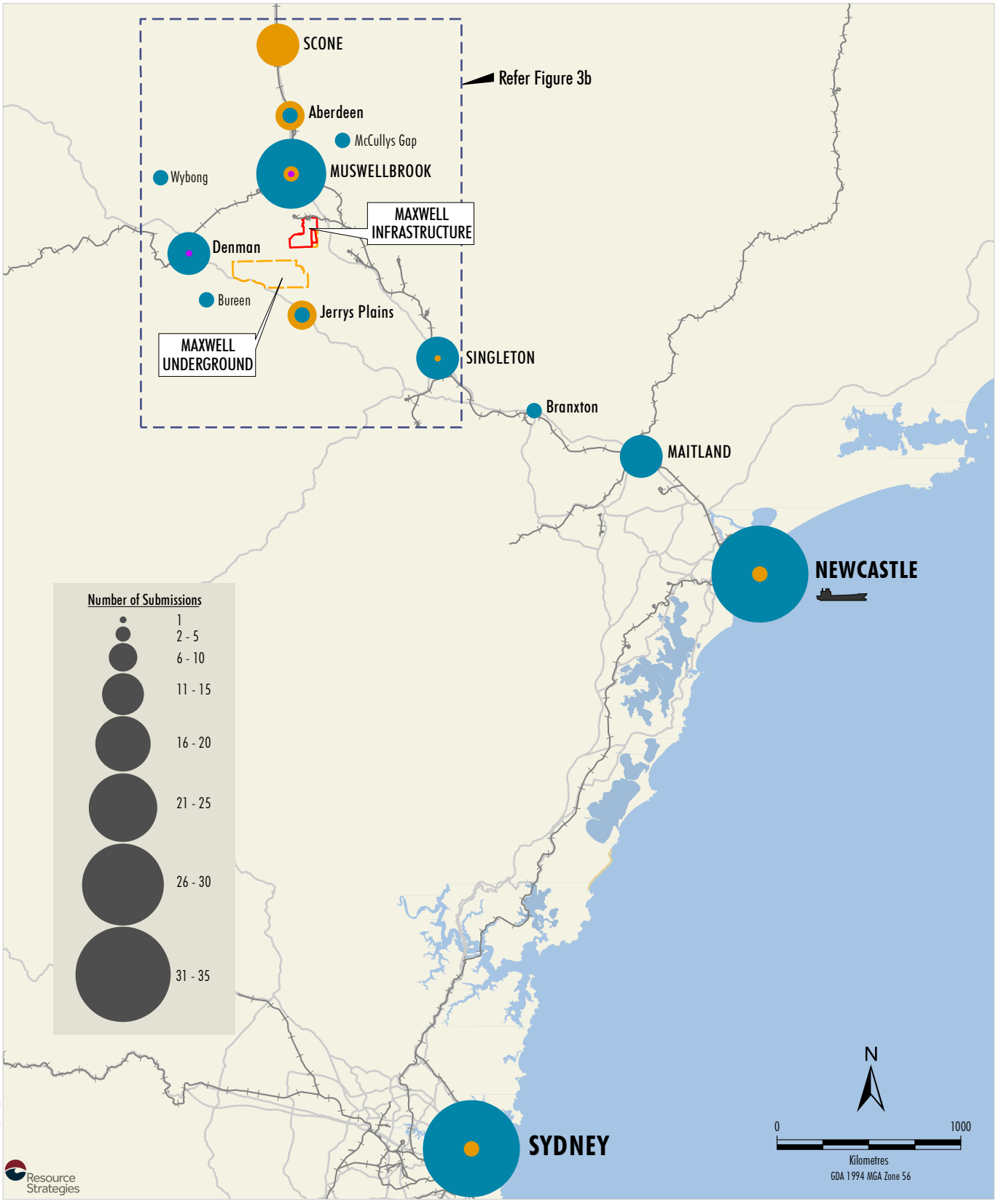


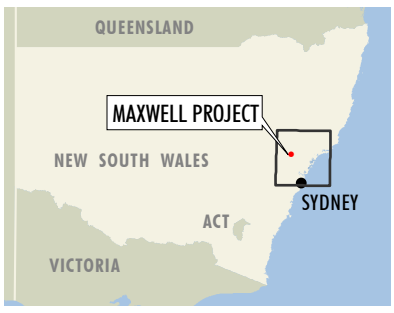
A total of 187 submissions were received from members of the public. Some 146 of the public submissions supported the Project, some 39 of the public submissions objected to the Project and two of the public submissions provided comments on the Project (Chart 3).

Chart 3
Summary of Public Submissions



The nature of submissions received from organisations and members of the public in the Project region is shown on Figures 3a and 3b.





LEGEND

Railway

Maxwell Project Exploration Licence Boundary

Maxwell Project Mining and Coal Lease Boundary

Nature of Submissions

Comment

Support

Objection

Source: Geoscience Australia (2016); Malabar (2019)

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MAXWELL PROJECT

Submission Locations

Figure 3a

LEGEND

- Mining Operation
- Proposed Mining Operation
- Railway
- Local Government Boundary
- State Forest
- National Parks and Wildlife Service Estate
- Maxwell Project Exploration Licence Boundary
- Maxwell Project Mining and Coal Lease Boundary
- Indicative Extent of Underground Development

Nature of Submissions

- Comment
- Support
- Objection

Number of Submissions

- 1
- 2 - 5
- 6 - 10
- 11 - 15
- 16 - 20
- 21 - 25

Source: © NSW Department of Planning and Environment (2019); NSW Department of Finance, Services and Innovation (2019); Office of Environment and Heritage NSW (2019)

MALABAR COAL

MAXWELL PROJECT

Submission Locations - Inset

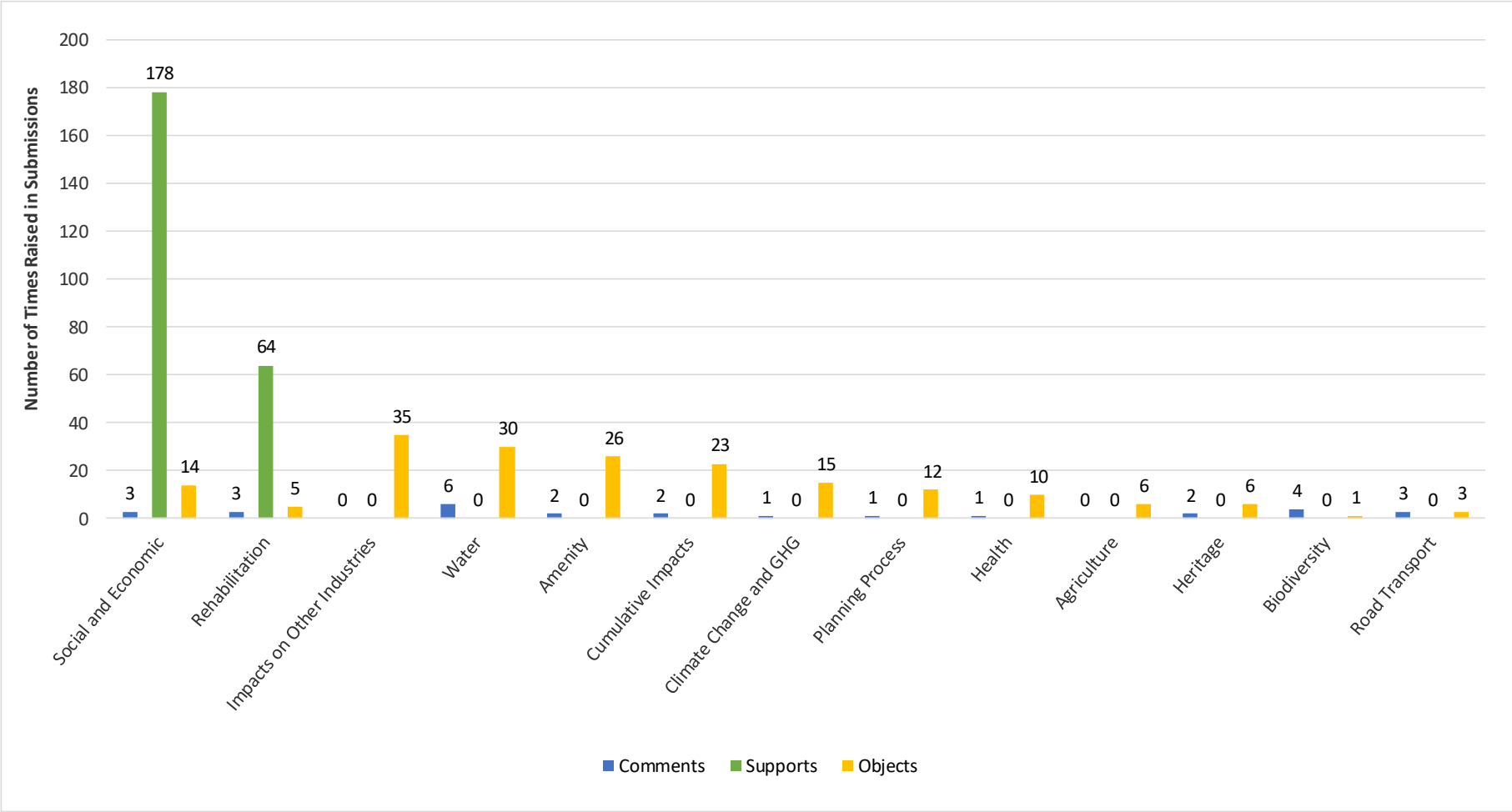
Figure 3b

3.4 KEY MATTERS RAISED IN SUBMISSIONS

The most commonly raised matters in relation to the Project are illustrated in Chart 4. As shown, the most comments pertained to the following matters:

- socio-economic benefits;
- benefits of rehabilitation at the Maxwell Infrastructure;
- potential land use incompatibility with other surrounding industries;
- potential impacts to groundwater and surface water;
- potential impacts to amenity (e.g. potential noise, air quality and visual impacts);
- potential cumulative impacts of the Project and surrounding mining operations; and
- greenhouse gas emissions associated with the Project.

Chart 4
Key Matters Raised in Submissions



GHG = greenhouse gases.

4 ACTIONS TAKEN SINCE LODGEMENT OF THE PROJECT EIS

4.1 ENGAGEMENT ACTIVITIES

Since the lodgement of the EIS, Malabar has continued to engage with key stakeholders, including government agencies, local organisations and community members regarding the Project. The consultation with each of these stakeholders is summarised in the following sections.

4.1.1 Consultation with Government Agencies

Since receiving submissions on the EIS from the DPIE, the following additional consultation with government agencies has been conducted by Malabar:

- Following the receipt of the Resources Regulator's submission on the Project, Malabar invited the Resources Regulator to an on-site meeting to discuss the comments in their submission and to provide a tour of the existing rehabilitation completed to date.
- Following the receipt of the submission from the Biodiversity and Conservation Division within DPIE (BCD) on the Project, Malabar offered to meet with the BCD to discuss their comments on the EIS; however, the BCD advised they did not wish to meet at this stage.
- On 1 November 2019, following the receipt of the EPA's submission on the Project, Malabar provided a letter to the EPA with the additional information requested in their submission.
- On 5 November 2019, Malabar met with DPIE to discuss the draft Submissions Report.

4.1.2 Consultation with the Equine Industry

Prior to the lodgement of the EIS, Malabar hosted a site visited for Coolmore Stud senior executives, plus senior executives from Malabar visited Coolmore Stud.

Following the lodgement of the EIS, Malabar continued consultation with key stakeholders in the equine industry, including the Coolmore Stud and the Godolphin Woodlands Stud. Malabar hosted a site visit for two senior executives from the Coolmore Stud in September 2019. A property-specific briefing booklet was provided to both the Coolmore Stud and Godolphin Woodlands Stud during the exhibition period, which included:

- a description of the key Project design measures that Malabar has implemented to address previous stakeholder concerns;
- an overview of how Malabar has addressed previous concerns raised during the assessment of the Drayton South Project, including concerns related to air quality, noise, vibration and reputational risk;
- a summary of key impact assessment outcomes related to concerns raised during the consultation process for the Project (including consideration of potential visual impacts, subsidence, traffic and transport and water resources); and
- an offer for further consultation.

Further to this, Malabar committed to:

- make senior and executive staff available for consultation with Coolmore Stud and Godolphin Woodlands Stud at all times;
- offered a site visit to representatives of the Coolmore Stud and Godolphin Woodlands Stud during the exhibition period; and
- offered to continue to consult with Coolmore Stud and Godolphin Woodlands Stud throughout the EIS assessment process to respond to any subsequent queries.

4.1.3 Consultation with Surrounding Landowners

Following the lodgement of the EIS, Malabar conducted further direct engagement with surrounding landowners. Property-specific information booklets were prepared for all landowners within 2.5 kilometres (km) of the Project. Subsequently, Malabar attempted to contact each landowner, and, where the landowner was available, presented an overview of their booklet to the respective landowners.

Each booklet included:

- a map showing the location of the Project relative to their property;
- a description of the key Project design measures that Malabar has implemented to address previous stakeholder concerns;
- a description of potential impacts of the Project in plain English, including potential impacts related to noise, air quality and visual amenity;
- contact information for a Malabar representative to provide an opportunity to discuss any residual concerns.

4.1.4 Other Community Consultation

Subsequent to the lodgement of the EIS, Malabar gave notice of a Development Application for consent to carry out the Project under Part 4 of the EP&A Act in accordance with clause 49(2)(b) of the *Environmental Planning and Assessment Regulation 2000*. This notice was published in *The Muswellbrook Chronicle* (9 August 2019), *Hunter Valley News* (7 August 2019), *Denman News* (8 August 2019) and *The Singleton Argus* (7 August 2019).

On 14 August 2019, Malabar notified the members of the Maxwell Infrastructure and Spur Hill Community Consultative Committee (CCCs) that DPIE had placed the EIS on public exhibition.

On 4 September 2019, Malabar met with the Spur Hill CCC members. The meeting provided an update following lodgement of the EIS, and an update on the status of rehabilitation at the Maxwell Infrastructure. As an outcome of the Spur Hill CCC meeting, EIS summary booklets were provided to members of the Spur Hill CCC and MSC Councillors.

Malabar has also updated their website, providing facts sheets about the Project and a link to the EIS along with an explanation on how feedback on the Project can be given.

4.2 ON-SITE ACTIVITIES

Ongoing rehabilitation activities at the Maxwell Infrastructure have continued since the lodgement of the EIS.

In July 2019, Malabar planted screening vegetation adjacent to the MEA, on the west slope of the bounding ridgeline. Since the lodgement of the EIS, Malabar has continued to maintain the planted screening vegetation.

In July 2019, Malabar fenced the identified areas of *Diuris tricolor* and *Acacia pendula* with a 20 m buffer, consistent with the recommendations of the Biodiversity Develompent Assessment Report (BDAR).

4.3 FURTHER ENVIRONMENTAL ASSESSMENT

Subsequent to the public exhibition of the Project, Malabar has continued investigating the potential to locate biodiversity offsets within the Muswellbrook LGA. This has included additional biodiversity surveys of land owned by Malabar within the LGA.

5 CHANGES TO THE PROJECT AND ADDITIONAL COMMITMENTS

No changes to the design of the Project are proposed as a result of Malabar's review of the various government agency, organisation and public submissions on the Project.

Notwithstanding, in response to submissions received on the EIS, Malabar has committed to the following additional management and monitoring measures:

- Malabar would consult with MSC regarding the post-mining use of the site access road prior to mine closure, including consideration of dedicating the site access road as a public road post-mining.
- Malabar would implement a monitoring program for the riparian vegetation along Saddlers Creek and outcomes would be reported in the Annual Review.
- Prior to operating the water treatment facility, Malabar would prepare a Brine Management Plan for the Project in consultation with the EPA.
- Malabar would include the additional surface water monitoring sites requested by the MSC, to monitor for potential off-site sediment generation due to subsidence.
- Malabar would maintain a file of historical information regarding the former Drayton Mine on-site. Malabar would make the information available to the public upon request (e.g. for students completing research projects). Malabar would also make the material available to MSC should it wish to establish a permanent memorial to the former Drayton Mine.
- In the event of a groundwater-related complaint from a local landholder in relation to a potential mine-related effect on their groundwater supply, Malabar would facilitate the provision of temporary water supply to provide immediate relief while an impact investigation is undertaken.
- Malabar would consult with DRG regarding potential resource sterilisation in biodiversity offset areas that are identified for the Project.
- If, by the end of 2025, no clear resolution is reached with other mining and industrial facilities in the region, Malabar would rehabilitate the South Void highwall and North Void low wall in accordance with the approved Final Void Management Plan, unless otherwise agreed with the Resources Regulator. The North Void highwall works would be completed once the rail and CHPP infrastructure are no longer required.
- Malabar supports the establishment of a working party to be established by 2035 to plan for the transition to an alternative post-mining land use. Malabar would also continue to consult with the Aboriginal community as part of the final land use planning for the Project.

A number of clarifications to address concerns that were raised on the basis of alternative interpretations of the information contained within the EIS are presented, where relevant, in Section 6.

6 RESPONSES TO SUBMISSIONS

6.1 RESPONSES TO GOVERNMENT AGENCY SUBMISSIONS

Responses to issues raised by government agencies are provided in the sub-sections below.

The following agencies had no specific queries or concerns regarding the Project and, therefore, do not require any specific response:

- Australian Rail Track Corporation (ARTC).
- Subsidence Advisory NSW.
- NSW Health.
- NSW Department of Primary Industries (DPI).
- NSW Heritage Council.

Agencies and councils that raised concerns or made more extensive comment regarding the Project are as follows, and are addressed in the sub-sections below:

- Division of Resources and Geoscience within DPIE (DRG).
- Resource Regulator within DPIE.
- Biodiversity and Conservation Division within DPIE (BCD).
- Transport for NSW.
- Environment Protection Authority (EPA).
- Roads and Maritime Services (RMS).
- NSW Natural Resources Access Regulator (NRAR) and Department of Planning, Industry and Environment – Water (DPIE – Water).
- Muswellbrook Shire Council (MSC).
- Upper Hunter Shire Council.

6.1.1 Subsidence

Surface Cracking

Issue

MSC recommended that adaptive management practices for subsidence-induced soil erosion are undertaken as part of the Project.

Response

Subsidence mitigation and remediation measures would be outlined in detail in the Land Management Plan component of future Extraction Plans.

It is proposed that the Extraction Plans would include an adaptive management program to monitor the success of subsidence remediation, which would be supported by Trigger Action Response Plans (TARPs) to implement specific follow-up actions where that monitoring indicates additional measures are required. Malabar would accept a Development Consent condition to this effect.

6.1.2 Water Resources

Water Licensing Requirements

Issue

NRAR and DPIE – Water recommended that the Submissions Report provide further information to confirm that Malabar has sufficient water licences to account for Project water take, including in the initial years of operation.

Response

Malabar currently holds sufficient licences to cover the modelled groundwater inflows for all water sources, with the exception of the "less productive" Sydney Basin-North Coast Groundwater Source (Attachment 8 of the EIS).

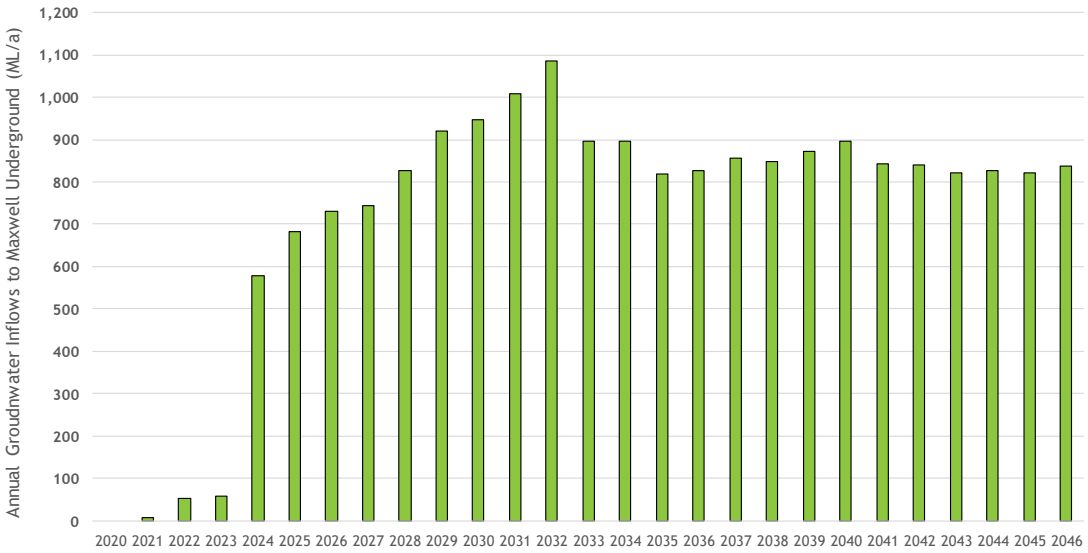
Malabar currently holds 527 units of Water Access Licences (WALs) in the Sydney Basin-North Coast Groundwater Source associated with WAL 41491 and WAL 41559[1] and has reached an agreement for the transfer of a further 89 units with existing WAL holders in the Sydney Basin-North Coast Groundwater Source (including an additional 25 units secured since the EIS was finalised).

The predicted annual groundwater inflow volumes to the Maxwell Underground, based on groundwater modelling by HydroSimulations (2019), are summarised in Chart 5. Malabar holds sufficient licences for the first four years of the Project, without the application of carry-over provisions.

The peak predicted annual groundwater licensing volume for the Sydney Basin-North Coast Groundwater Source is 1,096 megalitres per year (ML/year), which is predicted to occur in Year 12 of operations.

Review of the NSW Water Register indicates there are 16,807.50 units of unassigned water (Table 2). Notwithstanding, in the absence of a controlled allocation order, Malabar would seek and obtain the appropriate water licences for the Sydney Basin-North Coast Groundwater Source on the open market prior to the year they are required (i.e. additional licences would be obtained during the first four years of the Project). In 2019, Malabar has reached an agreement for the transfer of 89 units with existing WAL holders in the Sydney Basin-North Coast Groundwater Source. The ongoing acquisitions of WALs as they are required for mining operations is, therefore, considered reasonable.

Chart 5
Annual Groundwater Inflows



Source: WRM Water and Environment (2019) and HydroSimulations (2019).

[1] WAL 41491 and WAL 41559 were converted from 20BL111869/20BL122620. Anglo American plc wrote to DPI Water on 13 September 2017 indicating that 527 units were incorrectly assigned to the New England Fold Belt Coast Groundwater Source instead of the Sydney Basin-North Coast Groundwater Source. Malabar is consulting with relevant NSW Government agencies to resolve this administrative issue.

Table 2
Summary of Unassigned Water in the Sydney Basin-North Coast Groundwater Source

Category	Number of Licences	Annual Usage (ML/year)	Source
Aquifer Licences	165	66,805.5[1]	NSW Water Register for the 2019/20 period, (WaterNSW, 2019).
Local Water Utility Licences	9	1,300.0	NSW Water Register for the 2019/20 period, (WaterNSW, 2019).
Domestic and Stock Rights	N/A	5,087.0	Subclause 19(m) of the *Water Sharing Plan for the North Coast Fractured and Porous Rock Groundwater Sources 2016.*
Subtotal of Assigned Water	***174***	***73,192.5***	
Long-term Average Annual Extraction Limit	N/A	90,000.0	Subclause 26(14) of the *Water Sharing Plan for the North Coast Fractured and Porous Rock Groundwater Sources 2016*.
Total Unassigned Water	***N/A***	***16,807.50***	

[1] Aquifer licences in the Sydney Basin-North Coast Groundwater Source received an allocation of 1 ML per unit share of entitlement in the 2018/19 period (Department of Industry – Lands and Water Division, 2018).

Management of Existing Water Access Licences

Issue

NRAR and DPIE – Water recommended that Malabar effectively manages its existing WALs by:

- Confirming, in consultation with the NSW Government, that WAL 41491 and WAL 41559 are correctly assigned to Sydney Basin-North Coast Groundwater Source, under the *Water Sharing Plan for the North Coast Fractured and Porous Rock Groundwater Source 2016*.
- Consolidation of existing WALs to avoid double-up of water take with other projects, specifically WALs held in the Hunter Regulated River Water Source, under the *Water Sharing Plan for the Hunter Regulated River Water Source 2016*.

Response

Malabar would continue to consult with the NSW Government regarding the assignment of WAL 41491 and WAL 41559 to the Sydney Basin-North Coast Groundwater Source.

The maximum predicted annual water take for the Project from the Hunter Regulated River Water Source is 19 ML/year.

Malabar holds 1,423 units in the Hunter Regulated River Water Source. This allocation is used to support Malabar's agricultural activities with any excess to Malabar's requirements being leased to neighbouring agricultural enterprises. Malabar would continue to manage these licences to avoid any double-up of water take across different projects or agricultural activities, including consolidating the ownership of licences following approval of the Project where required in consultation with NRAR and DPIE – Water.

Historical Inflows to Former Drayton Mine Voids

Issue

NRAR and DPIE – Water recommended that Malabar provide information on the quantity of groundwater entering the three former Drayton Mine open cut voids.

Response

WRM Water and Environment (2019) calibrated the site water balance model over the period January 2017 to December 2018, for which stored water volumes on-site were available and there were no active operations at the mine. It was assumed that there were no changes to site catchments over this period, no transfers of water between the storages or voids, and no water consumption at Maxwell Infrastructure.

The calibration review used recorded daily site rainfall data and considered the stored volume within the open voids but did not include any allowance for water stored within the in-pit spoil.

The modelled combined inventory for North Void, East Void and South Void were compared to the recorded combined void inventory, which identified an additional inflow to the voids of approximately 6.1 megalitres per day (ML/day).

HydroSimulations (2019) determined that the source of the additional inflow is seepage from the in-pit spoil, with a small contribution from external groundwater inflows (WRM Water and Environment, 2019). The calibrated numerical groundwater model was used to quantify the volume of external groundwater inflows to the existing final voids. This was predicted to be 3 ML/year on average and less than 11 ML/year maximum (HydroSimulations, 2019).

As the water level in the voids increase, the rate of seepage from the in-pit spoil would decrease in accordance with Darcy's Law.

Groundwater levels around the Maxwell Infrastructure area show that North Void and South Void act as groundwater sinks in the long-term, drawing groundwater from the in-situ strata towards the mined area. At the predicted pit lake recovery level of 166 metres Australian Height Datum (mAHD) for the East Void, there would be a low gradient of flow from Liddell Ash Dam. Groundwater levels around East Void are more subdued to the east but also indicate that the East Void would act as a sink, largely due to localised recharge from the Liddell Ash Dam driving a slight gradient towards the East Void (HydroSimulations, 2019).

Given the predicted low gradient towards the final voids, long-term groundwater inflows are predicted to be negligible (HydroSimulations, 2019).

Groundwater Users

Issue

NRAR and DPIE – Water recommended that Malabar:

- Prepares a plan that documents the monitoring and associated "make-good" arrangements for the private bore that is predicted to meet the Level 2 impact criteria under the *NSW Aquifer Interference Policy* (the AIP).
- Commits to periodically undertaking a census of the closest private bores to create a benchmark of water level, yield and quality.

Response

A Water Management Plan would be developed for the Project. The Water Management Plan would be developed in consultation with DPIE – Water and NRAR, and would describe the groundwater monitoring program and "make-good" arrangements that would be implemented if monitoring or an investigation show greater than 2 metres (m) drawdown at a privately-owned bore that is attributable to the Project.

Malabar undertook a bore census for the Project in 2018. Landowners in the vicinity of the Project were invited to participate in the Bore Census. Through this consultation, the landowners of four properties agreed to participate in the Bore Census, while owners of two properties (including Coolmore Stud) indicated that they did not want to participate in the Bore Census on the basis that their properties did not use water extracted from groundwater bores. Landowners of eight properties (including Godolphin Woodlands Stud) either elected not to participate in the Bore Census or did not respond to the request to participate in the Bore Census.

Malabar would periodically invite the local landholders to participate in an updated bore census to continue developing the baseline water level, yield and quality of nearby bores. Upon request from a landholder, Malabar would also undertake a census of bores on any privately-owned land that has not previously participated in a bore census.

Malabar met with the owner of GW029660, which is predicted to experience cumulative drawdown greater than 2 m as a result of the Project and Mt Arthur Mine. At the meeting, Malabar explained the predicted drawdown effects and the "make-good" provisions that would be made available to the landowner.

Site Specific Trigger Levels

Issue

EPA requested details regarding the local field data used to derive site-specific trigger values in the Surface Water Assessment.

Response

The preliminary site-specific trigger values in the Surface Water Assessment are summarised in Table 3. The preliminary triggers have been developed based on surface water monitoring data from Site W1, which is shown on Figure 4.

Site W1 is associated with the former Drayton Mine and has been replaced for ongoing monitoring by Site SW1, which is in the same location and is associated with the Maxwell and Spur Hill projects (there is a concurrent period of monitoring when the former Drayton Mine and the Spur Hill Project were owned by separate entities). Site W1 has been selected for the establishment of trigger levels because it has an extensive baseline period of record (1998 – 2015) and is located downstream of any potential impacts of the Project on Saddlers Creek.

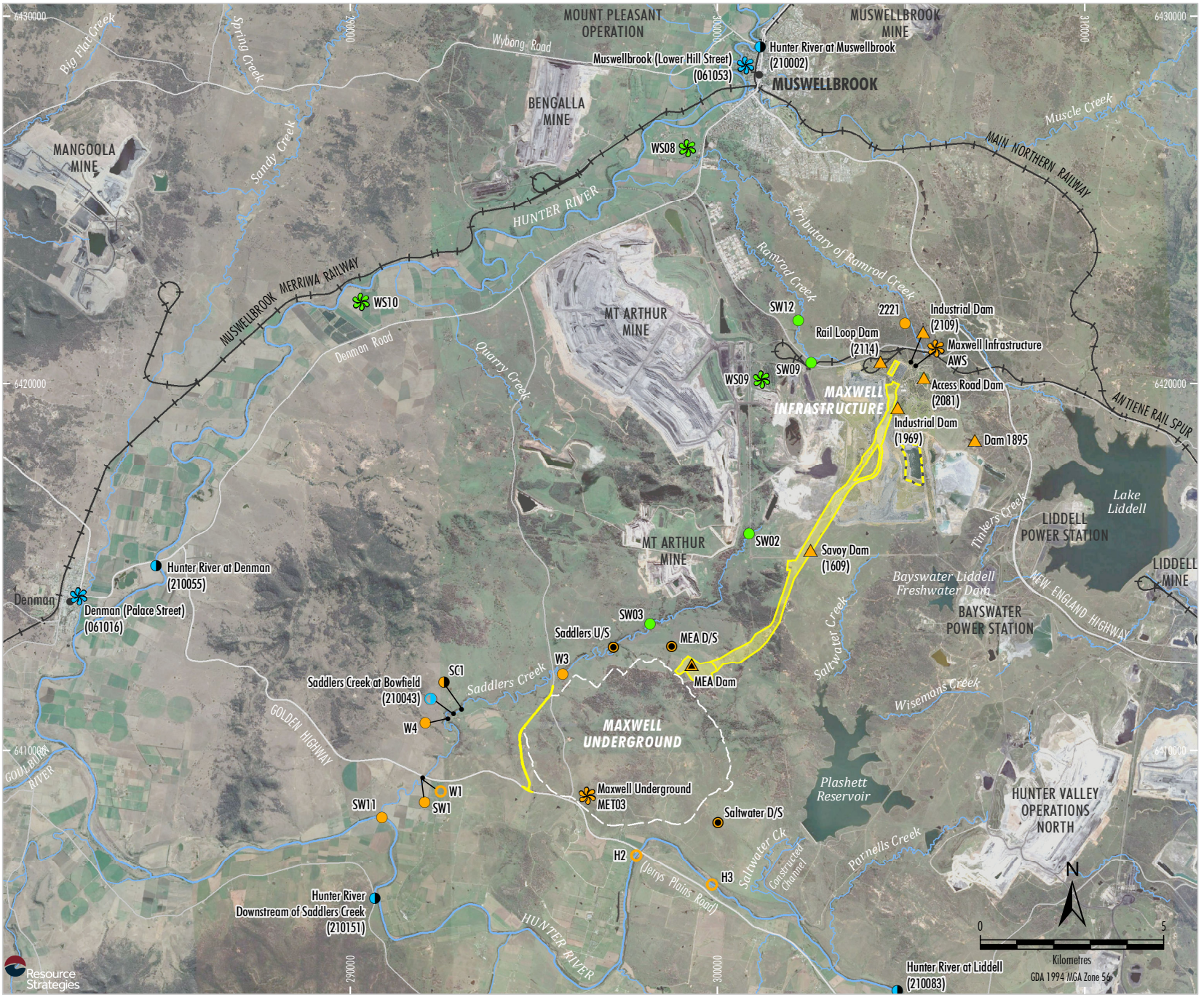
Table 3
Preliminary Site-specific Trigger Values

Parameter	Unit	Recorded Baseline Data (80%ile)	Preliminary Guideline Value	Comment
pH	pH	8.0 – 8.5	6.5 – 8.5	Lower bound based on Australian and New Zealand Environment and Conservation Council (ANZECC) guideline for ecosystem protection, upper bound based on baseline data.
EC	µS/cm	7,584	7,600	Baseline data adopted. Rounded up to nearest hundred.
TDS	mg/L	4,890	4,900	Baseline data adopted. Rounded up to nearest hundred.
Turbidity	NTU	-	-	To be derived based on TSS/Turbidity relationship.
TSS	mg/L	23	50	Department of Environment and Climate Change (DECC) (2008) guidelines adopted.

EC = electrical conductivity, TDS = total dissolved solids, TSS = total suspended solids, µS/cm = microSiemens per centimetre, mg/L = milligrams per litre, NTU = nephelometric turbidity units.

A summary of the baseline data available for Site W1, which has formed the basis of the triggers above, is provided in Table 4.

The preliminary trigger levels would be developed further as part of the Water Management Plan for the Project, including consideration of trigger levels for additional monitoring sites and consideration of any additional data collected prior to commencement of the Project.



LEGEND

- Railway
- Indicative Surface Development Area
- CHPP Reject Emplacement Area
- Extent of Conventional Subsidence (20 mm subsidence contour)

Malabar Monitoring Sites

- Former Surface Water Monitoring Site
- Existing Surface Water Monitoring Site
- Proposed Surface Water Monitoring Site
- Existing Water Management System Monitoring Site
- Proposed Water Management System Monitoring Site
- Gauging Station
- Meteorological Station

BHP Monitoring Sites

- Existing Surface Water Monitoring Site
- Meteorological Station

Other Monitoring Sites

- Former WaterNSW Gauging Station
- WaterNSW Gauging Station
- BoM Weather Station

Source: © NSW Department of Finance, Services & Innovation (2019); WRM Water & Environment Pty Ltd (2019); MSEC (2019)
Orthophoto: Google Digital Globe (2017)

MALABAR COAL

MAXWELL PROJECT

Relevant Surface Water Monitoring Locations

Figure 4

SHM-18-03 Maxwell_RtoS_203A

Table 4
Baseline Data from Surface Water Monitoring Site W1

Parameter	Unit	Period of Record	Number of Samples	20th Percentile	Median	80th Percentile
pH	pH	1998 – 2015	105	8.0	8.4	8.5
EC	µS/cm	1998 – 2015	105	2,648	5,380	7,584
TDS	mg/L	1998 – 2015	105	1,650	3,370	4,890
TSS	mg/L	1998 – 2015	104	4.0	8.0	23.0

Discharge Assessment

Issue

The EPA requested an assessment of any discharges from the water treatment facility (i.e. reverse osmosis plant) and any other water management dams or structures.

Response

Water treatment facilities at the MEA, including a water treatment facility (and/or other suitable water treatment technologies) would be developed to treat water for supply to underground mining operations (e.g. for cooling and underground dust suppression) not for discharge.

The site water balance modelling demonstrates the proposed water management system has sufficient capacity and flexibility to accommodate a wide range of groundwater inflows and climate scenarios while avoiding controlled release of water to the Hunter River (WRM Water and Environment, 2019).

The water balance model was used to assess the risk of uncontrolled off-site spills from the water management system. The dams that could potentially overflow directly to the receiving environment include:

- Rail Loop Dam (to Ramrod Creek);
- Access Road Dam (to Ramrod Creek);
- MEA Dam (to Saddlers Creek);
- Treated Water Dam (to Saddlers Creek); and
- Savoy Dam (to Saddlers Creek).

There were no modelled overflows from MEA Dam, Treated Water Dam and Savoy Dam during any of the modelled climate scenarios over the life of the Project (WRM Water and Environment, 2019).

There is a 1% probability (in any one year) that Rail Loop Dam and Access Road Dam could overflow to Ramrod Creek. The predicted overflow volume ranges from 20 to 30 megalitres (ML). However, overflows from these storages would only occur during extreme rainfall events. The water within the dams during these events would be heavily diluted by catchment inflows and any overflows would be further diluted by significant flows in Ramrod Creek (WRM Water and Environment, 2019).

Assessment of Sub-surface Fracturing

Issue

The EPA requested an assessment of potential impacts to water resources as a result of fracture propagation in the overlying strata, including from methane degassing.

Response

HydroSimulations (2019) evaluated the potential impacts of the Project on groundwater resources using a numerical regional groundwater model. The numerical model considered the potential impacts of sub-surface fracturing on the surrounding groundwater environment, as summarised below.

Sub-surface fracturing of overburden above mining panels causes changes in hydraulic properties, and potentially provides pathways for vertical and horizontal groundwater movement.

Fracturing is most significant and vertically connected immediately above the goaf, with the degree of vertical connection decreasing with height (HydroSimulations, 2019). The height of fracturing above the goaf, and associated height of groundwater depressurisation, is a key factor in assessing the potential impacts of longwall mining to groundwater.

Simulation of changes in hydraulic properties as a result of sub-surface fracturing has been conducted for the Project groundwater modelling using the 'stacked drain' method (HydroSimulations, 2019).

Dr Frans Kalf in the peer review of the Groundwater Assessment (Attachment 6 of the EIS) supports the use of the stacked drain method and states the method "is considered conservative".

Numerical modelling conducted as part of the Groundwater Assessment predicts a substantial reduction in potentiometric head in the groundwater systems of the Permian aged porous rock in the near vicinity of the Project. Recovery of the groundwater table and pressures within the porous and fractured rock groundwater system is predicted to occur over decades following the cessation of mining (HydroSimulations, 2019).

Notwithstanding, an assessment of potential impacts of the Project on groundwater resources also concluded (HydroSimulations, 2019):

- minimal impact (i.e. less than 2 m drawdown) in the "highly productive" Hunter River alluvium;
- minimal impact at all bores in alluvial aquifers;
- negligible adverse impact on groundwater quality in the alluvium;
- no change to the beneficial uses of the Permian hard-rock aquifers in or around the Project area during or following mining; and
- negligible impacts to groundwater dependent ecosystems (GDEs).

To address stakeholder concerns about visual impacts, the Project has been designed to limit surface disturbance for gas management to within the extent of the MEA.

Pre-mining gas drainage and goaf gas drainage would occur underground to reduce the gas content in the coal seams. Gas would be drained from the coal seams, and adjacent strata, by drilling in-seam (i.e. horizontal) boreholes into the coal seam in advance of mining. Pre-mining gas drainage would generally be facilitated by underground cross-panel drilling. Gas would be drained through an underground collection system and delivered to the centralised gas management infrastructure at the surface.

The fracturing of overlying strata is expected to be most pronounced following the extraction from the deepest mined seam (i.e. Bowfield Seam) after the three overlying seams have been extracted. Therefore, the groundwater modelling of coal extraction and fracturing of overlying strata is considered to present a conservative assessment of potential incremental impacts on groundwater, including in consideration of any potential impacts associated with gas drainage.

Groundwater Inflows to the Underground Workings

Issue

EPA requested further detail regarding the management of groundwater inflows to the underground workings.

Response

Predicted groundwater inflows to the underground workings over the life of the Project are predicted to be up to approximately 3 ML/day (HydroSimulations, 2019).

Groundwater and operational water that accumulates in the underground workings would be pumped to the surface via underground sumps, access drifts and/or boreholes. Overlying and adjacent workings may also be dewatered for safety reasons, if required.

A dam would be the primary water storage at the MEA. It would receive groundwater inflows pumped from the underground mining operations and would supply the proposed water treatment facility. It would have the ability to transfer water to/from the South Void at the Maxwell Infrastructure.

The proposed water treatment facility would provide treated water for use in the underground mining operations (e.g. for cooling and underground dust suppression). Groundwater inflows that are not treated and used for water supply would be pumped to the South Void at the Maxwell Infrastructure.

Brine Management Strategy

Issue

EPA requested additional information regarding brine management.

Response

Brine from the water treatment facility would be pumped to the Brine Dam. Brine would eventually be pumped from the Brine Dam to a separate impoundment area within the East Void. For operational water quality management purposes, the brine would be kept in a separate storage cell within the East Void to maintain separation from the co-disposed rejects decant water.

It is expected that the water treatment facility would generate approximately 0.52 ML of brine per day, with a salinity of approximately 26,000 µS/cm.

The approximate storage volume of the Brine Dam is 4 ML. The Brine Dam would be designed to store a 100 year average recurrence interval (ARI), 72 hour storm event and would be suitably lined to comply with a permeability standard of less than 1×10^{-9} m/s over 1,000 mm or equivalent standard.

Prior to operating the water treatment facility, Malabar would prepare a Brine Management Plan for the Project in consultation with the EPA. The Brine Management Plan would:

- be prepared by suitably qualified and experienced persons whose appointment has been approved by DPIE;
- detail the methods that would be used to manage brine;
- provide detailed design information regarding the location, volume and design of the Brine Dam; and
- develop a program to monitor potential impacts of brine storage, transfer and disposal in the East Void.

Water Quality Management for Transport and Services Corridor

Issue

MSC requested additional information regarding water quality management for the transport and services corridor.

Response

The transport and services corridor would comprise: (i) a site access road, (ii) a covered, overland conveyor, (iii) power supply, and, (iv) other ancillary infrastructure and minor services.

The site access road would be progressively sealed during the first year of mining operations.

The transport and services corridor would be managed through the dirty water management system, which would separate potentially sediment-laden runoff from disturbed areas from clean area runoff and collect it in sediment dams for treatment.

Runoff from the transport and services corridor would be managed in accordance with an erosion and sediment control plan. Erosion and sediment control techniques would be designed and operated in accordance with the requirements of *Managing Urban Stormwater: Soils and Construction Volume 1* (the Blue Book) (Landcom, 2004) and *Volume 2E Mines and Quarries* (DECC, 2008).

Site drainage and sediment control structures would be inspected regularly (monthly or following rainfall greater than 25 mm in 24 hours) to check for scouring of diversion drains (and their outlets) and accumulation of sediment in sediment traps (including sediment fences, sediment basins, etc.).

Regular inspections of control structures would be undertaken to maintain functionality as designed and required. Maintenance activities would be undertaken in accordance with Section 8.2 of the Blue Book (Landcom, 2004).

Potential Sediment Generation due to Subsidence

Issue

MSC recommended the following additional surface water monitoring points to monitor for potential off-site sediment generation due to subsidence from the Project:

- unnamed tributary of Saddlers Creek, between W3 and W4;
- Hunter River, downstream of the Maxwell Underground; and
- Plashett Reservoir, downstream of the transport and services corridor.

Response

Areas affected by subsidence have the potential to generate increased sediment loads in Saddlers Creek and Saltwater Creek due to increased levels of bed scouring and knickpoint formation (WRM Water and Environment, 2019). Mitigation measures to reduce the potential for erosion and increased in-stream sediment are discussed in the EIS.

WRM Water and Environment (2019) has assessed the potential impacts of the Project on surface water and concluded that, "*… by implementing an effective water management system, … the Project would not result in adverse impacts on receiving waters*".

Notwithstanding, **Malabar would include the additional monitoring sites requested by MSC** as part of the monitoring program for the Project.

Management of Excess Water

Issue

MSC noted that irrigation or evaporation of water within the Project site is the most likely option for the management of any excess water that accumulates at the Project.

Response

The site water balance modelling demonstrates the proposed water management system has sufficient capacity and flexibility to accommodate a wide range of groundwater inflows and climate scenarios while (WRM Water and Environment, 2019):

- containing mine-affected water on-site, with no uncontrolled off-site release; and
- avoiding controlled release of water to the Hunter River.

Malabar would implement the water management hierarchy in the event excess water accumulates on-site. This would include irrigation or evaporation of water within the Project site (e.g. if water sharing agreements are not established or water quality is not suitable for other preferred beneficial uses).

Potential Impacts on Privately-owned Bores

Issue

MSC recommended that Malabar implements an adaptive approach to manage drawdowns on private bores, including bores that are not predicted to be impacted in the EIS.

Response

In the event that a reasonable groundwater-related complaint is received from a local landholder in relation to a potential mine-related effect on their groundwater supply, Malabar would facilitate the provision of temporary water supply to provide immediate relief while an impact investigation is undertaken, including a review of:

- site activities being undertaken at the time;
- baseline groundwater monitoring results;
- groundwater results at nearby locations;
- the prevailing and preceding meteorological and streamflow conditions; and
- changes to the land use/activities being undertaken in the area, including mining/pastoral activities.

If required, Malabar would engage a suitably qualified hydrogeologist to assist with the investigation (e.g. interpretation of monitoring results).

Should monitoring or an investigation show greater than 2 m drawdown at a privately-owned bore, and the drawdown is attributable to the Project, “make-good” provisions for the affected groundwater user would be implemented, and may include:

- deepening the affected groundwater bore;
- construction of a new groundwater bore; and/or
- provision of an alternative water supply of suitable quality and quantity.

Privately-owned Groundwater Bores

Issue

DPIE requested additional information regarding predicted drawdowns at privately-owned bores, including bores that are predicted to experience less than 2 m drawdown.

Response

Malabar undertook a Bore Census for the Project in 2018. Landowners in the vicinity of the Project were invited to participate in the Bore Census. Through this consultation, the landowners of four properties agreed to participate in the Bore Census, while owners of two properties (including Coolmore Stud) indicated that they did not want to participate in the Bore Census on the basis that their properties did not use water extracted from groundwater bores. Landowners of eight properties (including Godolphin Woodlands Stud) either elected not to participate in the Bore Census or did not respond to the request to participate in the Bore Census.

To complement the results of the Bore Census, ENRS conducted a search of the online WaterNSW database of registered bores, which identified 147 registered bores within 10 km of the Project area. A summary of details from the resulting records for registered bores within 10 km of the project is presented in Appendix E of the Groundwater Assessment and the locations of the bores are shown on Figure 31 of the Groundwater Assessment (HydroSimulations, 2019).

Based on available information on the bores from WaterNSW and site information, 62 of the 147 bores are used for groundwater monitoring and testing (HydroSimulations, 2019). Monitoring and testing bores were excluded from the impact assessment.

Potential impacts on private groundwater bores (including registered bores and those identified during the Bore Census) were evaluated using the numerical groundwater model. Predicted drawdowns at all but one of the privately-owned groundwater bores were less than the AIP minimal harm criterion of 2 m. All bores in the “highly productive” Hunter River alluvium were predicted to experience cumulative drawdowns of less than 0.5 m (HydroSimulations, 2019).

One privately-owned bore (GW029660) is predicted to experience cumulative drawdown greater than 2 m as a result of the Project and Mt Arthur Mine (including both open cut and approved underground operations). Malabar has commenced consultation with the owner regarding “make-good” arrangements that would be implemented if monitoring or an investigation show greater than 2 m drawdown at the bore that is attributable to the Project.

Void Water Quality

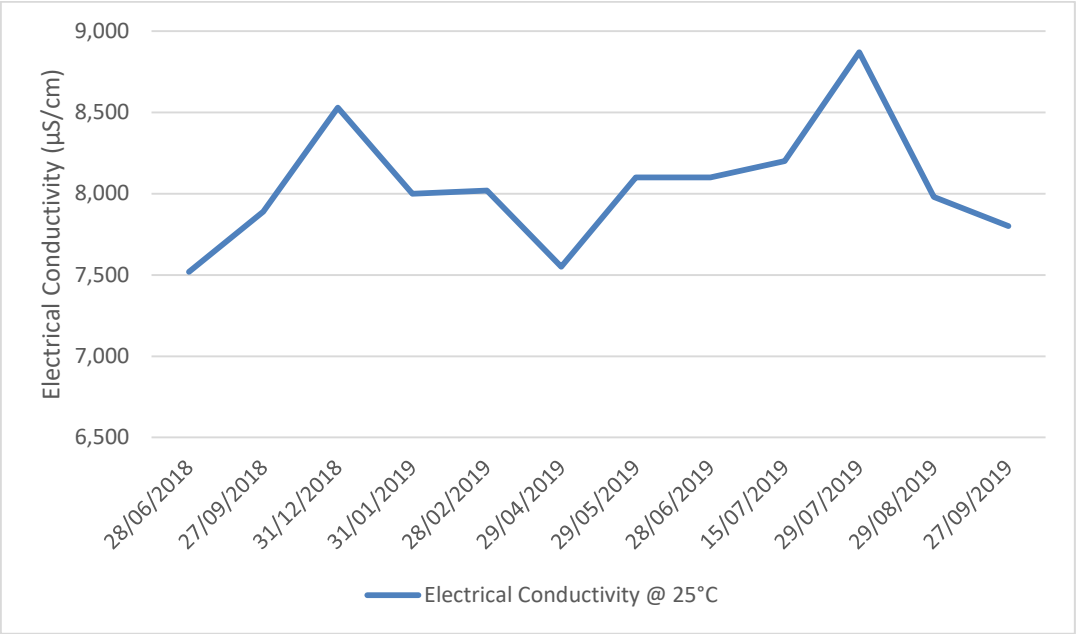
Issue

DPIE requested additional information regarding water quality in the final voids.

Response

Current water quality monitoring in the East Void indicates that EC (an indicator for salinity) ranges from 7,520 µS/cm to 8,870 µS/cm (Chart 6).

Chart 6
Existing East Void Salinity



HydroSimulations (2019) simulated the long-term behaviour of the final voids using a numerical groundwater model and determined that they would remain as permanent and localised groundwater sinks. Therefore, there would be no risk to groundwater quality as a result of the existing final voids at the Maxwell Infrastructure, including in the long-term.

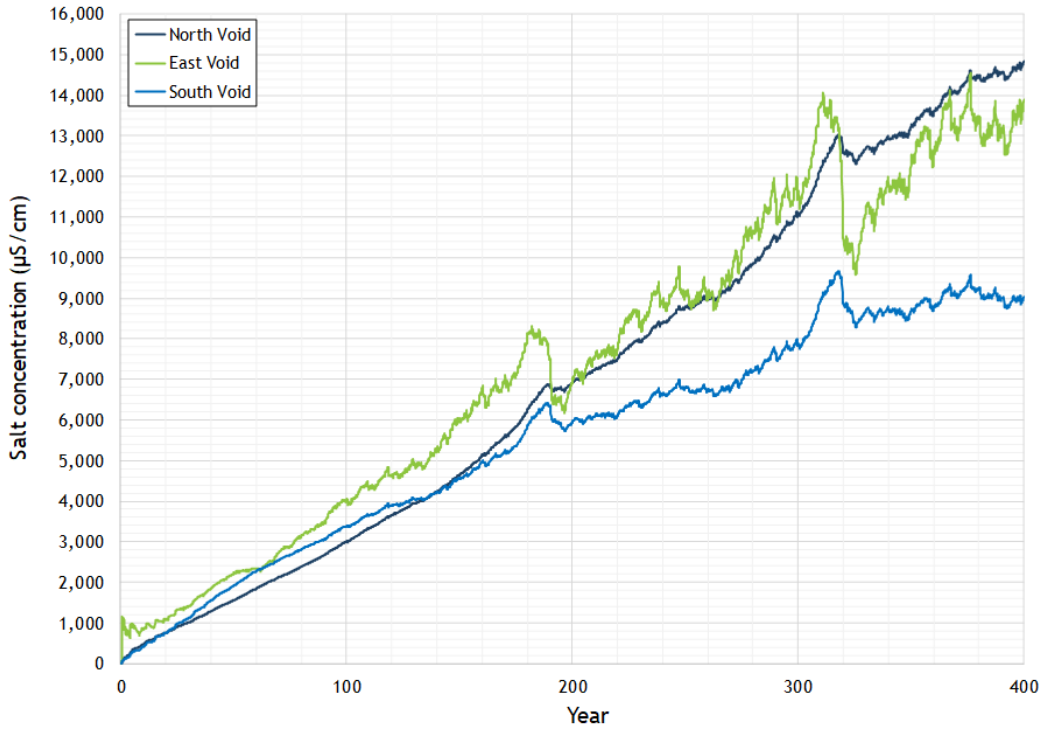
As there is no mechanism to lose salt within the closed void system, the voids continually accumulate salt over time and become hypersaline or approach hypersaline conditions over the 400-year simulation (WRM Water and Environment, 2019). The salinity in each of the voids over the 400-year simulation is shown on Chart 7.

The Geochemistry Assessment characterised CHPP Rejects that would be generated by the four coal seams in the Jerrys Plains Subgroup being targeted for the Project. The Geochemistry Assessment determined that the Rejects are expected to be enriched with As, Sb and Se in varying degrees and the contained Se is likely to be readily soluble (Geo-Environmental Management Pty Ltd [GEM], 2019).

Metals concentrations were tested in the East Void on 31 January 2019, 28 February 2019 and 15 July 2019. On all sampling events, concentrations of As, Sb and Se were below the reporting limits of 0.001 mg/L (As and Sb) and 0.01 mg/L (Se)[2].

[2] Sb was not tested on 15 July 2019.

Chart 7
Predicted Void Salinity



Source: WRM Water and Environment.

6.1.3 Air Quality

Modelling of Peak Daily Emissions

Issue

The EPA requested further information on whether peak daily emissions were modelled for each scenario.

Response

The Air Quality and Greenhouse Gas Assessment (Todoroski Air Sciences Pty Ltd [TAS], 2019a) was prepared in accordance with the *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* (the Approved Methods) (EPA, 2016) and the Secretary's Environmental Assessment Requirements (SEARs) for the Project, with emission inventories prepared and dispersion modelling conducted as per standard practice.

Each scenario in the dispersion model has included: peak daily emissions, peak rates of activity and the peak dust emissions in any hour during these periods.

Hourly varying emissions are modelled for all of the scenarios, including the maximum activity scenarios, and have been varied for meteorological factors, including wind speed.

The daily throughput assumed in modelling of the Project is based on the proposed peak annual throughput of the operation.

It should also be noted that the Project's predicted contribution to potential cumulative air quality impacts is very small. That is, the cumulative particulate matter concentrations and dust deposition levels at sensitive receivers are dominated by other sources of dust. Therefore, any short-term peaks in ROM coal extraction rates or CHPP throughput would have a relatively minor effect on proximal sensitive receivers.

Emission Factors for Stockpile Management Activities

Issue

The EPA requested clarification regarding whether dozers were included in the emissions inventory for stockpile management activities in Scenarios 1 and 2.

Response

During Scenario 1 and Scenario 2, the existing ROM pad and ROM hopper at the Maxwell Infrastructure would be utilised. Due to the relatively low tonnages proposed, any ROM coal not directly dumped to the ROM hopper would be rehandled with a front-end loader. Table 7-3 of the Air Quality and Greenhouse Gas Assessment incorporates the emissions associated with the front-end loaders on the ROM stockpiles at the Maxwell Infrastructure, represented in the emissions inventory as “Rehandle ROM at hopper”.

Once the new ROM pad is in operation and longwall mining commences (represented by ‘Scenario 3’), dozers would be used to maintain the new ROM coal stockpile at the Maxwell Infrastructure.

In regard to product stockpiles, the Project would utilise the existing stackers and reclaimers at the Maxwell Infrastructure for stockpile management activities. The proposed additional product stockpile would utilise skyline conveyor and reclaim valve system with dozer push where required. The additional product stockpile and associated dozer has been included as part of the emissions inventory in Scenario 3.

In summary, Table 7-3 of the Air Quality and Greenhouse Gas Assessment, dozers are not included in the emissions inventories for Scenario 1 and Scenario 2 for the maintenance of the ROM or product stockpiles as they would not be required during the operations that these scenarios represent.

Emission Factors for Ventilation Emissions

Issue

The EPA requested additional information regarding the derivation of the ventilation shaft emission factor.

Response

The ventilation emissions estimated for the Air Quality and Greenhouse Gas Assessment (TAS, 2019a) are based on the provisional ventilation shaft flowrates in each scenario and an assumed concentration of particulate matter in the air expelled.

The concentration adopted, approximately 4.7 milligrams of Total Suspended Particulates per Normal cubic metre (mg TSP/Nm^3), has been sourced from air quality assessments completed for existing underground mines in New South Wales (PAEHolmes, 2012; TAS, 2012), which was based on measurements from an operating ventilation shaft at an underground mine. The ventilation emissions estimated are commensurately scaled to account for the expected operations of the Project and are, therefore, considered representative.

In addition, it is noted that the ventilation shaft is removed from sensitive receivers, with the closest residence located more than 3 km away.

Emission Control Factors

Issue

The EPA requested clarification on the emission control factors adopted for the emissions inventory.

Response

The Air Quality and Greenhouse Gas Assessment has been prepared in accordance with the Approved Methods (EPA, 2016). Consistent with the Approved Methods, emission factors developed by the United States Environmental Protection Agency (1985 and updates) and Australia's National Pollutant Inventory (NPI) documentation have been used to estimate the particulate matter emissions generated by the Project.

Consistent with standard modelling practice, the dispersion modelling undertaken for the Air Quality and Greenhouse Gas Assessment includes an emissions control factor of 85% for watering along trafficked areas, including the unpaved site access road (i.e. during Year 1) and other unpaved internal roads used for rehabilitation activities at the Maxwell Infrastructure. The adopted emissions control factor has been applied for all hours for scenarios where there is traffic along unpaved roads. Note, watering would be undertaken as required to maintain unpaved roads at a suitable moisture level and, therefore, watering may not occur during every hour (e.g. water would not be required during or immediately after rainfall).

In regard to the emission control factors adopted for the unpaved site access road (during Year 1 of the Project), the EPA's Dust Stop Pollution Reduction Program included a requirement for all mines to demonstrate at least 80% dust control on unpaved roads used for coal transport (i.e. greater than the EPA's recommendation for a 75% control factor). The outcomes of the Dust Stop Pollution Reduction Program indicated that various mining operations achieved control levels greater than 90% for dust control on unpaved roads used for coal transport and, therefore, it is considered an emission control factor of 85% is appropriate for Scenario 1.

Coal transport along the site access road via trucks would only be undertaken during the initial three years of the Project, at significantly reduced tonnages. Furthermore, the site access road would be sealed before the end of Year 1 of the Project, which significantly reduces the potential for mechanical emission of particulate matter.

Consistent with standard modelling practice, the dispersion modelling undertaken also includes an emissions control factor of 85% for the implementation of an enclosure and use of fogging sprays at the hopper for the CHPP. A control factor of 70% has been applied to the conveyors and associated transfer points, for the implementation of an enclosure as well as the application of water sprays. Water sprays for the Project would typically be automated, and watering would be undertaken as required (i.e. when operational).

Wind Erosion of Exposed Surfaces

Issue

The EPA requested further information regarding the emissions from wind erosion of exposed surfaces.

Response

Appendix C of the Air Quality and Greenhouse Gas Assessment provides the comprehensive emission inventories for the three scenarios modelled. The wind erosion of the exposed surfaces included in the emission inventories for Scenario 1 and Scenario 2 are associated with the areas cleared ahead of the development of the site access road and covered overland conveyor.

Development of the mine infrastructure, transport and services corridor would be progressive. Land would be cleared ahead of construction activities (e.g. cut and fill operations, roadway development). Once the construction activities are complete (e.g. the site access road or covered, overland conveyor have been developed), the areas not used for operation would be stabilised, removing the potential to generate particulate matter emissions via wind erosion.

Note, as the Project would be an underground mine, there would not be significant exposed areas during the operational phase (in contrast to the disturbance areas typically associated with open cut mines).

Wind erosion from the ROM coal stockpiles and product stockpiles was included in all scenarios modelled and is presented in Appendix C of the Air Quality and Greenhouse Gas Assessment.

Change in Product Coal and ROM Coal Ratio

Issue

The EPA requested clarification on the changes in the ratio of product coal and ROM coal between the modelled scenarios.

Response

The changes in the ratio of product coal and ROM coal between the modelled scenarios in the Air Quality and Greenhouse Gas Assessment (TAS, 2019a), is a result of retention of water during processing of the coal.

Most of the ROM coal is treated through a wet process, this process increases the moisture content of both the product coal and CHPP reject material. The data presented in the Air Quality and Greenhouse Gas Assessment is reported on an "as received" moisture basis. The difference presented in the EPA's submission is the tonnes of water added as a result of the coal processing, that is delivered either to the customer with the product coal or that cannot be recovered from the coal rejects.

Presentation of Cumulative Assessment Predictions

Issue

The EPA requested the cumulative assessment predictions for annual average and 24-hour average, be presented in a segregated format.

Response

TAS (2019b) has prepared revised summaries of the predicted annual average cumulative impacts of the Project in the format requested by the EPA (Attachment 3).

It would not be practical to process the measured 24-hour average background levels using the same methodology as the annual average analysis, as the data required would not be available (i.e. hourly varying emission rates for surrounding operations). As such, the results cannot be presented in a segregated format and no changes have been made to the 24-hour average cumulative impact assessment presented in Appendix F of the Air Quality and Greenhouse Gas Assessment.

Note, the approach to the 24-hour average cumulative assessment for $PM_{2.5}$ and PM_{10} added the predicted increment of the Project to the measured background concentration level (which includes the surrounding mining operations) to estimate the cumulative 24-hour average $PM_{2.5}$ and PM_{10} impacts. This approach is consistent with EPA Level 2 assessment methodology (Section 11.2 of the Approved Methods).

Notwithstanding, the 24-hour cumulative impact analysis has been extended to Receiver 389, as requested (Attachment 3).

Reactive Air Quality Management System

Issue

The EPA requested additional details regarding the reactive air quality management system.

Response

The reactive air quality management system that would be developed for the Project would comprise various alert levels (e.g. green, amber and red) based on the particulate matter concentrations and meteorological parameters recorded at relevant monitoring locations.

A range of meteorological triggers that indicate a higher potential for dust generation would be considered. For example, a check for rainfall in the preceding hours, a check for high temperature (e.g. greater than 38 °C) and a check for wind towards the receivers the monitor is representing. As the key sensitive receivers are to the north and north-east of the Maxwell Infrastructure, triggers would likely require winds from the south or south-west. An upper bound may also be placed on the wind speed (e.g. wind speed must be greater than 8 m/s).

The particulate matter concentration triggers would be developed such that the different levels of alert would have corresponding increased levels of management/control actions. The highest level of alert would include operational changes to some dust-generating activities to maintain compliance with the relevant air quality criteria at sensitive receivers.

The reactive air quality management system and associated particulate matter concentration and meteorological triggers would be documented in an Air Quality Management Plan to be prepared for the Project in consultation with the relevant government agencies.

Site Access Road

Issue

MSC recommended that the site access road is sealed prior to construction and development of the Mine Entry Area.

Response

The site access for the Project would be from Thomas Mitchell Drive via the existing road. The access to the MEA would be via a roadway consisting of upgrades to existing internal roadways plus the development of new formation.

To balance earthworks volumes and material placement the MEA and the site access road need to be constructed simultaneously. The site access road would be sealed during the first year of mining operations. During this first year only relatively small quantities of coal would be transported (less than 500 kilotonnes).

The Air Quality and Greenhouse Gas Assessment (TAS, 2019a) considered the potential air quality impacts associated with the use of the unsealed sections of the site access road during construction in the first year of operations and demonstrated there would be no adverse air quality impacts on receivers (TAS, 2019a). As discussed in Section 6.1.2, during construction of the transport and services corridor, dust would be mitigated by watering. Erosion control structures would also be established to capture any runoff water.

In addition, the commencement of the extraction of early ROM coal while the site access road is being sealed would facilitate early employment and the associated social benefits of the Project.

6.1.4 Noise

Construction Noise Predictions against the Interim Construction Noise Guidelines

Issue

The EPA requested the noise predictions for the construction activities assessed against the relevant criteria in the *Interim Construction Noise Guidelines* (ICNG).

Response

The Noise Impact Assessment prepared for the EIS (Wilkinson Murray Pty Ltd [Wilkinson Murray], 2019a) includes a quantitative assessment of construction noise in accordance with the ICNG (DECC, 2009). Table 6-4 of the Noise Impact Assessment indicates construction noise levels would generally comply with the noise management levels recommended in the ICNG.

Cumulative Assessment of Construction and Operational Noise

Issue

The EPA requested clarification on the assessment of potential cumulative impacts of construction noise and operational noise.

Response

The ICNG and *Noise Policy for Industry* (NPfI) (EPA, 2017) do not provide guidance regarding the assessment of potential cumulative impacts of construction noise and operational noise. That is, the ICNG considers construction noise only and the NPfI considers operational noise only. Construction and operational noise levels are typically considered cumulatively in cases where:

- the construction noise would likely be indistinguishable from operational noise, as perceived by relevant receivers; and
- the construction activities would be undertaken over a significant period.

For the northern receivers, noise associated with upgrades at the existing Maxwell Infrastructure would largely be indistinguishable from operational activities, given the deployment of similar equipment and proximity to operational activities, and the construction activities would be undertaken for more than a year. Therefore, potential construction noise at the Maxwell Infrastructure was assessed in combination with operational noise against the daytime (operational) Project Noise Trigger Levels (PNTLs).

Construction activities associated with the site access road and covered, overland conveyor would progress along the transport and services corridor. The length of the transport and services corridor is approximately 10 km. Therefore, daytime construction works along the transport and services corridor are only expected to contribute to overall daytime noise levels for relatively short durations at the northern receivers (i.e. only 5-15% and 3.5-10% of the daytime of Year 1 and Year 3, respectively). Noise contributions from construction works at the northernmost end of the transport and services corridor were, therefore, not included in the operational noise modelling scenarios.

Notwithstanding, noise predictions for proposed construction and operation activities at the Maxwell Infrastructure, as well as construction activities at the northernmost end of the transport and services corridor are provided in Appendix E of the Noise Impact Assessment.

Low-Frequency Noise Assessment

Issue

The EPA requested further information on the low-frequency noise assessment and a detailed explanation on the normalising process in relation to low-frequency noise correction undertaken.

Response

Wilkinson Murray (2019b) (Attachment 4) has prepared a more detailed description of the low-frequency noise assessment completed for the Project, which includes the low-frequency noise curves reviewed for the assessed receiver locations and describes the normalisation process undertaken.

The low-frequency noise curves, based on data gathered from an audit undertaken for another Hunter Valley mine (Figures 1, 2 and 3 of Attachment 4), show that no privately-owned receiver is expected to experience dominant low-frequency noise.

The analysis provided in Section 5.6 of the Noise Impact Assessment (Wilkinson Murray, 2019a) is consistent with annual compliance noise assessments conducted for previous operations associated with the site, which showed that the audible mining operations at the northern receivers did not have dominant low-frequency content. The key fixed infrastructure used for the Project would be similar to the previous operations at the site.

Results of noise monitoring to be conducted for the Project would be assessed against the NPfI with respect to modifying factors (including for low-frequency noise). If monitoring results are found to contain dominant low-frequency content, appropriate modifying factors (i.e. penalties) would be applied to measured levels, in accordance with the NPfI, to account for additional annoyance at the receiver.

Noise Predictions with and without Pro-Active Noise Management Measures

Issue

The EPA requested the predicted noise levels both with and without mitigation at all receivers.

Response

The predicted operational noise levels of the Project are provided in Table 5-10 of the Noise Impact Assessment (Wilkinson Murray, 2019a). Where exceedances of the PNTLs (derived in accordance with the NPfI) are predicted in the absence of the proposed pro-active noise mitigation measures, which would be implemented during relevant noise-enhancing meteorological conditions, only the predicted level incorporating the proposed pro-active noise mitigation measures were presented in Table 5-10 (Wilkinson Murray, 2019a). The predicted noise levels in the absence of the proposed pro-active mitigation measures were nonetheless included in Appendix D of the Noise Impact Assessment (Wilkinson Murray, 2019a).

Note all noise level predictions presented in the Noise Impact Assessment (Wilkinson Murray, 2019a), including those in Table 5-10 and Appendix D, incorporate the reasonable and feasible mitigation measures that would be implemented for the Project. These mitigation measures include the installation of noise controls on a selection of mobile plant during fleet procurement and enclosure/acoustic shrouding and acoustic design for selected infrastructure items – including the covered, overland conveyor and ventilation fans.

It is assumed that the EPA's request relates to the provision of predicted noise levels at all receivers with and without the proposed pro-active noise management measures, not with and without all noise mitigation measures. As requested by the EPA, Wilkinson Murray (2019b) (Attachment 4) has prepared additional tables summarising the predicted noise levels with and without the proposed pro-active mitigation measures at all receivers.

Any Development Consent noise criteria for a receiver with no predicted exceedances of the PNTLs should be set at the PNTLs, not a predicted level lower than the PNTLs, in accordance with the NPfI.

Noise Monitoring and Management

Issue

MSC emphasised the importance of managing noise generated by the Project.

Response

A Noise Impact Assessment for the Project was undertaken by Wilkinson Murray (2019a) and is presented in Appendix I of the EIS.

Potential noise impacts are significantly mitigated by the adoption of underground mining methods and other Project design measures. The assessment of potential noise impacts is based on modelling that incorporates a range of conservative assumptions (including the operation of the Project continually working at the maximum production rate).

The Maxwell Infrastructure is located in the vicinity of residences in the Antiene and East Antiene residential areas located north of Thomas Mitchell Drive and near the New England Highway. Noise generated by the Maxwell Infrastructure during the Project life would generally be less than previously approved levels for open cut operations at the former Drayton Mine, which operated for over 30 years (Wilkinson Murray, 2019a).

Noise contributions from the Project at the Coolmore and Godolphin Woodlands Studs and Hollydene Estate Wines would be indistinguishable from background noise (Wilkinson Murray, 2019a).

A pro-active noise management system would be implemented to manage noise levels from the Project at nearby receivers (i.e. to reduce the likelihood that Project noise levels would exceed predicted operational noise levels at receiver locations).

A meteorological forecasting system would be used in conjunction with the real-time noise monitoring system, and would provide an alert for Malabar personnel to review the real-time data and to change or restrict surface operations as may be required. The Noise Management Plan would provide details on the operation of the pro-active noise management system.

With the implementation of appropriate Project mitigation measures, negligible or no exceedance of the Project noise trigger levels is predicted at all but four privately-owned receivers to the north of the Maxwell Infrastructure (Wilkinson Murray, 2019a).

The four properties that were predicted to experience marginal exceedances of the Project-specific noise trigger levels would have the right to request mitigation measures such as mechanical ventilation/comfort condition systems to enable windows to be closed (Wilkinson Murray, 2019a). Malabar, when requested, would implement mitigation measures in accordance with the *Voluntary Land Acquisition and Mitigation Policy – For State Significant Mining, Petroleum and Extractive Industry Developments* (VLAMP) (NSW Government, 2018) at these properties.

During the exhibition period for the Project, Malabar offered to meet with the four landowners with properties predicted to experience marginal exceedances of the Project-specific noise trigger levels. Two landowners accepted the opportunity at which time they were provided with an explanation of potential impacts to their properties along with explanations of the proposed mitigation measures.

6.1.5 Road Transport

Thomas Mitchell Drive and Denman Road Intersection

Issue

The RMS recommended assessment of the Thomas Mitchell Drive and Denman Road intersection without the upgrades required under Condition 47(c) of the Project Approval (09_0062) for the Mt Arthur Mine.

Response

The Road Transport Assessment (The Transport Planning Partnership [TTPP], 2019a) assessed the peak hour performance of key intersections with total predicted future traffic volumes using SIDRA. This included consideration of the Thomas Mitchell Drive and Denman Road intersection, both with and without the upgrades required under Condition 47(c) of the Project Approval (09_0062) for the Mt Arthur Mine.

The SIDRA results for the Thomas Mitchell Drive and Denman Road intersection, without the upgrades required under Project Approval (09_0062), are summarised in Table 5. During the evening peak hour, vehicles at this intersection currently experience delays, with limited spare capacity available to exit Thomas Mitchell Drive via a right turn (TTPP, 2019a).

Table 5
Predicted Performance of Thomas Mitchell Drive and Denman Road Intersection without Planned Upgrades

Year	Forecast Baseline Level of Service (without the Project)		Forecast Level of Service (with Project)	
	Morning Peak	Evening Peak	Morning Peak	Evening Peak
2020	C	F	C	F
2026	C	F	C	F
2033	C	D	D	D

The Thomas Mitchell Drive and Denman Road intersection is expected to be upgraded in accordance with Condition 47(c) of the Project Approval (09_0062) for the Mt Arthur Mine.

If the Thomas Mitchell Drive and Denman Road intersection is upgraded to a layout similar to the existing intersection of Thomas Mitchell Drive and the New England Highway, the evening peak hour performance of the intersection in 2026 would improve from a Level of Service F to a Level of Service A, both with and without Project traffic contributions (TTPP, 2019a).

Mangoola Coal Continued Operations Project Interaction with Site Access Road

Issue

RMS recommended clarification regarding traffic generated by the Mangoola Coal Continued Operations Project. Specifically, RMS requested clarification regarding turning movements generated at the Site Access Road and Thomas Mitchell Drive intersection.

Response

The Mangoola Coal Continued Operations Project would only contribute to through traffic at the intersection of the site access road and Thomas Mitchell Drive.

The contribution of through movements from the Mangoola Coal Continued Operations Project was determined by TTPP (2019b) from the traffic volume figures in Appendix B of the *Mangoola Coal Continued Operations Project Traffic and Transport Report* (GHD, 2019). These are reproduced in Figures 5 and 6 below.

Figures 3.1 to 3.6 of the Road Transport Assessment present Project traffic movements only.

Construction Workforce Parking

Issue

RMS requested additional information regarding parking arrangements for the peak construction workforce.

Response

Maxwell Infrastructure Parking (300 to > 600 vehicles)

On-site parking would be provided at the existing Maxwell Infrastructure carpark (which provides parking for around 300 vehicles in delineated car parks) (Figure 7). There are also sealed and unsealed areas available that could more than double the capacity at the Maxwell Infrastructure location.

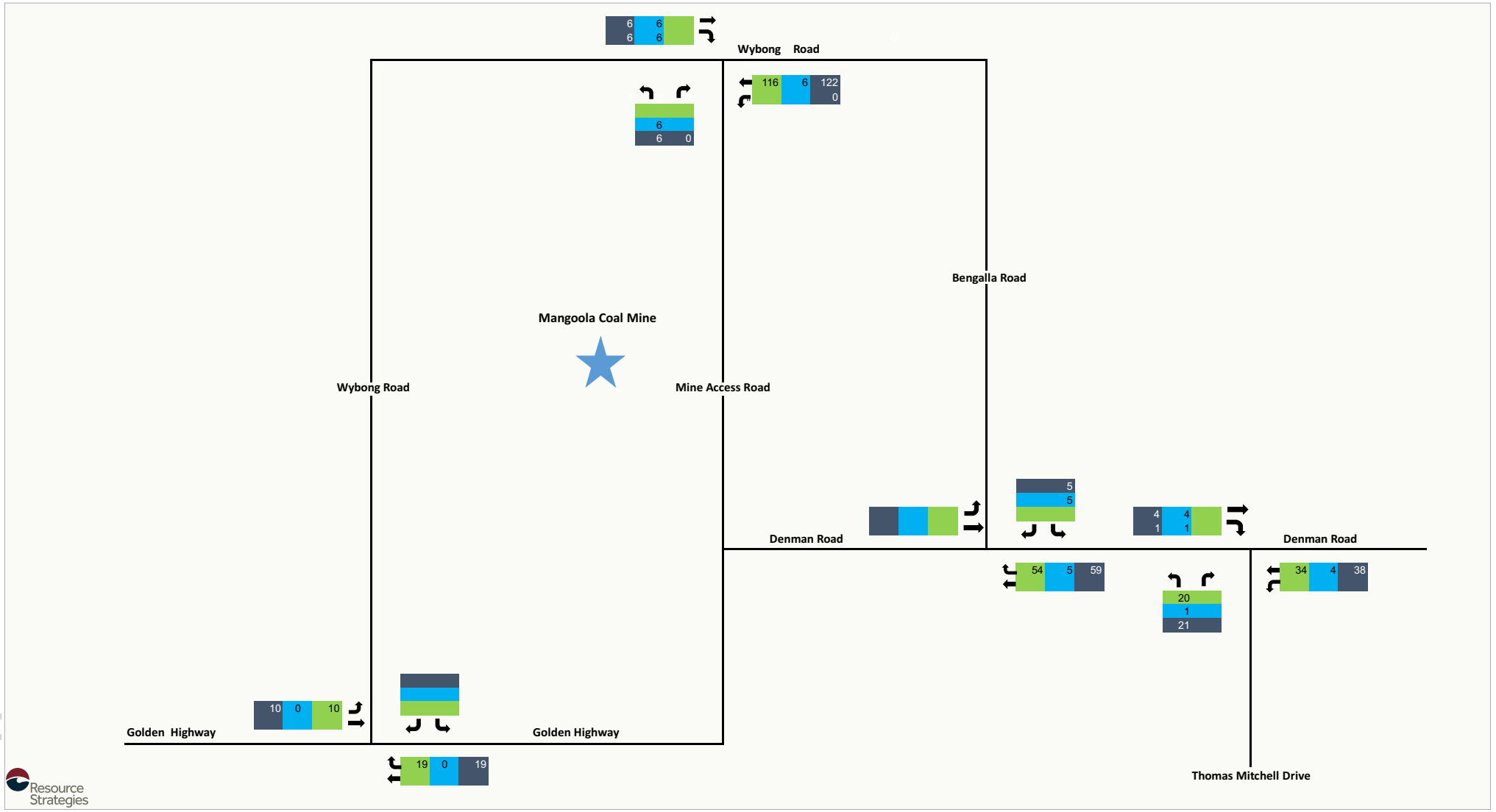
Maxwell MEA Parking (200 vehicles)

A new carpark (providing for at least 200 vehicles) would be established at the MEA, at the southern end of the proposed internal access road (refer Figure 3-5 of the EIS).

Hence, total parking capacity would be at least 500 vehicles with the potential to increase to more than 800.

Initial construction activity is expected to generate an average of 90 personnel, and a maximum of 250 personnel. At peak construction, it is estimated that night work would employ approximately 40 personnel, and the remaining 210 personnel would work during the day.

At peak construction, the Project is forecast to generate fewer vehicle trips per day than the former Drayton Mine generated in November 2013 (TTPP, 2019b). Accordingly, the existing and proposed on-site parking facilities are considered sufficient for the Project.



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Resource Strategies

LEGEND
Light Vehicles
Heavy Vehicles
Total Vehicles

Source: GHD (2019)

MALABAR COAL

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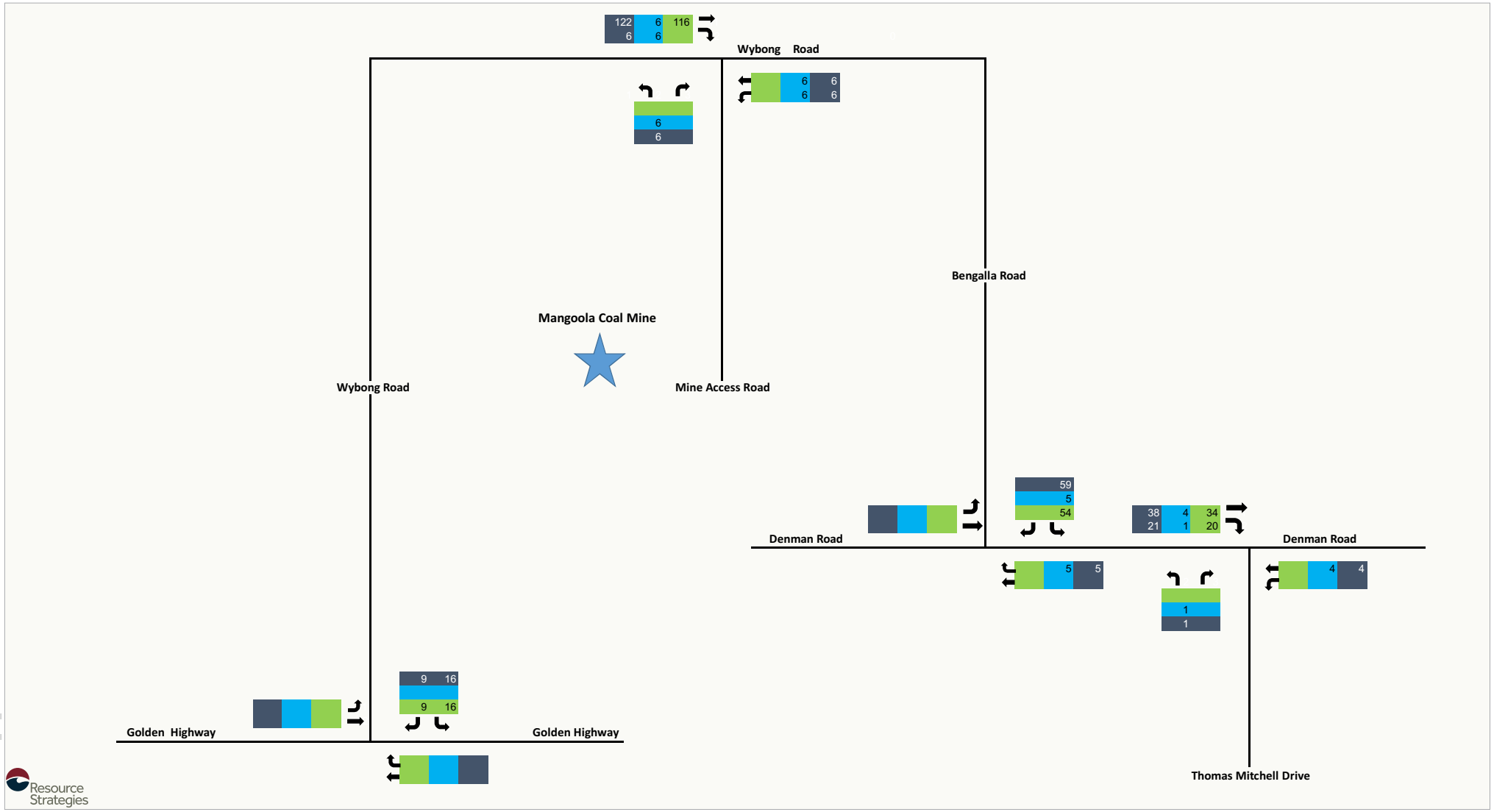
Mangoola Coal Continued Operations
Project Traffic Distribution
- Morning Peak

Figure 5



LEGEND
- Light Vehicles
- Heavy Vehicles
- Total Vehicles

Source: GHD (2019)

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Mangoola Coal Continued Operations
Project Traffic Distribution
- Evening Peak

Figure 6

Orthophoto: 2016

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MAXWELL PROJECT

Maxwell Infrastructure
Parking Facilities

Figure 7

Dangerous Goods Transport

Issue

Transport for NSW requested information regarding the transport of dangerous goods.

Response

The transportation, handling and storage of all dangerous goods for the Project would be conducted in accordance with the requirements of the *NSW Work Health and Safety Regulation, 2017* (or its latest equivalent).

The dangerous goods required for the Project would include compressed gases, flammable and combustible liquids, and corrosive substances.

Deliveries of dangerous goods would arrive at the Project via the existing site access road off Thomas Mitchell Drive. Thomas Mitchell Drive is under the control of Muswellbrook Shire Council and is an approved B-double route (RMS, 2019a). There are no schools located on Thomas Mitchell Drive and this road is also used by the Mt Arthur Mine and Muswellbrook Industrial Area.

Access to Thomas Mitchell Drive is via the New England Highway (Highway 9, Route A15), Denman Road (Main Road 209) or the Muswellbrook Industrial Area, which are also approved B-double routes (RMS, 2019a).

The transportation routes would be dependent on the location of contractors used to supply the respective goods. All dangerous goods required for the Project would be transported in accordance with State legislation.

Edderton Road Flood Immunity

Issue

The BCD requested clarification on the potential risk to the flood immunity of Edderton Road.

Response

The flood immunity of Edderton Road in the vicinity of the Project is determined by flooding in Saddlers Creek. There are no other watercourses that flood in the vicinity of Edderton Road where it is proximal to the Project.

The extent of conventional subsidence for the Project and the potential realignment of Edderton Road are both located outside the predicted probable maximum flood (PMF) extent of Saddlers Creek (Figure 8). Therefore, the Project would not influence the flood immunity of Edderton Road.

Bimbadeen Road Intersection

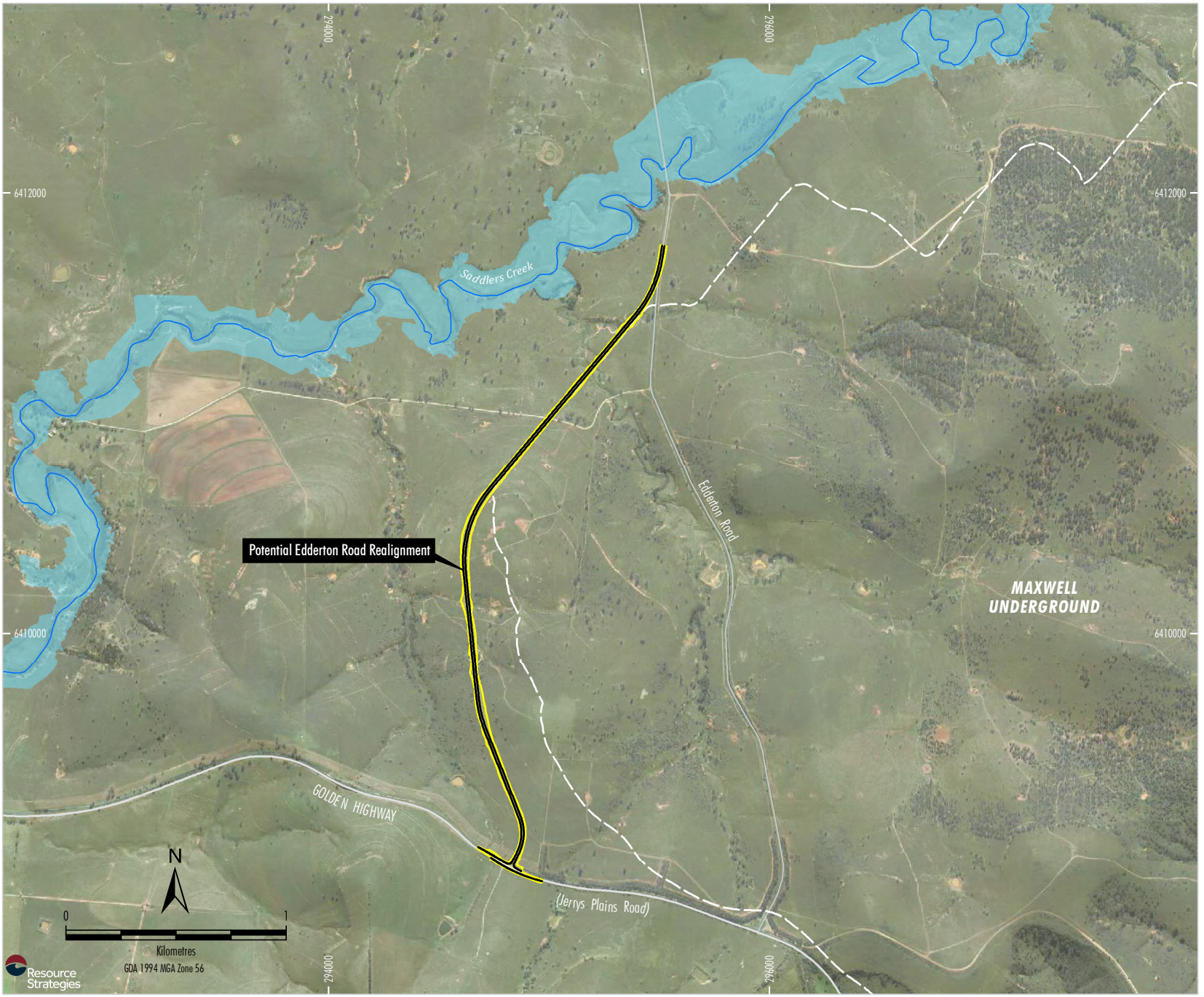
Issue

MSC recommended that the Development Consent for the Project include a requirement for a financial contribution to the upgrade of the Bimbadeen Road and New England Highway intersection to enable residential subdivisions that will utilise Bimbadeen Road.

Response

Malabar has undertaken negotiations to make an annual Community Contribution under a Voluntary Planning Agreement (Section 6.1.9) with the MSC. If the committee established to make recommendations on the distribution of the annual Community Contribution supports funding of an upgrade of the Bimbadeen Road and New England Highway intersection Malabar would not object to this use of the funds.

Malabar will also make financial contributions to the MSC through payments of Council rates.



LEGEND

- Indicative Surface Development Area
- Extent of Conventional Subsidence (20 mm subsidence contour)
- Probable Maximum Flood Extent

Source: © NSW Department of Planning and Environment (2019); NSW Department of Finance, Services & Innovation (2019) Orthophoto Mosaic: 2018, 2016, 2011

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MAXWELL PROJECT

Edderton Road Flood Immunity

Figure 8

SHM-18-03 Maxwell_RtoS_205A

Edderton Road Closures

Issue

MSC recommended that road closures on Edderton Road are limited, with the aim of closures being similar in duration to those required at other mines for blasting.

Response

The Subsidence Assessment (Mine Subsidence Engineering Consultants Pty Ltd [MSEC], 2019) reviewed the subsidence impacts on Broke and Charlton Roads, which were predicted to have similar magnitudes of subsidence effects (e.g. maximum curvatures) as Edderton Road. The impacts on Broke Road and Charlton Road 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.

During active subsidence some reduction in speed limits would be required. Some lane closures are likely with portable traffic lights or traffic controllers managing flow through the area (contraflow); however, full road closures are unlikely.

Therefore, it is expected that potential subsidence impacts on Edderton Road would be managed while maintaining Edderton Road open for through traffic.

New England Highway and Thomas Mitchell Drive Intersection

Issue

MSC recommended a full audit and design review of the New England Highway and Thomas Mitchell Drive intersection.

Response

The high-risk rating identified in the road safety audit relates to the shared cycle and turn lane in New England Highway approach to Thomas Mitchell Drive. Due to the high-speed environment on New England Highway, the intersection design should ideally consider the NSW best practice for crossing points at off-ramps of motorways (Roads and Traffic Authority, 2005), which includes a designated bicycle lane to the left of the left turn lane, with a designated point for the bicycle through movements to cross the left turn lane (TTPP, 2019a).

Any improvements to meet best practice are the responsibility of RMS, being the authority responsible for New England Highway (TTPP, 2019a).

Thomas Mitchell Drive and Site Access Road Intersection

Issue

MSC queried whether upgrades to the intersection of Thomas Mitchell Drive and the Site Access Road are required, particularly in relation to its location on a curved section of Thomas Mitchell Drive and projected increases in vehicle volumes.

Response

A Road Safety Audit (TTPP, 2018) was carried out by the following team of road safety auditors, registered with the NSW Centre for Road Safety:

- Ken Hollyoak (RSA-02-0249) – Level 3 road safety auditor (team leader); and
- Wayne Johnson (RSA-02-0769) – Level 3 road safety auditor (team member).

The Road Safety Audit was undertaken in accordance with the procedures outlined in the *Guidelines for Road Safety Audit Practices* (NSW Roads and Traffic Authority, 2011). The checklist contained within the *Guide to Road Safety: Part 6 Road Safety Audit* (Austroads, 2009) was also used as a reference in the audit. Key elements examined included:

- general topics;
- design issues;
- intersections;
- lighting, signs and delineation;
- physical objects;
- environmental constraints; and
- other matters.

The Road Safety Audit did not identify any specific road safety issues at or near the intersection of Thomas Mitchell Drive and the site access road that would warrant changes to its design or condition. The channelised left and right turn treatments at the existing intersection of Thomas Mitchell Drive with the site access road meet or exceed the treatment warrants as set out in Austroads (2017), allowing turning vehicles to slow and shelter clear of through traffic, with a significantly reduced risk of rear end and overtaking crashes. The existing intersection design is, therefore, considered appropriate for the forecast conditions (TTPP, 2019a).

The Project is forecast to generate less vehicle trips per day at its peak operational and construction phases than the former Drayton Mine generated in November 2013 (TTPP, 2019b).

Access to Site via Edderton Road

Issue

MSC recommended a Development Consent condition prohibiting access to the site from Edderton Road for mining-related activities.

Response

Agricultural and other land management activities would continue on Malabar-owned properties throughout the life of the Project. Access for these activities would continue to use existing access points on the Golden Highway and Edderton Road.

Malabar would be prepared to accept a condition to address MSC's recommendation, provided it does not preclude using Edderton Road and the Golden Highway for activities such as those described above.

Edderton Road Realignment

Issue

MSC noted that it is the relevant road authority for Edderton Road and, therefore, Malabar will be required to consult with MSC regarding the potential realignment or remediation of Edderton Road. MSC also noted that its current policy is to not approve any closures to public roads until the *Mine Affected Roads Network Plan* (MSC, 2015) has been reviewed and updated.

Response

Any realignment of Edderton Road would be subject to necessary approvals under the *NSW Roads Act, 1993* and consultation with RMS and MSC.

In the event that Edderton Road is undermined, a Built Features Management Plan would be prepared in consultation with the MSC.

Road Maintenance Contributions

Issue

MSC noted that Malabar is required to consult with MSC and DPIE to develop a plan to contribute to the maintenance of local roads under the control of MSC.

Response

Malabar's Voluntary Planning Agreement offers to contribute to the maintenance of Thomas Mitchell Drive. Thomas Mitchell Drive connects to two RMS maintained roads; the New England Highway to the east, and Denman Road to the west.

Also, as a rate payer Malabar will contribute to the overall funding of MSC activities, including road maintenance.

Emergency Product Coal Haulage

Issue

MSC stated that any emergency product coal haulage must meet the relevant road limits for public roads.

Response

Consistent with the current approval for the Antiene Rail Spur (DA 106-04-00), coal would only be hauled on public roads under emergency or special situations and with the prior written permission of the Secretary of the DPIE, RMS and MSC. All truck loads would meet the relevant load limits for public roads.

6.1.6 Biodiversity

Centralised Gas Management Infrastructure

Issue

The BCD requested clarification regarding the assessment of potential impacts of the centralised gas management infrastructure on threatened species and communities.

Response

The centralised gas management infrastructure would be located within the MEA, which would be contained within the Biodiversity Assessment Development Footprint that was assessed as part of the BDAR. The centralised gas management infrastructure would be constructed in the vicinity of the upcast ventilation shaft, which is shown on Figure 9.

Subsidence Remediation Activities

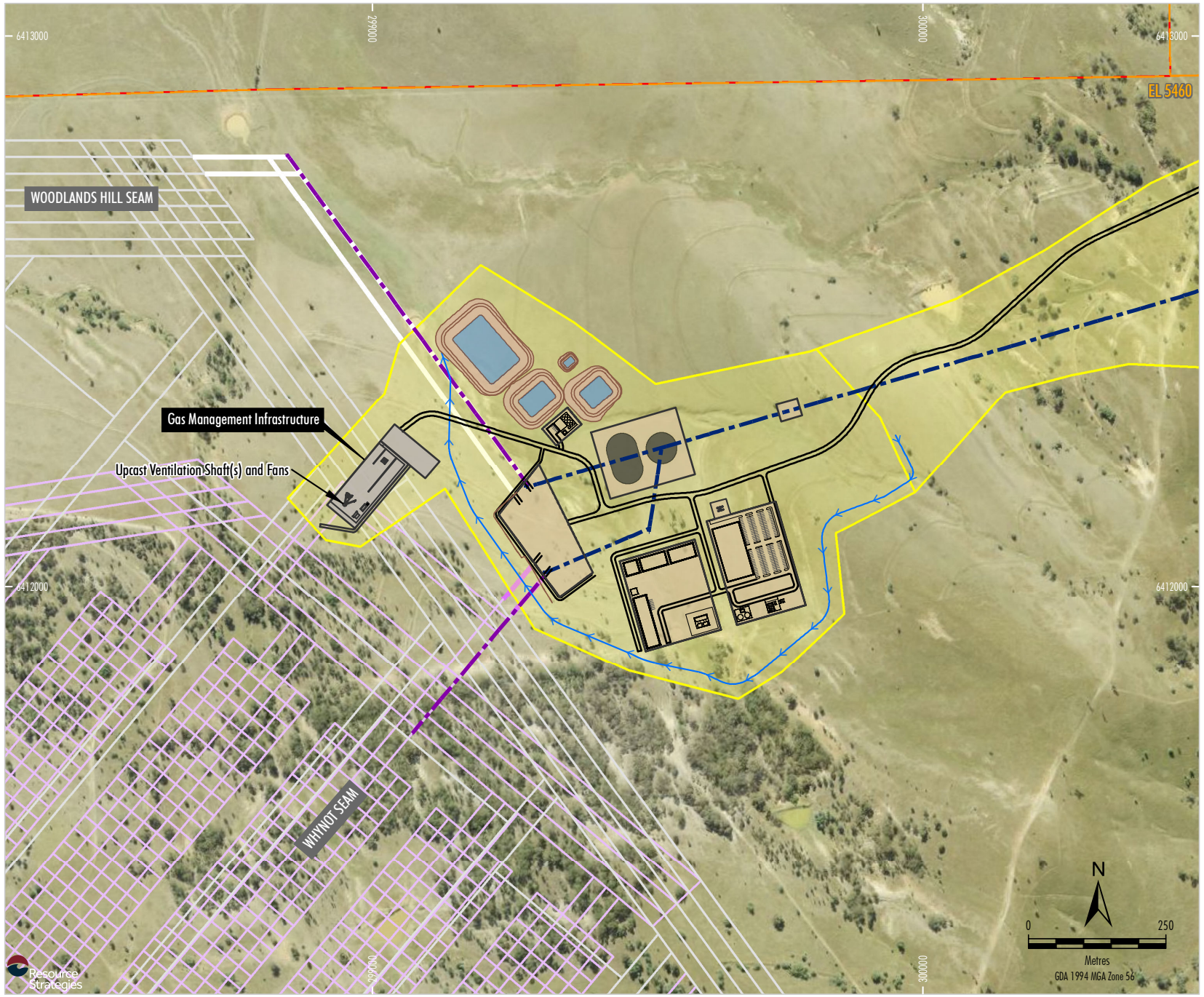
Issue

The BCD and MSC requested clarification regarding the assessment of potential impacts that remediation works for subsidence cracks would have on threatened species.

Response

Table 29 of the BDAR includes a commitment to review the environmental impacts caused by surface remediation activities and states that prior to any remediation of surface cracks there would be:

> *Review of environmental impacts that may result from subsidence remediation (threatened flora species and populations, rocky areas that may provide habitat for threatened lizards) and consideration of whether alternative methods of remediation are warranted (e.g. without machinery).*



LEGEND

- Exploration Licence Boundary
- Mining and Coal Lease Boundary
- Indicative Underground Mining Layout
- Indicative Surface Development Area
- Indicative Surface/Overland Conveyor Location
- Indicative Underground Conveyor Location

Source: © NSW Department of Planning and Environment (2019); NSW Department of Finance, Services & Innovation (2019); GHD (2018)
Orthophoto: NSW Department of Finance, Services & Innovation (2018)

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Location of Centralised Gas Management Infrastructure

Figure 9

SHM-18-03 Maxwell_RtoS_206A

The above commitment covers threatened flora such as the Pine Donkey Orchid (*Diuris tricolor*) (which Malabar have fenced off with a buffer of 20 m for the previously recorded sites on Malabar-owned land) and threatened reptiles such as the Pink-tailed Legless Lizard (*Aprasia parapulchella*) and the Striped Legless Lizard (*Delma impar*).

Prior to causing any subsidence, Malabar would be required to prepare and submit Extraction Plans for approval by the DPIE. The Extraction Plans would include a plan to manage and remediate subsidence impacts and/or environmental consequences (e.g. remediation of observed surface cracking). The majority (approximately 73%), of the area within the extent of conventional subsidence is derived native grassland in which subsidence can be readily remediated. Therefore, in most cases, impacts that may result from remediation would be temporary.

Malabar consider that it is appropriate for subsidence remediation to be adaptively managed through Extraction Plans. The NSW *Biodiversity Assessment Method* (BAM) (Office of Environment and Heritage [OEH], 2017) is not intended, or required, to be continually applied during implementation of an SSD (i.e. this Project).

Assessment of Unexpected Subsidence Impacts

Issue

The BCD recommended that unexpected mine subsidence impacts be assessed using the BAM.

Response

The impact assessments in the Subsidence Assessment for the Project have been prepared in consideration of uncertainties associated with subsidence impacts and based on a conservative prediction methodology.

Furthermore, the Subsidence Assessment was peer reviewed by Professor Bruce Hebblewhite (Attachment 6 of the EIS). In relation to the subsidence prediction methodology the peer reviewer, Professor Bruce Hebblewhite, noted:

> *It is noted that much of the Study Area is agricultural land with relatively few sensitive features that could be adversely impacted by the subsidence effects discussed. To this extent, the application of the MSEC IPM prediction methodology is considered to provide reasonable levels of confidence for subsidence prediction and impact assessment, given that "worst-case" scenarios have been adopted in the cases where greatest uncertainty exists.*

It should be noted that Extraction Plans would also be prepared for the Project, which would include a Biodiversity Management Plan, and would provide:

- a summary of relevant background or baseline data;
- a review of predictions of the potential subsidence effects, subsidence impacts and environmental consequences, incorporating any relevant information obtained since the EIS (such as monitoring results obtained during mining);
- a monitoring program to provide data to assist with the management of the risks associated with subsidence, validate subsidence predictions and analyse the relationship between subsidence effects and impacts and any ensuing environmental consequences;
- a plan to manage and remediate subsidence impacts and/or environmental consequences (e.g. remediation of observed cracking);
- TARPs to identify risks and outline specific follow-up actions to avoid exceedances of agreed performance measures;
- contingency plans that provide for adaptive management where monitoring indicates that there has been an exceedance of agreed performance measures; and
- reporting and review mechanisms.

Malabar consider that it is appropriate for subsidence remediation to be adaptively managed through Extraction Plans. The BAM is not intended, or required, to be continually applied during implementation of an SSD (i.e. this Project).

Active Management of Diuris Tricolor

Issue

The BCD recommended that the area of *Diuris tricolor* plants is subject to active management of plants that may out-compete the orchid.

Response

Malabar agrees to actively manage exotic tussock grasses or other plants within the *Diuris tricolor* enclosed area that may out-compete *Diuris tricolor*. The management of the *Diuris tricolor* enclosed area would be detailed in the Biodiversity Management Plan, and would include consideration of slashing or restricted grazing when the orchids are dormant in summer.

Vegetation along Saddlers Creek and Saltwater Creek

Issue

The BCD and NRAR and DPIE – Water recommended that monitoring of riparian vegetation (i.e. Swamp Oak) along Saddlers Creek and Saltwater Creek be undertaken as part of the Project.

Response

Potential impacts to riparian vegetation along Saddlers Creek and Saltwater Creek were assessed in accordance with the BAM. The Biodiversity Development Assessment Report (BDAR) describes that the Swamp Oak within the Saddlers Creek and Saltwater Creek are likely to be primarily accessing the stream baseflow and seepage in the soil profile rather than the deeper groundwater.

HydroSimulations (2019) also found that stream baseflow (and surface water flow) would not be affected by the predicted Project groundwater drawdown in the alluvium. Consequently, it is unlikely that the predicted Project groundwater drawdown would adversely impact the Swamp Oak along either Saddlers Creek or Saltwater Creek.

Given that no loss of vegetation or habitat is predicted, in accordance with the BAM, credits are not required to be generated.

Notwithstanding, Malabar would implement a monitoring program for the riparian vegetation along Saddlers Creek, which would include:

- monitoring of the shallow, alluvial bores in the Saddlers Creek alluvium (MW1, MW2, MB2-Alluvial and MB3-Alluvial); and
- annual Swamp Oak health inspections on Saddlers Creek and Saltwater Creek.

Malabar has an existing data-sharing agreement with BHP for the Mt Arthur Mine, and would periodically request monitoring data collected from the shallow, alluvial bores in Saddlers Creek (GW45 and GW47).

The outcomes of the riparian vegetation monitoring program would be reported in the Annual Review. The Annual Review would also identify if any additional monitoring sites are required, or if optimisation of the existing monitoring sites should be undertaken.

Hollow Bearing Trees

Issue

MSC requested clarification on the assessment undertaken for hollow bearing trees with particular focus on the habitat for Squirrel Gliders.

Response

Tables 4 and 16 of the BDAR prepared for the Project (Hunter Eco, 2019a) provide the number of trees with hollows within each vegetation zone in the Biodiversity Assessment Development Footprint, using the plot data as per the BAM (OEH, 2017), with the vegetation zones presented on Figures 7a and 7b of the BDAR. In addition, Figure 19 of the BDAR includes paddock trees that may provide potential habitat for the Squirrel Glider. During subsidence remediation activities, the location of potential Squirrel Glider habitat described in the BDAR would be considered.

Prior to any remediation of surface cracks, Malabar would undertake a review of environmental impacts that may result from the remediation at the specific location and consider whether remediation of surface cracks is environmentally beneficial or if alternative methods of remediating the crack is warranted (e.g. without machinery).

Baseline Flora Surveys

Issue

MSC requested clarification on the location of the flora surveys and transects undertaken for the BDAR.

Response

The BDAR was prepared in accordance with Section 6.4 of the BAM, with additional information supplied in the Baseline Flora Report (Hunter Eco, 2019b). Figure 9 of the Baseline Flora Report (Hunter Eco, 2019b) shows the threatened flora transects and surveys undertaken.

The Baseline Flora Report (Hunter Eco, 2019b) lists Plant Community Types (PCTs) potentially associated with *Diuris tricolor* (based on OEH information), namely PCTs 201, 1604, 1606 and 1655. Figures 7a and 7b of the BDAR present the occurrence of these PCTs within the vicinity of the Project, as well as occurrence of other vegetation zones.

Surveys for Diuris Tricolor

Issue

MSC queried the adequacy of the targeted surveys for *Diuris tricolor* due to the prevailing conditions.

Response

The Baseline Flora Report (Hunter Eco, 2019b) describes that surveys for *Diuris tricolor* occurred in 2011, 2017 and 2018. There is no evidence to suggest that this threatened species is widespread and likely to occur throughout the surface development area. The assessment in the BDAR is based on surveys undertaken across 2011, 2017 and 2018.

Exceeding standard requirements in the BAM, Malabar has erected a livestock proof fence providing a 20 m buffer from the *Diuris tricolor* records within the study area for the BDAR on Malabar-owned land (Figure 11 of the BDAR). The area has been signed “Environmental Protection Area”. The Project is likely to have a positive impact on the *Diuris tricolor* by excluding grazing livestock, as without the Project, the *Diuris tricolor* habitat would continue to be grazed without limitation by livestock.

Prior to any remediation of surface cracks, Malabar would undertake a review of environmental impacts that may result from the remediation at the specific location and consider whether remediation of surface cracks is environmentally beneficial or if alternative methods of remediating the crack is warranted (e.g. without machinery). The review would consider, among other factors, the known locations of threatened flora species and populations.

It is noted that the BCD has regulatory responsibility for biodiversity impact assessment in NSW and did not raise any concerns regarding the adequacy of the targeted surveys for *Diuris tricolor*: Malabar would implement the additional management measures for the *Diuris tricolor* recommended by the BCD, including actively managing exotic tussock grasses or other plants within the *Diuris tricolor* enclosed area that may out-compete *Diuris tricolor*. The management of the enclosed area would be detailed in the Biodiversity Management Plan, and would include consideration of slashing or restricted grazing when the orchids are dormant in summer.

Biodiversity Offset Strategy

Issue

MSC requested further information regarding the biodiversity offset strategy for the Project, including the proposed mechanisms to be adopted and the potential locations of offset areas.

Response

The BAM (OEH, 2017) does not require a Biodiversity Offset Strategy to be presented in a BDAR. The NSW Biodiversity Offset Scheme is established under the NSW *Biodiversity Conservation Act, 2016* (BC Act) and associated regulations. The Biodiversity Offset Scheme requires the credits calculated for the biodiversity impacts to be retired via the offset rules. Malabar would address NSW offset requirements by one, or a combination of the following options, consistent with the Biodiversity Offsets Scheme:

1. the retirement of biodiversity credits (either like-for-like or in accordance with the variation rules);
2. the funding of a biodiversity conservation action;
3. undertaking ecological mine rehabilitation; or
4. payment into the Biodiversity Conservation Fund.

Biodiversity credits could be retired by:

- Purchasing credits from the Biodiversity Credit Market and retiring credits.
- Establishing an offset area (Biodiversity Stewardship Site) and retiring the credits. The Biodiversity Stewardship Site would then be managed by Malabar.
- Retiring like-for-like biodiversity credits or credits under the variation rules (i.e. rules that allow credits of a vegetation type/species to be offset with a different vegetation type/species) for relevant threatened species and communities.

The funding of a biodiversity conservation action is only available for select species and is currently not available for those relevant to the Project.

Payments could be made to the Biodiversity Conservation Fund instead of, or as well as, retiring credits, with the cost of the payment determined by the BAM Credit Calculator.

The direct loss of habitat associated with the Project in combination with offset provisions would result in no net loss in biodiversity, as the biodiversity offset would be a greater area of land, multiple times the size of the Biodiversity Assessment Development Footprint, which would be conserved and managed to achieve a gain in biodiversity values.

Malabar is currently investigating potential to locate offsets within the Muswellbrook LGA.

Commonwealth Biodiversity Offset Strategy

Issue

MSC requested further details on the approach to offsetting Commonwealth *Environment Protection and Biodiversity Conservation Act, 1999* (EPBC Act) listed threatened specific and communities.

Response

Malabar would undertake like-for-like biodiversity offset measures for relevant EPBC Act listed threatened species and ecological communities as required by the EPBC Act. These biodiversity credits or other offset measures would be associated with the following EPBC Act listed threatened species and communities:

- *White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland*;
- *Central Hunter Valley Eucalypt Forest and Woodland*;
- Pink-tailed Legless Lizard;
- Striped Legless Lizard;
- Swift Parrot; and
- Regent Honeyeater.

It is acknowledged that the Commonwealth Department of the Environment and Energy (DEE) does not currently endorse the use of the Biodiversity Conservation Fund.

Malabar is currently investigating potential offsets within the Muswellbrook LGA.

Timing of Rehabilitation

Issue

MSC queried the timing of the rehabilitation at the Maxwell Infrastructure, with particular reference to woodland rehabilitation that would form part of the local and regional habitat corridors.

Response

It is acknowledged that the Project would utilise substantial elements of the existing infrastructure, resulting in the delay of some undertakings of the approved 2015 - 2020 Mining Operations Plan and Rehabilitation and Offset Management Plan (the approved MOP) until production from the Underground Project concludes. However, Malabar would continue rehabilitation of the former mining areas at the Maxwell Infrastructure as part of the Project. The landform design and post-mining land use objectives for the Maxwell Infrastructure are as follows:

- Provide a landscape that is safe, stable and non-polluting.
- Minimise potential environmental impacts and liability arising from mine closure.
- Remove any waste or potentially hazardous materials from site.
- Minimise the potential impacts of decommissioning.
- Develop landforms that return land affected by mining to a condition that is suitable for a range of sustainable land uses.
- Create a stable post-mining landform that is compatible with the surrounding landscape, and that is capable of productive land use that achieves the nominated land capability.
- Establish vegetation that is self-sustaining, perpetual, and provides a sustainable habitat for local fauna and successive flora species.

- Create a post-mining landform that enhances the local and regional habitat corridors as presented in the *Synoptic Plan: Integrated Landscapes for Coal Mine Rehabilitation in the Hunter Valley of New South Wales* (Department of Mineral Resources [DMR], 1999).
- Develop land uses that benefit the future use of the site for the local community.
- Develop a landscape that reduces the requirement for long-term monitoring and management.
- Minimise the impacts on surface and groundwater when compared to pre-mining conditions.
- Continue to engage with the local community and regulatory stakeholders on key environmental and socio-economic issues during the closure and post-mining phase.

Post-mining land use objectives and rehabilitation domains for the Maxwell Infrastructure are described in the approved MOP. These rehabilitation domains were developed following an assessment of potential post-mining land uses (e.g. nature conservation, agriculture), taking into account relevant strategic land use objectives in the region and the potential benefits of the post-mining land use to the environment, future landholders, and the community.

Resource Sterilisation in Biodiversity Offset Areas

Issue

DRG requested that Malabar consider potential resource sterilisation in any future biodiversity offset areas in consultation with DRG.

Response

Malabar would consult with DRG regarding potential resource sterilisation in biodiversity offset areas that are identified for the Project.

Commonwealth Assessment Requirements

Issue

DPIE recommended that each of the Commonwealth's assessment requirements are addressed.

Response

Detailed consideration of conservation advice, recovery plans for the species and community and relevant threat abatement plans have been provided in Section 7.3 of the BDAR for EPBC Act listed species and communities. These were summarised in Table 40 of the BDAR, which has been reproduced as Table 6.

Table 6
Impact Mitigation Measures Relevant to Threatened Species and Communities listed under the EPBC Act

Matter	Impact	Mitigation Measure	Techniques	Impact Mitigation Measures/Effectiveness	Basis for the Mitigation Measures
White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Clearance Impacts on Native Vegetation and Habitat	Vegetation Clearance Protocol	Areas to be cleared are delineated to prevent accidental damage to adjoining areas during vegetation clearance activities or other works.	Effective if clearly delineated.	Rawlings et al. (2010), Threatened Species Scientific Committee (TSSC) (2006) and Department of Environment, Climate Change and Water (DECCW) (2010) describe protection of the threatened ecological communities (TEC).
	Subsidence Impacts on Native Vegetation and Habitat	Remediation of surface cracks considered too large to naturally close	Remediation of mine subsidence effects (e.g. surface cracking and minor erosion). Preliminary assessment to minimise impact of remediation actions.	Effective when done in a controlled manner.	Rawlings et al. (2010), TSSC (2006) and DECCW (2010) describe protection of the TEC.
	Indirect Impacts on Native Vegetation and Habitat	Weed Management	Where they have been taken off road, washdown of vehicles and mechanical equipment to minimise seed transport off the site.	Effective when done in a controlled manner.	Rawlings et al. (2010), TSSC (2006) and DECCW (2010) describe weed management of the threatened ecological communities (TEC).
			Identification of weeds requiring control.		
			Mechanical removal of identified weeds and/or the application of approved herbicides.		
			Follow-up site inspections to determine the effectiveness of the eradication programs.		
		Bushfire Management	According to the Bushfire Management Procedure.	Effective when applied.	Standard practice.

Table 6 (Continued)
Impact Mitigation Measures Relevant to Threatened Species and Communities listed under the EPBC Act

Matter	Impact	Mitigation Measure	Techniques	Impact Mitigation Measures/Effectiveness	Basis for the Mitigation Measures
Central Hunter Valley Eucalypt Forest and Woodland	Clearance Impacts on Native Vegetation and Habitat	Vegetation Clearance Protocol	Areas to be cleared are delineated to prevent accidental damage during vegetation clearance activities or other works.	Effective if clearly delineated.	Department of the Environment (DotE) (2015a) and DEE (2016) describe protection of the TEC.
	Subsidence Impacts on Native Vegetation and Habitat	Remediation of surface cracks considered too large to naturally close	Remediation of mine subsidence effects (e.g. surface cracking and minor erosion).	Effective when done in a controlled manner.	DotE (2015a) and DEE (2016) describe protection of the TEC.
	Indirect Impacts on Native Vegetation and Habitat	Weed Management	Where they have been taken off road, washdown of vehicles and mechanical equipment to minimise seed transport off the site.	Effective when done in a controlled manner.	DotE (2015a) and DEE (2016) describe weed management of the TEC.
			Identification of weeds requiring control.		
			Mechanical removal of identified weeds and/or the application of approved herbicides.		
			Follow-up site inspections to determine the effectiveness of the eradication programs.		
		Bushfire Management	According to the Bushfire Management Procedure.	Effective when applied.	Standard practice.
Striped Legless Lizard	Clearance Impacts on Native Vegetation and Habitat	Vegetation Clearance Protocol	Areas to be cleared are delineated to prevent accidental damage during vegetation clearance activities or other works.	Effective if clearly delineated.	Department of Sustainability, Environment, Water, Population and Communities (SEWPaC) (2011).
	Loss of Individuals	Minimise Loss	Pre-clearance fauna surveys by suitably qualified personnel.	Relocation of captured individuals.	SEWPaC (2011).
			Impacts on fauna are managed during clearing activities by suitably qualified personnel.	Relocation of captured individuals.	

Table 6 (Continued)
Impact Mitigation Measures Relevant to Threatened Species and Communities listed under the EPBC Act

Matter	Impact	Mitigation Measure	Techniques	Impact Mitigation Measures/Effectiveness	Basis for the Mitigation Measures
Striped Legless Lizard (continued)	Loss of Habitat	Mine Site Rehabilitation and Revegetation	Surface disturbance areas associated with the Biodiversity Assessment Development Footprint would be rehabilitated and revegetated (when the surface facilities are no longer required or at the end of the mine life where no further ongoing beneficial use is identified).	Effective when applied.	SEWPaC (2011).
		Salvage and Re-Use of Material for Habitat Enhancement within Mine Site Rehabilitation	Identification of habitat features (e.g. surface rocks) that would be beneficial for habitat enhancement.	Effective when applied.	
	Subsidence Impacts on Native Vegetation and Habitat	Remediation of surface cracks considered too large to naturally close	Remediation of mine subsidence effects (e.g. surface cracking and minor erosion).	Effective when done in a controlled manner.	SEWPaC (2011).
	Indirect Impacts on Habitat	Feral Animal Management	Maintain a clean, rubbish-free environment to discourage scavenging and reduce the potential for colonisation of these areas by non-endemic fauna.	Effective if ongoing during development and operational stages.	SEWPaC (2011).
	Uncontrolled Spread of Weeds	Weed Management	Where they have been taken off road, washdown of vehicles and mechanical equipment to minimise seed transport off the site.	Effective when applied.	SEWPaC (2011).
			Identification of weeds requiring control.		
			Mechanical removal of identified weeds and/or the application of approved herbicides.		
			Follow-up site inspections to determine the effectiveness of the eradication programs.		

Table 6 (Continued)
Impact Mitigation Measures Relevant to Threatened Species and Communities listed under the EPBC Act

Matter	Impact	Mitigation Measure	Techniques	Impact Mitigation Measures/Effectiveness	Basis for the Mitigation Measures
Pink-tailed Legless Lizard	Clearance Impacts on Native Vegetation and Habitat	Vegetation Clearance Protocol	Areas to be cleared are delineated to prevent accidental damage during vegetation clearance activities or other works.	Effective if clearly delineated.	TSSC (2015).
	Loss of Individuals	Minimise	Pre-clearance fauna surveys by suitably qualified personnel.	Relocation of captured individuals.	TSSC (2015).
			Impacts on fauna are managed during clearing activities by suitably qualified personnel.	Relocation of captured individuals.	TSSC (2015).
	Loss of Habitat	Mine Site Rehabilitation and Revegetation	Surface disturbance areas associated with the Biodiversity Assessment Development Footprint would be rehabilitated and revegetated (when the surface facilities are no longer required or at the end of the mine life where no further ongoing beneficial use is identified).	Effective when applied	McDougall et al. (2016) and TSSC (2015).
		Salvage and Re-Use of Material for Habitat Enhancement within Mine Site Rehabilitation	Identification of habitat features (e.g. surface rocks) that would be beneficial for habitat enhancement.	Effective when applied.	TSSC (2015).
	Subsidence Impacts on Native Vegetation and Habitat	Remediation of surface cracks considered too large to naturally close	Remediation of mine subsidence effects (e.g. surface cracking and minor erosion).	Effective when done in a controlled manner.	TSSC (2015).
	Indirect Impacts on Habitat	Feral Animal Management	Maintain a clean, rubbish-free environment to discourage scavenging and reduce the potential for colonisation of these areas by non-endemic fauna.	Effective if ongoing during development and operational stages.	TSSC (2015).
	Uncontrolled Spread of Weeds	Weed Management	Where they have been taken off road, washdown of vehicles and mechanical equipment to minimise seed transport off the site.	Effective when applied.	Standard practice.
			Identification of weeds requiring control.		
			Mechanical removal of identified weeds and/or the application of approved herbicides.		
			Follow-up site inspections to determine the effectiveness of the eradication programs.		
		Bushfire Management	According to the Bushfire Management Procedure.	Effective when applied.	Standard practice.

Table 6 (Continued)
Impact Mitigation Measures Relevant to Threatened Species and Communities listed under the EPBC Act

Matter	Impact	Mitigation Measure	Techniques	Impact Mitigation Measures/Effectiveness	Basis for the Mitigation Measures
Swift Parrot	Clearance Impacts on Native Vegetation and Habitat	Vegetation Clearance Protocol	Areas to be cleared are delineated to prevent accidental damage during vegetation clearance activities or other works.	Effective if clearly delineated.	TSSC (2016) and Saunders and Tzaros (2011).
	Loss of Habitat	Mine Site Rehabilitation and Revegetation	Surface disturbance areas associated with the Biodiversity Assessment Development Footprint would be rehabilitated and revegetated (when the surface facilities are no longer required or at the end of the mine life where no further ongoing beneficial use is identified). Include recognised suitable feed trees in rehabilitation.	Effective when applied.	TSSC (2016) and Saunders and Tzaros (2011).
	Indirect Impacts on Native Vegetation and Habitat	Feral Animal Management	Maintain a clean, rubbish-free environment to discourage scavenging and reduce the potential for colonisation of these areas by non-endemic fauna.	Effective if ongoing during development and operational stages.	TSSC (2016b) and Saunders and Tzaros (2011).
Regent Honeyeater	Clearance Impacts on Native Vegetation and Habitat	Vegetation Clearance Protocol	Areas to be cleared are delineated to prevent accidental damage during vegetation clearance activities or other works.	Effective if clearly delineated.	DotE (2015b and 2016).
	Loss of Habitat	Mine Site Rehabilitation and Revegetation	Surface disturbance areas associated with the Biodiversity Assessment Development Footprint would be rehabilitated and revegetated (when the surface facilities are no longer required or at the end of the mine life where no further ongoing beneficial use is identified).	Effective when applied.	DotE (2015b and 2016).
	Indirect Impacts on Native Vegetation and Habitat	Feral Animal Management	Maintain a clean, rubbish-free environment to discourage scavenging and reduce the potential for colonisation of these areas by non-endemic fauna.	Effective if ongoing during development and operational stages.	DotE (2015b and 2016).

Striped Legless Lizards Habitat

Issue

DPIE recommended the potential impacts of the Project on habitat 'critical to the survival of the species' for the Striped Legless Lizard be clarified.

Response

The Project would result in the direct clearance of approximately 152.8 hectares (ha) of known and potential habitat for the Striped Legless Lizard (Figure 10). The clearance would be required for the proposed MEA, transport and services corridor and Edderton Road Realignment. The clearance areas also include a minor area (approximately 0.5 ha) of potential subsidence ponding (Figure 10).

The habitat for the Striped Legless Lizard in the subject land for the BDAR may represent 'habitat critical to the survival of the species' according to the TSSC (2016) because it provides foraging and breeding habitat and represents a newly discovered range extension. The Striped Legless Lizard has been previously recorded near Muswellbrook Common approximately 15 km north-east of the Project area (OEH, 2019). The Muswellbrook Common population appears to be disjunct from other recorded populations which occur greater than approximately 200 km to the south (OEH, 2019).

The previously unrecorded population of this species would persist in the surrounding locality due to the amount of known habitat and the occurrence of the species outside the Biodiversity Assessment Development Footprint and subsidence extent, with approximately 3,400 ha of 'habitat critical to the survival of the species' that has been mapped adjacent to the Biodiversity Assessment Development Footprint (Figure 10).

As a result, the Project may have a potential short and medium-term impact on the habitat of the Striped Legless Lizard, however, it is unlikely that the Project would lead to a long-term decrease in the size of the population of the Striped Legless Lizard.

Biodiversity Conservation Fund

Issue

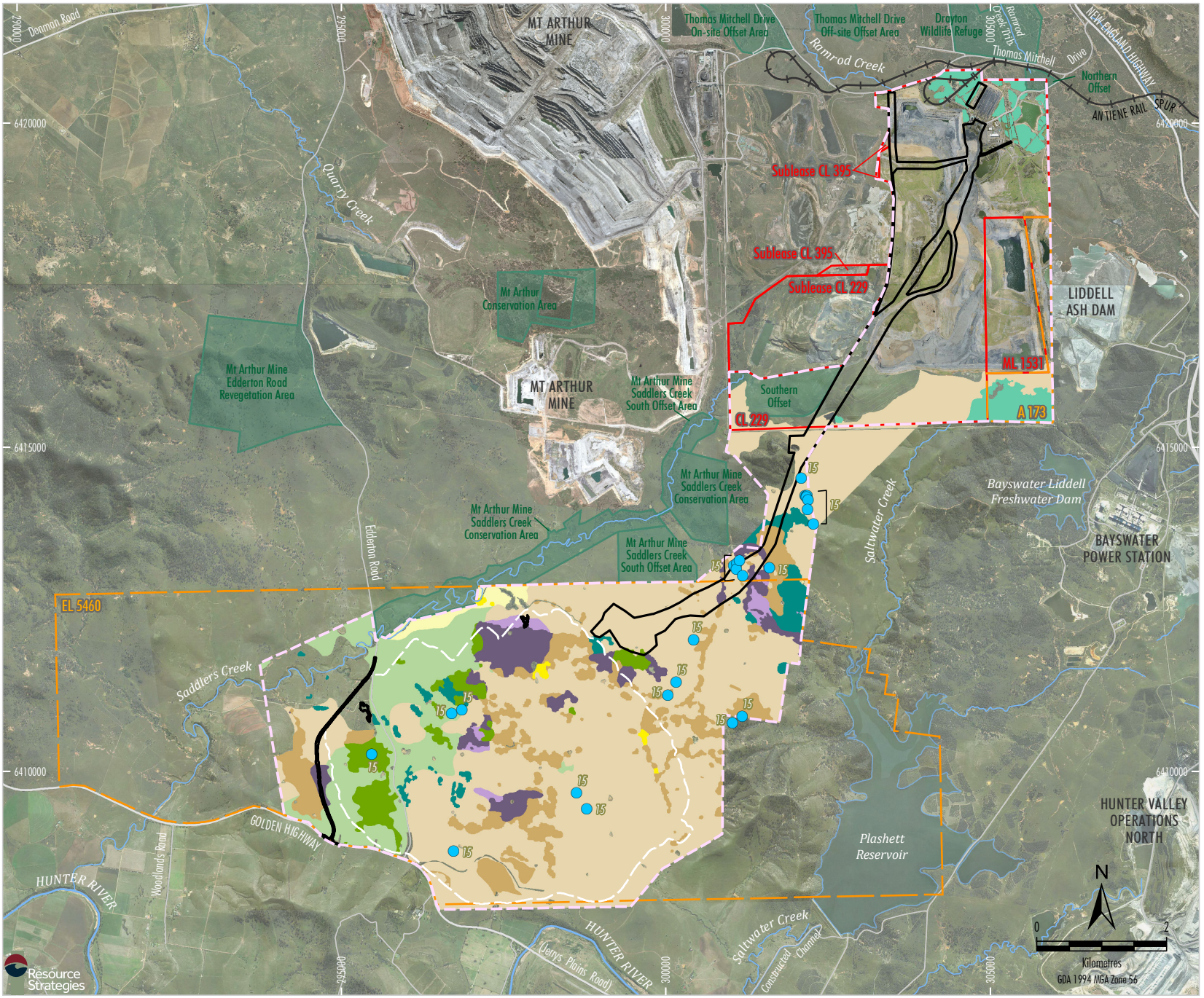
DPIE noted that the Biodiversity Conservation Fund has not yet been endorsed by the Commonwealth as an acceptable offsetting mechanism and requested information regarding ecological surveys of potential offset area(s).

Response

It is acknowledged that the Commonwealth Department of Environment and Energy does not currently endorse the use of the Biodiversity Conservation Fund. Malabar would undertake like-for-like biodiversity offset measures for relevant EPBC Act listed threatened species and ecological communities as required by the EPBC Act. These biodiversity credits or other offset measures would be associated with the following EPBC Act listed threatened species and communities:

- *White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland*;
- *Central Hunter Valley Eucalypt Forest and Woodland*;
- Pink-tailed Legless Lizard;
- Striped Legless Lizard;
- Swift Parrot; and
- Regent Honeyeater.

Ecological surveys undertaken within EL 5460 and EL 6812 as part of the BDAR indicate there are areas that would be suitable as offsets for the Project. Malabar is currently investigating potential additional offsets within the Muswellbrook Local Government Area.



LEGEND

- Maxwell Project Exploration Licence Boundary
- Maxwell Project Mining and Coal Lease Boundary
- Extent of Conventional Subsidence (20 mm subsidence contour)
- Biodiversity Assessment Development Footprint
- Ecology Study Area
- Existing Conservation/Offset Area

Threatened Species

- Striped Legless Lizard

SPECIES POLYGON MAPPING

Dry Sclerophyll Forests (Shrub/grass sub-formation)

- 2. White Box - Ironbark - Red Gum Shrubby Forest (PCT1606)
- 2a. White Box - Ironbark - Red Gum Shrubby Forest - Derived Native Grassland (PCT1606)

Dry Sclerophyll Forests (Shrubby sub-formation)

- 3. Slaty Box Shrubby Woodland (PCT1655)
- 3a. Slaty Box Shrubby Woodland - Derived Native Grassland (PCT1655)

Grassy Woodlands

- 6. Bull Oak Grassy Woodland (PCT1692)
- 7. Yellow Box - Apple Grassy Woodland (PCT1693)
- 7a. Yellow Box - Apple Grassy Woodland - Derived Native Grassland (PCT1693)
- 9. Ironbark - Grey Box Grassy Woodland (PCT1691)
- 9a. Ironbark - Grey Box Grassy Woodland - Derived Native Grassland (PCT1691)
- 11. Grey Box - Spotted Gum - Narrow-leaved Ironbark Woodland (PCT1604)

Reference:

15. Future Ecology (2019)

Note: There are no references 1 - 14 on this figure.

Source: © NSW Department of Planning and Environment (2019); NSW Department of Finance, Services & Innovation (2019); MSEC (2019)
Orthophoto Mosaic: 2018, 2016, 2011

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Striped Legless Lizard Species Polygon

Figure 10

6.1.7 Heritage

Partnerships with Local Aboriginal People

Issue

MSC encouraged the development of initiatives to:

- mitigate the loss of cultural landscape in the vicinity of the Project;
- address potential impacts on affordable housing; and
- target Aboriginal employees representing 10% of the Project workforce.

Response

An assessment of the potential impacts of the Project to Aboriginal cultural heritage was conducted in the Aboriginal Cultural Heritage Assessment (ACHA) prepared by AECOM Australia Pty Ltd (AECOM) (2019). A comprehensive Cultural Values Report was also prepared and included as Appendix A of the ACHA, which specifically assesses the Aboriginal cultural values within the vicinity of the Project.

The ACHA prepared for the Project (including the comprehensive Cultural Values Report) describes that Aboriginal community consultation for the assessment was undertaken in accordance with *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW, 2010b) and clause 80C of the NSW *National Parks and Wildlife Regulation, 2009*.

It was concluded that the impact of the Project on the potential Aboriginal archaeological resource of the region would not be significant in the context of known and potential heritage resource, and the Project would not materially contribute to potential cumulative impacts. Notwithstanding, Malabar would manage potential impacts on Aboriginal heritage sites through consultation with the Aboriginal community, salvage of sites and other management measures.

AECOM (2019) noted that, although the Project area is situated within a broader landscape of high historical significance for contemporary Aboriginal people, the Project area itself is assessed as having a low historical significance, with no evidence of post-contact Aboriginal occupation identified within the area. In addition, no historical records or oral histories specific to the use of the Project area by Aboriginal people were identified as part of the ACHA.

It is noted that the BCD has regulatory responsibility for Aboriginal cultural heritage impact assessment and stated (BCD, 20 September 2019):

> *We are satisfied with the Aboriginal cultural heritage assessment undertaken and no further Aboriginal cultural heritage assessment is required.*

Malabar maintains a number of commitments that would underpin the Project's social impact management strategies. Malabar plan to recruit approximately 50% of the operational workforce from individuals outside of the underground mining sector, of which 10% would be Indigenous.

Malabar would also seek to minimise additional pressure on the rental housing market through the following measures:

- Requiring construction contractors to contact accommodation operators in advance of construction commencing to schedule accommodation bookings and enable accommodation providers to plan for maximum capacity.
- Advising Council and real estate agents of workforce ramp-up and providing information on housing availability to in-migrating personnel.

- If the Project construction coincides with that of other projects, identifying existing housing and accommodation capacity relative to the Project workforce needs and preparing a workforce accommodation strategy which addresses the construction and operation phases.
- Participating in Council, industry or Government projects to monitor cumulative impacts on labour availability and/or housing.

Drayton Mine Historical Significance

Issue

MSC recommended that Malabar establish a memorial and written/pictorial history of the former Drayton Mine to recognise its historical significance and the economic and social benefits it provided.

Response

Malabar would maintain a file of historical information regarding the former Drayton Mine on-site.

Malabar would make the information available to the public upon request (e.g. for students completing research projects). Malabar would also make the material available to MSC should it wish to establish a permanent memorial to the former Drayton Mine.

Maintenance of Locally Significant Heritage Sites

Issue

MSC recommended that Malabar implement plans to manage the longevity of nearby sites of local heritage significance.

Response

Potential impacts on historic heritage sites (including those of local heritage significance) were assessed by Extent Heritage (2019) and MSEC (2019).

The Project would not result in any material adverse impacts on any heritage places, as such no specific measures are required or proposed to manage or mitigate potential impacts as part of the Project (Extent Heritage, 2019).

6.1.8 Rehabilitation and Mine Closure

Conceptual Final Landform Design

Issue

The Resources Regulator and MSC requested additional information regarding the conceptual final landform design, including:

- A clear description of landform design objectives.
- Consideration of micro/macro relief and/or variability in the landform design for remaining rehabilitation at the North Void and South Void (i.e. to integrate the rehabilitated highwall with adjacent rehabilitated landforms).
- Proposed final landform contours (at an appropriate interval) for rehabilitation areas and adjacent landforms.

Malabar met with the Resources Regulator on 31 October 2019. At the meeting, the Resources Regulator indicated the primary focus of its submission is the integration of the proposed emplacement of Rejects in the East Void with the existing final landform.

Response

As an underground mine, the Project would result in minimal changes to existing landforms.

The Project however would support enhancement of the rehabilitation of the former Drayton Mine (renamed Maxwell Infrastructure). The volume of the East Void would be reduced through the emplacement and subsequent capping of coarse and fine reject material generated from processing activities associated with the Project (collectively referred to as Rejects).

Since taking control of the site, Malabar has implemented various improvements to the Maxwell Infrastructure final landform, including:

- Developing drainage features in the post-mine landform that mitigate erosion potential.
- Reshaping areas to integrate seamlessly with adjacent landforms.
- Creating undulating landforms over predominately flatter areas.
- Redesigning horizontal drainage structures as larger undulations rather than sharper contours so as to be less visually intrusive.
- Enhancing the inert clay capping material with gypsum and either biosolids or mulch to better support plant growing conditions.
- Optimisation of equipment and methodology to place ameliorants and seed in undulating topography.

The rehabilitation objectives are covered in the next subsection of this document. Specifically, the objectives for the East Void Reject emplacement are as follows:

- The Rejects emplacement final landform is integrated with adjacent rehabilitated landforms (Figures 11 and 12).
- Any residual highwalls are geotechnically stable with a low risk of failure.
- Rejects are geochemically characterised, appropriately remediated, capped and rehabilitated.
- The Rejects emplacement is safe, stable, non-polluting and the rehabilitated surface is suitable for the designated post-mining land use (pasture).

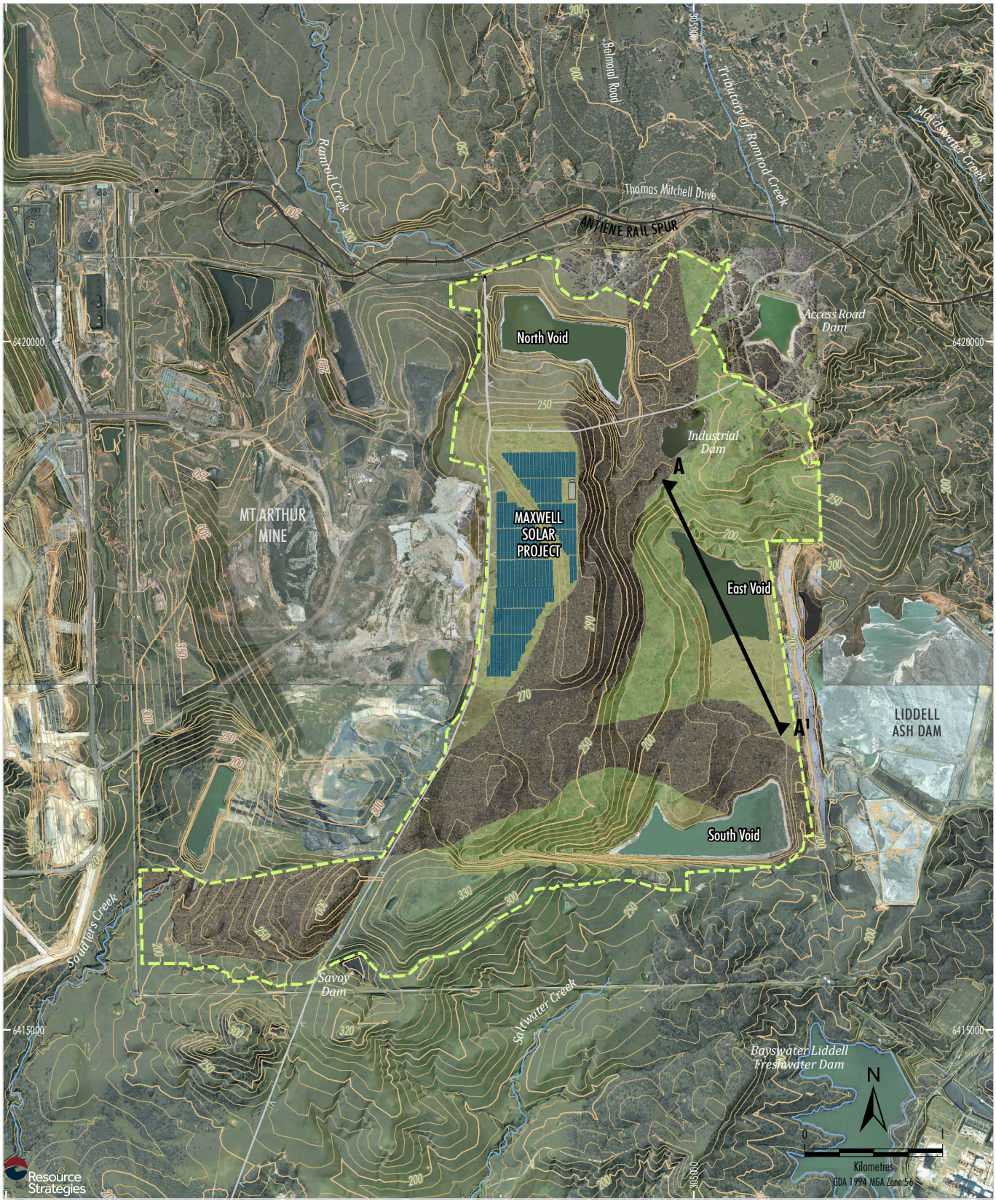
A simulation of the Maxwell Infrastructure final landform is provided on Figure 11. As requested by the Resources Regulator, the landform simulation includes the proposed final landform contours at appropriately spaced intervals. Landform design of the remaining rehabilitation areas has taken into account minimising further disturbance of natural ground, minimising disturbance of rehabilitation areas, minimising slope gradients to the extent practical and incorporating natural landform styles in rehabilitated landforms where possible.

A conceptual cross-section of the East Void Rejects emplacement is provided on Figure 12. Rejects would be progressively emplaced in the East Void.

The emplacement of Rejects in the East Void would significantly reduce the size of the final void with deposition location managed to achieve water return and to minimise final void area.

A geotechnical assessment of the final void highwalls was undertaken by Coffey (2014) for the approved MOP to address issues raised during consultation with DRE (now the Resources Regulator). The geotechnical assessment concludes that the existing highwalls in their current conditions are modelled as having a demonstrable factor of safety greater than 1.5 and Coffey (2014) considered the highwalls to be adequate. Notwithstanding, Coffey (2014) made several recommendations for the mine closure process at the Maxwell Infrastructure, including highwall blasting, to improve overall and sustained stability. Highwall blasting would assist in integrating the rehabilitated highwalls with adjacent rehabilitated landforms.

A Peer Review of the Coffey (2014) report was undertaken by Sherwood Geotechnical and Research Services (2014), which concurred that the final void highwalls would be sustainable in the long-term.



SHA-18-03 Maxwell_RtoS_204B

LEGEND

- Railway
- Proposed 66 kV Power Supply
- Ausgrid 66 kV Power Supply Extension #
- Maxwell Infrastructure Rehabilitation Area *

Subject to separate assessment and approval.

* Excludes Domain E Buffer Land.

Refer Figure 12 for cross-section.

Source: © NSW Department of Planning and Environment (2019); NSW Department of Finance, Services & Innovation (2019) Orthophoto Mosaic: 2018, 2016, 2011

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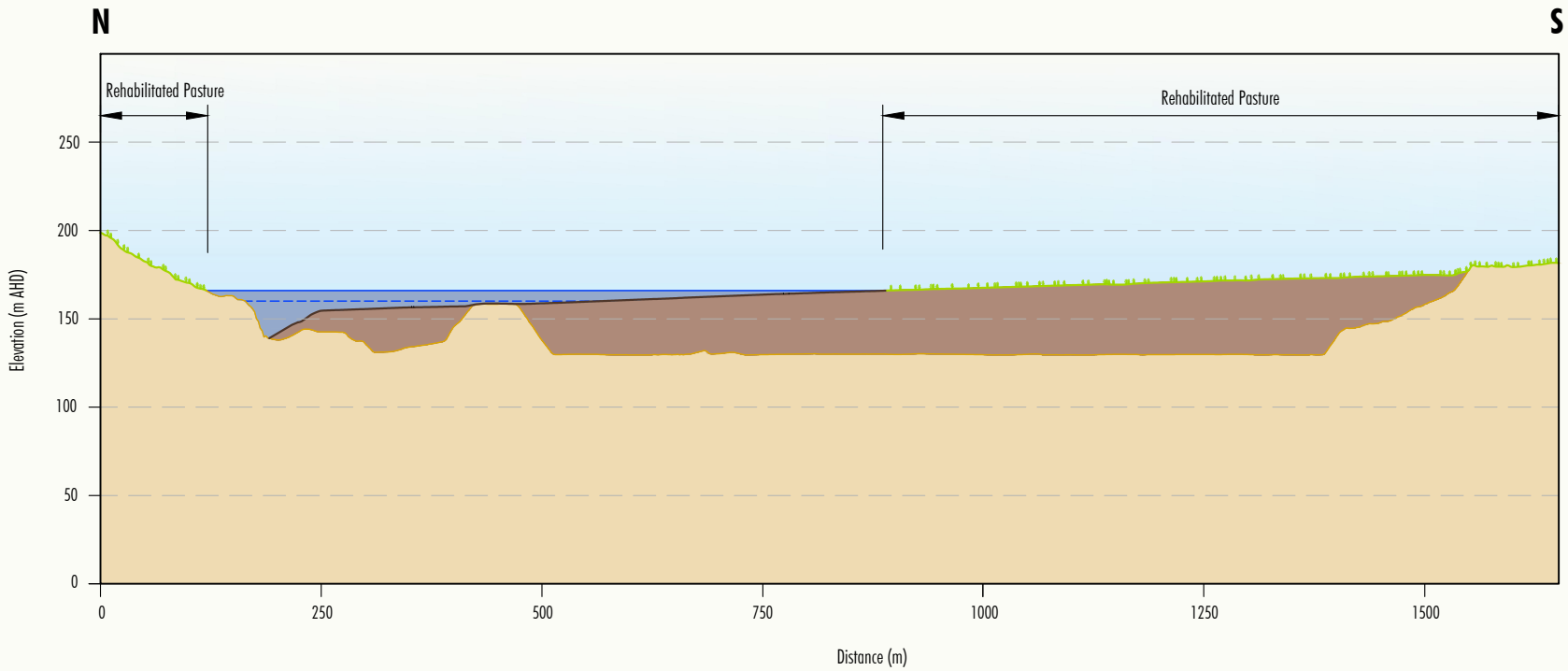
Rehabilitation Simulation - Maxwell Infrastructure

Figure 11



Cross-section A - A[1]

0 100
Vertical Scale
Metres

0 200
Horizontal Scale
Metres

SHM-18-03 Maxwell_RtnS_001A

Resource Strategies

LEGEND

- Existing Post-mining Surface
- Maximum Extent of CHPP Reject Emplacement
- Maximum Equilibrium Water Level
- Minimum Equilibrium Water Level

Refer Figure 11 for Cross-section location.

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CHPP Reject Emplacement Area
Cross-section A - A[1]

Figure 12

The Coffey (2014) recommendations have been included in the approved Final Void Management Plan (which forms part of the approved MOP). Implementation of the approved Final Void Management Plan would be, where practical, progressively implemented over the life of the Project, however some elements would be deferred until the end of the Project life, when nearby surface infrastructure would be decommissioned and removed, and the voids are no longer required for water storage and/or Rejects emplacement (refer 'Rehabilitation Schedule' subsection for additional information).

Rehabilitation Objectives and Preliminary Completion Criteria

Issue

The Resources Regulator requested that the rehabilitation objectives in Appendix A of the Preliminary Rehabilitation and Mine Closure Strategy are summarised for each domain.

Response

The overall rehabilitation objective for the Proposal is to create a safe, stable, non-polluting landform with the following features:

- Pasture to carry livestock.
- A woodland area and biodiversity area that provide habitat for native fauna and enhance floristic diversity.
- Water management areas that provide dams that collect runoff from the Project and provide a water resource for other land uses.
- A solar farm that provides electricity into the electricity grid.
- Provides flexibility to support alternate productive land uses subject to future development application(s).

The rehabilitation objectives provided in Appendix A of Appendix U of the EIS have been set out for each primary rehabilitation domain and secondary rehabilitation domain in Tables 7 and 8, respectively.

Table 7
Primary Rehabilitation Domain Objectives

Code	Domain	Objectives
1	Legacy Open Cut Pit	• Safe, stable and non-polluting. • Pit remains safely accessible. • No spontaneous combustion impacts.
2	Overburden Emplacement Area	• Overburden emplacement area is safely accessible. • Reshaped overburden emplacements safe and stable. • Overburden areas are free draining and non-polluting.
3	Water Management Area	• Operational infrastructure and any contamination removed. • Non-remaining water management areas are decommissioned. • Retained water management structures safe, stable and function as designed.
4	Infrastructure Area	• Identify beneficial long-term uses for any site infrastructure to remain. • Infrastructure decommissioned and land surface safe, stable and reshaped to meet post-mining land use requirements.
5	Rejects Emplacement	• Rejects emplacement is left in a safe and stable condition. • Rejects are adequately capped and rehabilitated. • Capped surface safe, stable and suited to post-mining land use.
6	Biodiversity Offset	• Refer Secondary Domain A (Biodiversity Offset).
7	Existing Rehabilitation	• Refer relevant Secondary Domains.

Table 7 (Continued)
Primary Rehabilitation Domain Objectives

Code	Domain	Objectives
8	Buffer Land	• Not applicable.
9	Maxwell Underground Mining Area	• Leave land free of obstruction for rehabilitation.
10	Maxwell Solar Project Infrastructure Area	• Land suitable for Maxwell Solar Project Infrastructure.

Table 8
Secondary Rehabilitation Domain Objectives

Code	Domain	Objectives
A	Biodiversity Offset	• Topsoil resource quality maintained. • Where active regeneration is required for offset areas, targeted vegetation communities are established and maintained across offset areas. • Threats to vegetation establishment are actively monitored and managed. • Native woodland vegetation develops into diverse and sustainable community. • Biodiversity areas enhance regional biodiversity value while providing local habitat and connectivity with remnant native vegetation.
B	Water Management Area	• Growth medium layer capable of sustaining a protective ground cover layer for erosion control and landform stability. • Re-established creeks and diversions stable and able to sustain riparian vegetation. • Risks to vegetation establishment monitored and managed. • Retained water features are safe, stable, non-polluting and suited to selected post-mining use.
C	Rehabilitation Area - Pasture	• Growth medium able to support the growth of targeted pasture species. • Growth medium meets land capability requirements. • No evidence of accelerated erosion or other degradation. • Risks to vegetation establishment monitored and managed. • Pasture vegetation and landscape able to support sustainable (low density) livestock grazing.
D	Rehabilitation Area - Woodland	• Growth medium able to support the growth of native plant communities. • No evidence of accelerated erosion or other degradation. • Rehabilitated native vegetation developed into diverse and sustainable woodland community. • Domain forms part of the established wildlife corridor. • Risks to vegetation establishment monitored and managed. • Woodland rehabilitation areas enhance regional biodiversity value while providing local habitat and connectivity with remnant native vegetation.
E	Buffer Land	• Not applicable.
F	Remediated Underground Mining Area	• Land affected by subsidence will be stable and will not present a greater safety or environmental hazard than surrounding land or present a risk to future final land use options. • All watercourses subject to subsidence impacts shall be hydraulically and geomorphologically stable.
G	Maxwell Solar Farm Infrastructure Area	• Land suitable for Maxwell Solar Farm infrastructure.

Rehabilitation Methodology

Issue

The Resources Regulator and MSC requested additional information regarding the key rehabilitation practices and measures proposed, with a particular focus on specific methods or controls required to minimise, mitigate or manage all identified risks, barriers or limitations to rehabilitation.

Malabar met with the Resources Regulator on 31 October 2019. At the meeting, the Resources Regulator indicated it required additional information regarding the management of rejects proposed to be emplaced in the East Void, including in consideration of the geochemistry of the proposed reject material.

Response

The Project would involve pumping CHPP Rejects to the existing East Void within the Maxwell Infrastructure, via a pipeline. Approximately 22 million bank cubic metres of Rejects would be produced over the life of the Project.

Malabar will continue to investigate beneficial uses for the voids in CL 229 and ML 1531. This will include emplacing Rejects from possible future underground mining activities undertaken by Malabar within EL 5460 (additional coal within the Maxwell exploration licence) and EL 7429 (Spur Hill Underground Coking Coal Project) and engagement with other mining and industrial facilities in the region (all would be subject to separate assessments and approvals).

Decant water from the Rejects emplacement area within the East Void would be recycled for use in CHPP and the Project (Section 3.10). If required, decant water would be treated prior to use in the CHPP. Infrastructure for the transfer of Rejects and decant water would be progressively relocated over the life of the Project.

The Geochemistry Assessment characterised Rejects that would be generated from the four coal seams in the Jerrys Plains Subgroup being targeted for the Project (GEM, 2019).

Rejects are expected to be moderately to highly saline and have an acidic pH, most likely due to the presence of organic acids. Rejects are also expected to have moderate sulphur, the majority of which is likely to occur as reactive sulphide, and low acid neutralising capacity. Based on these characteristics it is expected Rejects will typically be potentially acid forming (PAF) with only a low capacity to generate acid (i.e. PAF-LC). Rejects are expected to be enriched with arsenic (As), antimony (Sb) and selenium (Se) in varying degrees and the contained Se is likely to be readily soluble (GEM, 2019).

This is consistent with the geochemical characteristics of CHPP rejects generated by other mining operations targeting the Jerrys Plains Subgroup in the Hunter Valley (GEM, 2019).

Consistent with the recommendations made by GEM (2019), Malabar would implement the following management measures for the emplacement of Rejects:

- Ongoing geochemical characterisation of Rejects throughout the life of the Project (including kinetic net acid generation testing) to confirm the geochemical lag period of the material.
- Surface alkali treatment to extend the geochemical lag period of the Rejects or over-dumping with Rejects within the geochemical lag period so that acid conditions do not develop during active dumping.
- The Reject emplacement in the East Void would be designed to prevent the reactive rejects from oxidising and the salts from migrating to the revegetation layer.
- Water quality monitoring program for the East Void to include; pH, EC, alkalinity/acidity, sulphate (SO_4), As, Sb and Se.
- As areas within the East Void reach the final landform surface, they would be progressively capped and rehabilitated where practical.

Rejects would be emplaced above the long-term equilibrium water level of the East Void (Figures 11 and 12). Therefore, maintaining a long-term water cap over the Rejects is not practical. Inert capping material would be sourced from adjacent borrow pits.

The risk of spontaneous combustion associated with East Void Rejects emplacement is low. The Project mines the **Wittingham Coal Measures**, which are very low sulphur compared to the higher sulphur coal mined from **the Greta Coal Measures** at the former Drayton Mine. Notwithstanding, Malabar would continue to manage spontaneous combustion in accordance with the Spontaneous Combustion Management Plan, which is focused on; (i) capping areas with potential for spontaneous combustion, (ii) monitoring, and (iii) rectification, if required, of previously capped areas.

HydroSimulations (2019) simulated the long-term behaviour of the East Void Rejects emplacement using a numerical groundwater model and determined that it would remain as permanent and localised groundwater sink, with a low gradient of flow from the Liddell Ash Dam. Therefore, there would be no risk to groundwater quality as a result of Rejects emplacement, including in the long-term.

Rehabilitation Schedule

Issue

The Resources Regulator requested additional information regarding:

- Proposed timeframes to complete rehabilitation of disturbance associated with the former Drayton Mine (including overburden emplacement areas and final voids).
- Proposed staging of land clearing, construction of proposed key surface infrastructure, and rehabilitation of proposed surface infrastructure for the Project and existing Maxwell Infrastructure surface infrastructure.
- Emplacement of coarse and fine rejects, and the decommissioning and capping of reject materials.

Response

Rehabilitation at the Maxwell Infrastructure is managed in accordance with the approved MOP. The approved MOP describes the process to monitor the progress of rehabilitation activities under CL 229, ML 1531, CL 395 and Project Approval 06_0202 related to the Maxwell Infrastructure.

Malabar formally took control of the Maxwell Infrastructure, on 26 February 2018. Malabar resumed rehabilitation work on previously mined areas as quickly as possible, with the first bulldozer commencing work on the mine site in early March 2018.

Landform establishment for the dumped spoils at the Maxwell Infrastructure, including the implementation of natural drainage features, is largely complete.

Revegetation of rehabilitated areas is also ongoing, with some 25,000 saplings planted by Malabar on existing woodland rehabilitation areas. The timing for the completion of revegetation activities is dependent on a variety of factors, including climate. Malabar aims to avoid planting during adverse climate conditions (such as drought) so that revegetation is more likely to germinate and successfully grow. Notwithstanding, subject to favourable climatic conditions, Malabar expects to complete seeding of all completed Maxwell Infrastructure rehabilitation areas by the end of 2020. Some ongoing re-seeding may be undertaken in areas where rehabilitation monitoring indicates it is required.

Malabar would continue to monitor rehabilitation and undertake trials, including further grazing trials, to determine when existing rehabilitation areas satisfy the relevant completion criteria and can be relinquished in consultation with the Resources Regulator.

The East Void would be progressively backfilled with Rejects.

There may be opportunity to further reduce the size of the East Void, North Void and South Void by emplacing Rejects from possible future underground mining activities undertaken by Malabar within EL 5460 (additional coal within the Maxwell exploration licence) and EL 7429 (Spur Hill Underground Coking Coal Project) (subject to separate assessments and approvals).

There have also been discussions with nearby mining operations regarding the potential to utilise the South Void for overburden/interburden emplacement and the North Void for Rejects emplacement.

If, by the end of 2025, no clear resolution is reached with other mining and industrial facilities in the region, Malabar would rehabilitate the South Void highwall and North Void low wall in accordance with the approved Final Void Management Plan, unless otherwise agreed with the Resources Regulator. The North Void highwall works would be completed once the rail and CHPP infrastructure are no longer required.

The underground mining methods adopted for the Project significantly reduce surface disturbance in comparison to open cut mining methods. Given disturbance is primarily related to long-term surface infrastructure, there is limited opportunity to progressively rehabilitate areas of disturbance associated with the Project.

The provisional Project schedule (Figure 13) indicates that all key proposed surface infrastructure would be constructed in the first few years of the Project. The infrastructure would be utilised to support mining activities over the life of the Project and decommissioned when mining is complete.

Emplacement of Rejects in the East Void would commence when the CHPP is commissioned. Rejects would be emplaced above the maximum equilibrium water level, with a gradual slope to where a small residual water body would remain. Malabar would progressively rehabilitate the East Void Rejects emplacement as parts of the emplacement reach the planned final landform surface level.

Final Land Use

Issue

MSC queried the suitability of existing rehabilitation to sustain grazing activities and requested that the majority of the Project areas be rehabilitated to woodland.

Response

The agricultural rehabilitation domains for the Maxwell Infrastructure are described in the approved MOP. These rehabilitation domains were developed following an assessment of potential post-mining land uses (e.g. nature conservation, agriculture), taking into account relevant strategic land use objectives in the region and the potential benefits of the post-mining land use to the environment, future landholders and the community.

The development of pasture areas also aligns with MSC's preference for productive post-mining land uses. MSC's submission on the Maxwell Project EIS relevantly states:

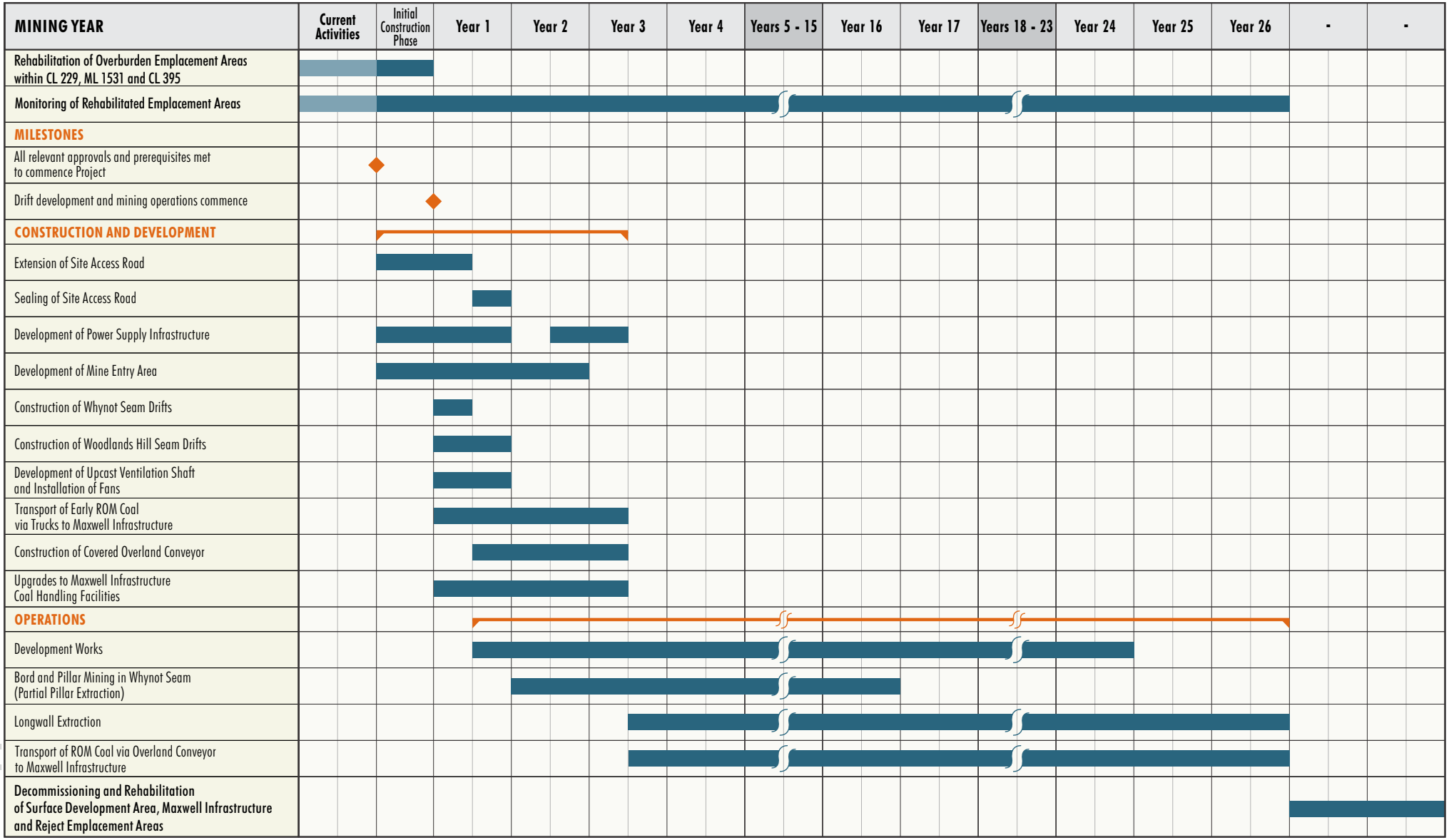
> *At the close of mining operations every effort should be made to maintain the quantum of employment opportunities…*

The existing agricultural rehabilitation domains were developed in consultation with NSW regulatory agencies, MSC and local landholders. The existing rehabilitation domains have been augmented to incorporate the Project.

Malabar notes that existing rehabilitation areas at the Maxwell Infrastructure site have not yet achieved the completion criteria outlined in the approved MOP. Current progressive rehabilitation areas are not necessarily representative of the ultimate rehabilitation at mine closure. Completion criteria for the pasture domains include the following:

> *Independent agronomist's report identifies that completion criteria are being met for pasture rehabilitation areas, and areas are capable of sustaining livestock grazing operations.*

Notwithstanding, Malabar commenced a cattle grazing trial on mine rehabilitation pasture in November 2018. The trial involved bringing 50 head of cattle into the Maxwell Infrastructure to graze an area of 140 ha, of which approximately 50 ha was mine site rehabilitation. The trial commenced after vegetation monitoring identified that the diversity of introduced and native grass species in this area was adequate for grazing. The trial aims to demonstrate the Maxwell Infrastructure can create a post-mining landscape that is compatible with the surrounding landscape and capable of sustaining a productive land use. In November 2018, when the cattle arrived to commence the grazing trial, the average weight was approximately 310 kilograms (kg). Some of the cattle were weighed in June 2019 and on average weighed approximately 480 kg, with current weight estimates ranging up to 600 kg.



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Resource Strategies

LEGEND

Current Maxwell Infrastructure Activities (Project Approval 06_0202)

Maxwell Project Activities (SSD 18_9526)

Source: Malabar (2019)

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Provisional Project Schedule

Figure 13

In addition, it is noted that the location of the Woodland domains has been selected to provide a long-term woodland corridor that aligns with the *Synoptic Plan: Integrated Landscapes for Coal Mine Rehabilitation in the Hunter Valley of New South Wales* (DMR, 1999).

Performance Indicators and Completion Criteria

Issue

MSC recommended detailed rehabilitation performance indicators and completion criteria for the Project.

Response

Preliminary performance indicators and completion criteria are provided in Appendix A of the Preliminary Rehabilitation and Mine Closure Strategy (Appendix U of the EIS).

Prior to commencement of the Project, Malabar would prepare an updated MOP and other associated management plans required under the Development Consent in consultation with relevant stakeholders. This would involve:

- Engaging suitably qualified and experienced rehabilitation/biodiversity experts to review the proposed final landform to confirm final land uses and rehabilitation objectives.
- Undertaking a detailed review of rehabilitation objectives, performance indicators and completion criteria, including identification of any required rehabilitation investigations/trials.

MOPs would continue to be developed as mining and rehabilitation activities progress over the life of the Project. As part of this process, performance indicators and completion criteria would be reviewed and updated to reflect the outcomes of rehabilitation trials, monitoring and review of control sites.

Post-mining Beneficial Use of Site Access Road

Issue

MSC recommended that Malabar enters into consultation with MSC regarding the dedication of the site access road as a public road post-mining.

Response

Malabar would consult with MSC regarding the post-mining use of the site access road prior to cessation of mining activities, including consideration of dedicating the site access road as a public road post-mining.

Post-mining Land Use Opportunities

Issue

MSC emphasised the importance of identifying land use opportunities that can generate social and economic benefits to the community. MSC recommended that a working party with representatives from MSC, DPIE, Premier and Cabinet, Malabar, Muswellbrook Chamber of Commerce, traditional owners and local land council members and the Hunter Joint Organisation Economic Transitions Committee be established by the year 2035 to commence planning for the transition to a post-mining suite of uses for the site. MSC noted the importance of consultation with the Aboriginal community as part of final land use planning.

Response

Malabar recognises that government and community stakeholders may identify final land uses that provide greater net benefits to the locality. Malabar would encourage and be supportive of other community and government proposals or initiatives for the use of Malabar land or infrastructure that can co-exist with or can be introduced following the cessation of mining activities. These alternative final land uses would be subject to separate assessments and approval, and do not form part of the Project.

Malabar supports the establishment of a working party to be established by 2035 to plan for the transition to an alternative post-mining land use. Malabar would also continue to consult with the Aboriginal community as part of the final land use planning for the Project.

Final Void Justification

Issue

The DPIE recommended further analysis and justification of the proposed final voids, including:

- Justification for the retention of all three existing voids in the final landform, including further options analysis regarding the potential to backfill one or more of the voids.
- Consideration of refining or improving the design of the final voids (for example reducing the size of voids, reducing the slope of highwalls and low walls).

Response

The *Drayton Mine Extension Environmental Assessment* (Hansen Bailey, 2007) considered and assessed two final landform scenarios:

- Three legacy final voids remaining at the Maxwell Infrastructure (North Void, South Void and East Void), with these voids gradually filling with water until an equilibrium water table level establishes within the spoil material and the open void.
- One legacy final void remaining at the Maxwell Infrastructure (South Void) if the following were to occur:
  - MacGen (now AGL Energy Limited [AGL]) used the East Void for disposal of fly-ash, subject to commercial arrangements and necessary planning approvals; and
  - North Void was used for coarse reject emplacement by neighbouring mining operations, subject to commercial arrangements and necessary planning approvals.

Figure 14 presents the two final landform scenarios described above and presented in the Drayton Mine Extension Environmental Assessment (Hansen Bailey, 2007).

Commercial arrangements and necessary planning approvals have not been obtained for beneficial use of the East Void and North Void to date, and three legacy voids remain at the Maxwell Infrastructure (Figure 2). It is noted that AGL retains an option for the transfer of ML 1531 and to seek planning and other required approvals to authorise disposal of fly-ash in the East Void (Section 2.3.5 of the EIS). Consultation continues with a neighbouring mine with respect to their potential use of the South and North voids to emplace overburden and/or reject material.

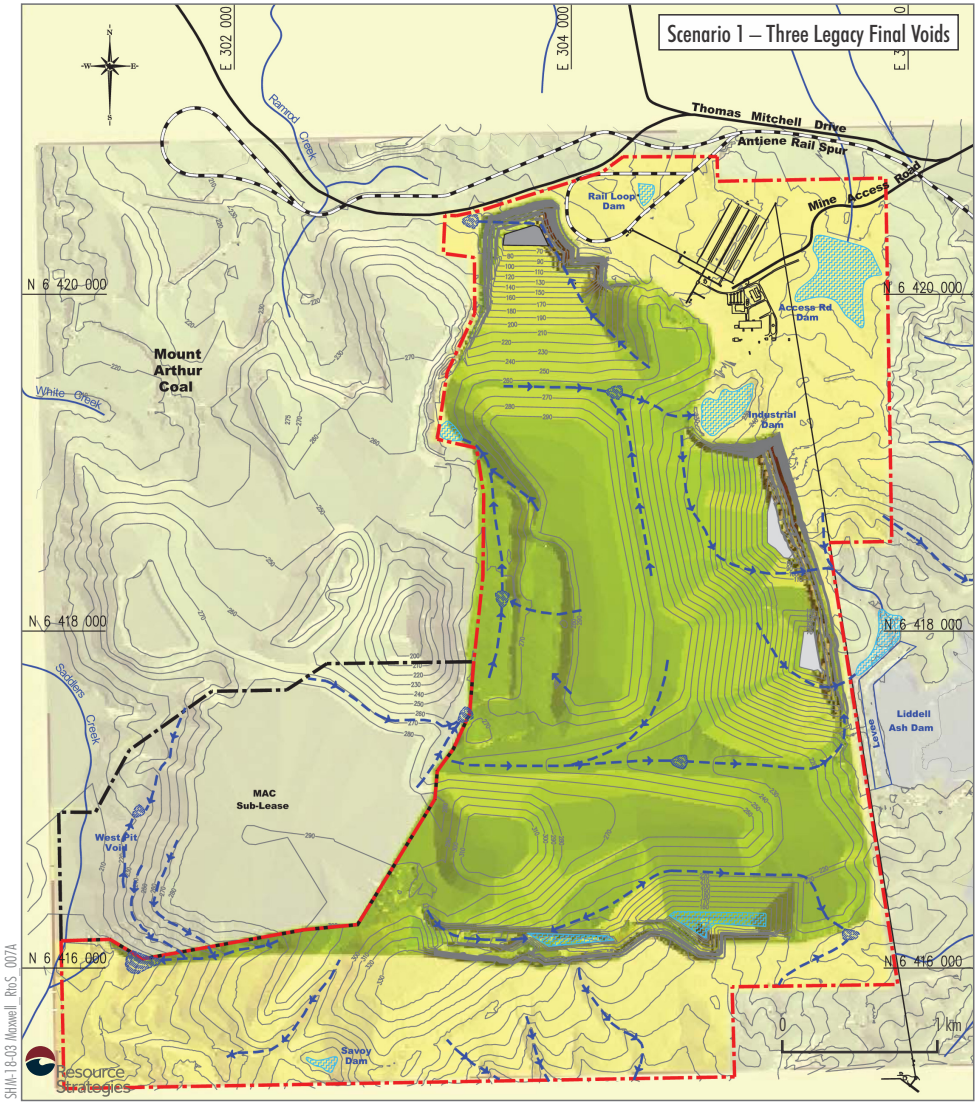
There may also be opportunity to further reduce the size of the East Void, North Void and South Void by emplacing Rejects from possible future underground mining activities undertaken by Malabar within EL 5460 (additional coal within the Maxwell exploration licence) and EL 7429 (Spur Hill Underground Coking Coal Project) (subject to separate assessments and approvals).

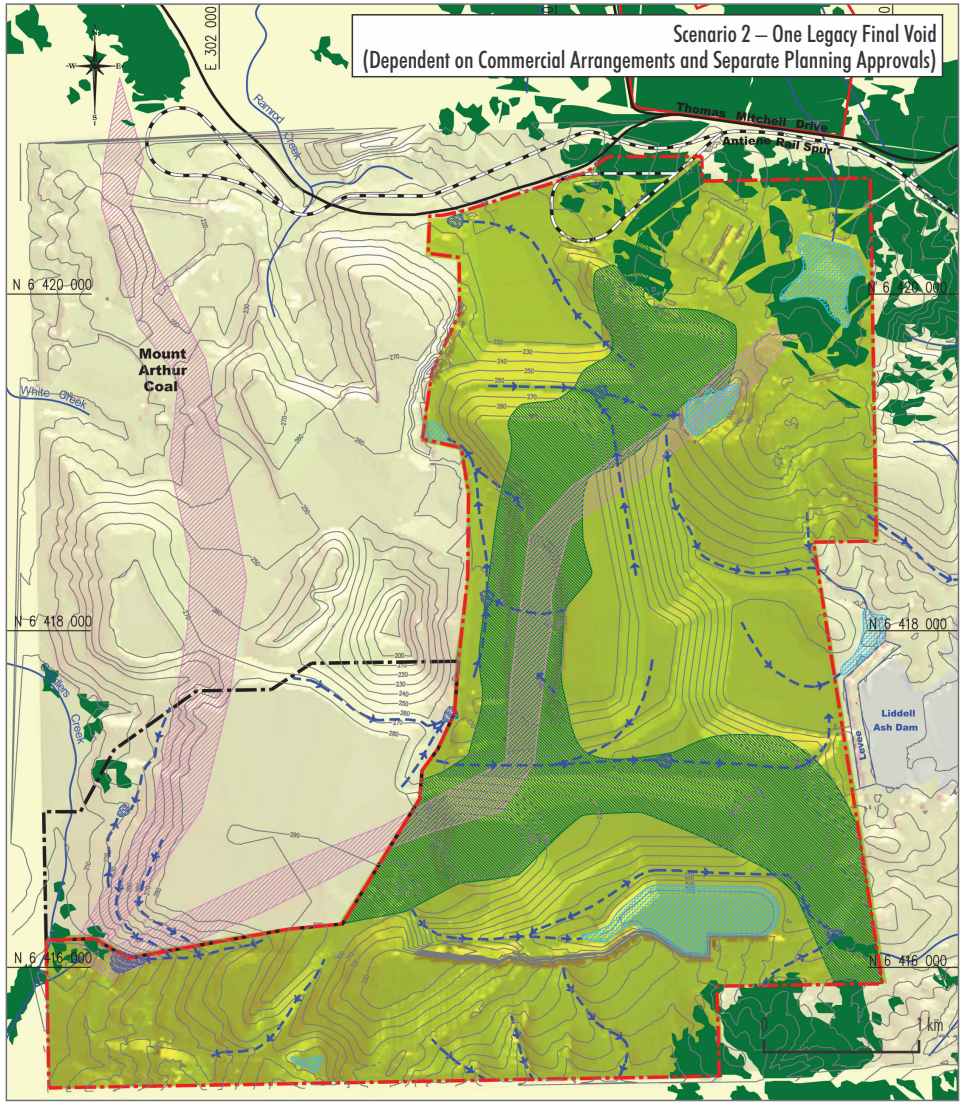
The Project supports continued rehabilitation of; (i) previously mined areas, and, (ii) existing overburden emplacement areas at the Maxwell Infrastructure.

In addition, the East Void would be reduced by around 22 million bank cubic metres (Mbcm) through the emplacement of reject material generated from processing of coal from the Project. The East Void would be progressively capped and rehabilitated during this period.

The emplacement of reject material in the East Void would significantly reduce the size of the final water body and enhance its integration with adjacent rehabilitated landforms to the south, east and west (refer Figures 11 and 12).

As an underground mine, the Project would result in minimal changes to existing landforms. Accordingly, further backfilling of the existing voids would require the rehandling of existing waste from the former Drayton Mine.





LEGEND

- Rehabilitation
- EA Boundary
- MAC Sub-lease
- Rail
- Road
- Creek
- Waterbody
- Fly Ash Emplacement
- Coarse Reject
- Drainage
- Proposed Dam
- Remnant Vegetation
- Proposed Woodland Area
- Synoptic Plan Corridor
- Wildlife Refuge

Source: Hansen Bailey (2007)

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Final Landform Scenarios
Assessed for the Drayton Mine Extension

Figure 14

Within the mining leases for the Maxwell Infrastructure, the existing landform at the Maxwell Infrastructure is below the surrounding natural surface levels, with the exception of the upper lifts of Overburden Emplacement Areas. This results from the historical open cut mining activities at the former Drayton Mine (Figure 14) which included the development of out-of-pit dumps. In order to create a free-draining landform, the area would need to be backfilled to the surrounding natural surface level (Plate 1).

Analysis undertaken by Malabar indicates approximately 190 Mbcm of waste material would be required to backfill the existing landform to the surrounding natural surface level. There is approximately 90 Mbcm of material available in the existing Overburden Emplacement Area above the natural surface level. Accordingly, in order to create a free-draining landform at the Maxwell Infrastructure, approximately 100 Mbcm of material would need to be sourced from outside the current pit area.

To backfill the existing landform to the natural surface, more than 800 ha of existing rehabilitation at the Maxwell Infrastructure would be disturbed. To mitigate against future spontaneous combustion events, over 16 Mbcm of inert material would need to be sourced. Currently only limited stocks of this material are available within the pit shell identified on Plate 1, so disturbance outside of the pit shell would be necessary.

In addition to the technical constraints associated with potential backfilling of the existing landform, there are a number of likely environmental impacts to consider, including:

- spontaneous combustion events due to the high propensity for spontaneous combustion associated with the Greta Coal Measures extracted at the Drayton Mine. These events would produce dust, smoke and odours;
- disturbance of existing rehabilitation areas, including approximately 25,000 tree saplings that Malabar has planted on existing woodland rehabilitation areas;
- air quality and noise impacts associated with a large open cut mining fleet;
- potential impacts to water resources if the free-draining landform no longer acts as a groundwater sink; and
- traffic impacts associated with the significant activities required to support these substantial works.

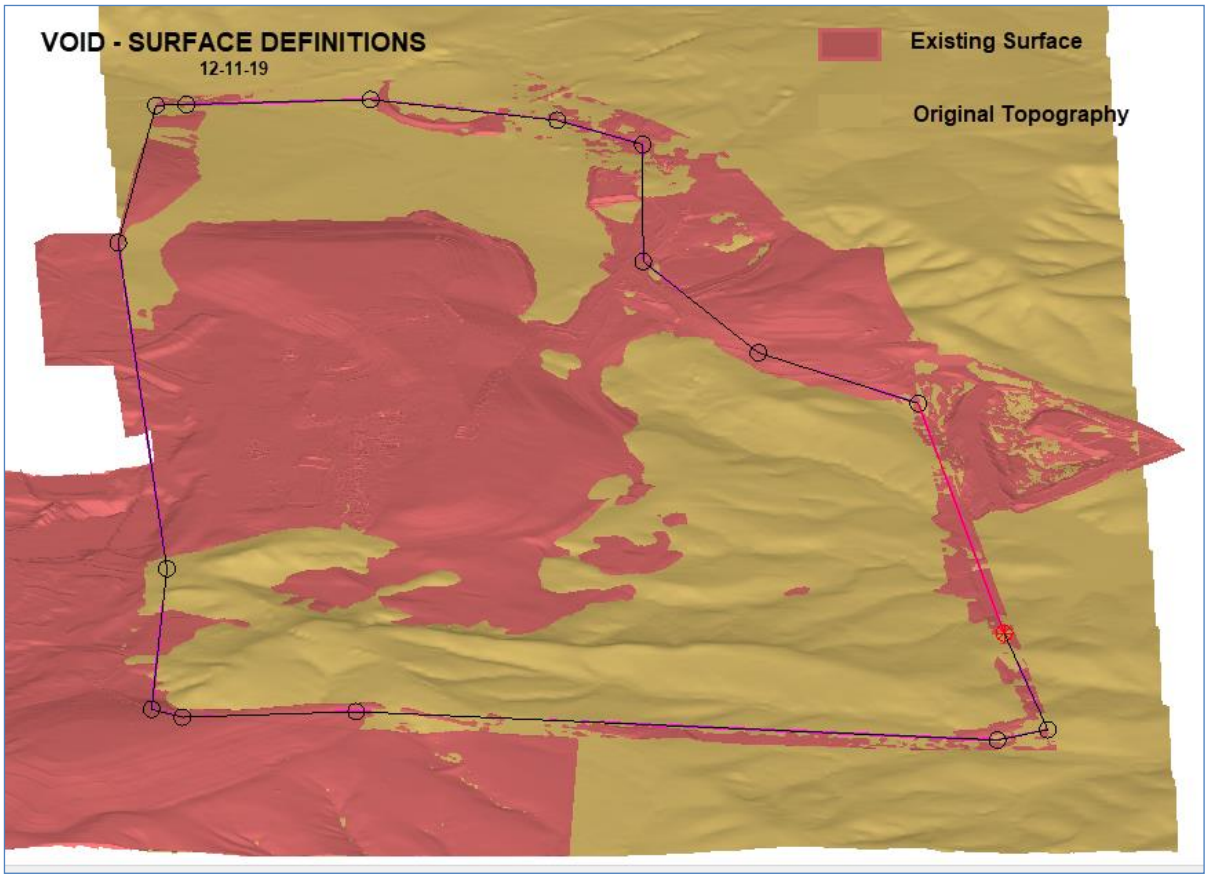


Plate 1 - Void Surface Definitions

Various spontaneous combustion events occurred at the former Drayton Mine since mining of the Greta Coal Measures began in 1980. Similar spontaneous combustion characteristics have also been observed at other operations which mine the Greta Coal Measures (Muswellbrook Mine and Mt Arthur Mine).

The risk of spontaneous combustion associated with Project mining activities is considered low. The Project coal resource is derived from Wittingham Coal Measures, which are very low sulphur compared to the higher sulphur materials that were derived from the Greta Coal Measures at the former Drayton Mine. However, rehandling of the existing higher sulphur materials from the Greta Coal Measures would create a material spontaneous combustion risk and associated environmental impacts (e.g. air quality, odour and bushfire risk).

The underground mining methods proposed for the Project significantly reduces environmental impacts, including dust, noise and surface disturbance, in comparison to open cut mining methods. The volume of waste material required to be rehandled in order to backfill the existing landform would require the use of large open cut mining equipment, which would generate noise and air quality impacts at the private receivers surrounding the Maxwell Infrastructure, particularly given the fleet would be operating at elevated levels on the Overburden Emplacement Area.

HydroSimulations (2019) simulated the long-term behaviour of the final voids using a numerical groundwater model and determined that they would remain as permanent and localised groundwater sinks. Therefore, there would be no risk to groundwater quality as a result of the existing final voids at the Maxwell Infrastructure, including in the long-term. If the existing landform was to be backfilled, it would potentially cease to act as a groundwater sink, resulting in water with elevated salt concentrations migrating to the surrounding environment.

The economic cost to backfill the existing landform to the surrounding natural surface level would be in the order of $760 million, based on an estimated cost of $4 per cubic metre of material rehandled and assuming the additional 100 Mbcm of material could be sourced from elsewhere at no cost. In practice, the cost would likely be much higher given the costs associated with importing the additional material and costs associated with sourcing inert materials to cap the final landform surface (which could be approximately $60 million).

In summary;

- The 3 voids were specified in the *Drayton Mine Extension Environmental Assessment* (Hansen Bailey, 2007), which was approved and is referenced in Condition 2, Schedule 2 of Project Approval 06_0202.
- The Project would involve largely backfilling the East Void.
- Any program to reshape the existing land form would lead to loss of previous rehabilitation, along with potentially significant air quality and noise impacts.
- The voids serve an important role in the management of water on the site, including as long-term groundwater sinks.
- There is potential to work with AGL and other mine operators to reduce the size of the voids through the emplacement of waste materials, subject to securing relevant approvals. There may also be opportunity to further reduce the size of the East Void, North Void and South Void by emplacing Rejects from possible future underground mining activities undertaken by Malabar within EL 5460 (additional coal within the Maxwell exploration licence) and EL 7429 (Spur Hill Underground Coking Coal Project) (subject to separate assessments and approvals).

6.1.9 Economic Effects and Social and Community Infrastructure

Voluntary Planning Agreement

Issue

MSC recommended that the Development Consent for the Project include a requirement for community enhancement contributions and payments to local road maintenance costs via a Voluntary Planning Agreement.

Response

Malabar is prepared to negotiate the terms of the Voluntary Planning Agreement outlined in Item 12 of the MSC's submission, noting that further detail regarding annual MSC road maintenance and infrastructure costs are yet to be provided.

Employment Benefits

Issue

MSC recognised the employment and training benefits of having an underground mine in the Muswellbrook LGA and suggested the following measures are implemented to encourage the employment of people residing in the Muswellbrook LGA:

- Providing ongoing training at the Muswellbrook TAFE campus to assist people with open cut mining qualifications to transition to an underground mining operation.
- Engaging the equivalent of four apprentices per year from the Muswellbrook LGA.
- Engaging permanent employees over casual labour or labour hire companies.

Response

As outlined as commitments in the EIS, Malabar would:

- Establish partnerships with Muswellbrook and Singleton High Schools to initiate training, apprenticeship, cadetship and/or intern programs that would provide pathways for local students to Project employment.
- Establish partnerships with the University of Newcastle, Muswellbrook TAFE Campus (Hunter TAFE) and Mining Skills Centre to develop Project-specific training programs and identify local young people with an interest in Project employment.
- Use its best endeavours to provide employment for four apprentices or trainees per year for the life of the mine sourced from residents within the Muswellbrook Shire.
- Focus recruitment on hiring residents of the Muswellbrook and Singleton LGAs, including local Indigenous people, young people, and local women.
- Encourage construction contractors and suppliers to hire locally where possible through contractual terms.
- Require construction contractors to engage with businesses in the Project region.
- Promote availability of Project employment and application arrangements in *The Muswellbrook Chronicle*, *Hunter Valley News*, *Denman News*, *Scone Advocate* and *The Singleton Argus*.
- Maintain regular engagement with local employment agencies to advise of opportunities for training and employment.
- Promote available services to assist candidates in preparing their applications and supporting documentation.

Distributive Equity

Issue

MSC requested the consideration of distributive equity of Project cost and benefits, including consideration of potential impacts on future generations.

Response

Social equity is defined by inter-generational and intra-generational equity. Inter-generational equity is the concept that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations, while intra-generational equity is applied within the same generation.

The principles of social equity are addressed through:

- assessment of the social and economic impacts of the Project (Appendices L and M of the EIS), including the distribution of impacts between stakeholders and consideration of the potential social and economic costs of climate change;
- mitigation measures to be implemented in relation to the potential impacts of the Project on water resources, Aboriginal heritage, land resources, noise, air quality, biodiversity, transport, hazards and risks, greenhouse gas emissions, visual character, economics, social values and surrounding land uses;
- implementation of environmental management and monitoring programs to minimise and evaluate potential environmental impacts (which include environmental management and monitoring programs covering the Project life); and
- implementation of biodiversity offsets to compensate for potential localised impacts that have been identified for the development.

The Project would benefit current and future generations through the creation of employment opportunities. It would also provide significant stimulus to local and regional economies and provide NSW export earnings and royalties, thus contributing to current and future generations through social welfare, amenity and infrastructure.

The Project incorporates a range of mitigation measures to minimise potential impacts on the environment and the costs of these measures would be met by Malabar and these costs have been included in the Economic Assessment (Deloitte Access Economics, 2019).

The potential benefits to current and future generations have therefore been calculated in the context of the mitigated Project.

Local Suppliers

Issue

MSC requested that Malabar implement a target of 25% of supplier expenditure being paid to companies with offices in Muswellbrook LGA.

Response

Malabar's existing operations support a number of local and regional contractors and suppliers, such as:

- BlackRock Industries (land management services, Muswellbrook);
- Blackwoods (industrial and safety supplies, Singleton);
- Enright Land Management Pty Ltd (land management services, Branxton);
- K Milwain & Sons (water cartage services, Muswellbrook);
- Kirkwood Produce (rural and rehabilitation supplies, Singleton);
- Muswellbrook Nissan (vehicle sales and servicing, Muswellbrook);
- Muswellbrook Security Services (alarm and security services, Muswellbrook);
- T&C Services (maintenance services, Muswellbrook);
- TLE (electrical supplies, Muswellbrook); and
- Upper Hunter Security Services (security services, Muswellbrook).

Approval of the Project would allow Malabar to continue and expand support for local and regional contractors and suppliers.

Malabar is estimated to directly spend $43 million a year on average during ongoing operations on non-labour operating expenditure associated with the Project. The local share of total expenditure (i.e. expenditure within the Muswellbrook and Upper Hunter LGAs) is anticipated to be approximately 28% (Deloitte Access Economics, 2019).

Economic Diversification Contribution

Issue

MSC recommended that Malabar make an economic contribution to support the diversification of the economy post-mining.

Response

Malabar has committed to making a number of economic contributions as part of the anticipated Voluntary Planning Agreement provisions and its ongoing voluntary contributions to community organisations and education (Primary, Secondary and Tertiary). The Project would also contribute to the diversification of the economy as an underground, predominantly metallurgical coal mine. Also, Malabar has committed to the provision of traineeships and apprenticeships providing skills that would be transferrable to other industries.

Accordingly, further economic contributions for the diversification of the economy are not considered justified.

First Hand Views of Stakeholders

Issue

DPIE recommended supplementary documentation be prepared to consider the first hand views of key stakeholders provided in the public submissions.

Response

Malabar has prepared the *Consideration of First Hand Views in Public Submissions Report* (Malabar, 2019b) to provide supplementary information in addition to the SIA included as part of the EIS (Attachment 5).

6.1.10 Other Environmental Matters

Development Consent

Issue

MSC recommended that a single new approval for the Project, incorporating infrastructure on, and rehabilitation required for, the former Drayton mine, and the ongoing use of the Antiene rail spur and other infrastructure, be issued. MSC also queried whether modifications to Project Approval 06_0202 (former Drayton Mine) and Antiene Development Consent DA 106-04-00 (Antiene rail spur) are required.

Response

Malabar intends to consolidate current rehabilitation activities under Project Approval 06_0202 at the former Drayton Mine into the Project's Development Consent, if approved. Should Development Consent be granted for the Project (which includes the ongoing rehabilitation at the former Drayton Mine) and subject to Malabar being satisfied with the consent conditions, Project Approval 06_0202 would be surrendered so that the mine operates under only one consent. Accordingly, no modification to Project Approval 06_0202 would be required.

The section of the Antiene Rail Spur used to service the former Drayton Mine is approved to operate under Development Consent DA 106-04-00 until November 2025. Malabar will separately lodge a modification to extend the operation of Development Consent DA 106-04-00. Potential environmental impacts associated with use of the Antiene Rail Spur for the Project have been assessed in the EIS.

Export Management Plan

Issue

MSC recommended that the Development Consent for the Project include a requirement to prepare an Export Management Plan.

Response

The NSW Government has announced that it will introduce legislation to prevent the regulation of Scope 3 emissions in NSW mining approvals (NSW Government, 2019).

Malabar would manage its contribution to Australian greenhouse gas emissions inventories through participation in the *National Greenhouse and Energy Report Scheme* (NGERS), as well as other applicable government initiatives and policies implemented to manage emissions at the national level under Australia's progressive Nationally Determined Contributions (NDCs).

Upper Hunter Shire Council

Issue

Upper Hunter Shire Council raised concerns regarding potential impacts on the Hunter Equine Critical Industry Cluster (CIC), including potential impacts on water resources.

Response

Potential impacts on the Hunter Equine CIC, including potential impacts on water resources, are discussed in the responses to specific issues raised in the organisation and public submissions (Section 6.2).

6.2 RESPONSES TO ORGANISATIONS AND PUBLIC SUBMISSIONS

Responses to issues or concerns raised by organisations and public submissions are provided in the sub-sections below.

It is noted that submissions from organisations and public submissions that supported the Project are not repeated or described below.

6.2.1 Subsidence

Subsidence Influence on Groundwater Predictions

Issue

Some organisation submissions raised concerns regarding potential groundwater impacts associated with subsidence fracturing.

Response

HydroSimulations (2019) evaluated the potential impacts of the Project on groundwater resources using a numerical regional groundwater model.

The numerical model incorporates the influence of sub-surface fracturing on the surrounding groundwater environment, including changes in hydraulic properties, and potential pathways for vertical and horizontal groundwater movement.

Fracturing is most significant and vertically connected immediately above the goaf, with the degree of vertical connection decreasing with height (HydroSimulations, 2019). The height of fracturing above the goaf, and associated height of groundwater depressurisation, is an important factor in assessing the potential impacts of longwall mining to groundwater.

Various methodologies for estimating the height of sub-surface fracturing and groundwater depressurisation are described in the Groundwater Assessment, including empirical methods such as the 'Tammetta Equation' and 'Ditton Equation'. The methodology adopted to determine the height of fracturing for multi-seam mining is also discussed in the Groundwater Assessment.

A conservative multi-seam correction was applied to determine the height of fracturing by adjusting the effective thickness of the uppermost seam by the sum of the thicknesses of all undermined seams. This approach is considered conservative because, in practise, the total subsidence would be less than the sum of extracted seam thicknesses (HydroSimulations, 2019).

Simulation of changes in hydraulic properties as a result of sub-surface fracturing has been conducted for the Project groundwater modelling using the 'stacked drain' method (HydroSimulations, 2019).

Dr Frans Kalf in the peer review of the Groundwater Assessment (Attachment 6 of the EIS) supports the use of the stacked drain method and states the method "is considered conservative".

The numerical groundwater modelling predicts a substantial reduction in potentiometric head in the groundwater systems of the Permian aged porous rock in the near vicinity of the Project. Recovery of the groundwater water table and pressures within the porous and fractured rock groundwater system is predicted to occur over many decades following the cessation of mining (HydroSimulations, 2019).

Notwithstanding, an assessment of potential impacts of the Project on groundwater resources also concluded (HydroSimulations, 2019):

- minimal impact (i.e. less than 2 m drawdown) in the "highly productive" Hunter River alluvium;
- minimal impact at all bores in alluvial aquifers;
- negligible adverse impact on groundwater quality in the alluvium;
- no change to the beneficial uses of the Permian hard-rock aquifers in or around the Project area during or following mining; and
- negligible impacts to GDEs.

Subsidence Impacts on Agriculture

Issue

Some organisations and public submissions raised concerns regarding the potential for subsidence to impact the suitability of lands for agriculture. In particular, the following concerns were raised:

- risks associated with saline water infiltrating through the soil profile;
- waterlogging of crops and pastures;
- impacts on irrigation; and
- impacts on crop harvests.

Response

The land above the Maxwell Underground area is primarily used for cattle grazing and associated infrastructure. Historical cropping in the Maxwell Underground area is limited to small areas of opportunistic fodder cropping (under favourable conditions).

Vegetation mapping for the BDAR (Hunter Eco, 2019a) indicates the majority of the Maxwell Underground area comprises derived native grassland associated with White Box – Ironbark Red Gum Shrubby Forest – Derived Native Grassland (PCT1606) and Slaty Box Shrubby Woodland (PCT1655), which are both threatened ecological communities listed under the BC Act and EPBC Act. No areas of cultivation (i.e. cropping) were mapped within the Maxwell Underground area.

Fluvial Systems Pty Ltd (Fluvial Systems) (2019) concluded that subsidence may result in the formation of new depressions, or the expansion/deepening of existing depressions along the channels of smaller, unnamed watercourses above the Maxwell Underground. However, ultimately the depressions would fill with sediment, reforming an even stream grade.

The increased ponding across the landscape would act to trap sediment and increase the persistence of hydrologic refugia. An increased capacity of the catchment to trap sediment would help to offset the historically higher-than-natural rates of sediment generation in the catchment due to historical land clearance and management (Fluvial Systems, 2019).

The Agricultural Impact Statement considered the potential for subsidence to impact soil quality through ponding and soil degradation. With the implementation of land management planning and action to minimise erosion through retention of high levels of ground cover, avoiding cultivation, repairing residual soil cracks and managing areas of poor drainage, the Project would have no significant impact on soil quality (2rog Consulting [2rog], 2019).

During active subsidence, if a proactive management approach is not adopted, there could be safety risks to cattle and personnel as a result of the development of surface cracking. These risks would be mitigated by preventing access for livestock and unauthorised personnel to areas of active subsidence (e.g. via temporary fencing) until the area is inspected, any necessary remediation completed and deemed safe (2rog, 2019).

Based on experience at the Beltana Mine, surface cracking is expected to affect less than 0.09% of the surface area (MSEC, 2019).

The Agricultural Impact Statement for the Project concludes (2rog, 2019):

- Any subsidence impacts to agricultural land use would be short-term, with minimal to no impacts to production.
- Subsidence as a result of the Project is not expected to result in changes to Land and Soil Capability Class.

The above conclusions by 2rog (2019) in the Agricultural Impact Statement are supported by a review of literature (e.g. Trotter and Frazier [2009], Frazier *et al*. [2010] Thompson *et al*. [2010], Hinchliffe *et al*. [2003], Frazier [2015]) and performance at other underground mining operations (e.g. Beltana No. 1 Underground Mine, Kestrel Mine, Beltana Mine).

The EIS for the Project describes a range of mitigation measures that would be implemented to reduce potential impacts on agriculture.

Malabar is currently improving the agricultural capacity of the land above the Maxwell Underground project through a range of capital programs including fencing, upgraded stock water systems and pasture improvements. Malabar would continue these activities throughout the life of the Project.

6.2.2 Water Resources

Water Impacts on Other Industries

Issue

A number of organisation and public submissions raised concerns regarding potential impacts on agricultural and equine industries due to potential impacts of the Project on water resources.

Response

Malabar has committed that no water will be drawn from external sources (e.g. the Hunter River) over the life of the Project.

The potential impacts of the Project on water resources have been comprehensively assessed in the Surface Water Assessment (WRM Water and Environment, 2019) and Groundwater Assessment (HydroSimulations, 2019).

A number of the submissions emphasise the importance of the Hunter River for water supply to the agriculture and equine industries, in particular the Coolmore and Godolphin Woodlands Studs. Photographs of irrigation undertaken on the Coolmore Stud are shown on Plates 2 and 3.

The Hunter River is a regulated river supplying water from Glenbawn Dam to a range of industrial and agricultural users as well as town water supplies. WaterNSW releases water from Glenbawn Dam based on water orders received from licensed downstream users (including the Coolmore and Godolphin Woodlands Studs).

2rog Consulting (2019) identified that water for both Coolmore and Godolphin Woodlands Studs is drawn primarily from the Hunter Regulated River Water Source. The Godolphin Woodlands Stud has access of up to approximately 3,764 ML per annum from the Hunter River (WAL 1034, 1033, 1321, 789, 1271, 1020 and 1215) and the Coolmore Stud has access of up to 5,290 ML per annum from the Hunter River (WAL 11175, 13797, 616 and 1311).

Further to the above, Ross Watson (2015), an agronomist commissioned by Coolmore, noted that the Coolmore Stud is the largest area of irrigated pasture on a single property in the Hunter Region, and the largest area of pasture serviced by travelling irrigation systems in the southern hemisphere.

The relevant Hunter River water sources and management zones in the vicinity of the Project are summarised in Table 9. The maximum predicted annual licensing volumes required for the Project, based on groundwater modelling by HydroSimulations (2019), are also summarised in Table 9.

Table 9
Hunter River Water Sources

Water Sharing Plan	Water Source	Total Entitlements in the Water Source (units)	Maximum Predicted Annual Water Take for the Project (ML per annum)*	Percentage of Water Source Required for Project
Water Sharing Plan for the Hunter Regulated River Water Source 2016	Management Zone 1B (Hunter River from Goulburn River Junction to Glennies Creek Junction) of the Hunter Regulated River Water Source	34,177	19	0.06%
Water Sharing Plan for the Hunter Unregulated and Alluvial Water Sources 2009	Upstream Glennies Creek Management Zone in the Hunter Regulated River Alluvial Water Source	15,937	35	0.22%

** Malabar holds sufficient regulated river (general security) access licences to account for the Project's incidental take from the Hunter Regulated River even in the event of severe drought conditions (which has historically reduced the available water determinations for general security licences to 0.35 ML per unit share).*

Malabar holds 1,423 units in the Hunter Regulated River Source and 125 units in the Hunter Regulated River Alluvial Water source. These allocations are used to support Malabar's agricultural activities with any excess to Malabar's requirements being leased to neighbouring agricultural enterprises.

The maximum predicted annual licensing volume for the Project in the Hunter Regulated River Water Source represents 0.06% of the total water source and 0.21% of the total licensed entitlement of Coolmore and Godolphin Woodlands Studs. Accordingly, the Project is not anticipated to result in impacts on water resources used by agricultural and equine industries, including the Coolmore and Godolphin Woodlands Studs.

Malabar would implement an extensive groundwater and surface water monitoring program over the life of the Project. Monitoring results would be regularly reviewed and used to refine modelling predictions, and implement an adaptive management and continuous improvement approach.

Plate 2 – Irrigated Land vs Non-irrigated Land at the Coolmore Stud in September 2019 (Coolmore, 2019).

Plate 3 – Irrigated Land vs Non-irrigated Land at the Coolmore Stud in September 2019 (Coolmore, 2019).

Site Water Balance Modelling

Issue

Some organisation submissions raised concerns regarding the accuracy of the site water balance modelling undertaken for the Project. In particular, the following perceived issues with the site water balance were identified:

- The model was calibrated to a period of site-specific data from January 2017 to December 2018, which was a prolonged dry period.
- Disparities between the groundwater inflows used in the site water balance and those determined by the groundwater model.
- The statistical interpretation of the model misrepresents the probability of critical outcomes, including cumulative probabilities.

Response

The site water balance model for the Project provides a statistical analysis of the water management system's performance encompassing 103 separate simulations representing a full range of historical climatic sequences. The simulations are based on measured rainfall data dating as far back as 1889, with the first run based on rainfall data from 1889 to 1915, the second using data from 1890 to 1916 and so on (WRM Water and Environment, 2019).

This approach provides the widest possible range of climate scenarios covering the full range of climatic conditions represented in the available historical rainfall record (WRM Water and Environment, 2019) for the area.

Calibration of the water balance model was undertaken over the period January 2017 to December 2018. This provided a baseline where stored water volumes at the Maxwell Infrastructure were available and there were no active operations at the former Drayton Mine (WRM Water and Environment, 2019).

Although the calibration occurred during a prolonged dry period, the entire record of historical rainfall was used for the predictive realisations and, therefore, the full range of historical climatic conditions that have occurred since 1889 are represented in the results of the water balance modelling.

The use of such a large number of climate sequences reflecting the full range of historical climatic conditions provides modelling of the performance of Project's water management system under very wet, very dry and average climatic conditions (WRM Water and Environment, 2019).

The groundwater inflows to the Maxwell Underground adopted in the site water balance model are shown on Figure 5.2 of the Surface Water Assessment (WRM Water and Environment, 2019). These inflows are consistent with the inflows to the Maxwell Underground predicted by the groundwater model, as shown on Figure 69 of the Groundwater Assessment (HydroSimulations, 2019).

With respect to groundwater inflows to the Maxwell Infrastructure voids, the Surface Water Assessment (WRM Water and Environment, 2019) states:

> *Analysis by HydroSimulations (2019) indicates that groundwater inflows to the Maxwell Infrastructure voids would be negligible over the life of the Project. Rather, the voids would typically lose water to the surrounding spoil until it re-saturates. Water would flow to the voids when the head in the spoil is greater than the water level in the voids, and vice versa.*
>
> *In order to capture the gain/loss of water between the voids and the spoil, the storage capacity of the spoil pore space has been incorporated in the storage curves for the voids.*

Similarly, the Groundwater Assessment (HydroSimulations, 2019) states:

> *The calibrated groundwater model was used to quantify the volume of groundwater seeping into the void areas. This was estimated at 3 ML/year on average and less than 11 ML/year maximum. These rates were considered negligible for the purposes of the site water balance modelling conducted by WRM, which also factored in seepage from the surrounding spoil.*

Based on the above, there is no disparity between the groundwater inflows used in the site water balance and those determined by the groundwater model.

The site water balance model results are presented as percentiles based on the probability of exceedance. Each percentile trace shows the likelihood of a particular value on each day and does not represent continuous results from a single model realisation. Presenting the site water balance model results as percentiles is conventional industry practice and is considered appropriate to represent the probability of key outcomes of the water management system.

Surface Water Impacts

Issue

Some organisation submissions raised concerns regarding the assessment of potential impacts to watercourses.

Response

The potential impacts of the Project on watercourses have been assessed in the Surface Water Assessment (WRM Water and Environment, 2019). Where relevant, the Surface Water Assessment draws on the conclusions of the Subsidence Assessment (MSEC, 2019), Geomorphology Assessment (Fluvial Systems, 2019) and Groundwater Assessment (HydroSimulations, 2019).

The Hunter River and Saddlers Creek are located outside the Maxwell Underground area and would not be subject to direct subsidence impacts (MSEC, 2019).

The Surface Water Assessment concludes (WRM Water and Environment, 2019):

- Potential impacts of the Project on flow and water quality in the Hunter River would be negligible.
- The Project would result in negligible incremental change to the existing cumulative impacts on flow in Saddlers Creek, Saltwater Creek, Ramrod Creek or Bayswater Creek; related to the Mt Arthur Mine, existing Maxwell Infrastructure and Bayswater and Liddell Power Stations.
- The Project would have no adverse effect on surface water quality in downstream receiving waters.

Subsidence has the potential to result in knickpoint formation and stream channel alignment change on drainage lines overlying the Maxwell Underground area (Fluvial Systems, 2019).

The majority of the streams in the Maxwell Underground area were classified as ‘headwater’ streams. The identified headwater streams are considered geomorphologically resilient because of their setting in confined valleys (i.e. no alluvial floodplains present). Thus, mining is not expected to present a significant risk to change in geomorphic character of the headwater streams (Fluvial System, 2019).

The other stream types are of high or moderate fragility and are, therefore, at risk of geomorphic change due to subsidence, which would occur progressively throughout the Project life. Of the thirty streams within the Maxwell Underground area, eight were assessed as having a greater risk of geomorphic change due to subsidence, all of which have intermittent, and mostly ephemeral, flow-regimes (Fluvial System, 2019).

The risk of knickpoint formation and stream channel alignment change would be addressed through a process of adaptive management and, where necessary, remediation.

The increased ponding across the landscape would act to trap sediment and increase the persistence of hydrologic refugia. An increased capacity of the catchment to trap sediment would help to offset the historically higher-than-natural rates of sediment generation in the catchment due to historical land clearance and management (Fluvial Systems, 2019).

Final Voids

Issue

Some organisations and public submissions raised concerns regarding potential impacts of the existing Maxwell Infrastructure final voids on water resources. In particular, concerns were raised regarding:

- Potential overflows of water from the voids due to rainfall.
- Potential seepage of groundwater to nearby alluvial water sources.

Response

There are three existing voids as a result of previous mining activities at the former Drayton Mine (North Void, East Void and South Void). The Project would support continued rehabilitation activities at the Maxwell Infrastructure, including reduction in the volume of the existing final voids through emplacement of Rejects generated by coal processing activities. That is, the Maxwell Underground would improve the environmental outcomes at the former Drayton Mine.

The accumulation of surface runoff combined with groundwater inflows may result in the formation of a pond of water in the voids at the Maxwell Infrastructure, which would rise until the average rate of inflow is balanced by evaporation from its surface (WRM Water and Environment, 2019).

Pit lake equilibrium levels were determined by WRM Water and Environment (2019) based on direct rainfall to the void surface and catchment runoff, less evaporation losses. The recovery groundwater modelling predicts that net groundwater inflows to the voids at the predicted equilibrium level would be negligible (HydroSimulations, 2019).

The historical rainfall and evaporation sequences (129 years) were repeated five times to create a long-term climate record. No overflows from any of the three voids were simulated, with the maximum modelled water level reaching (WRM Water and Environment, 2019):

- 44 m below the North Void overflow level;
- 9 m below the East Void overflow level; and
- 11 m below the South Void overflow level.

HydroSimulations (2019) evaluated the potential impacts of the Project on groundwater resources using a numerical regional groundwater model. Groundwater modelling included predictive modelling over the life of the Project as well as recovery modelling for a 1,000-year period post-mining.

Pit lake levels derived by WRM Water and Environment (2019) were implemented in the recovery groundwater model using a series of constant heads over time. HydroSimulations (2019) simulated the long-term behaviour of the final voids and determined that they would remain as permanent and localised groundwater sinks.

Ash placement by AGL has not been considered in the EIS as there is no proposal at this time for any deposition of ash within the voids. In the event that AGL proposes to deposit ash within the voids this would require a separate Development Application and associated studies to consider the potential impacts.

Alluvial Drawdown and Baseflow Impacts

Issue

Organisation and public submissions raised concerns regarding potential drawdowns in alluvial aquifers and baseflow impacts.

Response

HydroSimulations (2019) evaluated the potential impacts of the Project on groundwater resources using a numerical regional groundwater model. The Groundwater Assessment has been peer reviewed by Kalf and Associates (Dr Frans Kalf) and the review report is presented in Attachment 6 of the EIS.

The Project is predicted to reduce upward leakage from the Permian coal measures to the overlying alluvium in localised areas along Saddlers Creek, Saltwater Creek and the Hunter River (HydroSimulations, 2019).

Along Saddlers Creek and Saltwater Creek, the reduction in upward seepage from the Permian coal measures to the alluvium is predicted to average 6 ML/year, with a maximum of 12 ML/year during active mining. Post-mining the reduction in upward seepage peaks at 25 ML/year, but reduces back to 9 ML/year at equilibrium (HydroSimulations, 2019).

Alluvium along the Hunter River also shows a slight decline in upward seepage from the Permian coal measures to the overlying alluvium due to the Project, with reduced seepage predicted of up to 5 ML/year during mining and up to 19 ML/year post-mining in the "highly productive" alluvium associated with the Hunter Regulated River Water Source. The predicted reduction in seepage is considered negligible in the context of the high rates of recharge to the Hunter River alluvium (HydroSimulations, 2019).

Predicted groundwater drawdowns in the "highly productive" Hunter River alluvium are within the AIP minimal harm criterion of less than 2 m (HydroSimulations, 2019).

Drawdown exceeding the AIP criteria of 2 m was predicted within the Saddlers Creek alluvium, Saltwater Creek alluvium and in the alluvium associated with a tributary of Saltwater Creek (HydroSimulations, 2019).

The groundwater modelling predicts that the groundwater drawdown in the Saddlers Creek and Saltwater Creek alluvium largely occurs post-mining. Due to conservative assumptions, the drawdown in the alluvium is sustained over time in the groundwater recovery model. These assumptions result in reduced potential recharge to the alluvium compared to conditions that have been observed along Saddlers Creek and, therefore, provide a conservative prediction of potential impacts on the alluvium (HydroSimulations, 2019).

HydroSimulations (2019) predicted there would be no change in baseflow along Saddlers Creek and Saltwater Creek. There is potential for localised groundwater drawdown within the saturated alluvium in the upper reaches of Saddlers Creek, however, these areas exhibit "losing conditions" and, therefore, it is expected that there would not be a reduction in baseflow (HydroSimulations, 2019).

The predicted drawdown extends toward the Hunter River alignment, with the model predicting increased leakage of up to 0.55 ML/year from the Hunter River to the underlying alluvium, which is considered negligible in comparison to the observed historical flow rates in the Hunter River and the regulation of its flow (HydroSimulations, 2019). For comparison, the median annual flow in the Hunter River at the Liddell Gauging Station (210083) is approximately 87,600 ML/year.

Impacts on Highly Productive Bores

Issue

An organisation queried the finding that the Project would have minimal impact to bores in "highly productive" aquifers, including questioning the quantification of minimal impact.

Response

"Minimal impact" is defined in the AIP (NSW Government, 2012) as less than 2 m decline cumulatively at any water supply work.

HydroSimulations (2019) evaluated the potential impacts of the Project on privately-owned bores using a numerical regional groundwater model and found that no bores in the "highly productive" Hunter River alluvium or the Saddlers Creek alluvium are predicted to experience cumulative drawdowns greater than 2 m, maximum at any privately owned bore is 0.5 m. The Project would result in less than 0.5 m of maximum drawdown along the Hunter River alluvium (HydroSimulations, 2019).

Malabar undertook a bore census for the Project in 2018 (the Bore Census). Coolmore declined to participate in the Bore Census on the basis that their property did not use water extracted from groundwater bores.

Groundwater Assessment Uncertainty

Issue

Some organisations and public submissions raised concerns regarding potential uncertainty in groundwater model predictions.

Response

HydroSimulations (2019) evaluated the potential impacts of the Project on groundwater resources using a numerical regional groundwater model.

HydroSimulations (2019) tested the uncertainty of the groundwater predictions using scenario analysis. This is one of three methods of undertaking uncertainty analysis recommended by the Independent Expert Scientific Committee on Coal Seam Gas and Large Coal Mining Development (IESC) in *Uncertainty analysis—Guidance for groundwater modelling within a risk management framework* (Middlemis and Peeters, 2018).

Using the scenario analysis approach, the aim is to assess the predictive groundwater models' simulated Project mining effects with regard to their sensitivity to selected model parameters (HydroSimulations, 2019).

The groundwater model parameters were adjusted to encompass the range of likely uncertainty in key parameters. This was achieved by changing and assessing the following key parameters (HydroSimulations, 2019):

- ± 1 order of magnitude change (i.e. a 10x change) in specific storage (Ss) for all geological units, with values within the range of expected values based on Rau *et al*. (2018);
- an increase in coal seam drain conductance by 300% (to 0.3 square metres per day);
- rainfall recharge:
  - NSW and ACT Regional Climate Modelling (NARCliM) projection for near future (2020 to 2039) – simulation of median (+3%), highest (+16%) and lowest (-13%) predicted changes to average rainfall;
  - NARCliM projection for far future (2060 to 2079) – simulation of median (+8%) predicted changes to average rainfall;
- ± 1 order of magnitude change (i.e. a 10x change) in horizontal hydraulic conductivity (Kx) for all geological units;
- ± 1 order of magnitude change (i.e. a 10x change) in vertical hydraulic conductivity (Kz) for all geological units;
- boundary conditions (including testing of general head boundaries); and
- dykes within Maxwell Underground area.

The uncertainty in the model predictions in terms of groundwater depressurisation extent, alluvial groundwater take and river leakage were assessed by HydroSimulations (2019) and are summarised in Table 10.

Table 10
Summary of Groundwater Uncertainty Analysis Outcomes

Sensitivity Scenario	Groundwater Depressurisation	Alluvial Groundwater Take	River Leakage
Decreased General Head Boundary conductance	✓	✓	✓
NARCliM Far Future – median change to rainfall	✓	✓	✓
NARCliM Near Future – median change to rainfall	✓	✓	✓
NARCliM Near Future – lowest change to rainfall	✓	✓	✓
NARCliM Near Future – highest change to rainfall	✓	✓	✓
Kx increased	Increased extent of depressurisation	Increased alluvial groundwater take	✓
Kx decreased	✓	✓	✓
Kz increased	✓	✓	✓
Kz decreased	✓	✓	✓
Ss increased	✓	✓	✓
Ss decreased	✓	✓	✓
Low permeability dykes	✓	✓	✓
Increased drain conductance	✓	✓	✓

✓ = Sensitivity scenario resulted in negligible change or reduced impact relative to the base case model.

All sensitivity scenarios resulted in negligible change or reduced impact relative to the base case model, with the exception of the modelled increase in hydraulic conductivity. With regard to the modelled increase in hydraulic conductivity, it is relevant to note that (HydroSimulations, 2019):

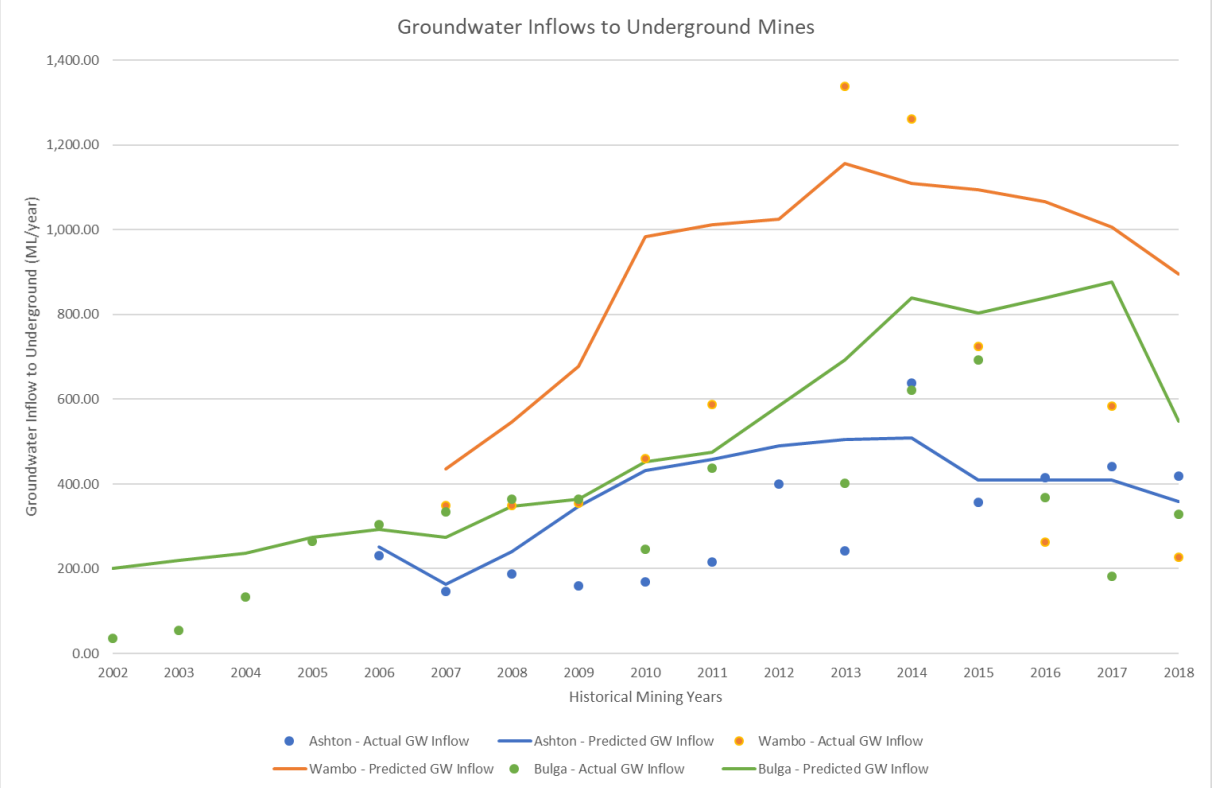
- The base case model horizontal hydraulic conductivity for alluvium is conservatively high and the sensitivity range includes parameters outside of expected field ranges.
- Predicted drawdown in the Hunter River alluvium remained below the minimal impact criteria of 2 m in the sensitivity scenario.
- Predicted groundwater take from the Upstream Glennies Creek Management Zone in the Hunter Regulated River Alluvial Water Source increased to 72 ML/year in the sensitivity scenario, which is within Malabar's existing licensed entitlement and is negligible when compared to the total entitlement in the water source (15,937 units).
- Predicted groundwater take from the Management Zone 1B (Hunter River from Goulburn River Junction to Glennies Creek Junction) of the Hunter Regulated River Water Source increased to 90 ML/year in the sensitivity scenario, which is within Malabar's existing licensed entitlement and is negligible when compared to the total entitlement in the water source (34,177 units).

Dr Frans Kalf in the peer review of the Groundwater Assessment (Attachment 6 of the EIS) reviewed the outcomes of the uncertainty analysis and concluded that the groundwater model is considered "fit-for-purpose".

Further to the uncertainty analysis undertaken for the Project groundwater model, a review of long-term underground mining case studies in the Hunter Valley has been undertaken to compare predicted and actual groundwater inflows (Chart 6). Information has been compiled from relevant groundwater assessments, groundwater reports, annual reviews and annual environmental management reports for three underground mines in the Hunter Valley with long-term (>10 years) groundwater inflow records (Ashton, Wambo and Bulga underground mines).

This review indicates that measured annual groundwater inflows have typically been approximately equal to or less than those predicted with a numerical groundwater model.

Chart 6
Review of Measured vs Predicted Groundwater Inflows at Example Underground Mines in the Hunter Valley



Sources: Australasian Groundwater and Environmental Consultants (2003; 2016; 2017; 2018; 2019), Aquaterra (2010), David (2015a; 2015b; 2016; 2017; 2019), Mackie Environmental Research (2003; 2009a; 2009b), Peter Dundon & Associates Pty Ltd (2008), RPS (2014; 2015), RPS Aquaterra (2011; 2013), Wambo Coal Pty Ltd (2008; 2009; 2010; 2011; 2014; 2015; 2016; 2017; 2018; 2019).

Water Access Licences in the Sydney Basin - North Coast Groundwater Source

Issue

One organisation submission raised the following concerns regarding Project licensing requirements in the Sydney Basin – North Coast Groundwater Source:

- Malabar relies on carry over provisions to reduce the maximum licensing requirement;
- Malabar does not hold the full amount of licences required to account for the maximum predicted annual licensing requirement; and
- a Controlled Allocation Order would not be undertaken for the groundwater source because the Rules Summary Sheet states there is only 3,453ML of unassigned water.

Response

With regard to carry over provisions in the Sydney Basin-North Coast Groundwater Source, subclause 38(3) of the *Water Sharing Plan for the North Coast Fractured and Porous Rock Groundwater Sources 2016* relevantly states:

> *(3) The maximum water allocation that can be carried over from one water year to the next in the water allocation account for an aquifer access licence is equal to:*
>
> *(a) 100% of the access licence share component for access licences with share components expressed as ML/year, or*
>
> *(b) 1 ML per unit share of the access licence share component for access licences with share components expressed as a number of unit shares.*

Clause 38 of the *Water Sharing Plan for the North Coast Fractured and Porous Rock Groundwater Sources 2016* does not prevent the application of carry over provisions under any circumstances. Accordingly, it is considered appropriate to consider carry over provisions when determining the licensing requirements for the Project.

The submission identifies a current licence shortfall of 505 ML (228 ML with the application of carry over provisions and additional agreements reached for the transfer of existing WALs) in the Sydney Basin – North Coast Groundwater Source for the maximum annual licensing requirement. Malabar holds sufficient licences for the first four years of the Project, and would obtain additional licences as they are required in accordance with the requirements of the *Water Management Act, 2000*.

The *Rules Summary Sheet Sydney Basin – North Coast Groundwater Source* (DPI Water, 2016a) states that there is 3,453 ML/year of unassigned water in the Sydney Basin – North Coast Groundwater Source. This is based on the *Water Sharing Plan for the North Coast Fractured and Porous Rock Groundwater Sources Background document* (DPI Water, 2016b), which states that there are 86,547 ML/year of existing licences and basic landholder requirements. However, review of the NSW Water Register indicates there is 16,807.50 units of unassigned water because there is actually only 73,192.5 of existing licences and basic landholder requirements (Table 11).

Accordingly, a controlled allocation order for the Sydney Basin – North Coast Groundwater Source is considered warranted.

In the absence of a controlled allocation order, Malabar would seek and obtain the appropriate water licences for the Sydney Basin-North Coast Groundwater Source on the open market. In 2019, Malabar has reached an agreement for the transfer of 89 units with existing WAL holders in the Sydney Basin-North Coast Groundwater Source. The ongoing acquisitions of WALs as they are required for mining operations is, therefore, considered viable.

Table 11
Summary of Unassigned Water in the Sydney Basin-North Coast Groundwater Source

Category	Number of Licences	Annual Usage (ML/year)	Source
Aquifer Licences	165	66,805.5[1]	NSW Water Register for the 2019/20 period, (WaterNSW, 2019).
Local Water Utility Licences	9	1,300.0	NSW Water Register for the 2019/20 period, (WaterNSW, 2019).
Domestic and Stock Rights	N/A	5,087.0	Subclause 19(m) of the *Water Sharing Plan for the North Coast Fractured and Porous Rock Groundwater Sources 2016*.
Subtotal of Assigned Water	***174***	***73,192.5***	
Long-term Average Annual Extraction Limit	N/A	90,000.0	Subclause 26(14) of the *Water Sharing Plan for the North Coast Fractured and Porous Rock Groundwater Sources 2016*.
Total Unassigned Water	***N/A***	***16,807.50***	

[1] Aquifer licences in the Sydney Basin-North Coast Groundwater Source received an allocation of 1 ML per unit share of entitlement in the 2018/19 period (Department of Industry – Lands and Water Division, 2018).

Groundwater Dependent Ecosystems

Issue

An organisation noted the IESC advice on the Maxwell Project Gateway Application regarding the need to assess potential impacts to GDEs.

Response

An Integrated Assessment of Potential Impacts on Groundwater Dependent Ecosystems (GDE Assessment) was prepared for the Project and is included as Appendix V of the EIS. The GDE Assessment to satisfy the assessment requirements pertaining to GDEs in the SEARs, regulatory input to the SEARs and relevant GDE guidelines.

The GDE Assessment drew on information and assessments in the following technical reports prepared for the Project:

- BDAR (Hunter Eco, 2019a);
- Groundwater Assessment (HydroSimulations, 2019);
- Surface Water Assessment (WRM Water and Environment, 2019);
- Aquatic Ecology and Stygofauna Assessment (Eco Logical Australia Pty Ltd [Eco Logical], 2019);
- Subsidence Assessment (MSEC, 2019); and
- Geomorphology Assessment (Fluvial Systems, 2019).

The following guidelines were considered in the preparation of the GDE Assessment:

- *Information Guidelines for the Independent Expert Scientific Committee advice on coal seam gas and large coal mining development proposals* (IESC, 2018).
- *Assessing Groundwater Dependent Ecosystems: IESC Information Guidelines Explanatory Note* [Consultation Draft] (Doody, Hancock and Pritchard, 2018).
- *NSW State Groundwater Dependent Ecosystems Policy* (Department of Land and Water Conservation, 2002).
- *Risk Assessment Guidelines for Groundwater Dependent Ecosystems* (NSW Office of Water, 2012).

The GDE Assessment determined that GDEs in the vicinity of the Project are constrained to the shallow groundwater available in the alluvium associated with Saddlers Creek, Saltwater Creek and the lower sections of their tributaries. Potential impacts on any GDEs that may be present along the Hunter River were also considered. Key conclusions with respect to potential impacts on GDEs are as follows:

- In the context of the Hunter River regulated system, a baseflow loss of 0.55 ML/year is negligible. Hence, the Project would not measurably affect baseflow in the downstream waterways (WRM Water and Environment, 2019).
- The Swamp Oak along Saddlers Creek and Saltwater Creek are dependent on the surface expression of groundwater (i.e. baseflow). Consequently, it is unlikely that the predicted Project groundwater drawdown would adversely impact the Swamp Oak along either Saddlers Creek or Saltwater Creek (Hunter Eco, 2019a).
- The Project is not likely to have a significant impact on stygofauna (Eco Logical, 2019).
- The Project would not have an impact on GDEs due to adverse changes to groundwater quality (Hunter Eco, 2019a and Eco Logical, 2019).

Potential Groundwater Impacts North of the Maxwell Infrastructure

Issue

Concern was raised in one public submission that the potential impacts to a groundwater bore to the north of the Maxwell Infrastructure has restricted the ability to install a bore on their property.

Response

HydroSimulations (2019) evaluated the potential impacts of the Project on groundwater resources using a numerical regional groundwater model. There were no predicted impacts to bores to the north of the Maxwell Infrastructure as a result of the Project.

Notwithstanding, Malabar would periodically invite the local landholders to participate in an updated bore census to continue developing the baseline understanding of water level, yield and quality of nearby bores. Upon request from a landholder, Malabar would also undertake a census of bores on any privately-owned land that has not previously participated in a bore census.

Erosion and Sediment Movement

Issue

Concern was raised in one public submission that the clearance of native vegetation for the Project would result in erosion and sediment movement.

Response

Malabar is committed to developing the Project solely as an underground mining operation. Underground mining methods significantly reduce environmental impacts, including surface disturbance, in comparison to open cut mining methods.

An erosion and sediment control plan would be developed to manage runoff during the construction phase and to manage runoff from the disturbed areas peripheral to the MEA (i.e. transport and services corridor and ventilation shaft site).

Erosion and sediment control techniques would be designed and operated in accordance with the requirements of the Blue Book (Landcom, 2004) and *Volume 2E Mines and Quarries* (DECC, 2008).

Site drainage and sediment control structures would be inspected regularly (monthly or following rainfall greater than 25 mm in 24 hours) to check for scouring of diversion drains (and their outlets) and accumulation of sediment in sediment traps (including sediment fences, sediment basins, etc.).

Regular inspections of control structures would be undertaken to maintain functionality as designed and required. Maintenance activities would be undertaken in accordance with Section 8.2 of the Blue Book (Landcom, 2004).

Access Road Dam

Issue

A landholder downstream of the existing Access Road Dam at the Maxwell Infrastructure requested a Development Consent condition that requires:

- the Access Road Dam to be decommissioned;
- water to be regularly released from the Access Road Dam to supply water to downstream landholders; or
- Malabar provide alternative water supply to the property downstream of the Access Road Dam.

Response

The Access Road Dam is an existing mine affected water storage at Maxwell Infrastructure, with a capacity of 750 ML, that is used to supply water for dust suppression, industrial wash down and as the primary water supply to the CHPP (WRM Water and Environment, 2019). The dam has only a small catchment (65 ha) with capacity primarily maintained through pumping water from other water storages within the mine area.

As the catchment is small, decommissioning of the Access Road Dam would make little difference to the volume of water that would flow off site.

Water contained in the dam has elevated salinity with EC of around 6,900 µS/cm, hence this water is not suitable for release from the site.

6.2.3 Visual and Landscape Character

Visual Impacts from Edderton Road

Issue

One organisation submission raised concern regarding potential visual impacts of the Project on people travelling on Edderton Road.

Response

Potential visual impacts of the Project on people travelling along Edderton Road were assessed in the Landscape and Visual Impact Assessment (Van Pelt Allen Visual Planning and Assessment [VPA], 2019).

There would be limited views of the MEA and transport and services corridor from a low-lying section of Edderton Road near Saddlers Creek, as shown on Figure 15.

These components would occupy less than 3% of the primary view zone from a distance of approximately 3.8 km and, therefore, visual impacts from Edderton Road would be considered low (VPA, 2019).

During a journey along Denman Road and Edderton Road, this limited view of the Project is seen in the larger context of existing mining at the Mt Arthur Mine and Bengalla Mine (VPA, 2019).

In July 2019, Malabar planted screening vegetation adjacent to the MEA, on the west slope of the bounding ridgeline. It is expected this would significantly reduce the visual effect of the Project on Edderton Road.

Dynamic Landscape Impacts

Issue

Some organisation submissions raised concerns regarding dynamic landscape impacts, including potential dynamic, static, direct and indirect visual impacts and impacts on perception.

Response

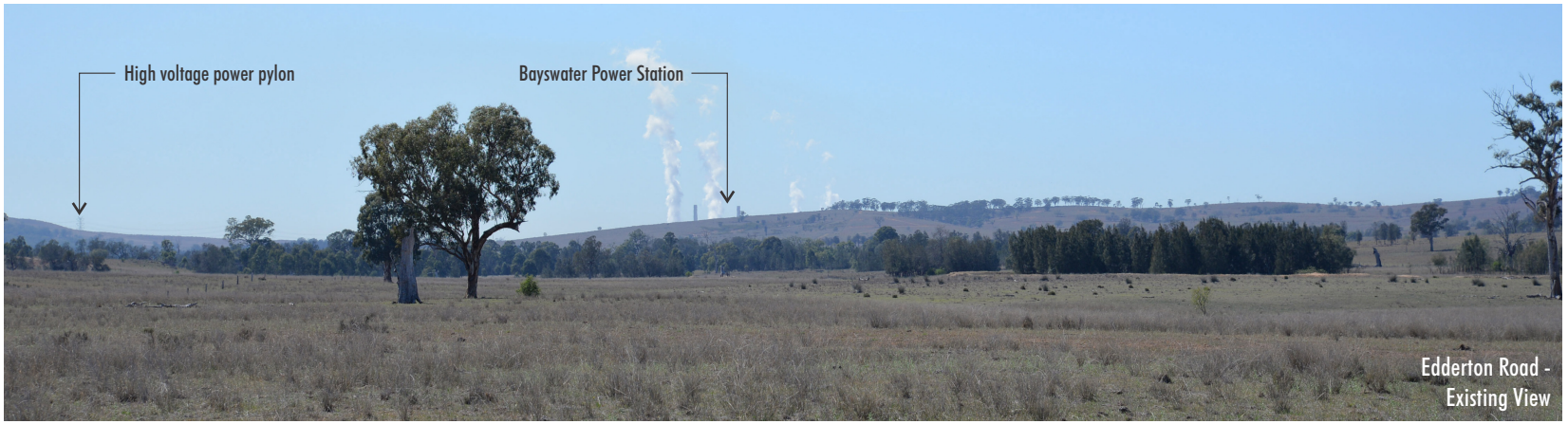
Potential indirect or dynamic visual impacts (collectively referred to as dynamic landscape impacts) were identified by the NSW Planning Assessment Commission (PAC) (2015) as a key issue during the assessment of the Drayton South Coal Project. During consultation undertaken for the EIS, Godolphin reiterated the importance of considering dynamic landscape impacts in the Landscape and Visual Impact Assessment.

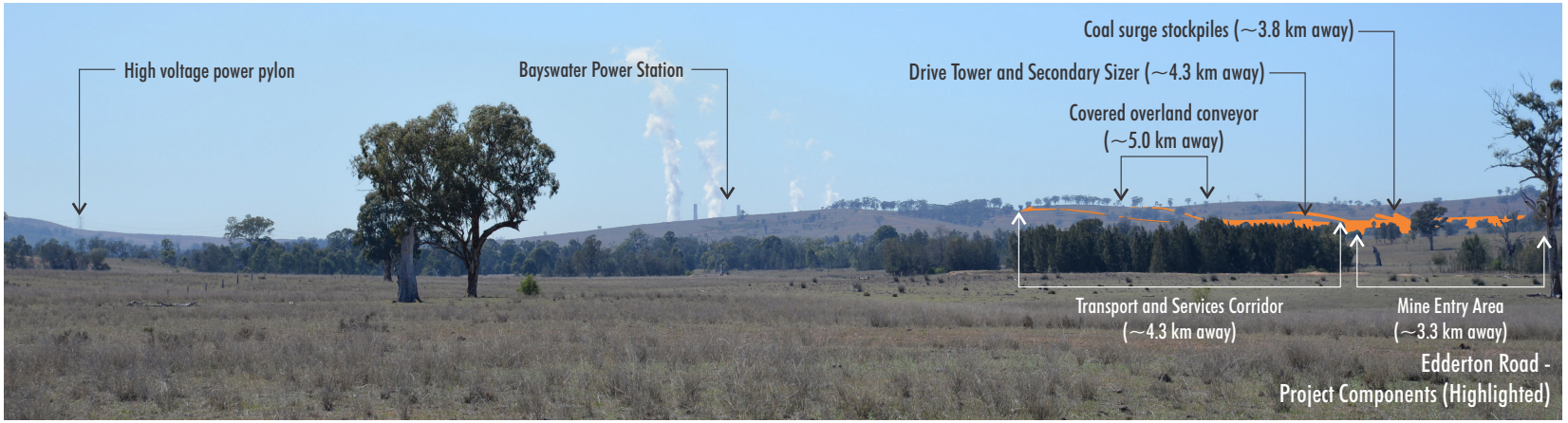
The Landscape and Visual Impact Assessment for the Project (VPA, 2019) included a dynamic landscape assessment.

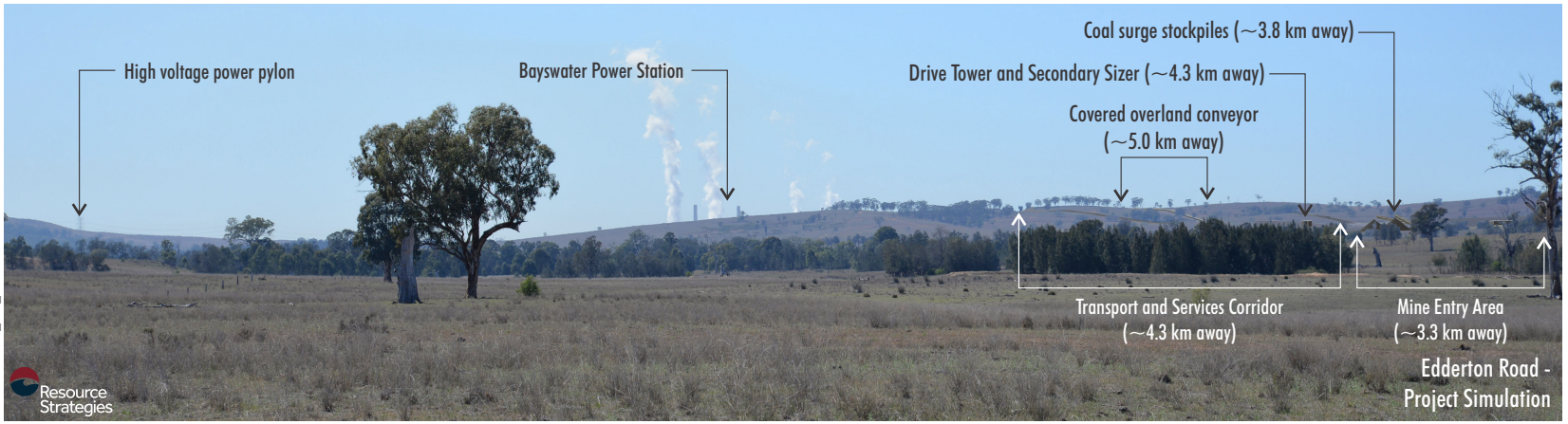
Dynamic landscape assessment refers to the collective evaluation of people's perceptions as they move through the landscape. Dynamic landscape assessment focuses on the perceptual and aesthetic characteristics of a landscape, including visual, sound, smell, touch/feel, preferences, associations and memories (VPA, 2019).

The dynamic landscape assessment in the Landscape and Visual Impact Assessment focused on three components (VPA, 2019):

- ephemeral effects, such as noise, dust and smell;
- visual experiences at regional and sub-regional scale; and
- knowledge-based perception.







LEGEND
Visual Simulation

Source: VPA (2019)

SHM-18-03 Maxwell_RtnS_005A

Resource Strategies

MALABAR COAL

MAXWELL PROJECT

Visual Simulation Results –
Edderton Road (Location 11)

Figure 15

Individual perception varies between individuals and can, therefore, be difficult to assess. In the *Social impact assessment guideline for State significant mining, petroleum production and extractive industry development*, the Department of Planning and Environment (DP&E) (2017) state the following with respect to assessing perceptions of adverse impacts:

> *When considering perceptions of adverse impacts on amenity, an evaluation must be made of the reasonableness of those perceptions. This evaluation involves 'the identification of evidence that can be objectively assessed to ascertain whether it supports a factual finding of an adverse effect on amenity…': Telstra Corporation Ltd v Hornsby Shire Council [2006] NSWLEC 133.*

There would be some people who would continue to have an existing adverse perception of mining activity, no matter how low the impacts or how informative the educational inputs (VPA, 2019). This impact is not necessarily tied to one's experience of the actual landscape and can create an adverse perception in those that have not even experienced the area.

VPA (2019) concluded that the dynamic landscape impact of the Project would be low, based on the limited scale of impact of the Project on visual and other perceptual experiences, and in the context of existing mining in the locality, sub-region and region.

6.2.4 Air Quality

Cumulative Air Quality Assessment

Issue

Some organisation and public submissions raised concerns regarding the assessment of cumulative air quality impacts in the EIS.

Response

The Air Quality and Greenhouse Gas Assessment in the EIS (Appendix J) includes both a Project-only and a cumulative impact assessment in accordance with the Approved Methods (EPA, 2016). The Human Health Risk Assessment (Appendix R of the EIS) also considers cumulative impacts.

The EPA 'contemporaneous assessment method' was applied by TAS (2019a) to analyse the potential maximum cumulative 24-hour average concentrations (TAS, 2019a).

No exceedances of the EPA assessment criteria or relevant VLAMP acquisition criteria were predicted at any privately-owned receiver for 24-hour average PM_{10} or $PM_{2.5}$[3] concentrations, annual average PM_{10}, $PM_{2.5}$ or total suspended particulates (TSP) concentrations or dust deposition levels due to the cumulative contributions from the Project, plus the Mt Arthur Mine, Bengalla Mine, Hunter Valley Operations and other sources included in the background levels (TAS, 2019a).

Air quality contour plots of the predicted cumulative annual average PM_{10}, $PM_{2.5}$ and TSP concentrations and dust deposition levels are provided in the Air Quality and Greenhouse Gas Assessment.

Background Air Quality Levels

Issue

One organisation submission queried why background air quality levels adopted in the Air Quality and Greenhouse Gas Assessment (TAS, 2019a) are lower than those found in Muswellbrook or the Upper Hunter Air Quality Monitoring Network.

[3] PM_{10} represents fine particles smaller than 10 micrometres (µm) and PM2.5 represents fine particles smaller than 2.5 µm.

Response

The Air Quality and Greenhouse Gas Assessment in the EIS adopted background levels based on monitoring sites that are representative of the sensitive receivers closest to the Project. The monitoring sites adopted for background levels are outlined in Table 8-2 of Appendix J of the EIS and include monitoring data collected by Malabar and by BHP for the adjacent Mt Arthur Mine.

TAS (2019a) noted that ambient $PM_{2.5}$ levels at the Muswellbrook monitoring station are likely to be influenced by many non-mining background sources such as wood heaters and motor vehicles. The $PM_{2.5}$ monitors located near mining operations (and away from towns) have no significant seasonal trends in comparison to the Muswellbrook monitoring station (part of the Upper Hunter Air Quality Monitoring Network). This suggests the influence of anthropogenic sources on $PM_{2.5}$ levels are localised to the towns and do not significantly affect the areas that are sparsely populated near the existing open cut mining operations and in proximity to the Project.

Temporary ROM Coal Haulage

Issue

Some organisation and public submissions raised concerns regarding the temporary transport of ROM coal via trucks prior to commissioning of the covered, overland conveyor.

Response

Malabar makes a clear commitment that the covered, overland conveyor would be operational prior to the commencement of transport of coal extracted by longwall mining machinery.

Early ROM coal would be transported by truck (at significantly lower tonnages), while the covered, overland conveyor is constructed and commissioned. This approach would allow the employment and other social benefits of the Project to commence earlier. Transfer of the small and intermittent volumes of coal at these early development and commissioning phases is also not efficient via overland conveyor.

Trucks used for coal transport would be units that are purpose-built for the transport of bulk materials on highways. The large off-road coal haul trucks in general use at open cut mines would not be used.

The Air Quality and Greenhouse Gas Assessment (TAS, 2019a) considered the potential air quality impacts associated with the transport of ROM coal via trucks and demonstrated that no adverse air quality impacts on receivers (including the nearby equine enterprises) would arise during the road transport of early ROM coal, or at any stage during the construction and operation of the Project (TAS, 2019a).

6.2.5 Noise and Vibration

Noise Exceedances

Issue

Some organisation submissions raised concerns regarding predicted exceedances of noise criteria at receivers to the north of the Project.

Response

The Maxwell Infrastructure is located in the vicinity of residences in the Antiene and East Antiene residential areas located north of Thomas Mitchell Drive and near the New England Highway.

A Noise Impact Assessment for the Project was undertaken by Wilkinson Murray (2019a) and is presented in Appendix I of the EIS.

Noise generated by the Maxwell Infrastructure during the Project life would generally be less than previously approved levels for open cut operations at the former Drayton Mine, which operated for over 30 years (Wilkinson Murray, 2019a).

With the implementation of appropriate Project mitigation measures, negligible or no exceedance of the Project noise trigger levels is predicted at all but four privately-owned receivers to the north of the Maxwell Infrastructure (Wilkinson Murray, 2019a).

These four properties would experience marginal exceedances of the Project-specific noise trigger levels and would have the right to mitigation measures at their property on request, such as mechanical ventilation/comfort condition systems to enable windows to be closed (Wilkinson Murray, 2019a). Malabar would implement mitigation measures in accordance with the VLAMP (NSW Government, 2018) at these properties.

During the exhibition period for the Project, Malabar offered to meet with each of the four landowners with properties predicted to experience marginal exceedances of the Project-specific noise trigger levels. Two landowners accepted the opportunity to meet with Malabar and indicated they are unconcerned by the predicted noise exceedance and expressed general support for the Project.

Background Noise Levels

Issue

Some organisation submissions raised concerns regarding the background noise level adopted in the Noise Assessment for the Project.

Response

The Rating Background Level (RBL) is the background noise level determined without the subject premises in operation, in accordance with the NPfI (EPA, 2017).

Wilkinson Murray (2019a) referred to background noise surveys conducted in 2007 by Bridges Acoustics in the vicinity of the Maxwell Infrastructure to characterise RBLs for the northern receivers. Wilkinson Murray (2019a) considers the RBLs derived for the northern receivers to be conservative (i.e. lower than actual) as these levels do not fully capture the contribution of traffic noise from the New England Highway and were determined using a conservative approach.

RBLs for the southern receivers were determined based on long-term unattended and short-term attended noise surveys conducted by Bridges Acoustics in 2011 in the vicinity of the Maxwell Underground and are also considered conservative (Wilkinson Murray, 2019a).

Noise Assessment

Issue

One organisation submission raised concern that the Noise Impact Assessment does not use applicable contemporary modelling methods or standards.

Response

The Noise Impact Assessment for the Project was undertaken by Wilkinson Murray (2019a) in accordance with:

- *NSW Noise Policy for Industry* (EPA, 2017) (which superseded and replaced the outdated *Industrial Noise Policy*); and
- NSW *Interim Construction Noise Guideline* (DECC, 2009).

Relevant aspects of the VLAMP were also applied.

The EPA did not raise any concerns with the modelling software used for the Noise Impact Assessment undertaken for the Project in their submission on the EIS (1 October 2019).

Blasting

Issue

A number of organisations and public submissions raised concerns regarding potential blasting impacts to the Coolmore and Godolphin Woodlands Studs.

Response

Malabar would seek to eliminate or minimise the need for construction blasting, with material preferentially removed through the use of dozers and excavators only. Blasting of material may be required during construction activities; for example, to develop the coal surge stockpile area, site access road, access to the underground workings and/or water storage dams.

The requirement for blasting would be dictated by the geotechnical properties of the material being excavated. Any blasts required for construction activities would be limited to a Maximum Instantaneous Charge (MIC) of approximately 500 kg. This is substantially smaller than blasting that would occur in an open cut mining operation (an MIC typically in the order of 2,000 kg to 4,000 kg).

Due to the very low magnitude of vibration and overpressure predicted by Wilkinson Murray (2019a), vibration and overpressure associated with potential construction blasts for the Project would not be noticeable at either the Coolmore and Godolphin Woodlands Studs.

Potential Noise Impacts on Neighbouring Equine Enterprises

Issue

Concerns were raised in the public submissions regarding potential noise impacts at the neighbouring equine enterprises.

Response

Potential noise impacts are significantly mitigated by the adoption of underground mining methods and other Project design measures.

The assessment of potential noise impacts is based on modelling that incorporates a number of conservative assumptions (such as the continual operation of the Project at its maximum production rate).

The modelling indicates that noise contributions from the Project at the Coolmore and Godolphin Woodlands Studs would be indistinguishable from background noise.

Noise Affected Properties

Issue

One landowner indicated that their property was omitted from the noise affected properties in the noise assessment.

Response

The property described in the submission (Lot 172 DP 740181) was considered as part of the Noise Impact Assessment. Given there is currently no dwelling (i.e. a receiver) on the property, it was considered as part of the Vacant Land Noise Assessment of the Noise Impact Assessment.

According to the VLAMP, voluntary land acquisition noise rights apply for vacant land where: “the noise generated by the development could contribute to exceedances of the acceptable noise levels plus 5 dB in Table 2.2 of the NPfI on more than 25% of any privately owned land”.

Wilkinson Murray (2019a) reviewed the relevant noise contours and land tenure information for the Project and determined no privately-owned property is predicted to experience exceedances of the relevant VLAMP noise criteria on greater than 25% of privately-owned land.

6.2.6 Road Transport

Issue

Coolmore Australia raised concerns regarding additional travel time associated with the potential realignment of Edderton Road. In particular, Coolmore Australia raised concerns regarding travel times between the Coolmore Stud and the Scone Equine Clinic.

Response

Review by TTPP of the design of the potential Edderton Road realignment concluded:

- the proposed carriageway and shoulder widths would comply with appropriate Austroads requirements;
- the turn treatments at the new intersection would meet or exceed the warrants set out by Austroads and are considered satisfactory; and
- the layout is safer than that of the existing intersection of Edderton Road and the Golden Highway, as it allows turning vehicles to slow, clear of the through traffic on the Golden Highway.

The potential realignment of Edderton Road would have a minor impact on travel time, increasing travel time for drivers travelling from Coolmore Stud by approximately 66 seconds.

Alternatively, should the existing alignment of Edderton Road remain, it is expected that potential subsidence impacts could be managed while maintaining Edderton Road open for through traffic. Reductions in speed limits from 100 kilometres per hour (km/h) to 40 km/h would increase travel time in both directions by up to approximately 2 minutes and 20 seconds during periods of active subsidence management (TTPP, 2019a).

Cumulative travel time impacts associated with Mt Arthur Mine's proposed realignment of Edderton Road have also been assessed. If both realignments proceed, travel time along Edderton Road would increase by up to two minutes and 39 seconds compared with existing conditions.

The current travel time between Coolmore Stud and Scone Equine Clinic is approximately 45 minutes. The increase in travel time due to the Project is, therefore, small relative to the existing trip.

Malabar also notes that the RMS is currently upgrading the Golden Highway between Ogilvies Hill and Winery Hill, including an additional overtaking lane at the intersection with Edderton Road (RMS, 2018). RMS (2019b) state that travel times may be affected by up to 15 minutes as a result of the earthworks. The increase in travel time due to the Project is, therefore, also small relative to existing delays currently experienced by Coolmore and Godolphin Woodlands Studs as a result of RMS roadworks.

Potential Impacts on Road Users

Issue

Concerns were raised in the public submissions that the Project would generate additional traffic in the area.

Response

A Road Transport Assessment for the Project was undertaken by TTPP (2019a) and was presented in Appendix K of the EIS. The assessment included cumulative assessment with other surrounding developments, such as the Maxwell Solar Project, Mt Arthur Mine, Mount Pleasant Operation, Bengalla Mine, Mangoola Mine and Dartbrook Mine.

TTPP (2019a) concluded that the existing road network can satisfactorily accommodate the forecast traffic demands resulting from the Project without any specific additional road upgrade requirements.

6.2.7 Biodiversity

Biodiversity Offset Strategy

Issue

Concern was raised in one public submission that the EIS did not include sufficient information regarding the proposed biodiversity offsets for the Project.

Response

Malabar would address NSW offset requirements by one, or a combination of the following options, consistent with the NSW Biodiversity Offsets Scheme:

1. the retirement of biodiversity credits (either like-for-like or in accordance with the variation rules);
2. the funding of a biodiversity conservation action;
3. undertaking ecological mine rehabilitation; or
4. payment into the Biodiversity Conservation Fund.

Biodiversity credits could be retired by:

- Purchasing credits from the Biodiversity Credit Market and retiring credits.
- Establishing an offset area (Biodiversity Stewardship Site) and retiring the credits. The Biodiversity Stewardship Site would then be managed by Malabar.
- Retiring like-for-like biodiversity credits or credits under the variation rules (i.e. rules that allow credits of a vegetation type/species to be offset with a different vegetation type/species) for relevant threatened species and communities.

The funding of a biodiversity conservation action is only available for select species and is currently not available for those relevant to the Project.

Payments could be made to the NSW Biodiversity Conservation Fund instead of, or as well as, retiring credits, with the cost of the payment determined by the BAM Credit Calculator (Appendix E of the EIS).

Malabar would undertake like-for-like biodiversity offset measures for relevant EPBC Act listed threatened species and ecological communities as required by the EPBC Act. These biodiversity credits or other offset measures would be associated with the following EPBC Act listed threatened species and communities:

- *White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland*;
- *Central Hunter Valley Eucalypt Forest and Woodland*;
- Pink-tailed Legless Lizard;
- Striped Legless Lizard;
- Swift Parrot; and
- Regent Honeyeater.

Clearance of Native Vegetation

Issue

Concern was raised in one public submission that the clearance of native vegetation for the Project would result in loss of habitat for species.

Response

Malabar is committed to developing the Project solely as an underground mining operation. Underground mining methods significantly reduce environmental impacts, including vegetation and habitat disturbance, in comparison to open cut mining methods.

In addition to the use of underground mining methods, the Project elements have been located and designed to avoid or minimise impacts to vegetation and habitat disturbance and fauna species.

The potential direct and indirect impacts of the Project on terrestrial ecology have been assessed in the BDAR (Hunter Eco, 2019a).

6.2.8 Heritage

Heritage Impacts

Issue

Some organisation and public submissions raised concerns regarding the potential impacts of the Project on the Aboriginal cultural heritage and historic heritage, including concerns regarding the level of assessment conducted, potential subsidence effects and cumulative impacts.

Response

An assessment of the potential impacts of the Project to Aboriginal cultural heritage was conducted in the ACHA prepared by AECOM (2019). A comprehensive Cultural Values Report was also prepared and included as Appendix A of the ACHA, which specifically assesses the Aboriginal cultural values within the vicinity of the Project.

The ACHA prepared for the Project (including the comprehensive Cultural Values Report) describes that Aboriginal community consultation for the assessment was undertaken in accordance with *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW, 2010b) and clause 80C of the NSW *National Parks and Wildlife Regulation, 2009*.

It was concluded that the impact of the Project on the potential Aboriginal archaeological resource of the region would not be significant in the context of known and potential heritage resource, and the Project would not materially contribute to potential cumulative impacts. Notwithstanding, Malabar would manage potential impacts on Aboriginal heritage sites through consultation with the Aboriginal community, salvage of sites and other management measures.

AECOM (2019) noted that, although the Project area is situated within a broader landscape of high historical significance for contemporary Aboriginal people, the Project area itself is assessed as having a low historical significance, with no evidence of post-contact Aboriginal occupation identified within the area. In addition, no historical records or oral histories specific to the use of the Project area by Aboriginal people were identified as part of the ACHA.

It is noted that the BCD has regulatory responsibility for Aboriginal cultural heritage impact assessment and stated (BCD, 20 September 2019):

> *We are satisfied with the Aboriginal cultural heritage assessment undertaken and no further Aboriginal cultural heritage assessment is required.*

An assessment of the potential impacts of the Project to historic heritage was conducted in the Historic Heritage Assessment prepared by Extent Heritage Pty Ltd. Appendix H of the EIS describes that the changes to the local topography within the Muswellbrook-Jerrys Plains Landscape Conservation Area, as a result of subsidence from the Project, would not be readily discernible from within the Muswellbrook-Jerrys Plains Landscape Conservation Area.

The submission from Heritage NSW advised that they have no comment on this proposal, as there were no identified impacts to State heritage listed items or historical archaeological relics.

Consultation and Assessment Process

Issue

Scott Franks and Anor on the behalf of the Wonnarua people raised concerns regarding the adequacy of consultation undertaken for the ACHA, processes under the *Native Title Act, 1993* and the identification of a potential massacre site at the Project.

Response

The ACHA prepared for the Project (including the comprehensive Cultural Values Report) describes that Aboriginal community consultation for the assessment was undertaken in accordance with *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW, 2010b) and clause 80C of the NSW *National Parks and Wildlife Regulation, 2009*.

Review of tenure associated with the proposed Mining Lease Application area(s) associated with the Project determined that Native Title had been extinguished in all relevant areas for the Project.

Malabar met with Scott Franks on behalf of the Wonnarua people during the preparation of the ACHA (Table 2 of Appendix G of the EIS) and also provided Scott Franks on behalf of the Wonnarua people with various written correspondence during the process. As part of this consultation, Malabar clarified that the Project is unrelated to land associated with the neighbouring projects where Native Title may not have been extinguished. Spur Hill Management Pty Ltd, a subsidiary of Malabar, commenced a Right to Negotiate process in relation to the nearby Spur Hill Underground Coking Coal Project, which is separate to, and unrelated, to the Project. As the Spur Hill Underground Coking Coal Project is no longer proceeding as previously proposed, the Mining Lease Application (MLA 484) for that project was withdrawn and the Right to Negotiate process terminated.

Appendix A of the ACHA describes that no physical evidence has been identified related to a massacre in 'The Pocket' despite the detailed archaeological survey previously conducted, the comprehensive Cultural Values Report undertaken, significant consultation with the registered Aboriginal parties for the Project, and the previous assessment undertaken for the Drayton South Coal Project Aboriginal Cultural Heritage Assessment.

With regard to the confidential submission prepared for the HTBA by GML Heritage for the Drayton South Coal Project, AECOM offered to meet with Scott Franks on the behalf of the Wonnarua people during the preparation of the Maxwell Project ACHA to discuss the sharing of the cultural values described in the previously confidential submission. The offer was declined.

It is noted that BCD has regulatory responsibility for Aboriginal cultural heritage impact assessment and stated (BCD, 20 September 2019):

> *We are satisfied with the Aboriginal cultural heritage assessment undertaken and no further Aboriginal cultural heritage assessment is required.*

Malabar understands that representatives of the BCD (formerly the Office of Environment and Heritage) who were involved in assessing both the Drayton South Coal Project and the Maxwell Project, viewed and reviewed the previous confidential submission described above. Malabar also understands that the outcome of the BCD's involvement in the Drayton South Coal Project was that all matters associated with Aboriginal cultural heritage were considered adequately addressed. As previously described, the underground mining methods proposed for the Project significantly reduce environmental impacts (including to Aboriginal cultural heritage), in comparison to open cut mining methods.

Historic Heritage

Issue

Concern was raised in one public submission regarding the assessment of impact to European cultural heritage due to the Project.

Response

An assessment of the potential impacts of the Project to historic heritage was conducted in the Historic Heritage Assessment prepared by Extent Heritage Pty Ltd, in accordance with the relevant principles and articles contained in:

- *The Burra Charter: The Australian ICOMOS Charter for Places of Cultural Significance* (Australia International Council on Monuments and Sites [ICOMOS], 2013a);
- *The Burra Charter Practice Note: Understanding and Assessing Cultural Significance* (Australia ICOMOS, 2013b);
- *NSW Heritage Manual* (NSW Heritage Office and NSW Department of Urban Affairs and Planning, 1996);
- *Archaeological Assessments Guidelines* (NSW Heritage Office, 1996);
- *Statements of Heritage Impact* (NSW Heritage Office, 2002);
- *Assessing Heritage Significance* (NSW Heritage Office, 2001);
- *Assessing Significance for Historical Archaeological Sites and 'Relics'* (NSW Heritage Office, 2009); and
- *Criteria for the Assessment of Excavation Directors* (NSW Heritage Council, 2011).

No items of historic heritage would be directly disturbed by surface development for the Project.

MSEC (2019) assessed the potential for subsidence impacts associated with the Project on historic heritage sites. Extent Heritage (2019) concluded that the limited heritage values of the stockyard would not be impacted by the Project and all other historic heritage sites identified are located outside the area of underground mining influence and are predicted to experience negligible ground movements due to the Project.

Furthermore, the Project would not result in adverse indirect impacts on any other historic heritage site.

The submission from Heritage NSW stated:

> *As there are no identified impacts to State heritage listed item or historical archaeological relics, Heritage NSW has no further comments at this stage.*

6.2.9 Rehabilitation and Mine Closure

Rehabilitation of Existing Maxwell Infrastructure Areas

Issue

Some organisation submissions raised concerns regarding the rehabilitation of the previously mined areas at the existing Maxwell Infrastructure.

Response

Rehabilitation at the Maxwell Infrastructure is managed in accordance with the approved MOP. The approved MOP describes the process to monitor the progress of rehabilitation activities under CL 229, ML 1531, CL 395 and Project Approval 06_0202 related to the Maxwell Infrastructure. Development Consent DA 106-04-00 is the relevant consent for the operation of the Antiene Rail Spur and does not include detailed rehabilitation requirements. A summary of rehabilitation activities undertaken at the Maxwell Infrastructure and relevant rehabilitation monitoring results are documented in the Annual Reviews.

Rehabilitation occurred progressively at the Maxwell Infrastructure as ancillary disturbance areas and final mine landforms became available for revegetation. The approved revegetation strategy (as documented in the MOP) recognises the alternative land uses that exist in the region, with the aim of establishing the potential for sustainable grazing lands and enhancing the local and regional habitat corridors.

Progressive rehabilitation activities have been conducted at the Maxwell Infrastructure (formerly known as the Drayton Mine) since 1983.

Malabar formally took control of the Maxwell Infrastructure, on 26 February 2018. Malabar resumed rehabilitation work on previously mined areas as quickly as possible, with the first bulldozer commencing work on the mine site in early March 2018 (Plates 4 to 7).

Plate 4 – Dozers Spreading Inert Capping Material for Rehabilitation

Plate 5 – Rehabilitated Maxwell Infrastructure Waste Emplacement – September 2018

Plate 6 – Rehabilitated Maxwell Infrastructure Waste Emplacement – April 2019

Plate 7 – Rehabilitated Maxwell Infrastructure Waste Emplacement – August 2019

The Project would involve continued rehabilitation activities at the Maxwell Infrastructure. The EIS outlines the rehabilitation and mine closure strategy for the life of the Project.

In the long-term, all sites would be rehabilitated to a safe, stable and sustainable landform of a similar character to surrounding areas. A conceptual post-mining land use of a combination of agriculture and nature conservation has been selected for the majority of the Project domains.

Over the life of the Project, rehabilitation performance measures and completion criteria would, periodically, be updated and refined in consultation with relevant regulatory authorities and stakeholders to reflect evolving mine site rehabilitation practices and standards.

Relationship with Maxwell Solar Farm

Issue

One organisation submission raised concerns regarding the relationship between rehabilitation of the previously mined areas at the existing Maxwell Infrastructure and the Maxwell Solar Project.

Response

The Maxwell Solar Farm would not constrain or negatively impact the development of this Project. The development of the Maxwell Solar Farm would be subject to separate environmental assessment and approvals.

Malabar have set aside a separate rehabilitation domain for the Maxwell Solar Farm in the Preliminary Rehabilitation and Mine Closure Strategy (Malabar, 2019c), and the final integration of rehabilitation domains for the Project and the Maxwell Solar Farm would be subject to the approval of both proposals. If approved, the Maxwell Solar Farm would remain following completion of mining; therefore, the solar infrastructure is considered both a primary and secondary domain.

In the event the Maxwell Solar Farm does not proceed, the existing waste emplacement area would be rehabilitated to pasture. The rehabilitated pasture domain is discussed further in the Preliminary Rehabilitation and Mine Closure Strategy.

Application of Final Landform Design Principles

Issue

One organisation submission raised concerns GeoFluv™ design principles have not been applied to the final landform at the existing Maxwell Infrastructure.

Response

As an underground mine, the Project would result in minimal changes to existing landforms.

The Project however would support enhancement of the rehabilitation of Maxwell Infrastructure. The volume of the East Void would be reduced through the emplacement and subsequent capping of Rejects.

Since taking control of the site, Malabar has implemented various improvements to the Maxwell Infrastructure final landform, including:

- Developing drainage features in the post-mine landform that mitigate erosion potential.
- Reshaping areas to integrate seamlessly with adjacent landforms.
- Creating undulating landforms over predominately flatter areas.
- Redesigning horizontal drainage structures as larger undulations rather than sharper contours so as to be less visually intrusive.
- Enhancing the inert clay capping material with gypsum and either biosolids or mulch to better support plant growing conditions.
- Optimisation of equipment and methodology to place ameliorants and seed in undulating topography.

Additional information is provided in Section 6.1.8, in response to feedback from the Resources Regulator and MSC.

Rehabilitation Security Deposit

Issue

Some organisation submissions raised concerns regarding the adequacy of the existing security deposit for the existing Maxwell Infrastructure.

Response

Malabar operates within the NSW Government's stated policy that the people of NSW should not incur a financial liability as a result of coal, mineral and petroleum exploration and production activities (DRG, 2017a). Therefore, all titleholders engaged in mining activities are required to lodge a security deposit.

The security deposit covers the full estimated costs, which are determined by the NSW Government, in undertaking rehabilitation in the event of default by the titleholder. A security deposit is currently held by the Government for rehabilitation activities at the Maxwell Infrastructure in the form of a bank guarantee.

The security deposit has been calculated in consultation with the Resources Regulator and reflected the required work to complete rehabilitation as at 2015. Since then, significant rehabilitation has been completed such that a recalculation would reduce the security deposit.

Prior to the commencement of any activities under a Mining Operations Plan for the Project, Malabar would lodge a revised security deposit in accordance with the following relevant guidelines (or their contemporary versions):

- *ESP1: Rehabilitation security deposits* (DRG, 2017a); and
- *ESG1: Rehabilitation Cost Estimate Guidelines* (DRG, 2017b).

Final Void Stability

Issue

One organisation submission raised concerns regarding the geotechnical stability of final void highwalls.

Response

A geotechnical assessment of the final void highwalls was undertaken by Coffey (2014) for the approved MOP to address issues raised during consultation with the DRE (now the NSW Resources Regulator). The geotechnical assessment concludes that the existing highwalls in their current conditions are modelled as having a demonstrable factor of safety greater than 1.5 and Coffey (2014) considered the highwalls to be adequate. Notwithstanding, Coffey (2014) made several recommendations for the proposed mine closure, including highwall blasting, to improve overall and sustained stability.

A Peer Review of the Coffey (2014) report was undertaken by Sherwood Geotechnical and Research Services (2014), which concurred that the final void highwalls would be sustainable in the long-term.

The Coffey (2014) recommendations have been included in the approved Final Void Management Plan (which forms part of the approved MOP).

Implementation of the approved Final Void Management Plan would be deferred until the end of the Project life, when nearby surface infrastructure would be decommissioned and removed, and the voids are no longer required for water storage and/or CHPP reject emplacement.

Acid Generating Materials and Spontaneous Combustion

Issue

Some organisation and public submissions raised concerns regarding the management of acid generating materials and spontaneous combustion in rehabilitation.

Response

A Geochemistry Assessment for the Project was undertaken by GEM (2019) and is presented in Appendix P of the EIS.

Review of geochemical investigations conducted for coal mining operations in the Project region indicates relative consistency in the geochemical characteristics of the stratigraphy throughout the region.

Based on a review of the detailed geochemical characterisation of the overburden and interburden from the surrounding open cut and underground mining operations, it is expected that the rock excavated during establishment of the Project underground operations would be non-acid forming with low salinity. However, these materials have a risk of being sodic. As is typical for the stratigraphy of the Wittingham Coal Measures in this region, the establishment rock is expected to be enriched with As, Sb and Se, and the contained As and Se is likely to be readily soluble (GEM, 2019).

GEM (2019) provides the following recommendations for the management of establishment rock:

- The establishment rock would not require any specific handling for disposal. However, due to the risk of this material being sodic, it is recommended that allowance is made to treat these materials (e.g. with gypsum) to negate the sodicity, as required. No untreated sodic materials should be used for construction or site earthworks.
- It is recommended that As, Sb and Se are included in the site water quality monitoring program.

The Rejects produced at the Maxwell Infrastructure CHPP and to be disposed within the existing voids, are expected to be moderately to highly saline and have an acidic pH, most likely due to the presence of organic acids. The Rejects are also expected to have moderate sulphur, the majority of which is likely to occur as reactive sulphide, and low acid neutralising capacity. Based on these characteristics, it is expected the Rejects will typically be PAF with only a low capacity to generate acid (i.e. PAF-LC). The Rejects are expected to be enriched with As, Sb and Se in varying degrees, and the contained Se is likely to be readily soluble (GEM, 2019).

GEM (2019) provides the following recommendations for the management of coal rejects:

- *As part of the ongoing process for managing CHPP rejects emplacements, geochemical characterisation should be undertaken to maintain an understanding of the materials classification. The recommended geochemical characterisation of the CHPP rejects should include kinetic net acid generation testing to determine the geochemical lag period (period of exposure to atmospheric oxidation before acid conditions are developed) of this material. Surface alkali treatment to extend the geochemical lag period of the rejects or over-dumping with rejects within the geochemical lag period may be required so that acid conditions do not develop during active dumping.*
- *Due to the expected presence of moderate salinity, PAF-LC material, the in-pit reject emplacement should be designed to prevent the reactive rejects from oxidising and the salts from migrating to the revegetation layer.*
- *It is recommended that the water quality monitoring program for the reject emplacement facilities includes pH, EC, alkalinity/acidity, SO_4, As, Sb and Se. This program is designed to identify the ongoing processes of sulphide oxidation, and acid generation and neutralisation resulting from the exposure of PAF-LC materials prior to acid conditions developing.*

HydroSimulations (2019) simulated the long-term behaviour of the final voids using a numerical groundwater model and determined that they would remain as permanent and localised groundwater sinks. Therefore, there would be no risk to groundwater quality as a result of the existing final voids at the Maxwell Infrastructure, including in the long-term.

Spontaneous combustion at the Maxwell Infrastructure is managed in accordance with the Spontaneous Combustion Management Plan, which is focused on capping areas with potential for spontaneous combustion and monitoring along with rectification, if required, of previously capped areas. Regular monthly inspections are conducted using a thermal imaging camera to identify areas where ground surface temperatures are above background levels. An annual aerial survey using a fixed wing aircraft fitted with infrared detection is used to identify the presence of any hot spots on a site-wide basis. Rehabilitation activities at Maxwell Infrastructure include the placement of inert material to minimise the potential for spontaneous combustion outbreaks.

The risk of spontaneous combustion associated with Project mining activities is considered low. The Project coal resource is derived from Wittingham Coal Measures, which are very low sulphur compared to the higher sulphur materials that were derived from the Greta Coal Measures at the former Drayton Mine.

Management of Rehabilitation

Issue

Concern was raised in one public submission regarding rehabilitation at the site and how the rehabilitation liability is managed.

Response

Rehabilitation at the Maxwell Infrastructure is managed in accordance with the approved MOP.

Furthermore, Malabar operates within the NSW Government's stated policy that the people of NSW should not incur a financial liability as a result of coal, mineral and petroleum exploration and production activities (DRG, 2017a). Therefore, all titleholders engaged in mining activities are required to lodge a security deposit.

A security deposit covers the full estimated costs, which are determined by the NSW Government, in undertaking rehabilitation in the event of default by the titleholder. A security deposit is currently held by the Government for rehabilitation activities at the Maxwell Infrastructure in the form of a bank guarantee.

An existing security deposit has been calculated in consultation with the Resources Regulator and reflected the required work to complete rehabilitation as at 2015. Since then, significant rehabilitation has been completed such that a recalculation would reduce the security deposit.

Prior to the commencement of any activities under a Mining Operations Plan for the Project, Malabar would lodge a revised security deposit.

6.2.10 Economic Effects and Social and Community Infrastructure

Economic Assessment

Issue

One organisation submission raised concerns regarding the Economic Assessment prepared for the EIS, including the potential for the overstatement of benefits.

Response

The Economic Assessment prepared for the EIS (Deloitte Access Economics, 2019) was undertaken in accordance with *Guidelines for the economic assessment of mining and coal seam gas proposals* (NSW Government, 2015) and the *Technical Notes Supporting the Guidelines for the Economic Assessment of Mining and Coal Seam Gas Proposals* (DP&E, 2018).

The cost-benefit analysis conducted by Deloitte Access Economics was undertaken in consideration of the *NSW Government Guide to Cost-Benefit Analysis* (NSW Treasury, 2017).

The assumed coal prices for projecting revenue from the Project were developed from price forecasts published by Consensus Economics in November 2018. These are considered to be a reasonable and independent source for coal prices. In addition, sensitivity analyses for potential changes in coal prices were also conducted, and showed that in all circumstances the Project would still have a substantial net benefit.

Furthermore, the DRG completed its own independent assessment of economic benefits from the Project. The DRG calculated that royalties generated by the Project would be $955 million (undiscounted), which is comparable to the estimate by Deloitte Access Economics (2019) in the EIS ($993 million [undiscounted]). This demonstrates that the benefits described in the EIS are reasonable and robust.

Social Impact Assessment

Issue

One organisation submission raised concerns regarding the assessment of social impacts associated with the Project, including the quantification of intergenerational and distributive impacts.

Response

The Social Impact Assessment (Appendix L of the EIS) was prepared in accordance with *Social impact assessment guideline for State significant mining, petroleum production and extractive industry development* (DP&E, 2017).

Where possible, the Social Impact Assessment has attempted to address concerns and issues raised in previous assessments at the site. The Social Impact Assessment describes the stakeholder inputs to the consultation mechanisms and describes the historic opposition to the Drayton South Coal Project. It is noted that stakeholder views (including surrounding landowners and community members) recognised the less intrusive nature of the underground mining method proposed for the Project.

Inter-generational equity is the concept that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations.

The Project would benefit current and future generations through the creation of employment opportunities. It would also provide significant stimulus to local and regional economies and provide NSW export earnings and royalties, thus contributing to current and future generations through social welfare, amenity and infrastructure.

Throughout the EIS, the principles of social equity, including inter-generational equity, have been addressed via:

- assessment of the social and economic impacts of the Project, including the distribution of impacts between stakeholders and consideration of the potential social and economic costs of climate change;
- mitigation measures to be implemented in relation to the potential impacts of the Project on water resources, Aboriginal heritage, land resources, noise, air quality, biodiversity, transport, hazards and risks, greenhouse gas emissions, visual character, economics, social values and surrounding land uses;
- implementation of environmental management and monitoring programs to minimise and evaluate potential environmental impacts (which include environmental management and monitoring programs covering the Project life); and
- implementation of biodiversity offsets to compensate for potential localised impacts that have been identified for the development.

Malabar will continue to engage with near neighbours and the local community to respond to any concerns or reservations about potential Project impacts prior to and throughout the life of the Project, however, it is noted that some concerns may persist for some community members regardless of these strategies.

Community Cohesion

Issue

Concerns we raised in the public submissions that the Project would cause disruption to community cohesion, including the potential impacts associated with a drive-in/drive-out workforce.

Response

Malabar provides sponsorship and donations that focus on support for local community infrastructure, including health, education and childcare, as well as support for local community values and cohesion through support for local events, sporting organisations and community-led projects.

Malabar would seek to reduce potential impacts to community cohesion by:

- maintaining a consistent and transparent engagement process with various stakeholders so that concerns about the Project and related impacts can be addressed;
- providing consistent, accessible information about the potential impacts and benefits of the Project to all sectors of the community; and
- working with community partners to deliver initiatives which support community cohesion and wellbeing.

Malabar aims to maximise local employment (in Muswellbrook and Singleton LGAs), which would minimise the requirement for a drive-in/drive-out workforce, through:

- promoting availability of Project employment and application arrangements in *The Muswellbrook Chronicle*, *Hunter Valley News*, *Denman News*, *Scone Advocate* and *The Singleton Argus*.
- focusing recruitment on hiring residents of the Muswellbrook and Singleton LGAs, including local Indigenous people, young people, and local women.
- promoting available services to assist candidates in preparing their applications and supporting documentation.
- establishing partnerships with Muswellbrook and Singleton High Schools to initiate training, apprenticeship, cadetship and/or intern programs that would provide pathways for local students to Project employment.
- establishing Partnerships with University of Newcastle, Muswellbrook TAFE Campus (Hunter TAFE) and Mining Skills Centre to develop Project-specific training programs and identify local young people with an interest in Project employment.

The Social Impact Assessment prepared by Elliott Whiteing Pty Ltd (2019) acknowledges the Project has the potential for social impacts including, stress and anxiety for some neighbouring landowners due to uncertainties or concerns about environmental or social impacts of the Project. Malabar would manage these concerns through ongoing and adaptive management including engagement and information provision relating to specific areas of community concerns. However, concerns may persist for some community members regardless of these strategies.

Automation of Workforce Fleet

Issue

Concern was raised in one public submission that automation of the workforce fleet would reduce the potential employment benefits of the Project.

Response

While underground mining does provide for some automation of functions, currently available and foreseen technologies require a significant workforce to support the operations.

Employee Safety

Issue

Concern was raised in one public submission that mining generally poses a high degree of safety risk to the employees.

Response

Malabar operates under a safety management system established to manage risks to health and safety in accordance with the requirements of the *Work Health and Safety (Mines and Petroleum Sites) Act, 2013* and the *Work Health and Safety (Mines and Petroleum Sites) Regulation, 2014*. Malabar would continue to meet these obligations for the Project.

6.2.11 Other Matters

Incompatibility between Mining and Existing Land Uses

Issue

Some organisations and public submissions raised concerns that mining is incompatible with other land uses in the vicinity of the Project (including the equine and viticulture CICs).

Response

Previous open cut mining proposals in EL 5460 have been considered to be incompatible with nearby equine land uses, notably the Coolmore and Godolphin Woodlands Studs.

This Project is for an **underground** mining operation that is unlike previous proposals in EL 5460. Stakeholder concerns and perceptions of previous proposals have been considered and incorporated into the Project design and Malabar's operating philosophy.

Malabar has approached the design of this Project and its relationship with nearby equine enterprises with the following aims:

- being aware of the points of view and perceptions of nearby equine enterprises;
- making key senior Malabar personnel approachable and available for consultation to allow for direct consideration of stakeholder feedback;
- incorporating significant design measures into the Project to avoid and mitigate potential direct impacts on nearby equine enterprises; and
- developing an operating philosophy that also addresses the perceptions of stakeholders associated with nearby equine enterprises (including customers).

Table 12 presents a summary of the key EIS assessment outcomes related to the Coolmore and Godolphin Woodlands Studs, as well as Hollydene Estate Wines.

With the proposed Project design, there is not anticipated to be any material biophysical incompatibility between the Project and the Coolmore and Godolphin Woodlands Studs.

In addition to the Project design measures already incorporated and the engagement conducted to date, Malabar would implement the following measures to address perceptions and queries of stakeholders associated with nearby equine enterprises (including customers):

- Malabar would offer to meet regularly with representatives of the Coolmore Stud and Godolphin Woodlands Stud over the life of the Project.
- Malabar would maintain fence lines, entrances and roadside plantings within Malabar-owned properties to present a visually pleasing appearance that is congruent and sympathetic with the appearance of surrounding rural properties.
- Malabar would discourage workers from wearing high-visibility clothing when travelling to public places in Jerrys Plains.
- When and where appropriate, Malabar would:
  - Use appropriate media platforms to disseminate current Project information that outlines the relative benefits of underground mining and the beneficial outcomes of the Project.
  - Offer to release joint media with horse studs or other sensitive receptors regarding the potential for co-existence between underground mining and other local industries (including equine, viticulture and agriculture).

Table 12
Summary of Key Assessment Outcomes for Nearby Equine and Viticulture Enterprises

Potential Impact	Summary of Assessment Outcomes
Potential impacts to infrastructure used by nearby equine and viticulture enterprises	
Subsidence impacts on infrastructure owned by equine and viticulture enterprises.	There would be no subsidence impacts on infrastructure owned by Coolmore Australia, Godolphin or Hollydene Estate Wines (MSEC, 2019).
Subsidence impacts on public road infrastructure.	The Golden Highway, a State highway that provides access to the Coolmore and Godolphin Woodlands Studs and Hollydene Estate Wines, is not predicted to experience any measurable tilts, curvatures or strains and would remain in a safe and serviceable condition during and after the Project underground mining (MSEC, 2019). Edderton Road, a local road used by Coolmore and Godolphin Woodlands Studs as an alternative to the main roads to access Muswellbrook and Scone, crosses the western part of the Maxwell Underground area. Malabar has mitigated concerns about potential impacts on Edderton Road by presenting two alternatives that would maintain both the safety and operability of Edderton Road. The two proposed options are: (i) subsidence management and normal road maintenance techniques along the existing alignment; or (ii) the realignment of the road around the Maxwell Underground area.
Increased traffic levels on surrounding road network.	The Project would use the existing site access to the Maxwell Infrastructure from Thomas Mitchell Drive. This would limit Project traffic movements on the Golden Highway and Edderton Road, which are used by Coolmore and Godolphin Woodlands Studs and Hollydene Estate Wines. Any employee travel on the Golden Highway past these operations would be primarily limited to employees residing locally (e.g. in Jerrys Plains). Deliveries to the Project would not travel on this section of road unless necessary due to RMS requirements. The Road Transport Assessment (TTPP, 2019a) concludes that the existing road network can satisfactorily accommodate the forecast traffic demands resulting from the Project without any specific additional road upgrade requirements.
Changes in travel times on surrounding road network.	Potential changes in travel time on the surrounding road network would be limited to changes associated with Edderton Road. The potential realignment of Edderton Road would have a minor impact on travel time, resulting in a minor decrease in travel time for drivers travelling to and from Golden Highway west of Edderton Road and an increase in travel time for drivers travelling east by approximately one minute (TTPP, 2019a). The layout of the new intersection with the Golden Highway would be safer than that of the existing intersection of Edderton Road and the Golden Highway, as it allows turning vehicles to slow clear of the through traffic on the Golden Highway (TTPP, 2019a). In the event that subsidence on Edderton Road is managed along the existing alignment, reductions in speed limits from 100 km/h to 40 km/h would increase travel time in both directions by up to approximately 2.5 minutes during periods of active subsidence management (TTPP, 2019a). Malabar would provide Jerrys Plains residents, Coolmore and Godolphin Woodlands Studs and Hollydene Estate Wines with notice of upcoming relevant Project works on Edderton Road throughout the life of the Project.
Access to equine and viticulture support services and infrastructure.	The Project would not have any material impact on support services or infrastructure, as there would be no property acquisitions or other impacts likely to isolate any equine or viticulture enterprise from, or lead to the closure of, a support service, such as an equine veterinarian (2rog, 2019). Malabar contributes to the overall viticulture cluster in the Upper Hunter through its ownership of Merton Vineyard (home of the 'Small Forest Wines' brand), which would not be affected by the Project.
Potential impacts to agricultural resources used by nearby equine and viticulture enterprises	
Availability and/or quality of water available to equine and viticulture enterprises.	The Project would not have any material impacts on water resources used by nearby equine and viticulture enterprises (surface water extraction from the regulated Hunter River and rainfall runoff) (WRM Water and Environment, 2019).
Increased biosecurity risks (weeds, plants and animals).	Malabar would implement weed and pest animal management programs to reduce biosecurity risks to off-site areas. Where vehicles and mechanical equipment have operated off-road, these would be washed down to minimise seed transport off-site.

Table 12 (Continued)
Summary of Key Assessment Outcomes for Nearby Equine and Viticulture Enterprises

Potential Impact	Summary of Assessment Outcomes
Potential impacts affecting amenity and/or customer perception of nearby equine enterprises	
Construction and operational noise and vibration.	Noise contributions from the Project at the Coolmore and Godolphin Woodlands Studs and Hollydene Estate Wines would be indistinguishable from background noise (Wilkinson Murray, 2019a). There would be no noticeable vibration as a result of the Project at the Coolmore and Godolphin Woodlands Studs and Hollydene Estate Wines (Wilkinson Murray, 2019a).
Dust emissions.	Changes in particulate matter concentrations in the air at Coolmore and Godolphin Woodlands Studs and Hollydene Estate Wines would be negligible (i.e. less than 0.1 micrograms per cubic metre [µg/m^3] of $PM_{2.5}$ averaged over any 24-hour period) (TAS, 2019a). Changes in dust deposition on pastures at Coolmore and Godolphin Woodlands Studs and vines at Hollydene Estate Wines would also be negligible (i.e. less than 0.05 grams per square metre per month [g/m^2/month]) (TAS, 2019a).
Odour.	Events that could potentially cause releases of odour (i.e. spontaneous combustion) would be managed and monitored during operations. It is not expected that spontaneous combustion would occur at the Maxwell Underground due to the low sulphur content of the targeted coal seams.
Visual and landscape changes.	In both the sub-regional and regional contexts, the Project's surface components are considered to be insignificant in terms of extent of visibility and the visual context, which includes extensive existing mining landscapes (VPA, 2019). There would be no views of the Project from Hollydene Estate Wines (VPA, 2019). Views of the Project's surface components would be largely screened at nearby equine enterprises by the topography to the north of the Golden Highway. There would be no views of the Project from the majority of viewpoints on the Coolmore and Godolphin Woodlands Studs. At the highest vantage points on these properties, a section of the transport and services corridor and covered overland conveyor would be potentially visible as it crosses ridgelines north-east of the MEA. These components of the Project would be between 7.5 km and 7.7 km from the viewer and would take up a very small portion of the primary view (<1%), which significantly reduces discernible components. The assessed visual impact at these vantage points is low and would be in the context of existing views of the Mt Arthur Mine from this location (VPA, 2019). The visual impacts of diffuse lighting associated with the MEA and transport and services corridor would be minimal compared to existing diffuse lighting as a result of the existing surrounding mining operations and power stations (VPA, 2019).
Perception of impacts as a result of preferences, associations and memories.	Personal perceptions would be affected by preferences, associations and memories derived from reading, hearing and/or seeing information on previous, existing and proposed activities and stakeholder interactions. Perceptions vary between individuals and can, therefore, be difficult to assess (VPA, 2019). DP&E (2017) relevantly states: *When considering perceptions of adverse impacts on amenity, an evaluation must be made of the reasonableness of those perceptions. This evaluation involves 'the identification of evidence that can be objectively assessed to ascertain whether it supports a factual finding of an adverse effect on amenity…': Telstra Corporation Ltd v Hornsby Shire Council [2006] NSWLEC 133.* Assessment of potential impacts on nearby equine and viticulture enterprises is provided above and in Section 6 of the EIS based on the evidence available. Malabar would continue to mitigate potential impacts on the perceptions of stakeholders associated with nearby equine enterprises (including customers) through the implementation of a number of measures described in Section 8 of the EIS. Malabar would continue to engage with both the owners and the operators of Hollydene Estate Wines to identify and manage any concerns.

Potential impacts on Hollydene Estate Wines have been avoided or mitigated through the significant design measures incorporated into the Project. The compatibility between the Project and other land uses is acknowledged by Hollydene Estate Wines' supporting submission, which states (emphasis added):

> *My name is Karen Williams and I am the Managing Director and founder of United Pastoral Pty Limited which operate Hollydene Estate Wines at 3483 Golden Highway Jerrys Plains which directly neighbours the proposed Maxwell Underground Coal Project.*
>
> *Over many years Hollydene Estate Wines has had to contend with then proposed Anglo Coal's Drayton South project. Here we submitted three successive very detailed formal objections and at substantial cost engaging our own experts. Our principle objection was large open cut mine literally at our front gate which would have been seriously detrimental to our award-winning tourism and wine business.*
>
> *The Maxwell Underground Coal Mine Project although within the same exploration licensed area as Drayton South now as an underground mine development eliminates all of our real concerns and will enable Hollydene Estate Wines to completely co-exist sustainably with the Maxwell Project.*
>
> *The project as proposed provides significant benefits to the community and in turn Hollydene Estate Wines as a local business reliant on a strong local economy. With the Maxwell Project providing long term local employment aligned with committed local expenditure and utilisation of local services there is no doubt this mine will be a key economic driver in the Muswellbrook Shire.*
>
> *To this end Hollydene Estate Wines fully supports the Maxwell Project and we look forward to the timely approval, development and ultimate production.*

NSW Planning Process

Issue

Organisations associated with the thoroughbred breeding industry and public submissions raised concerns regarding the NSW planning process and the associated uncertainty for the equine industry and potential investors.

Response

It is considered that comments in relation to the NSW planning system are directed at the NSW Government for consideration.

The Maxwell Project would generate a significant net benefit to the local community and the State of NSW. Malabar has sought to comply with all relevant planning requirements in relation to the Maxwell Project.

Proposed Underground Mining Method

Issue

One organisation submission raised concerns regarding the proposed use of longwall mining methods in the Woodlands Hill, Arrowfield and Bowfield seams, instead of bord and pillar mining methods.

Response

The EIS describes that longwall mining methods are proposed in the Woodlands Hill, Arrowfield and Bowfield seams, as opposed to bord and pillar mining, to maximise coal recovery and mining efficiency. Due to the *in-situ* coal thickness, the continuity of the seams, and depths of cover, the longwall mining method for the Woodlands Hill, Arrowfield and Bowfield seams provides greater resource recovery, is more efficient and hence lower cost, in comparison to bord and pillar mining methods.

It is noted that, in their submission on the EIS for the Project, the DRG stated:

> *Given the constraints outlined in the Proponent's EIS, the Division considers the Project an efficient development of coal resources that provides an appropriate return to the NSW Government.*

Future Applications for Open Cut Mining

Issue

One organisation submission raised concerns regarding the risk that a later modification will result in an open cut mine being developed at the Project site.

Response

Malabar is committed to development of the resource in EL 5460 solely as an underground mine. Malabar's commitment to an underground mining operation has been reaffirmed through:

- a public statement in May 2017, when Malabar first announced its intention to acquire EL 5460 and the Maxwell Infrastructure, that the resource would be developed only as an underground mine;
- voluntary acceptance of conditions that prevent any open cut development that were imposed on EL 5460 as part of the licence renewal process in December 2017;
- a public submission in December 2017 in support of changes to a State Environmental Planning Policy (SEPP) that prohibit any development application for open cut mining in EL 5460;
- consistent communication of Malabar's intentions through interactions with stakeholders and public statements;
- Malabar's significant investment in technical and environmental studies into the development of the site solely as an underground mining operation; and
- Malabar's recent addition to the team of a highly experienced underground mine manager, who will take responsibility for the delivery of the Project.

The underground mining methods proposed for the Project significantly reduce environmental impacts, including dust, noise and surface disturbance, in comparison to open cut mining methods.

Greenhouse Gas Emissions

Issue

Some organisation and public submissions raised concerns regarding greenhouse gas emissions from the Project.

Response

At least 75% of coal produced by the Project would be capable of being used in steel-making (coking coals).

It is acknowledged that (subject to the efficacy of national and international greenhouse gas abatement measures) all sources of greenhouse gas emissions will contribute in some way towards the potential global, national, state and regional effects of climate change.

The Project's contribution to global climate change effects would be proportional to its contribution to global greenhouse gas emissions. Greenhouse gases directly generated at the Project (i.e. Scope 1 emissions) and indirect emissions associated with the on-site use of fuel and electricity (i.e. Scope 2 emissions) have together been estimated at approximately 0.41 million tonnes of carbon dioxide equivalent per year (Mt CO_2-e per year).

These emissions would be significantly less than the Scope 3 emissions produced by customers using Project product coal. It is anticipated that a significant majority of the Scope 3 emissions from the use of Project coal would occur overseas.

Expected export markets for Project coal are described in Section 9.1.3 and Table 9-6 of the EIS. All of these export markets are either signatories to the *Paris Agreement* or have commitments to reduce greenhouse gas emissions.

Under the *Paris Agreement*, each country is required to determine NDCs that will contribute to the long-term goals of the *Paris Agreement* to achieve a balance between anthropogenic emissions by sources and removal by sinks of greenhouse gases in the second half of this century (United Nations Framework Convention on Climate Change [UNFCCC], 2019).

It is important to note that, under the *Paris Agreement*, each climate plan reflects the country's ambition for reducing emissions, taking into account its domestic circumstances and capabilities (UNFCCC, 2019). Each country will have its own range of opportunities and priorities to trade off various alternative emission reduction (and carbon sink) options that relate to the economic status and physical attributes of the country.

Malabar would manage its contribution to Australian greenhouse gas emissions inventories through participation in the NGERS, as well as other applicable government initiatives and policies implemented to manage emissions at the national level under Australia's progressive NDCs.

The NSW Government has announced that it will introduce legislation to prevent the regulation of Scope 3 emissions in NSW mining approvals (NSW Government, 2019).

Greenhouse Gas Emissions Estimation Methodology

Issue

Concerns were raised in the public submissions regarding the method used to quantify greenhouse gases, including that it did not include a component to account for methane emissions from the coal seams (i.e. fugitive emissions or emissions associated with the clearance of native vegetation).

Response

The Air Quality and Greenhouse Gas Assessment for the Project prepared by TAS (2019a) considers the Scope 1 and 2 greenhouse gas emission sources associated with the operation and construction of the Project, which includes fugitive gases from the exposed coal seams (i.e. methane).

Project direct and indirect greenhouse gas emissions have been estimated by TAS using published emission factors from the *National Greenhouse Accounts Factors* (DEE, 2018), where available.

The estimate amount of fugitive gases generated from the exposed coal seams were calculated from the average amount of gas generated per tonne of material for each of the different coal seams, which varies over the life of the Project with respect to the production schedule.

Table 9-1 of the Air Quality and Greenhouse Gas Assessment provides the estimated quantities of fugitive gas and electricity consumption on an annual basis for the Project. It is important to note, the fugitive gas emissions in Table 9-1 provides a worst-case scenario of greenhouse gas emissions, as the Project may include gas management and abatement (e.g. flaring) which reduces the overall amount of methane liberated from the coal seams.

Of the clearing to be undertaken, only 23.3 ha would be classified as woodland, the remainder of the clearing would be grassland. It is understood that the contribution of the greenhouse gas emissions from the clearance of the native vegetation would be very small. Furthermore, the progressive rehabilitation for the Project, including the planting of trees, would offset the greenhouse gases emissions produced through the clearance of vegetation.

Cumulative Impacts

Issue

Concerns were raised in the public submissions that the potential cumulative impacts of the Project and other mines have not been sufficiently considered (including air quality and water impacts). Also, concerns were also raised regarding the number of mining operations in the Hunter Valley.

Response

Table 2-2 of the EIS provides an overview of the approach to cumulative impact assessment taken for the key studies completed in support of this EIS. In particular, Table 2-2 of the EIS describes:

- how cumulative impacts have been considered, including the Project's relative contribution to those cumulative impacts;
- which past, present and reasonably foreseeable planned developments are relevant due to their proximity and/or potential to interact with potential Project impacts; and
- which cumulative impacts are separately assessed and/or managed through strategic planning or policy.

As an underground operation, the Project is predicted to have minimal impacts in comparison to an open cut mine.

Integration with Spur Hill

Issue

Concerns were raised in the public submissions that the approval of the Project would lead to future integration with the neighbouring Spur Hill Exploration Licence.

Response

Malabar is continuing to undertake work to enhance its geological understanding of the Spur Hill Exploration Licence area, with the current focus on the zone where EL 5460 meets EL 7429. The improved understanding will be used to optimise the development plans for the Spur Hill Underground Coking Coal Project.

Any future integration of the Maxwell Project and the Spur Hill Underground Coking Coal Project would be subject to future separate rigorous environmental assessment and approvals, including assessment of any potential cumulative impacts.

Perceived Health Impacts

Issue

Concerns were raised in the public submissions regarding potential impacts on human health associated with potential impacts of the Project to air quality, noise and stress.

Response

Potential impacts related to human health and amenity have been assessed in the Human Health Risk Assessment prepared by Environmental Risk Sciences (2019), which concluded:

- There are no potential impacts of concern in relation to cumulative concentrations of suspended particulate matter for the population in the vicinity of the Project.
- The conservative calculated incremental risk of health effects for individual receivers associated with exposure to nitrogen dioxide are considered to be acceptable and are considered to be negligible during operations.
- The potential for adverse health impacts associated with noise generated during construction and operations is considered to be negligible.
- With the implementation of the proposed water management system, the potential for adverse health impacts associated with potential impacts to surface water and groundwater as a result of the Project is considered to be negligible.

The Social Impact Assessment prepared by Elliott Whiteing Pty Ltd (2019) acknowledges the Project has the potential for social impacts including, stress and anxiety for some neighbouring landowners due to uncertainties or concerns about environmental or social impacts of the Project. Malabar would manage these concerns through ongoing and adaptive management including engagement and information provision relating to specific areas of community concerns.

Malabar will continue to engage with near neighbours and the local community to respond to any concerns or reservations about potential Project impacts prior to and throughout the life of the Project, and to lessen the potential for stress and anxiety. However, it is noted that some concerns may persist for some community members regardless of these strategies.

Community Consultation

Issue

Concerns were raised in the public submissions regarding the perceived lack of community consultation.

Response

Section 5 of the EIS outlines the extensive consultation undertaken by Malabar prior to and during the assessment phase of the EIS, and the consultation to be conducted in the future.

Malabar sought to engage with the local community throughout the preparation of the EIS, including via:

- distributing community newsletters to local residents and other stakeholders;
- conducting community information sessions;
- providing briefings to Malabar's CCCs;
- directly consulting with representatives of the Aboriginal community;
- consulting local community groups;
- proactively providing information through local media; and
- briefing Malabar's locally based staff and contractors.

In addition to the consultation undertaken during the preparation of the EIS, Malabar also maintains open lines of communication with the community through a number of community initiatives and local involvement mechanisms, including:

- ongoing facilitation of Malabar's CCCs;
- maintenance of a website (https://malabarcoal.com.au);
- a dedicated community call line ([02] 6542 0283);
- an email address (info@malabarcoal.com.au);
- media contact point;
- website feedback form;
- community contributions, programs and sponsorships; and
- public reporting.

Further to the consultation outlined above and subsequent to the lodgement of the EIS, Malabar gave notice of a Development Application for consent to carry out the Project under Part 4 of the EP&A Act in accordance with clause 49(2)(b) of the Environmental Planning and Assessment Regulation 2000, which was published in *The Muswellbrook Chronicle*, *Hunter Valley News*, *Denman News* and *The Singleton Argus*.

Malabar subsequently updated their website providing facts sheets about the Project and a link to the EIS along with an explanation on how feedback can be given on the Project.

Interpretation of the EIS

Issue

Concern was raised in one public submission regarding the difficulty to interpret technical information within the EIS.

Response

Where possible, the EIS uses plain English to describe the findings of all the specialist studies.

During the preparation of the EIS, Malabar also invited the local community to community information sessions where the specialists that prepared the assessments for the Project were available to describe the potential impacts of the Project.

Since the lodgement of the EIS, Malabar has continued to consult with local organisations and community members regarding the Project, including meeting with landowners and providing property-specific information booklets to landowners with dwellings located within 2.5 km of the Project (Section 4.1).

Also, an Executive Summary (22 pages) was prepared as part of the EIS, and is available on the NSW Government Major Projects website, with a link provided on the Malabar website.

Maxwell Solar Farm

Issue

Concern was raised in one public submission that the Maxwell Solar Farm would not be developed.

Response

As a separate project, and in parallel with the Project, Malabar is planning to submit a development application for a solar farm, known as the “Maxwell Solar Farm” (SSD 18_9820). The solar panels would be located on areas of previous open cut mining disturbance within CL 229. The Maxwell Solar Farm would not constrain or negatively impact the development of this Project.

At the time of writing Malabar had lodged the Maxwell Solar Farm Environmental Impact Statement with the DPIE for review.

Project Coal Quality

Issue

Concerns were raised in the public submissions whether the quality of coal from the Project would meet the 'coking coal' standards as the product coal quality of surrounding mines and previous applications is predominantly thermal coal.

Response

The Project would produce high-quality coals over the period of approximately 26 years.

At least 75 % of coal produced by the Project would be capable of being used in the making of steel (coking coals). The balance would be export thermal coals suitable for the new-generation High Efficiency, Low Emissions power generators.

It should be noted that the Project targets different coal seams that were proposed in previous proposals at the site, due to a different mining method targeting seams deeper in the stratigraphic sequence (i.e. underground mining only for the Project). In contrast, the Mt Arthur Mine also targets different coal seams and uses a different mining method to that proposed for the Project.

7 PROJECT EVALUATION

Submissions on the Project were received from government agencies, local councils, organisations and members of the public during the exhibition period for the EIS. Approximately 75% of submissions received from organisations and members of the public supported the Project.

This Submissions Report provides responses to issues raised by submissions from government agencies, local councils, organisations and members of the public during the exhibition period for the EIS and has been prepared in consideration of the Draft *Guideline 4: Guidance for State Significant Projects - Preparing a Submissions Report June 2019* (DPIE, 2019).

Malabar has continued to engage with key stakeholders, including government agencies, local councils, local organisations and community members regarding the Project and has sought to address previous feedback by committing to underground mining, other significant Project design measures, genuine community engagement and successful environmental management over time.

Through the voluntary adoption of the proposed Project design measures and operating philosophy, Malabar is confident that the Project would be compatible with existing and future surrounding land uses, including existing equine and viticulture enterprises. This is reinforced by the receipt of a supporting submission on the Project from Hollydene Estate Wines, who submitted three formal objections to the previous Drayton South Project.

Potential impacts of the Project have been assessed against established thresholds of acceptability contained in relevant guidelines and policies. Potential impacts have been avoided or minimised as far as is reasonable or feasible, and mitigation measures and offset strategies are proposed where residual impacts are predicted.

Local community members and other stakeholders have identified increased local employment opportunities and support for local businesses as key Project benefits.

The Project would also generate a significant net benefit to the State of NSW. Economic benefits potentially forgone if the Project does not proceed amount to a net benefit of $1,010 million to the State of NSW in NPV terms (Appendix M of the EIS).

In weighing up the main environmental impacts (costs and benefits) associated with the proposal as assessed and described in the EIS and the Submissions Report, the Project is, on balance, considered to be in the public interest.

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ATTACHMENT 1

SUBMISSIONS SUMMARY

Table A1-1
Submissions Summary

Submitter	Reference Number	Suburb	State	Group	View	Social and Economic	Rehabilitation	Impacts on Other Industries	Water	Amenity	Cumulative Impacts	Climate Change and GHG	Planning Process	Health	Agriculture	Heritage	Biodiversity	Road Transport
Rob Tickle	471886	Frazers Creek	NSW	Public	Objects	-	-	-	-	-	-	-	-	-	-	1	-	-
Robert Kennedy	471891	Singleton	NSW	Public	Objects	-	-	1	-	-	1	-	-	-	-	-	-	-
Anonymous	471951	Muswellbrook	NSW	Public	Objects	-	-	-	1	1	-	-	-	-	-	-	-	1
Ian Kilminster	471981	Artarmon	NSW	Public	Objects	-	-	-	-	-	-	-	-	-	-	-	-	-
Daniel King	472091	Mayfield	NSW	Public	Objects	-	-	1	-	-	-	-	-	-	-	-	-	-
Rachael Scoott	472106	Merewether	NSW	Public	Objects	-	-	1	1	-	-	1	-	-	-	-	1	-
Liam Oakwood	472131	Panton Hill	VIC	Public	Objects	-	-	-	-	-	-	1	-	-	-	-	-	-
Anna Harvey	472181	Croydon	NSW	Public	Objects	-	-	1	1	-	-	1	-	-	-	-	-	-
Anonymous	472486	Jerrys Plains	NSW	Public	Objects	1	-	1	1	-	-	-	1	-	-	-	-	-
Paula Woolfson	472496	Jerrys Plains	NSW	Public	Objects	-	-	1	1	1	-	-	-	-	-	-	-	-
Anonymous	472536	Muswellbrook	NSW	Public	Objects	-	-	-	-	-	1	-	-	-	1	-	-	-
craig benjamin	472551	Anna Bay	NSW	Public	Objects	-	1	1	1	1	-	-	-	-	-	-	-	-
Bruce Murray	472581	Jerrys Plains	NSW	Public	Objects	-	-	-	1	1	-	-	-	-	-	1	-	-
Nicola Cramsie	472586	Scone	NSW	Public	Objects	-	-	1	1	1	1	-	-	-	-	-	-	-
Anonymous	472591	Aberdeen	NSW	Public	Objects	-	-	1	-	-	1	-	-	-	-	-	-	-
Anonymous	472626	Jerrys Plains	NSW	Public	Objects	-	-	1	-	1	1	-	1	-	-	-	-	-
Anonymous	472666	Rouchel	NSW	Public	Objects	-	-	1	-	-	-	-	-	-	-	-	-	-
Anonymous	472686	Jerrys Plains	NSW	Public	Objects	-	-	-	1	1	-	-	-	-	-	-	-	-
John Borg	472691	Jerrys Plains	NSW	Public	Objects	-	-	1	1	-	-	-	1	1	-	-	-	-
Matthew Melmeth	472696	Muswellbrook	NSW	Public	Objects	-	-	1	1	-	-	-	-	-	-	-	-	-
Douglas Bennett	472726	Riverwood	NSW	Public	Objects	1	-	1	-	-	-	-	-	-	-	-	-	-
Anonymous	472736	Jerrys Plains	NSW	Public	Objects	-	-	1	1	-	-	-	-	-	1	-	-	-
Allen Barry	472766	Appletree Flat	NSW	Public	Objects	1	-	1	1	1	1	-	1	-	-	-	-	-
Meryan McRobert	472771	Rouchel	NSW	Public	Objects	1	-	1	-	1	1	-	-	-	-	-	-	-
Anonymous	472801	Scone	NSW	Public	Objects	-	-	1	1	1	1	-	-	-	1	-	-	-
Anonymous	472831	Scone	NSW	Public	Objects	-	-	1	1	1	1	1	1	1	-	-	-	-
Noni Jacobsen	472871	Muswellbrook	NSW	Public	Objects	1	-	-	1	1	-	-	1	1	-	-	-	-
Anonymous	472891	Scone	NSW	Public	Objects	-	-	1	1	-	-	-	1	1	-	-	-	-
Douglas Robertson	472901	Scone	NSW	Public	Objects	-	-	-	-	-	1	-	-	-	-	-	-	-
Nicola Robertson	472906	Scone	NSW	Public	Objects	1	-	1	1	1	1	1	-	1	-	-	-	-
Anonymous	472911	Aberdeen	NSW	Public	Objects	1	1	1	-	1	-	1	-	1	-	-	-	-
Anonymous	472931	Aberdeen	NSW	Public	Objects	-	-	-	-	1	-	1	-	-	-	-	-	-
Anonymous	472936	Segenhoe	NSW	Public	Objects	-	-	-	-	1	1	-	1	1	-	-	-	-
Anonymous	472941	Segenhoe	NSW	Public	Objects	1	-	1	1	1	1	-	-	-	-	-	-	1

Submitter	Reference Number	Suburb	State	Group	View	Social and Economic	Rehabilitation	Impacts on Other Industries	Water	Amenity	Cumulative Impacts	Climate Change and GHG	Planning Process	Health	Agriculture	Heritage	Biodiversity	Road Transport
Anonymous	472946	Segenhoe	NSW	Public	Objects	-	-	-	-	-	-	1	1	1	-	-	-	-
Anonymous	472951	Gundy	NSW	Public	Objects	1	-	-	-	-	1	1	1	-	-	1	-	-
Bev Atkison	472976	Not Provided	NSW	Public	Objects	1	-	-	-	-	1	-	-	-	-	-	-	-
Ian and Robyn Moore	472981	Jerrys Plains	NSW	Public	Objects	-	-	1	1	1	-	-	-	-	1	-	-	-
Kaye Monro	472996	Not Provided	NSW	Public	Objects	-	-	-	1	-	-	1	-	-	-	-	-	-
Anonymous	471806	Rhodes	NSW	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Steven Fordham	471811	Muswellbrook	NSW	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Scott Carrall	471816	Muswellbrook	NSW	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
John Saunders	471821	Avalon Beach	NSW	Public	Supports	1	1	-	-	-	-	-	-	-	-	-	-	-
Paul Verner	471826	Woollahra	NSW	Public	Supports	1	1	-	-	-	-	-	-	-	-	-	-	-
Kate Wolfgang	471831	Denman	NSW	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Robert Hayes	471836	Jerrys Plains	NSW	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Ryan Young	471846	Farmborough Heights	NSW	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Anonymous	471851	Thirroul	NSW	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Phillip Enderby	471856	Speers Point	NSW	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Anonymous	471861	Seaforth	NSW	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Tom Lundy	471866	Branxton	NSW	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Alex Pauza	471871	Keiraville	NSW	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Chris March	471876	Muswellbrook	NSW	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Christopher Smith	471881	Singleton	NSW	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Tyler Wolfgang	471896	Jerrys Plains	NSW	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Anonymous	471901	Aberdeen	NSW	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Kellie Parish	471906	Martindale	NSW	Public	Supports	1	1	-	-	-	-	-	-	-	-	-	-	-
Wes Mackinnon	471911	Redhead	NSW	Public	Supports	1	1	-	-	-	-	-	-	-	-	-	-	-
Mick Close	471926	Muswellbrook	NSW	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Steve Wylie	471936	Fishermans Bay	NSW	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Peter York	471941	Mccullys Gap	NSW	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Douglas Knox	471956	Brookvale	NSW	Public	Supports	1	1	-	-	-	-	-	-	-	-	-	-	-
Anonymous	471966	Rathmines	NSW	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Anonymous	471976	Kilaben Bay	NSW	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Brett Lewis	471986	Merewether	NSW	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Robert Parish	471991	Bureen	NSW	Public	Supports	1	1	-	-	-	-	-	-	-	-	-	-	-
Renata Roberts	471996	Merewether	NSW	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
John Richards	472001	Newcastle East	NSW	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Donna Croft	472006	Wattle Ponds	NSW	Public	Supports	1	1	-	-	-	-	-	-	-	-	-	-	-
Geoffrey Thompson	472011	Westbrook	NSW	Public	Supports	1	1	-	-	-	-	-	-	-	-	-	-	-
Paul Glasson	472026	Lithgow	NSW	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-

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Rhys Brett	472031	Bowral	NSW	Public	Supports	1	1	-	-	-	-	-	-	-	-	-	-	-
Richard Johnson	472036	Port Kembla	NSW	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Kerry Mctaggart	472041	Mccullys Gap	NSW	Public	Supports	1	1	-	-	-	-	-	-	-	-	-	-	-
Shannon Rhook	472046	Muswellbrook	NSW	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Lindi-May Lochner	472051	Gladesville	NSW	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
David Wood	472056	Toronto	NSW	Public	Supports	1	1	-	-	-	-	-	-	-	-	-	-	-
Anonymous	472061	Gresford	NSW	Public	Supports	1	1	-	-	-	-	-	-	-	-	-	-	-
Barry Wright	472071	Merewether	NSW	Public	Supports	1	1	-	-	-	-	-	-	-	-	-	-	-
Tim Burt	472076	Gladesville	NSW	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Anonymous	472081	Denman	NSW	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Vicki Riddy	472086	Muswellbrook	NSW	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Mick Hartley	472096	Wybong	NSW	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Norah St George	472101	Singleton	NSW	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Linda Benson	472121	Muswellbrook	NSW	Public	Supports	1	1	-	-	-	-	-	-	-	-	-	-	-
Andrew Forbes	472126	Cooks Hill	NSW	Public	Supports	1	1	-	-	-	-	-	-	-	-	-	-	-
Simon Collins	472136	Singleton Heights	NSW	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Anonymous	472141	Sutton Forest	NSW	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Alan Phillips	472146	Towradgi	NSW	Public	Supports	1	1	-	-	-	-	-	-	-	-	-	-	-
Jim Middleton	472151	East Corrimal	NSW	Public	Supports	1	1	-	-	-	-	-	-	-	-	-	-	-
Rhonda Foster	472156	Gowrie	NSW	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Susan Pickersgill	472161	Denman	NSW	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Lincoln Amidy	472166	Hamilton	NSW	Public	Supports	1	1	-	-	-	-	-	-	-	-	-	-	-
Tina Lambkin	472171	Whittingham	NSW	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Richard Webb	472176	Attunga	NSW	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Anonymous	472186	Reedy Creek	NSW	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Justin Burt	472191	Gladesville	NSW	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Michael Whitehurst	472196	Gunnedah	NSW	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Amanda Barry	472201	Denman	NSW	Public	Supports	1	1	-	-	-	-	-	-	-	-	-	-	-
Troy Greedy	472206	Muscle Creek	NSW	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Anonymous	472211	Pelaw Main	NSW	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Andrew Bremner	472216	Kurraba Point	NSW	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Jason Baker	472226	Greta	NSW	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Dan Cleary	472236	Grattai	NSW	Public	Supports	1	1	-	-	-	-	-	-	-	-	-	-	-
Steven Lothian	472241	Hamlyn Terrace	NSW	Public	Supports	1	1	-	-	-	-	-	-	-	-	-	-	-
Kim Anderson	472246	Wamberal	NSW	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Travers Wood	472251	Springfield	NSW	Public	Supports	1	1	-	-	-	-	-	-	-	-	-	-	-
Peter Weatherhead	472256	Bateau Bay	NSW	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-

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David Lofthouse	472261	Point Clare	NSW	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Jean Du Plessis	472266	Wyong	NSW	Public	Supports	1	1	-	-	-	-	-	-	-	-	-	-	-
Michael Barker	472271	Fennell Bay	NSW	Public	Supports	1	1	-	-	-	-	-	-	-	-	-	-	-
Anonymous	472276	Woollahra	NSW	Public	Supports	1	1	-	-	-	-	-	-	-	-	-	-	-
Tracey Collett	472281	Muswellbrook	NSW	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Nick Hardgraves	472286	Young	NSW	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Ken Mann	472291	Muswellbrook	NSW	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Bailey Pope	472296	Young	NSW	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Paul Vincent	472301	Wybong	NSW	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
John Whitney	472306	Not Supplied	NSW	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Anonymous	472311	Metford	NSW	Public	Supports	1	1	-	-	-	-	-	-	-	-	-	-	-
Stephen Luck	472321	Lidsdale	NSW	Public	Supports	1	1	-	-	-	-	-	-	-	-	-	-	-
Logan Francis	472326	Pokolbin	NSW	Public	Supports	1	1	-	-	-	-	-	-	-	-	-	-	-
Anonymous	472336	Merewether	NSW	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Warwick Morris	472351	Mosman	NSW	Public	Supports	1	1	-	-	-	-	-	-	-	-	-	-	-
Kim Schofield	472356	Singleton	NSW	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Anonymous	472361	Frenchs Forest	NSW	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Anonymous	472366	Sydney	NSW	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
David Maher	472371	Desert Springs	NT	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Anonymous	472376	Aberdeen	NSW	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Anonymous	472386	Farmborough Heights	NSW	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Anonymous	472391	Lilyfield	NSW	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Jonathan Scales	472396	Seaforth	NSW	Public	Supports	1	1	-	-	-	-	-	-	-	-	-	-	-
Anonymous	472401	Gladesville	NSW	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Warwick Crebert	472406	Redbournberry	NSW	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Jason Needham	472416	Lindfield	NSW	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Jarrod Cameron	472421	Muswellbrook	NSW	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Tim Freeman	472426	Bureen	NSW	Public	Supports	1	1	-	-	-	-	-	-	-	-	-	-	-
Anonymous	472431	Maroochydore	QLD	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Anonymous	472436	Chinchilla	QLD	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Christopher Dalton	472446	Queens Park	NSW	Public	Supports	1	1	-	-	-	-	-	-	-	-	-	-	-
Travis Zolnikov	472451	Muswellbrook	NSW	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Andy Forster	472466	North Balgowlah	NSW	Public	Supports	1	1	-	-	-	-	-	-	-	-	-	-	-
Donna Mclaughlin	472471	Reedy Creek	NSW	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Frank Lantry	472481	Kin Kora	QLD	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Tracey Johnson	472491	Chisholm	NSW	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Anonymous	472511	Gladesville	NSW	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-

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Gavin Wilks	472516	Denman	NSW	Public	Supports	1	1	-	-	-	-	-	-	-	-	-	-	-
Matt Frost	472521	Adamstown Heights	NSW	Public	Supports	1	1	-	-	-	-	-	-	-	-	-	-	-
Anonymous	472526	Westleigh	NSW	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Andrew Radcliffe	472531	Denman	NSW	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Jason Troy	472541	Muswellbrook	NSW	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Rod Barry	472546	Wangi Wangi	NSW	Public	Supports	1	1	-	-	-	-	-	-	-	-	-	-	-
Bill Johnson	472556	Hillsborough	NSW	Public	Supports	1	1	-	-	-	-	-	-	-	-	-	-	-
Tom Higgins	472561	Wickham	NSW	Public	Supports	1	1	-	-	-	-	-	-	-	-	-	-	-
Sue Jolliffe	472566	Fern Gully	NSW	Public	Supports	1	1	-	-	-	-	-	-	-	-	-	-	-
Anonymous	472571	Lindfield	NSW	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Benjamin Johnson	472576	Fletcher	NSW	Public	Supports	1	1	-	-	-	-	-	-	-	-	-	-	-
Bobby Dodovski	472606	Adamstown	NSW	Public	Supports	1	1	-	-	-	-	-	-	-	-	-	-	-
Roger Turner	472611	Terrigal	NSW	Public	Supports	1	1	-	-	-	-	-	-	-	-	-	-	-
Matthew Gallego	472621	Belmont North	NSW	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Mick Reis	472636	Maryland	NSW	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
James Johnson	472641	Muswellbrook	NSW	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Robert Davies	472661	Blackville	NSW	Public	Supports	1	1	-	-	-	-	-	-	-	-	-	-	-
Kim Lundy	472671	Branxton	NSW	Public	Supports	1	1	-	-	-	-	-	-	-	-	-	-	-
Thomas Lundy	472676	Branxton	NSW	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Mark Fogarty	472681	East Maitland	NSW	Public	Supports	1	1	-	-	-	-	-	-	-	-	-	-	-
Anonymous	472701	Fishing Point	NSW	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Peter Barry	472706	Denman	NSW	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Darren Waters	472711	Wattle Ponds	NSW	Public	Supports	1	1	-	-	-	-	-	-	-	-	-	-	-
Paul Youman	472716	Hamilton South	NSW	Public	Supports	1	1	-	-	-	-	-	-	-	-	-	-	-
Mal Peattie	472721	Wollstonecraft	NSW	Public	Supports	1	1	-	-	-	-	-	-	-	-	-	-	-
John Flood	472741	Muswellbrook	NSW	Public	Supports	1	1	-	-	-	-	-	-	-	-	-	-	-
Anonymous	472746	Wamberal	NSW	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Milica Sekulovski	472761	Bankstown	NSW	Public	Supports	1	1	-	-	-	-	-	-	-	-	-	-	-
Atsuko Radcliffe	472786	Denman	NSW	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Michelle Bowditch	472806	Muswellbrook	NSW	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Geoffrey Bowditch	472811	Sandy Hollow	NSW	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Jason Beddow	472841	Hunters Hill	NSW	Public	Supports	1	1	-	-	-	-	-	-	-	-	-	-	-
Simon Bird	472851	Wahroonga	NSW	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
J.H.F Cruickshank	472856	Page	ACT	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Gary Flanagan	472861	Singleton	NSW	Public	Supports	1	1	-	-	-	-	-	-	-	-	-	-	-
Lauren Browne	472956	Muswellbrook	NSW	Public	Supports	1	1	-	-	-	-	-	-	-	-	-	-	-
Myles Wylie	472961	Catherine Hill Bay	NSW	Public	Supports	1	1	-	-	-	-	-	-	-	-	-	-	-

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Anonymous	472966	Curtin	ACT	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Anonymous	472971	Terrigal	NSW	Public	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Michael Egan	472986	Green Point	NSW	Public	Supports	1	1	-	-	-	-	-	-	-	-	-	-	-
Fiona Hordern	472441	Denman	NSW	Public	Comments	1	1	-	-	-	-	-	-	-	-	-	-	-
Anonymous	472461	Muswellbrook	NSW	Public	Comments	-	-	-	1	-	-	-	-	-	-	-	-	-
McElroy Bryan Geological Services	471841	Wahroonga	NSW	Organisation	Supports	1	1	-	-	-	-	-	-	-	-	-	-	-
One Key Resources	471916	Singleton	NSW	Organisation	Supports	1	1	-	-	-	-	-	-	-	-	-	-	-
Muswellbrook Motors	471921	Muswellbrook	NSW	Organisation	Supports	1	1	-	-	-	-	-	-	-	-	-	-	-
PBE Rutherford	471931	East Maitland	NSW	Organisation	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Unity Power Engineers	471946	Medowie	NSW	Organisation	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
GHT Holdings Pty. Ltd.	471961	Morpeth	NSW	Organisation	Supports	1	1	-	-	-	-	-	-	-	-	-	-	-
Chubb Fire	471971	Aberglasslyn	NSW	Organisation	Supports	1	1	-	-	-	-	-	-	-	-	-	-	-
Lycopodium Infrastructure Pty Ltd	472016	Broadmeadow	NSW	Organisation	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Palaris Australia	472021	Toronto	NSW	Organisation	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Palaris Australia Pty Ltd	472066	Bar Beach	NSW	Organisation	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Denman Junior Cricket Association	472111	Denman	NSW	Organisation	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
RMS SERVICES (NSW) PTY LTD	472116	Muswellbrook	NSW	Organisation	Supports	1	1	-	-	-	-	-	-	-	-	-	-	-
Greenedge Contracting NSW	472221	Tarro	NSW	Organisation	Supports	1	1	-	-	-	-	-	-	-	-	-	-	-
KE Solutions Group Pty Ltd	472316	Grose Vale	NSW	Organisation	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Muswellbrook Chamber of Commerce & Industry	472331	Muswellbrook	NSW	Organisation	Supports	1	1	-	-	-	-	-	-	-	-	-	-	-
Sydney Mining Club	472346	Brooklyn	NSW	Organisation	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Enjoi Pty Ltd T/As Pirtek Muswellbrook	472411	Muscle Creek	NSW	Organisation	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Komatsu (Joy Global Australia Pty Ltd)	472456	Wacol	QLD	Organisation	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Longwall Engineering Consultants	472476	Wattle Ponds	NSW	Organisation	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Hollydene Estate	472501	Jerrys Plains	NSW	Organisation	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
United Pastoral	472506	Jerrys Plains	NSW	Organisation	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Quantum Engineering and Consulting Group Pty Ltd	472616	Merewether	NSW	Organisation	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
AusProof	472631	Raworth	NSW	Organisation	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Denman Sandy Hollow JRLFC	472751	Gungal	NSW	Organisation	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Denman Sandy Hollow JRLFC	472756	Gungal	NSW	Organisation	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Daracon	472791	Beresfield	NSW	Organisation	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Bowditch Earthmoving Pty Ltd	472821	Sandy Hollow	NSW	Organisation	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Aero Logistics Helicopters	472836	Mayfield West	NSW	Organisation	Supports	1	1	-	-	-	-	-	-	-	-	-	-	-
SADA Services Pty Limited	472866	Narellan	NSW	Organisation	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
JE & J ROBINSON PTY LTD	472876	Muswellbrook	NSW	Organisation	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Hunter Business Chamber	472886	Broadmeadow	NSW	Organisation	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-
Ampcontrol	472916	Tomago	NSW	Organisation	Supports	1	-	-	-	-	-	-	-	-	-	-	-	-

Submitter	Reference Number	Suburb	State	Group	View	Social and Economic	Rehabilitation	Impacts on Other Industries	Water	Amenity	Cumulative Impacts	Climate Change and GHG	Planning Process	Health	Agriculture	Heritage	Biodiversity	Road Transport
Scott Franks and Anor on the behalf of the Wonnarua People	471801	Miranda	NSW	Organisation	Objects	-	-	-	-	-	-	-	-	-	-	1	-	-
Denman Aberdeen Muswellbrook Scone Healthy Environment Group	472646	Kayuga	NSW	Organisation	Objects	-	-	-	1	-	1	1	-	-	-	-	-	-
Newgate Group	472731	Aberdeen	NSW	Organisation	Objects	-	-	1	1	1	1	-	-	-	-	-	-	-
Yarraman Park Stud	472776	Moobi	NSW	Organisation	Objects	-	-	1	1	1	-	-	-	-	-	-	-	-
Godolphin Australia Pty Ltd	472781	Aberdeen	NSW	Organisation	Objects	-	-	1	1	1	-	-	-	-	-	-	-	-
Scone Equine Hospital	472796	Scone	NSW	Organisation	Objects	1	-	1	1	1	1	-	1	-	-	1	-	-
Hunter Thoroughbred Breeders' Association	472816	Scone	NSW	Organisation	Objects	1	1	1	1	1	1	1	-	-	1	1	-	-
Coolmore Australia	472826	Jerrys Plains	NSW	Organisation	Objects	1	1	1	1	1	1	-	-	-	1	-	-	1
William Inglis & Son	472846	Warwick Farm	NSW	Organisation	Objects	-	-	1	-	-	-	-	-	-	-	-	-	-
Lock the Gate Alliance	472881	Newcastle	NSW	Organisation	Objects	-	-	1	1	-	1	1	-	-	-	-	-	-
Friends of the Upper Hunter Inc	472926	Aberdeen	NSW	Organisation	Objects	1	1	1	-	1	1	1	-	1	-	-	-	-
Cressfield	472991	Parkville	NSW	Organisation	Objects	-	-	1	-	-	-	1	-	-	-	-	-	-
Australian Rail Track Corporation	472231	Broadmeadow	NSW	Government	Comments	-	-	-	-	-	-	-	-	-	-	-	-	-
Transport for NSW	472341	Haymarket	NSW	Government	Comments	-	-	-	-	-	-	-	-	-	-	-	-	1
Subsidence Advisory NSW	472381	Newcastle West	NSW	Government	Comments	-	-	-	-	-	-	-	-	-	-	-	-	-
NSW Health	472596	Wallsend	NSW	Government	Comments	-	-	-	-	-	-	-	-	1	-	-	-	-
Division of Resources & Geoscience	472601	Maitland	NSW	Government	Comments	1	-	-	-	-	-	-	-	-	-	-	1	-
Biodiversity and Conservation Division	472651	Newcastle	NSW	Government	Comments	-	-	-	1	-	-	-	-	-	-	-	1	-
Department of Primary Industries	472656	-	NSW	Government	Comments	-	-	-	-	-	-	-	-	-	-		-	-
Upper Hunter Shire Council	472896	Scone	NSW	Council	Objects	-	-	1	1	1	1	-	1	1	-	-	-	-
NSW Resources Regulator	473001	Maitland	NSW	Government	Comments	-	1	-	1	-	-	-	-	-	-	-	-	-
Muswellbrook Shire Council	571451	Muswellbrook	NSW	Council	Comments	1	1	-	1	1	1	1	1	-	-	1	1	1
Environment Protection Authority	571446	Newcastle	NSW	Government	Comments	-	-	-	1	1	1	-	-	-	-	-	-	-
NSW Heritage Council	571441	Parramatta	NSW	Government	Comments	-	-	-	-	-	-	-	-	-	-	1	-	-
Roads and Maritime Services	574091	-	NSW	Government	Comments	-	-	-	-	-	-	-	-	-	-	-	-	1
Department of Planning, Industry and Environment - Water and NSW Natural Resources Access Regulator	573691	Sydney	NSW	Government	Comments	-	-	-	1	-	-	-	-	-	-	-	1	-
Total						**195**	**72**	**35**	**36**	**28**	**25**	**16**	**13**	**11**	**6**	**8**	**5**	**6**
Government						1	1	0	4	1	1	0	0	1	0	1	3	2
Council						36	12	10	8	7	7	5	1	1	2	3	0	1
Organisation						36	12	10	8	7	7	5	1	1	2	3	0	1
Public						157	58	24	22	18	15	10	10	8	4	3	1	2

ATTACHMENT 2

REGISTER OF SUBMITTERS

Table A2-1
Register of Submitters

Group	Reference Number	Name	Where Comments are Addressed (Section)
Public	471886	Rob Tickle	6.2.8
	471891	Robert Kennedy	6.2.11
	471951	Anonymous	6.2.2, 6.2.4, 6.2.6
	471981	Ian Kilminster	-
	472091	Daniel King	6.2.11
	472106	Rachael Scoott	6.2.2, 6.2.7, 6.2.11
	472131	Liam Oakwood	6.2.11
	472181	Anna Harvey	6.2.2, 6.2.11
	472486	Anonymous	6.2.2, 6.2.11
	472496	Paula Woolfson	6.2.2, 6.2.4, 6.2.11
	472536	Anonymous	6.2.1, 6.2.11
	472551	Craig Benjamin	6.2.2, 6.2.4, 6.2.5, 6.2.11
	472581	Bruce Murray	6.2.2, 6.2.8, 6.2.4
	472586	Nicola Cramsie	6.2.2, 6.2.4, 6.2.11
	472591	Anonymous	6.2.11
	472626	Anonymous	6.2.4, 6.2.11
	472666	Anonymous	6.2.11
	472686	Anonymous	6.2.2, 6.2.4
	472691	John Borg	6.2.2, 6.2.11
	472696	Matthew Melmeth	6.2.2, 6.2.11
	472726	Douglas Bennett	6.2.10
	472736	Anonymous	6.2.1, 6.2.2, 6.2.11
	472766	Allen Barry	6.2.2, 6.2.4, 6.2.5, 6.2.9, 6.2.10, 6.2.11
	472771	Meryan McRobert	6.2.4, 6.2.11
	472801	Anonymous	6.2.1, 6.2.2, 6.2.4, 6.2.11
	472831	Anonymous	6.2.2, 6.2.4, 6.2.11

Table A2-1 (Continued)
Register of Submitters

Group	Reference Number	Name	Where Comments are Addressed (Section)
Public	472871	Noni Jacobsen	6.2.2, 6.2.5, 6.2.10, 6.2.11
	472891	Anonymous	6.2.2, 6.2.11
	472901	Douglas Robertson	6.2.11
	472906	Nicola Robertson	6.2.2, 6.2.4, 6.2.5, 6.2.10, 6.2.11
	472911	Anonymous	6.2.4, 6.2.9, 6.2.10, 6.2.11
	472931	Anonymous	6.2.4, 6.2.11
	472936	Anonymous	6.2.4, 6.2.11
	472941	Anonymous	6.2.2, 6.2.4, 6.2.6, 6.2.11
	472946	Anonymous	6.2.11
	472951	Anonymous	6.2.8, 6.2.11
	472976	Bev Atkison	6.2.11
	472981	Ian and Robyn Moore	6.2.1, 6.2.2, 6.2.4, 6.2.5, 6.2.11
	472996	Kaye Monro	6.2.2, 6.2.11
	472441	Fiona Hordern	-
	472461	Anonymous	6.2.2
Organisation	471801	Scott Franks and Anor on the behalf of the Wonnarua People	6.2.8
	472646	Denman Aberdeen Muswellbrook Scone Healthy Environment Group	6.2.2, 6.2.11
	472731	Newgate Group	6.2.2, 6.2.3, 6.2.4, 6.2.11
	472776	Yarraman Park Stud	6.2.2, 6.2.4, 6.2.11
	472781	Godolphin Australia Pty Ltd	6.2.2, 6.2.3, 6.2.4, 6.2.5, 6.2.6, 6.2.11
	472796	Scone Equine Hospital	6.2.2, 6.2.4, 6.2.5, 6.2.6, 6.2.8, 6.2.10, 6.2.11
	472816	Hunter Thoroughbred Breeders' Association	6.2.1, 6.2.2, 6.2.3, 6.2.4, 6.2.5, 6.2.8, 6.2.9, 6.2.10, 6.2.11
	472826	Coolmore Australia	6.2.1, 6.2.2, 6.2.3, 6.2.4, 6.2.5, 6.2.6, 6.2.9, 6.2.11
	472846	William Inglis & Son	6.2.11
	472881	Lock the Gate Alliance	6.2.1, 6.2.2, 6.2.11
	472926	Friends of the Upper Hunter Inc	6.2.2, 6.2.4, 6.2.5, 6.2.9, 6.2.10, 6.2.11
	472991	Cressfield	6.2.11

Table A2-1 (Continued)
Register of Submitters

Group	Reference Number	Name	Where Comments are Addressed (Section)
Government	472231	Australian Rail Track Corporation	-
	472341	Transport for NSW	6.1.5
	472381	Subsidence Advisory NSW	-
	472596	NSW Health	-
	472601	Division of Resources and Geoscience	6.1.6
	472651	Biodiversity and Conservation Division	6.1.5, 6.1.6
	472656	Department of Primary Industries	-
	473001	NSW Resources Regulator	6.1.2, 6.1.8
	571446	Environment Protection Authority	6.1.2, 6.1.3, 6.1.4
	571441	NSW Heritage Council	-
	574091	Roads and Maritime Services	6.1.5
	573691	Department of Planning, Industry and Environment - Water and NSW Natural Resources Access Regulator	6.1.2, 6.1.6
Council	571451	Muswellbrook Shire Council	6.1.1, 6.1.2, 6.1.3, 6.1.4, 6.1.5, 6.1.6, 6.1.7, 6.1.8, 6.1.9, 6.1.10
	472896	Upper Hunter Shire Council	6.2.2, 6.2.11

ATTACHMENT 3

TODOROSKI AIR SCIENCES PTY LTD –
RESPONSE TO EPA SUBMISSION

TODOROSKI AIR SCIENCES
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1 November 2019

Bill Dean
Malabar Coal Limited
c/- Resource Strategies

RE: Maxwell Project – Air Quality and Greenhouse Gas Assessment – Response to EPA Submission

Dear Bill,

This letter provides additional information and responses to address selected comments from the New South Wales (NSW) Environment Protection Authority (EPA) relating to the Maxwell Project *Air Quality and Greenhouse Gas Assessment* (AQIA) (**Todoroski Air Sciences, 2019**).

The Maxwell Project EIS presents the Project's incremental and total cumulative impacts. The EPA has requested further detail, namely all the components of the cumulative impact assessment.

For annual average dust metrics, these are explicitly set out in **Table 1** to **Table 3**, which present the segregated receptor results for Scenario 1 to 3, as requested by the EPA.

The 24-hour average assessment was conducted in accordance with the EPA Level 2 assessment methodology outlined in Section 11.2 of the *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* (**NSW EPA, 2017**). Per the EPA Level 2 assessment methodology, the dispersion model prediction for the Project was added to the corresponding measured background concentration (which includes dust levels from existing, neighbouring operations) to estimate the cumulative 24-hour average $PM_{2.5}$ and PM_{10} impacts.

The EPA Level 2 methodology does not address the explicit inclusion of other modelled sources in the dispersion modelling, as the measured background dust levels includes the dust associated with all existing sources (i.e. other modelled sources). To determine the contribution of key existing sources would require accurate hourly varying emission rates from other operations, and this is typically not available. Therefore, it is not practical to undertake the 24-hour cumulative analysis in the same detailed manner that is completed for annual average impacts.

As such, no changes have been made to the EPA Level 2 assessment methodology applied in the cumulative impact assessment of 24-hour average dust metrics.

Table 1: Modelling prediction for Scenario 1

Receptor ID	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)	TSP (µg/m³)	DD (g/m²/mth)	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)	TSP (µg/m³)	DD (g/m²/mth)	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)	TSP (µg/m³)	DD (g/m²/mth)	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)	TSP (µg/m³)	DD (g/m²/mth)
	Project alone				Other modelled sources				Background/ 'residual dust level'				Total impact			
	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.
	Air quality impact criteria															
	-	-	-	2	-	-	-	-	-	-	-	-	8	25	90	4
24a	0	0	0	0	0.2	2.3	2.7	0	4.5	8.9	31.2	1.6	4.7	11.2	33.9	1.6
24b	0	0	0	0	0.2	2.3	2.7	0	4.5	8.9	31.2	1.6	4.7	11.2	33.9	1.6
25	0	0	0	0	0.2	2.3	2.8	0	4.5	8.9	31.2	1.6	4.7	11.2	34	1.6
57	0	0	0.1	0	0.3	2.8	3.3	0	4.5	8.9	31.2	1.6	4.8	11.7	34.6	1.6
58a	0	0	0.1	0	0.3	2.6	3.1	0	4.5	8.9	31.2	1.6	4.8	11.5	34.4	1.6
58b	0	0	0.1	0	0.3	2.6	3	0	4.5	8.9	31.2	1.6	4.8	11.5	34.3	1.6
60a	0.1	0.3	0.6	0	0.6	6.7	8.2	0.1	4.5	8.9	31.2	1.6	5.2	15.9	40	1.7
60b	0.1	0.4	0.8	0	0.7	7.3	8.9	0.1	4.5	8.9	31.2	1.6	5.3	16.6	40.9	1.7
60c	0.1	0.3	0.7	0	0.7	7.3	8.9	0.1	4.5	8.9	31.2	1.6	5.3	16.5	40.8	1.7
60d	0.1	0.3	0.7	0	0.7	7.1	8.6	0.1	4.5	8.9	31.2	1.6	5.3	16.3	40.5	1.7
145a	0	0.1	0.1	0	0.4	3.9	4.9	0.1	4.5	8.9	31.2	1.6	4.9	12.9	36.2	1.7
145b	0	0.1	0.1	0	0.4	3.5	4.3	0.1	4.5	8.9	31.2	1.6	4.9	12.5	35.6	1.7
145c	0	0	0.1	0	0.3	3.3	4	0.1	4.5	8.9	31.2	1.6	4.8	12.2	35.3	1.7
172	0	0	0.1	0	0.2	2.3	2.6	0	4.5	8.9	31.2	1.6	4.7	11.2	33.9	1.6
240b	0	0	0	0	0.2	1.7	2	0	4.5	8.9	31.2	1.6	4.7	10.6	33.2	1.6
207	0	0	0	0	0.2	2.1	2.5	0	4.5	8.9	31.2	1.6	4.7	11	33.7	1.6
209	0	0	0.1	0	0.2	2.4	2.8	0	4.5	8.9	31.2	1.6	4.7	11.3	34.1	1.6
211a	0	0	0.1	0	0.2	2.3	2.7	0	4.5	8.9	31.2	1.6	4.7	11.2	34	1.6
211b	0	0	0.1	0	0.2	2.4	2.8	0	4.5	8.9	31.2	1.6	4.7	11.3	34.1	1.6
211c	0	0	0.1	0	0.2	2.4	2.7	0	4.5	8.9	31.2	1.6	4.7	11.3	34	1.6
217c	0	0	0.1	0	0.2	2.4	2.9	0	4.5	8.9	31.2	1.6	4.7	11.3	34.2	1.6
217d	0	0	0.1	0	0.2	2.3	2.7	0	4.5	8.9	31.2	1.6	4.7	11.2	34	1.6
217e	0	0	0	0	0.2	2.2	2.7	0	4.5	8.9	31.2	1.6	4.7	11.1	33.9	1.6
217f	0	0	0	0	0.2	2.2	2.7	0	4.5	8.9	31.2	1.6	4.7	11.1	33.9	1.6
219a	0	0	0	0	0.2	2.3	2.8	0	4.5	8.9	31.2	1.6	4.7	11.2	34	1.6
219b	0	0	0	0	0.2	2.3	2.8	0	4.5	8.9	31.2	1.6	4.7	11.2	34	1.6
219c	0	0	0	0	0.2	2.3	2.8	0	4.5	8.9	31.2	1.6	4.7	11.2	34	1.6
219d	0	0	0	0	0.2	2.3	2.7	0	4.5	8.9	31.2	1.6	4.7	11.2	33.9	1.6
219e	0	0	0	0	0.2	2.1	2.5	0	4.5	8.9	31.2	1.6	4.7	11	33.7	1.6
226a	0	0	0.1	0	0.3	2.5	3	0	4.5	8.9	31.2	1.6	4.8	11.4	34.3	1.6
226b	0	0	0.1	0	0.3	2.6	3	0	4.5	8.9	31.2	1.6	4.8	11.5	34.3	1.6

Receptor ID	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)	TSP (µg/m³)	DD (g/m²/mth)	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)	TSP (µg/m³)	DD (g/m²/mth)	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)	TSP (µg/m³)	DD (g/m²/mth)	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)	TSP (µg/m³)	DD (g/m²/mth)
	Project alone				Other modelled sources				Background/ 'residual dust level'				Total impact			
	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.
	Air quality impact criteria															
	-	-	-	2	-	-	-	-	-	-	-	-	8	25	90	4
226c	0	0	0.1	0	0.3	2.6	3.1	0	4.5	8.9	31.2	1.6	4.8	11.5	34.4	1.6
226d	0	0	0.1	0	0.2	2.3	2.7	0	4.5	8.9	31.2	1.6	4.7	11.2	34	1.6
227a	0	0	0.1	0	0.2	2.1	2.4	0	4.5	8.9	31.2	1.6	4.7	11	33.7	1.6
227b	0	0	0.1	0	0.2	2	2.3	0	4.5	8.9	31.2	1.6	4.7	10.9	33.6	1.6
227c	0	0	0.1	0	0.2	2	2.3	0	4.5	8.9	31.2	1.6	4.7	10.9	33.6	1.6
227d	0	0	0.1	0	0.2	2	2.3	0	4.5	8.9	31.2	1.6	4.7	10.9	33.6	1.6
227f	0	0	0.1	0	0.3	2.4	2.8	0	4.5	8.9	31.2	1.6	4.8	11.3	34.1	1.6
228a	0	0	0	0	0.1	1.3	1.5	0	4.5	8.9	31.2	1.6	4.6	10.2	32.7	1.6
228b	0	0	0	0	0.1	1.3	1.5	0	4.5	8.9	31.2	1.6	4.6	10.2	32.7	1.6
228c	0	0	0	0	0.1	1.3	1.5	0	4.5	8.9	31.2	1.6	4.6	10.2	32.7	1.6
227e	0	0	0	0	0.2	2	2.4	0	4.5	8.9	31.2	1.6	4.7	10.9	33.6	1.6
228e	0	0	0	0	0.1	1.3	1.5	0	4.5	8.9	31.2	1.6	4.6	10.2	32.7	1.6
228f	0	0	0	0	0.1	1.3	1.5	0	4.5	8.9	31.2	1.6	4.6	10.2	32.7	1.6
228g	0	0	0	0	0.1	1.3	1.5	0	4.5	8.9	31.2	1.6	4.6	10.2	32.7	1.6
228h	0	0	0	0	0.1	1.3	1.5	0	4.5	8.9	31.2	1.6	4.6	10.2	32.7	1.6
228i	0	0	0	0	0.1	1.3	1.5	0	4.5	8.9	31.2	1.6	4.6	10.2	32.7	1.6
228j	0	0	0	0	0.1	1.1	1.3	0	4.5	8.9	31.2	1.6	4.6	10	32.5	1.6
228k	0	0	0	0	0.1	1.3	1.5	0	4.5	8.9	31.2	1.6	4.6	10.2	32.7	1.6
228l	0	0	0	0	0.2	1.5	1.8	0	4.5	8.9	31.2	1.6	4.7	10.4	33	1.6
228m	0	0	0	0	0.2	1.6	1.9	0	4.5	8.9	31.2	1.6	4.7	10.5	33.1	1.6
228n	0	0	0	0	0.2	1.7	2.1	0	4.5	8.9	31.2	1.6	4.7	10.6	33.3	1.6
228o	0	0	0	0	0.2	1.6	1.9	0	4.5	8.9	31.2	1.6	4.7	10.5	33.1	1.6
228p	0	0	0	0	0.1	1.4	1.6	0	4.5	8.9	31.2	1.6	4.6	10.3	32.8	1.6
228q	0	0	0	0	0.2	1.5	1.7	0	4.5	8.9	31.2	1.6	4.7	10.4	32.9	1.6
228r	0	0	0	0	0.2	1.6	1.9	0	4.5	8.9	31.2	1.6	4.7	10.5	33.1	1.6
230a	0	0	0	0	0.1	1	1.2	0	4.5	8.9	31.2	1.6	4.6	9.9	32.4	1.6
230b	0	0	0	0	0.1	1	1.2	0	4.5	8.9	31.2	1.6	4.6	9.9	32.4	1.6
238a	0	0	0	0	0.1	1	1.2	0	4.5	8.9	31.2	1.6	4.6	9.9	32.4	1.6
238b	0	0	0	0	0.1	1	1.2	0	4.5	8.9	31.2	1.6	4.6	9.9	32.4	1.6
238c	0	0	0	0	0.1	1	1.2	0	4.5	8.9	31.2	1.6	4.6	9.9	32.4	1.6
238d	0	0	0	0	0.1	1.1	1.2	0	4.5	8.9	31.2	1.6	4.6	10	32.4	1.6
238e	0	0	0	0	0.1	1.1	1.2	0	4.5	8.9	31.2	1.6	4.6	10	32.4	1.6

Receptor ID	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)	TSP (µg/m³)	DD (g/m²/mth)	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)	TSP (µg/m³)	DD (g/m²/mth)	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)	TSP (µg/m³)	DD (g/m²/mth)	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)	TSP (µg/m³)	DD (g/m²/mth)
	Project alone				Other modelled sources				Background/ 'residual dust level'				Total impact			
	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.
	Air quality impact criteria															
	-	-	-	2	-	-	-	-	-	-	-	-	8	25	90	4
238f	0	0	0	0	0.1	1.1	1.2	0	4.5	8.9	31.2	1.6	4.6	10	32.4	1.6
238g	0	0	0	0	0.1	1	1.2	0	4.5	8.9	31.2	1.6	4.6	9.9	32.4	1.6
238h	0	0	0	0	0.1	1	1.2	0	4.5	8.9	31.2	1.6	4.6	9.9	32.4	1.6
239a	0	0	0	0	0.1	1.1	1.3	0	4.5	8.9	31.2	1.6	4.6	10	32.5	1.6
239b	0	0	0	0	0.1	1.1	1.3	0	4.5	8.9	31.2	1.6	4.6	10	32.5	1.6
239c	0	0	0	0	0.1	1.1	1.3	0	4.5	8.9	31.2	1.6	4.6	10	32.5	1.6
239d	0	0	0	0	0.1	1.1	1.3	0	4.5	8.9	31.2	1.6	4.6	10	32.5	1.6
239e	0	0	0	0	0.1	1.1	1.3	0	4.5	8.9	31.2	1.6	4.6	10	32.5	1.6
239f	0	0	0	0	0.1	1.1	1.3	0	4.5	8.9	31.2	1.6	4.6	10	32.5	1.6
239g	0	0	0	0	0.1	1.1	1.3	0	4.5	8.9	31.2	1.6	4.6	10	32.5	1.6
239h	0	0	0	0	0.1	1.1	1.3	0	4.5	8.9	31.2	1.6	4.6	10	32.5	1.6
239i	0	0	0	0	0.1	1.2	1.4	0	4.5	8.9	31.2	1.6	4.6	10.1	32.6	1.6
239j	0	0	0	0	0.1	1.2	1.4	0	4.5	8.9	31.2	1.6	4.6	10.1	32.6	1.6
239k	0	0	0	0	0.1	1.2	1.4	0	4.5	8.9	31.2	1.6	4.6	10.1	32.6	1.6
240a	0	0	0	0	0.2	1.5	1.8	0	4.5	8.9	31.2	1.6	4.7	10.4	33	1.6
240c	0	0	0	0	0.2	1.7	2	0	4.5	8.9	31.2	1.6	4.7	10.6	33.2	1.6
240d	0	0	0	0	0.2	1.7	2	0	4.5	8.9	31.2	1.6	4.7	10.6	33.2	1.6
240e	0	0	0	0	0.2	1.6	1.9	0	4.5	8.9	31.2	1.6	4.7	10.5	33.1	1.6
250a	0	0	0.1	0	0.2	1.8	2	0	4.5	8.9	31.2	1.6	4.7	10.7	33.3	1.6
250b	0	0	0.1	0	0.2	1.8	2.1	0	4.5	8.9	31.2	1.6	4.7	10.7	33.4	1.6
253	0	0	0	0	0.1	1.3	1.5	0	4.5	8.9	31.2	1.6	4.6	10.2	32.7	1.6
254a	0	0	0	0	0.1	1.3	1.5	0	4.5	8.9	31.2	1.6	4.6	10.2	32.7	1.6
254b	0	0	0	0	0.1	1.3	1.5	0	4.5	8.9	31.2	1.6	4.6	10.2	32.7	1.6
254c	0	0	0	0	0.1	1.3	1.5	0	4.5	8.9	31.2	1.6	4.6	10.2	32.7	1.6
255	0	0	0	0	0.1	1.2	1.4	0	4.5	8.9	31.2	1.6	4.6	10.1	32.6	1.6
279	0	0	0	0	0.1	1.1	1.3	0	4.5	8.9	31.2	1.6	4.6	10	32.5	1.6
284	0	0	0	0	0.1	1.2	1.4	0	4.5	8.9	31.2	1.6	4.6	10.1	32.6	1.6
285	0	0	0	0	0.1	1.1	1.3	0	4.5	8.9	31.2	1.6	4.6	10	32.5	1.6
298a	0	0	0	0	0.2	1.6	1.9	0	4.5	8.9	31.2	1.6	4.7	10.5	33.1	1.6
298b	0	0	0	0	0.2	1.6	1.9	0	4.5	8.9	31.2	1.6	4.7	10.5	33.1	1.6
287	0	0	0	0	0.1	1.1	1.3	0	4.5	8.9	31.2	1.6	4.6	10	32.5	1.6
299	0	0	0	0	0.1	1.1	1.9	0	4.5	8.9	31.2	1.6	4.6	10	33.1	1.6

Receptor ID	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)	TSP (µg/m³)	DD (g/m²/mth)	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)	TSP (µg/m³)	DD (g/m²/mth)	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)	TSP (µg/m³)	DD (g/m²/mth)	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)	TSP (µg/m³)	DD (g/m²/mth)
	Project alone				Other modelled sources				Background/ 'residual dust level'				Total impact			
	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.
	Air quality impact criteria															
	-	-	-	2	-	-	-	-	-	-	-	-	8	25	90	4
306	0	0	0	0	0.2	1.5	1.8	0	4.5	8.9	31.2	1.6	4.7	10.4	33	1.6
384	0	0.1	0.1	0	0.6	6.3	8	0.1	4.5	8.9	31.2	1.6	5.1	15.3	39.3	1.7
385	0	0.1	0.1	0	0.6	6.1	7.8	0.1	4.5	8.9	31.2	1.6	5.1	15.1	39.1	1.7
386	0	0.1	0.2	0	0.7	7.4	9.3	0.1	4.5	8.9	31.2	1.6	5.2	16.4	40.7	1.7
387	0	0.1	0.2	0	0.8	8.2	10.3	0.2	4.5	8.9	31.2	1.6	5.3	17.2	41.7	1.8
389	0.1	0.3	0.5	0	0.8	9.2	11.6	0.2	4.5	8.9	31.2	1.6	5.4	18.4	43.3	1.8
390	0.1	0.2	0.4	0	0.8	9.1	11.3	0.2	4.5	8.9	31.2	1.6	5.4	18.2	42.9	1.8
398	0	0.1	0.2	0	0.8	8.5	10.7	0.2	4.5	8.9	31.2	1.6	5.3	17.5	42.1	1.8
399	0	0.1	0.2	0	0.7	7.8	9.8	0.1	4.5	8.9	31.2	1.6	5.2	16.8	41.2	1.7
400	0	0.1	0.1	0	0.7	7	8.8	0.1	4.5	8.9	31.2	1.6	5.2	16	40.1	1.7
402	0	0.1	0.2	0	0.7	7.8	9.8	0.1	4.5	8.9	31.2	1.6	5.2	16.8	41.2	1.7
403	0	0.1	0.2	0	0.8	8.2	10.2	0.1	4.5	8.9	31.2	1.6	5.3	17.2	41.6	1.7
404	0	0.1	0.1	0	0.7	7.5	9.4	0.1	4.5	8.9	31.2	1.6	5.2	16.5	40.7	1.7
410	0.1	0.2	0.3	0	0.7	8.4	10.6	0.1	4.5	8.9	31.2	1.6	5.3	17.5	42.1	1.7
411	0.1	0.2	0.3	0	0.7	7.9	9.9	0.1	4.5	8.9	31.2	1.6	5.3	17	41.4	1.7
418	0.1	0.2	0.3	0	0.6	7.4	9.4	0.1	4.5	8.9	31.2	1.6	5.2	16.5	40.9	1.7
419	0	0.2	0.3	0	0.7	6.9	8.8	0.1	4.5	8.9	31.2	1.6	5.2	16	40.3	1.7
420	0	0.1	0.2	0	0.7	6.8	8.5	0.1	4.5	8.9	31.2	1.6	5.2	15.8	39.9	1.7
421	0	0.1	0.2	0	0.7	6.8	8.5	0.1	4.5	8.9	31.2	1.6	5.2	15.8	39.9	1.7
423	0	0.1	0.2	0	0.7	6.9	8.6	0.1	4.5	8.9	31.2	1.6	5.2	15.9	40	1.7
424	0	0.1	0.1	0	0.6	6.8	8.6	0.1	4.5	8.9	31.2	1.6	5.1	15.8	39.9	1.7
425	0	0.1	0.1	0	0.6	6.4	8.2	0.1	4.5	8.9	31.2	1.6	5.1	15.4	39.5	1.7
427	0	0.1	0.1	0	0.6	6.6	8.3	0.1	4.5	8.9	31.2	1.6	5.1	15.6	39.6	1.7
429	0	0.1	0.1	0	0.6	6.1	7.7	0.1	4.5	8.9	31.2	1.6	5.1	15.1	39	1.7
432	0	0	0.1	0	0.5	5.8	7.3	0.1	4.5	8.9	31.2	1.6	5	14.7	38.6	1.7
433a	0	0.1	0.1	0	0.5	5.7	7.3	0.1	4.5	8.9	31.2	1.6	5	14.7	38.6	1.7
433b	0	0	0.1	0	0.5	5.4	6.8	0.1	4.5	8.9	31.2	1.6	5	14.3	38.1	1.7
435a	0	0	0.1	0	0.5	5.4	6.7	0.1	4.5	8.9	31.2	1.6	5	14.3	38	1.7
435b	0	0.1	0.1	0	0.5	5.6	7.1	0.1	4.5	8.9	31.2	1.6	5	14.6	38.4	1.7
438	0	0	0	0	0.4	4.4	5.6	0.1	4.5	8.9	31.2	1.6	4.9	13.3	36.8	1.7
440	0	0.1	0.1	0	0.5	5.5	6.9	0.1	4.5	8.9	31.2	1.6	5	14.5	38.2	1.7
441a	0	0.1	0.1	0	0.4	4.5	5.8	0.1	4.5	8.9	31.2	1.6	4.9	13.5	37.1	1.7

Receptor ID	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)	TSP (µg/m³)	DD (g/m²/mth)	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)	TSP (µg/m³)	DD (g/m²/mth)	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)	TSP (µg/m³)	DD (g/m²/mth)	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)	TSP (µg/m³)	DD (g/m²/mth)
	Project alone				Other modelled sources				Background/ 'residual dust level'				Total impact			
	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.
	Air quality impact criteria															
	-	-	-	2	-	-	-	-	-	-	-	-	8	25	90	4
441b	0	0.1	0.1	0	0.4	4.5	5.7	0.1	4.5	8.9	31.2	1.6	4.9	13.5	37	1.7
443	0	0.1	0.1	0	0.5	5.2	6.6	0.1	4.5	8.9	31.2	1.6	5	14.2	37.9	1.7
444	0	0.1	0.2	0	0.6	5.8	7.3	0.1	4.5	8.9	31.2	1.6	5.1	14.8	38.7	1.7
446a	0	0.1	0.2	0	0.5	5.5	6.9	0.1	4.5	8.9	31.2	1.6	5	14.5	38.3	1.7
451	0	0.1	0.1	0	0.4	4.6	5.8	0.1	4.5	8.9	31.2	1.6	4.9	13.6	37.1	1.7
455	0	0.1	0.1	0	0.4	4.4	5.6	0.1	4.5	8.9	31.2	1.6	4.9	13.4	36.9	1.7
456	0	0.1	0.1	0	0.4	4.4	5.6	0.1	4.5	8.9	31.2	1.6	4.9	13.4	36.9	1.7
460	0	0	0.1	0	0.5	5.5	6.9	0.1	4.5	8.9	31.2	1.6	5	14.4	38.2	1.7
500	0	0	0.1	0	0.5	5.2	6.5	0.1	4.5	8.9	31.2	1.6	5	14.1	37.8	1.7
507	0	0	0.1	0	0.5	5.3	6.6	0.1	4.5	8.9	31.2	1.6	5	14.2	37.9	1.7
508	0	0	0.1	0	0.5	5.1	6.3	0.1	4.5	8.9	31.2	1.6	5	14	37.6	1.7
509	0	0	0.1	0	0.4	4.8	6	0.1	4.5	8.9	31.2	1.6	4.9	13.7	37.3	1.7
527	0	0	0	0	0.2	1.7	2	0	4.5	8.9	31.2	1.6	4.7	10.6	33.2	1.6
528	0	0	0.1	0	0.2	2.3	2.7	0	4.5	8.9	31.2	1.6	4.7	11.2	34	1.6
532	0	0	0	0	0.1	1.2	1.4	0	4.5	8.9	31.2	1.6	4.6	10.1	32.6	1.6
536	0	0.1	0.1	0	0.4	4	5	0.1	4.5	8.9	31.2	1.6	4.9	13	36.3	1.7
537	0	0.1	0.2	0	0.8	8.6	10.9	0.2	4.5	8.9	31.2	1.6	5.3	17.6	42.3	1.8
538	0	0.1	0.1	0	0.7	7.3	9.2	0.1	4.5	8.9	31.2	1.6	5.2	16.3	40.5	1.7
539	0	0.1	0.2	0	0.7	6.9	8.7	0.1	4.5	8.9	31.2	1.6	5.2	15.9	40.1	1.7

Table 2: Modelling prediction for Scenario 2

Receptor ID	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)	TSP (µg/m³)	DD (g/m²/mth)	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)	TSP (µg/m³)	DD (g/m²/mth)	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)	TSP (µg/m³)	DD (g/m²/mth)	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)	TSP (µg/m³)	DD (g/m²/mth)
	Project alone				Other modelled sources				Background/ 'residual dust level'				Total impact			
	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.
	Air quality impact criteria															
	-	-	-	2	-	-	-	-	-	-	-	-	8	25	90	4
24a	0	0	0	0	0.2	2.3	2.8	0	4.5	8.9	31.2	1.6	4.7	11.2	34	1.6
24b	0	0	0	0	0.2	2.3	2.8	0	4.5	8.9	31.2	1.6	4.7	11.2	34	1.6
25	0	0	0	0	0.3	2.4	2.9	0	4.5	8.9	31.2	1.6	4.8	11.3	34.1	1.6
57	0	0	0.1	0	0.3	2.9	3.4	0	4.5	8.9	31.2	1.6	4.8	11.8	34.7	1.6
58a	0	0	0	0	0.3	2.7	3.3	0	4.5	8.9	31.2	1.6	4.8	11.6	34.5	1.6
58b	0	0	0	0	0.3	2.7	3.2	0	4.5	8.9	31.2	1.6	4.8	11.6	34.4	1.6
60a	0	0.2	0.6	0	0.7	7	8.5	0.1	4.5	8.9	31.2	1.6	5.2	16.1	40.3	1.7
60b	0	0.3	0.7	0	0.8	7.6	9.3	0.1	4.5	8.9	31.2	1.6	5.3	16.8	41.2	1.7
60c	0	0.3	0.7	0	0.8	7.5	9.2	0.1	4.5	8.9	31.2	1.6	5.3	16.7	41.1	1.7
60d	0	0.2	0.6	0	0.8	7.4	9	0.1	4.5	8.9	31.2	1.6	5.3	16.5	40.8	1.7
145a	0	0	0.1	0	0.4	4.2	5.1	0.1	4.5	8.9	31.2	1.6	4.9	13.1	36.4	1.7
145b	0	0	0.1	0	0.4	3.7	4.5	0.1	4.5	8.9	31.2	1.6	4.9	12.6	35.8	1.7
145c	0	0	0.1	0	0.3	3.4	4.1	0.1	4.5	8.9	31.2	1.6	4.8	12.3	35.4	1.7
172	0	0	0	0	0.2	2.3	2.8	0	4.5	8.9	31.2	1.6	4.7	11.2	34	1.6
240b	0	0	0	0	0.2	1.7	2	0	4.5	8.9	31.2	1.6	4.7	10.6	33.2	1.6
207	0	0	0	0	0.2	2.2	2.6	0	4.5	8.9	31.2	1.6	4.7	11.1	33.8	1.6
209	0	0	0	0	0.3	2.5	3	0	4.5	8.9	31.2	1.6	4.8	11.4	34.2	1.6
211a	0	0	0	0	0.2	2.4	2.9	0	4.5	8.9	31.2	1.6	4.7	11.3	34.1	1.6
211b	0	0	0	0	0.2	2.5	3	0	4.5	8.9	31.2	1.6	4.7	11.4	34.2	1.6
211c	0	0	0	0	0.2	2.4	2.9	0	4.5	8.9	31.2	1.6	4.7	11.3	34.1	1.6
217c	0	0	0	0	0.3	2.5	3.1	0	4.5	8.9	31.2	1.6	4.8	11.4	34.3	1.6
217d	0	0	0	0	0.2	2.4	2.9	0	4.5	8.9	31.2	1.6	4.7	11.3	34.1	1.6
217e	0	0	0	0	0.2	2.3	2.8	0	4.5	8.9	31.2	1.6	4.7	11.2	34	1.6
217f	0	0	0	0	0.2	2.3	2.8	0	4.5	8.9	31.2	1.6	4.7	11.2	34	1.6
219a	0	0	0	0	0.2	2.4	2.8	0	4.5	8.9	31.2	1.6	4.7	11.3	34	1.6
219b	0	0	0	0	0.2	2.4	2.9	0	4.5	8.9	31.2	1.6	4.7	11.3	34.1	1.6
219c	0	0	0	0	0.2	2.4	2.9	0	4.5	8.9	31.2	1.6	4.7	11.3	34.1	1.6

Receptor ID	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)	TSP (µg/m³)	DD (g/m²/mth)	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)	TSP (µg/m³)	DD (g/m²/mth)	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)	TSP (µg/m³)	DD (g/m²/mth)	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)	TSP (µg/m³)	DD (g/m²/mth)
	Project alone				Other modelled sources				Background/ 'residual dust level'				Total impact			
	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.
	Air quality impact criteria															
	-	-	-	2	-	-	-	-	-	-	-	-	8	25	90	4
219d	0	0	0	0	0.2	2.3	2.8	0	4.5	8.9	31.2	1.6	4.7	11.2	34	1.6
219e	0	0	0	0	0.2	2.1	2.6	0	4.5	8.9	31.2	1.6	4.7	11	33.8	1.6
226a	0	0	0.1	0	0.3	2.6	3.1	0	4.5	8.9	31.2	1.6	4.8	11.5	34.4	1.6
226b	0	0	0.1	0	0.3	2.7	3.1	0	4.5	8.9	31.2	1.6	4.8	11.6	34.4	1.6
226c	0	0	0.1	0	0.3	2.7	3.2	0	4.5	8.9	31.2	1.6	4.8	11.6	34.5	1.6
226d	0	0	0.1	0	0.2	2.4	2.8	0	4.5	8.9	31.2	1.6	4.7	11.3	34.1	1.6
227a	0	0	0	0	0.2	2.2	2.6	0	4.5	8.9	31.2	1.6	4.7	11.1	33.8	1.6
227b	0	0	0	0	0.2	2.1	2.5	0	4.5	8.9	31.2	1.6	4.7	11	33.7	1.6
227c	0	0	0	0	0.2	2.1	2.5	0	4.5	8.9	31.2	1.6	4.7	11	33.7	1.6
227d	0	0	0	0	0.2	2.1	2.5	0	4.5	8.9	31.2	1.6	4.7	11	33.7	1.6
227f	0	0	0	0	0.3	2.5	3.1	0	4.5	8.9	31.2	1.6	4.8	11.4	34.3	1.6
228a	0	0	0	0	0.1	1.3	1.5	0	4.5	8.9	31.2	1.6	4.6	10.2	32.7	1.6
228b	0	0	0	0	0.1	1.3	1.5	0	4.5	8.9	31.2	1.6	4.6	10.2	32.7	1.6
228c	0	0	0	0	0.1	1.3	1.5	0	4.5	8.9	31.2	1.6	4.6	10.2	32.7	1.6
227e	0	0	0	0	0.2	2	2.4	0	4.5	8.9	31.2	1.6	4.7	10.9	33.6	1.6
228e	0	0	0	0	0.1	1.3	1.6	0	4.5	8.9	31.2	1.6	4.6	10.2	32.8	1.6
228f	0	0	0	0	0.1	1.3	1.6	0	4.5	8.9	31.2	1.6	4.6	10.2	32.8	1.6
228g	0	0	0	0	0.1	1.3	1.6	0	4.5	8.9	31.2	1.6	4.6	10.2	32.8	1.6
228h	0	0	0	0	0.1	1.3	1.6	0	4.5	8.9	31.2	1.6	4.6	10.2	32.8	1.6
228i	0	0	0	0	0.1	1.3	1.6	0	4.5	8.9	31.2	1.6	4.6	10.2	32.8	1.6
228j	0	0	0	0	0.1	1.2	1.4	0	4.5	8.9	31.2	1.6	4.6	10.1	32.6	1.6
228k	0	0	0	0	0.1	1.3	1.6	0	4.5	8.9	31.2	1.6	4.6	10.2	32.8	1.6
228l	0	0	0	0	0.2	1.6	1.9	0	4.5	8.9	31.2	1.6	4.7	10.5	33.1	1.6
228m	0	0	0	0	0.2	1.7	2	0	4.5	8.9	31.2	1.6	4.7	10.6	33.2	1.6
228n	0	0	0	0	0.2	1.8	2.2	0	4.5	8.9	31.2	1.6	4.7	10.7	33.4	1.6
228o	0	0	0	0	0.2	1.6	1.9	0	4.5	8.9	31.2	1.6	4.7	10.5	33.1	1.6
228p	0	0	0	0	0.1	1.4	1.7	0	4.5	8.9	31.2	1.6	4.6	10.3	32.9	1.6
228q	0	0	0	0	0.2	1.5	1.8	0	4.5	8.9	31.2	1.6	4.7	10.4	33	1.6

Receptor ID	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)	TSP (µg/m³)	DD (g/m²/mth)	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)	TSP (µg/m³)	DD (g/m²/mth)	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)	TSP (µg/m³)	DD (g/m²/mth)	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)	TSP (µg/m³)	DD (g/m²/mth)
	Project alone				Other modelled sources				Background/ 'residual dust level'				Total impact			
	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.
	Air quality impact criteria															
	-	-	-	2	-	-	-	-	-	-	-	-	8	25	90	4
228r	0	0	0	0	0.2	1.6	1.9	0	4.5	8.9	31.2	1.6	4.7	10.5	33.1	1.6
230a	0	0	0	0	0.1	1	1.2	0	4.5	8.9	31.2	1.6	4.6	9.9	32.4	1.6
230b	0	0	0	0	0.1	1.1	1.2	0	4.5	8.9	31.2	1.6	4.6	10	32.4	1.6
238a	0	0	0	0	0.1	1.1	1.3	0	4.5	8.9	31.2	1.6	4.6	10	32.5	1.6
238b	0	0	0	0	0.1	1.1	1.2	0	4.5	8.9	31.2	1.6	4.6	10	32.4	1.6
238c	0	0	0	0	0.1	1.1	1.2	0	4.5	8.9	31.2	1.6	4.6	10	32.4	1.6
238d	0	0	0	0	0.1	1.1	1.3	0	4.5	8.9	31.2	1.6	4.6	10	32.5	1.6
238e	0	0	0	0	0.1	1.1	1.3	0	4.5	8.9	31.2	1.6	4.6	10	32.5	1.6
238f	0	0	0	0	0.1	1.1	1.3	0	4.5	8.9	31.2	1.6	4.6	10	32.5	1.6
238g	0	0	0	0	0.1	1.1	1.2	0	4.5	8.9	31.2	1.6	4.6	10	32.4	1.6
238h	0	0	0	0	0.1	1.1	1.2	0	4.5	8.9	31.2	1.6	4.6	10	32.4	1.6
239a	0	0	0	0	0.1	1.1	1.3	0	4.5	8.9	31.2	1.6	4.6	10	32.5	1.6
239b	0	0	0	0	0.1	1.2	1.4	0	4.5	8.9	31.2	1.6	4.6	10.1	32.6	1.6
239c	0	0	0	0	0.1	1.2	1.4	0	4.5	8.9	31.2	1.6	4.6	10.1	32.6	1.6
239d	0	0	0	0	0.1	1.2	1.4	0	4.5	8.9	31.2	1.6	4.6	10.1	32.6	1.6
239e	0	0	0	0	0.1	1.2	1.4	0	4.5	8.9	31.2	1.6	4.6	10.1	32.6	1.6
239f	0	0	0	0	0.1	1.1	1.3	0	4.5	8.9	31.2	1.6	4.6	10	32.5	1.6
239g	0	0	0	0	0.1	1.1	1.3	0	4.5	8.9	31.2	1.6	4.6	10	32.5	1.6
239h	0	0	0	0	0.1	1.2	1.4	0	4.5	8.9	31.2	1.6	4.6	10.1	32.6	1.6
239i	0	0	0	0	0.1	1.2	1.4	0	4.5	8.9	31.2	1.6	4.6	10.1	32.6	1.6
239j	0	0	0	0	0.1	1.2	1.4	0	4.5	8.9	31.2	1.6	4.6	10.1	32.6	1.6
239k	0	0	0	0	0.1	1.2	1.4	0	4.5	8.9	31.2	1.6	4.6	10.1	32.6	1.6
240a	0	0	0	0	0.2	1.5	1.8	0	4.5	8.9	31.2	1.6	4.7	10.4	33	1.6
240c	0	0	0	0	0.2	1.7	2	0	4.5	8.9	31.2	1.6	4.7	10.6	33.2	1.6
240d	0	0	0	0	0.2	1.7	2.1	0	4.5	8.9	31.2	1.6	4.7	10.6	33.3	1.6
240e	0	0	0	0	0.2	1.7	2	0	4.5	8.9	31.2	1.6	4.7	10.6	33.2	1.6
250a	0	0	0	0	0.2	1.8	2.2	0	4.5	8.9	31.2	1.6	4.7	10.7	33.4	1.6
250b	0	0	0	0	0.2	1.9	2.2	0	4.5	8.9	31.2	1.6	4.7	10.8	33.4	1.6

Receptor ID	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)	TSP (µg/m³)	DD (g/m²/mth)	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)	TSP (µg/m³)	DD (g/m²/mth)	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)	TSP (µg/m³)	DD (g/m²/mth)	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)	TSP (µg/m³)	DD (g/m²/mth)
	Project alone				Other modelled sources				Background/ 'residual dust level'				Total impact			
	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.
	Air quality impact criteria															
	-	-	-	2	-	-	-	-	-	-	-	-	8	25	90	4
253	0	0	0	0	0.1	1.3	1.5	0	4.5	8.9	31.2	1.6	4.6	10.2	32.7	1.6
254a	0	0	0	0	0.1	1.3	1.5	0	4.5	8.9	31.2	1.6	4.6	10.2	32.7	1.6
254b	0	0	0	0	0.1	1.3	1.5	0	4.5	8.9	31.2	1.6	4.6	10.2	32.7	1.6
254c	0	0	0	0	0.1	1.3	1.5	0	4.5	8.9	31.2	1.6	4.6	10.2	32.7	1.6
255	0	0	0	0	0.1	1.2	1.5	0	4.5	8.9	31.2	1.6	4.6	10.1	32.7	1.6
279	0	0	0	0	0.1	1.1	1.3	0	4.5	8.9	31.2	1.6	4.6	10	32.5	1.6
284	0	0	0	0	0.1	1.2	1.4	0	4.5	8.9	31.2	1.6	4.6	10.1	32.6	1.6
285	0	0	0	0	0.1	1.2	1.3	0	4.5	8.9	31.2	1.6	4.6	10.1	32.5	1.6
298a	0	0	0	0	0.2	1.7	2	0	4.5	8.9	31.2	1.6	4.7	10.6	33.2	1.6
298b	0	0	0	0	0.2	1.7	2	0	4.5	8.9	31.2	1.6	4.7	10.6	33.2	1.6
287	0	0	0	0	0.1	1.2	1.4	0	4.5	8.9	31.2	1.6	4.6	10.1	32.6	1.6
299	0	0	0	0	0.1	1.2	2	0	4.5	8.9	31.2	1.6	4.6	10.1	33.2	1.6
306	0	0	0	0	0.2	1.5	1.8	0	4.5	8.9	31.2	1.6	4.7	10.4	33	1.6
384	0	0.1	0.1	0	0.6	6.5	8.3	0.1	4.5	8.9	31.2	1.6	5.1	15.5	39.6	1.7
385	0	0.1	0.1	0	0.6	6.3	8	0.1	4.5	8.9	31.2	1.6	5.1	15.3	39.3	1.7
386	0	0.1	0.2	0	0.7	7.7	9.7	0.1	4.5	8.9	31.2	1.6	5.2	16.7	41.1	1.7
387	0	0.1	0.3	0	0.8	8.5	10.6	0.2	4.5	8.9	31.2	1.6	5.3	17.5	42.1	1.8
389	0.1	0.3	0.8	0	0.9	9.6	12	0.2	4.5	8.9	31.2	1.6	5.5	18.8	44	1.8
390	0.1	0.2	0.5	0	0.8	9.4	11.8	0.2	4.5	8.9	31.2	1.6	5.4	18.5	43.5	1.8
398	0	0.1	0.3	0	0.8	8.8	11	0.2	4.5	8.9	31.2	1.6	5.3	17.8	42.5	1.8
399	0	0.1	0.2	0	0.8	8.1	10.2	0.2	4.5	8.9	31.2	1.6	5.3	17.1	41.6	1.8
400	0	0.1	0.1	0	0.7	7.2	9.1	0.1	4.5	8.9	31.2	1.6	5.2	16.2	40.4	1.7
402	0	0.1	0.2	0	0.8	8.1	10.2	0.1	4.5	8.9	31.2	1.6	5.3	17.1	41.6	1.7
403	0	0.1	0.2	0	0.8	8.5	10.6	0.1	4.5	8.9	31.2	1.6	5.3	17.5	42	1.7
404	0	0.1	0.1	0	0.7	7.7	9.8	0.1	4.5	8.9	31.2	1.6	5.2	16.7	41.1	1.7
410	0.1	0.2	0.4	0	0.8	8.7	11	0.1	4.5	8.9	31.2	1.6	5.4	17.8	42.6	1.7
411	0.1	0.2	0.4	0	0.7	8.2	10.3	0.1	4.5	8.9	31.2	1.6	5.3	17.3	41.9	1.7
418	0.1	0.2	0.3	0	0.7	7.7	9.8	0.1	4.5	8.9	31.2	1.6	5.3	16.8	41.3	1.7

Receptor ID	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)	TSP (µg/m³)	DD (g/m²/mth)	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)	TSP (µg/m³)	DD (g/m²/mth)	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)	TSP (µg/m³)	DD (g/m²/mth)	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)	TSP (µg/m³)	DD (g/m²/mth)
	Project alone				Other modelled sources				Background/ 'residual dust level'				Total impact			
	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.
	Air quality impact criteria															
	-	-	-	2	-	-	-	-	-	-	-	-	8	25	90	4
419	0	0.2	0.3	0	0.7	7.2	9.2	0.1	4.5	8.9	31.2	1.6	5.2	16.3	40.7	1.7
420	0	0.1	0.2	0	0.7	7	8.9	0.1	4.5	8.9	31.2	1.6	5.2	16	40.3	1.7
421	0	0.1	0.2	0	0.7	7	8.8	0.1	4.5	8.9	31.2	1.6	5.2	16	40.2	1.7
423	0	0.1	0.2	0	0.7	7.1	9	0.1	4.5	8.9	31.2	1.6	5.2	16.1	40.4	1.7
424	0	0.1	0.1	0	0.7	7	8.9	0.1	4.5	8.9	31.2	1.6	5.2	16	40.2	1.7
425	0	0.1	0.1	0	0.6	6.7	8.5	0.1	4.5	8.9	31.2	1.6	5.1	15.7	39.8	1.7
427	0	0.1	0.1	0	0.6	6.8	8.6	0.1	4.5	8.9	31.2	1.6	5.1	15.8	39.9	1.7
429	0	0.1	0.1	0	0.6	6.3	8	0.1	4.5	8.9	31.2	1.6	5.1	15.3	39.3	1.7
432	0	0	0.1	0	0.6	6	7.5	0.1	4.5	8.9	31.2	1.6	5.1	14.9	38.8	1.7
433a	0	0.1	0.1	0	0.6	5.9	7.6	0.1	4.5	8.9	31.2	1.6	5.1	14.9	38.9	1.7
433b	0	0	0.1	0	0.5	5.6	7.1	0.1	4.5	8.9	31.2	1.6	5	14.5	38.4	1.7
435a	0	0	0.1	0	0.5	5.6	7	0.1	4.5	8.9	31.2	1.6	5	14.5	38.3	1.7
435b	0	0	0.1	0	0.5	5.9	7.4	0.1	4.5	8.9	31.2	1.6	5	14.8	38.7	1.7
438	0	0	0	0	0.4	4.6	5.8	0.1	4.5	8.9	31.2	1.6	4.9	13.5	37	1.7
440	0	0.1	0.1	0	0.5	5.7	7.2	0.1	4.5	8.9	31.2	1.6	5	14.7	38.5	1.7
441a	0	0.1	0.1	0	0.5	4.7	6	0.1	4.5	8.9	31.2	1.6	5	13.7	37.3	1.7
441b	0	0.1	0.1	0	0.4	4.6	5.9	0.1	4.5	8.9	31.2	1.6	4.9	13.6	37.2	1.7
443	0	0.1	0.1	0	0.5	5.3	6.8	0.1	4.5	8.9	31.2	1.6	5	14.3	38.1	1.7
444	0	0.1	0.2	0	0.6	6	7.6	0.1	4.5	8.9	31.2	1.6	5.1	15	39	1.7
446a	0	0.1	0.2	0	0.6	5.7	7.1	0.1	4.5	8.9	31.2	1.6	5.1	14.7	38.5	1.7
451	0	0.1	0.1	0	0.5	4.7	6.1	0.1	4.5	8.9	31.2	1.6	5	13.7	37.4	1.7
455	0	0.1	0.1	0	0.4	4.6	5.8	0.1	4.5	8.9	31.2	1.6	4.9	13.6	37.1	1.7
456	0	0.1	0.1	0	0.4	4.5	5.8	0.1	4.5	8.9	31.2	1.6	4.9	13.5	37.1	1.7
460	0	0	0.1	0	0.5	5.7	7.2	0.1	4.5	8.9	31.2	1.6	5	14.6	38.5	1.7
500	0	0	0	0	0.5	5.3	6.8	0.1	4.5	8.9	31.2	1.6	5	14.2	38	1.7
507	0	0	0.1	0	0.5	5.4	6.8	0.1	4.5	8.9	31.2	1.6	5	14.3	38.1	1.7
508	0	0	0.1	0	0.5	5.2	6.5	0.1	4.5	8.9	31.2	1.6	5	14.1	37.8	1.7
509	0	0	0	0	0.5	4.9	6.3	0.1	4.5	8.9	31.2	1.6	5	13.8	37.5	1.7

Receptor ID	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)	TSP (µg/m³)	DD (g/m²/mth)	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)	TSP (µg/m³)	DD (g/m²/mth)	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)	TSP (µg/m³)	DD (g/m²/mth)	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)	TSP (µg/m³)	DD (g/m²/mth)
	Project alone				Other modelled sources				Background/ 'residual dust level'				Total impact			
	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.
	Air quality impact criteria															
	-	-	-	2	-	-	-	-	-	-	-	-	8	25	90	4
527	0	0	0	0	0.2	1.8	2.1	0	4.5	8.9	31.2	1.6	4.7	10.7	33.3	1.6
528	0	0	0	0	0.2	2.4	2.9	0	4.5	8.9	31.2	1.6	4.7	11.3	34.1	1.6
532	0	0	0	0	0.1	1.2	1.4	0	4.5	8.9	31.2	1.6	4.6	10.1	32.6	1.6
536	0	0.1	0.1	0	0.4	4.2	5.2	0.1	4.5	8.9	31.2	1.6	4.9	13.2	36.5	1.7
537	0	0.1	0.2	0	0.8	8.9	11.3	0.2	4.5	8.9	31.2	1.6	5.3	17.9	42.7	1.8
538	0	0.1	0.1	0	0.7	7.5	9.5	0.1	4.5	8.9	31.2	1.6	5.2	16.5	40.8	1.7
539	0	0.1	0.2	0	0.7	7.1	9	0.1	4.5	8.9	31.2	1.6	5.2	16.1	40.4	1.7

Table 3: Modelling prediction for Scenario 3

Receptor ID	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)	TSP (µg/m³)	DD (g/m²/mth)	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)	TSP (µg/m³)	DD (g/m²/mth)	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)	TSP (µg/m³)	DD (g/m²/mth)	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)	TSP (µg/m³)	DD (g/m²/mth)
	Project alone				Other modelled sources				Background/ 'residual dust level'				Total impact			
	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.
	Air quality impact criteria															
	-	-	-	2	-	-	-	-	-	-	-	-	8	25	90	4
24a	0	0	0	0	0.3	2.4	2.8	0	4.5	8.9	31.2	1.6	4.8	11.3	34	1.6
24b	0	0	0	0	0.2	2.4	2.8	0	4.5	8.9	31.2	1.6	4.7	11.3	34	1.6
25	0	0	0	0	0.3	2.4	2.9	0	4.5	8.9	31.2	1.6	4.8	11.3	34.1	1.6
57	0	0	0	0	0.3	2.9	3.5	0	4.5	8.9	31.2	1.6	4.8	11.8	34.7	1.6
58a	0	0	0	0	0.3	2.7	3.3	0	4.5	8.9	31.2	1.6	4.8	11.6	34.5	1.6
58b	0	0	0	0	0.3	2.7	3.3	0	4.5	8.9	31.2	1.6	4.8	11.6	34.5	1.6
60a	0	0.1	0.3	0	0.7	7.1	8.6	0.1	4.5	8.9	31.2	1.6	5.2	16.1	40.1	1.7
60b	0	0.2	0.4	0	0.8	7.7	9.4	0.1	4.5	8.9	31.2	1.6	5.3	16.8	41	1.7
60c	0	0.2	0.4	0	0.8	7.6	9.3	0.1	4.5	8.9	31.2	1.6	5.3	16.7	40.9	1.7
60d	0	0.2	0.3	0	0.8	7.4	9.2	0.1	4.5	8.9	31.2	1.6	5.3	16.5	40.7	1.7
145a	0	0	0	0	0.4	4.2	5.3	0.1	4.5	8.9	31.2	1.6	4.9	13.1	36.5	1.7
145b	0	0	0	0	0.4	3.8	4.7	0.1	4.5	8.9	31.2	1.6	4.9	12.7	35.9	1.7
145c	0	0	0	0	0.3	3.5	4.3	0.1	4.5	8.9	31.2	1.6	4.8	12.4	35.5	1.7
172	0	0	0	0	0.2	2.4	2.8	0	4.5	8.9	31.2	1.6	4.7	11.3	34	1.6
240b	0	0	0	0	0.2	1.7	2.1	0	4.5	8.9	31.2	1.6	4.7	10.6	33.3	1.6
207	0	0	0	0	0.2	2.2	2.7	0	4.5	8.9	31.2	1.6	4.7	11.1	33.9	1.6
209	0	0	0	0	0.3	2.6	3.1	0	4.5	8.9	31.2	1.6	4.8	11.5	34.3	1.6
211a	0	0	0	0	0.2	2.4	2.9	0	4.5	8.9	31.2	1.6	4.7	11.3	34.1	1.6
211b	0	0	0	0	0.3	2.5	3	0	4.5	8.9	31.2	1.6	4.8	11.4	34.2	1.6
211c	0	0	0	0	0.2	2.5	3	0	4.5	8.9	31.2	1.6	4.7	11.4	34.2	1.6
217c	0	0	0	0	0.3	2.6	3.1	0	4.5	8.9	31.2	1.6	4.8	11.5	34.3	1.6
217d	0	0	0	0	0.2	2.5	3	0	4.5	8.9	31.2	1.6	4.7	11.4	34.2	1.6
217e	0	0	0	0	0.2	2.3	2.8	0	4.5	8.9	31.2	1.6	4.7	11.2	34	1.6
217f	0	0	0	0	0.2	2.3	2.8	0	4.5	8.9	31.2	1.6	4.7	11.2	34	1.6
219a	0	0	0	0	0.2	2.4	2.9	0	4.5	8.9	31.2	1.6	4.7	11.3	34.1	1.6
219b	0	0	0	0	0.2	2.5	3	0	4.5	8.9	31.2	1.6	4.7	11.4	34.2	1.6
219c	0	0	0	0	0.2	2.4	2.9	0	4.5	8.9	31.2	1.6	4.7	11.3	34.1	1.6

Receptor ID	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)	TSP (µg/m³)	DD (g/m²/mth)	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)	TSP (µg/m³)	DD (g/m²/mth)	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)	TSP (µg/m³)	DD (g/m²/mth)	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)	TSP (µg/m³)	DD (g/m²/mth)
	Project alone				Other modelled sources				Background/ 'residual dust level'				Total impact			
	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.
	Air quality impact criteria															
	-	-	-	2	-	-	-	-	-	-	-	-	8	25	90	4
219d	0	0	0	0	0.2	2.4	2.9	0	4.5	8.9	31.2	1.6	4.7	11.3	34.1	1.6
219e	0	0	0	0	0.2	2.2	2.6	0	4.5	8.9	31.2	1.6	4.7	11.1	33.8	1.6
226a	0	0	0	0	0.3	2.7	3.2	0	4.5	8.9	31.2	1.6	4.8	11.6	34.4	1.6
226b	0	0	0	0	0.3	2.7	3.2	0	4.5	8.9	31.2	1.6	4.8	11.6	34.4	1.6
226c	0	0	0	0	0.3	2.7	3.3	0	4.5	8.9	31.2	1.6	4.8	11.6	34.5	1.6
226d	0	0	0	0	0.3	2.5	3	0	4.5	8.9	31.2	1.6	4.8	11.4	34.2	1.6
227a	0	0	0	0	0.2	2.2	2.6	0	4.5	8.9	31.2	1.6	4.7	11.1	33.8	1.6
227b	0	0	0	0	0.2	2.1	2.6	0	4.5	8.9	31.2	1.6	4.7	11	33.8	1.6
227c	0	0	0	0	0.2	2.1	2.5	0	4.5	8.9	31.2	1.6	4.7	11	33.7	1.6
227d	0	0	0	0	0.2	2.1	2.5	0	4.5	8.9	31.2	1.6	4.7	11	33.7	1.6
227f	0	0	0	0	0.3	2.5	3.1	0	4.5	8.9	31.2	1.6	4.8	11.4	34.3	1.6
228a	0	0	0	0	0.1	1.3	1.6	0	4.5	8.9	31.2	1.6	4.6	10.2	32.8	1.6
228b	0	0	0	0	0.1	1.3	1.6	0	4.5	8.9	31.2	1.6	4.6	10.2	32.8	1.6
228c	0	0	0	0	0.1	1.3	1.6	0	4.5	8.9	31.2	1.6	4.6	10.2	32.8	1.6
227e	0	0	0	0	0.2	2.1	2.5	0	4.5	8.9	31.2	1.6	4.7	11	33.7	1.6
228e	0	0	0	0	0.1	1.3	1.6	0	4.5	8.9	31.2	1.6	4.6	10.2	32.8	1.6
228f	0	0	0	0	0.1	1.4	1.6	0	4.5	8.9	31.2	1.6	4.6	10.3	32.8	1.6
228g	0	0	0	0	0.1	1.4	1.6	0	4.5	8.9	31.2	1.6	4.6	10.3	32.8	1.6
228h	0	0	0	0	0.1	1.4	1.6	0	4.5	8.9	31.2	1.6	4.6	10.3	32.8	1.6
228i	0	0	0	0	0.1	1.4	1.6	0	4.5	8.9	31.2	1.6	4.6	10.3	32.8	1.6
228j	0	0	0	0	0.1	1.2	1.4	0	4.5	8.9	31.2	1.6	4.6	10.1	32.6	1.6
228k	0	0	0	0	0.1	1.4	1.6	0	4.5	8.9	31.2	1.6	4.6	10.3	32.8	1.6
228l	0	0	0	0	0.2	1.6	1.9	0	4.5	8.9	31.2	1.6	4.7	10.5	33.1	1.6
228m	0	0	0	0	0.2	1.7	2	0	4.5	8.9	31.2	1.6	4.7	10.6	33.2	1.6
228n	0	0	0	0	0.2	1.8	2.2	0	4.5	8.9	31.2	1.6	4.7	10.7	33.4	1.6
228o	0	0	0	0	0.2	1.7	2	0	4.5	8.9	31.2	1.6	4.7	10.6	33.2	1.6
228p	0	0	0	0	0.2	1.4	1.7	0	4.5	8.9	31.2	1.6	4.7	10.3	32.9	1.6
228q	0	0	0	0	0.2	1.5	1.8	0	4.5	8.9	31.2	1.6	4.7	10.4	33	1.6

Receptor ID	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)	TSP (µg/m³)	DD (g/m²/mth)	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)	TSP (µg/m³)	DD (g/m²/mth)	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)	TSP (µg/m³)	DD (g/m²/mth)	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)	TSP (µg/m³)	DD (g/m²/mth)
	Project alone				Other modelled sources				Background/ 'residual dust level'				Total impact			
	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.
	Air quality impact criteria															
	-	-	-	2	-	-	-	-	-	-	-	-	8	25	90	4
228r	0	0	0	0	0.2	1.7	2	0	4.5	8.9	31.2	1.6	4.7	10.6	33.2	1.6
230a	0	0	0	0	0.1	1	1.2	0	4.5	8.9	31.2	1.6	4.6	9.9	32.4	1.6
230b	0	0	0	0	0.1	1.1	1.3	0	4.5	8.9	31.2	1.6	4.6	10	32.5	1.6
238a	0	0	0	0	0.1	1.1	1.3	0	4.5	8.9	31.2	1.6	4.6	10	32.5	1.6
238b	0	0	0	0	0.1	1.1	1.3	0	4.5	8.9	31.2	1.6	4.6	10	32.5	1.6
238c	0	0	0	0	0.1	1.1	1.3	0	4.5	8.9	31.2	1.6	4.6	10	32.5	1.6
238d	0	0	0	0	0.1	1.1	1.3	0	4.5	8.9	31.2	1.6	4.6	10	32.5	1.6
238e	0	0	0	0	0.1	1.1	1.3	0	4.5	8.9	31.2	1.6	4.6	10	32.5	1.6
238f	0	0	0	0	0.1	1.1	1.3	0	4.5	8.9	31.2	1.6	4.6	10	32.5	1.6
238g	0	0	0	0	0.1	1.1	1.2	0	4.5	8.9	31.2	1.6	4.6	10	32.4	1.6
238h	0	0	0	0	0.1	1.1	1.2	0	4.5	8.9	31.2	1.6	4.6	10	32.4	1.6
239a	0	0	0	0	0.1	1.1	1.3	0	4.5	8.9	31.2	1.6	4.6	10	32.5	1.6
239b	0	0	0	0	0.1	1.2	1.4	0	4.5	8.9	31.2	1.6	4.6	10.1	32.6	1.6
239c	0	0	0	0	0.1	1.2	1.4	0	4.5	8.9	31.2	1.6	4.6	10.1	32.6	1.6
239d	0	0	0	0	0.1	1.2	1.4	0	4.5	8.9	31.2	1.6	4.6	10.1	32.6	1.6
239e	0	0	0	0	0.1	1.2	1.4	0	4.5	8.9	31.2	1.6	4.6	10.1	32.6	1.6
239f	0	0	0	0	0.1	1.2	1.3	0	4.5	8.9	31.2	1.6	4.6	10.1	32.5	1.6
239g	0	0	0	0	0.1	1.2	1.4	0	4.5	8.9	31.2	1.6	4.6	10.1	32.6	1.6
239h	0	0	0	0	0.1	1.2	1.4	0	4.5	8.9	31.2	1.6	4.6	10.1	32.6	1.6
239i	0	0	0	0	0.1	1.2	1.4	0	4.5	8.9	31.2	1.6	4.6	10.1	32.6	1.6
239j	0	0	0	0	0.1	1.2	1.4	0	4.5	8.9	31.2	1.6	4.6	10.1	32.6	1.6
239k	0	0	0	0	0.1	1.2	1.4	0	4.5	8.9	31.2	1.6	4.6	10.1	32.6	1.6
240a	0	0	0	0	0.2	1.6	1.8	0	4.5	8.9	31.2	1.6	4.7	10.5	33	1.6
240c	0	0	0	0	0.2	1.7	2.1	0	4.5	8.9	31.2	1.6	4.7	10.6	33.3	1.6
240d	0	0	0	0	0.2	1.8	2.1	0	4.5	8.9	31.2	1.6	4.7	10.7	33.3	1.6
240e	0	0	0	0	0.2	1.7	2	0	4.5	8.9	31.2	1.6	4.7	10.6	33.2	1.6
250a	0	0	0	0	0.2	1.9	2.2	0	4.5	8.9	31.2	1.6	4.7	10.8	33.4	1.6
250b	0	0	0	0	0.2	1.9	2.3	0	4.5	8.9	31.2	1.6	4.7	10.8	33.5	1.6

Receptor ID	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)	TSP (µg/m³)	DD (g/m²/mth)	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)	TSP (µg/m³)	DD (g/m²/mth)	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)	TSP (µg/m³)	DD (g/m²/mth)	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)	TSP (µg/m³)	DD (g/m²/mth)
	Project alone				Other modelled sources				Background/ 'residual dust level'				Total impact			
	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.
	Air quality impact criteria															
	-	-	-	2	-	-	-	-	-	-	-	-	8	25	90	4
253	0	0	0	0	0.1	1.3	1.6	0	4.5	8.9	31.2	1.6	4.6	10.2	32.8	1.6
254a	0	0	0	0	0.1	1.3	1.6	0	4.5	8.9	31.2	1.6	4.6	10.2	32.8	1.6
254b	0	0	0	0	0.1	1.3	1.5	0	4.5	8.9	31.2	1.6	4.6	10.2	32.7	1.6
254c	0	0	0	0	0.1	1.3	1.5	0	4.5	8.9	31.2	1.6	4.6	10.2	32.7	1.6
255	0	0	0	0	0.1	1.3	1.5	0	4.5	8.9	31.2	1.6	4.6	10.2	32.7	1.6
279	0	0	0	0	0.1	1.2	1.3	0	4.5	8.9	31.2	1.6	4.6	10.1	32.5	1.6
284	0	0	0	0	0.1	1.2	1.4	0	4.5	8.9	31.2	1.6	4.6	10.1	32.6	1.6
285	0	0	0	0	0.1	1.2	1.4	0	4.5	8.9	31.2	1.6	4.6	10.1	32.6	1.6
298a	0	0	0	0	0.2	1.7	2	0	4.5	8.9	31.2	1.6	4.7	10.6	33.2	1.6
298b	0	0	0	0	0.2	1.7	2	0	4.5	8.9	31.2	1.6	4.7	10.6	33.2	1.6
287	0	0	0	0	0.1	1.2	1.4	0	4.5	8.9	31.2	1.6	4.6	10.1	32.6	1.6
299	0	0	0	0	0.1	1.2	2	0	4.5	8.9	31.2	1.6	4.6	10.1	33.2	1.6
306	0	0	0	0	0.2	1.6	1.8	0	4.5	8.9	31.2	1.6	4.7	10.5	33	1.6
384	0	0.2	0.3	0	0.6	6.6	8.4	0.1	4.5	8.9	31.2	1.6	5.1	15.7	39.9	1.7
385	0	0.1	0.2	0	0.6	6.5	8.1	0.1	4.5	8.9	31.2	1.6	5.1	15.5	39.5	1.7
386	0	0.2	0.5	0	0.7	7.8	9.8	0.2	4.5	8.9	31.2	1.6	5.2	16.9	41.5	1.8
387	0	0.3	0.5	0	0.8	8.6	10.8	0.2	4.5	8.9	31.2	1.6	5.3	17.8	42.5	1.8
389	0.1	0.8	1.7	0	0.9	9.8	12.2	0.2	4.5	8.9	31.2	1.6	5.5	19.5	45.1	1.8
390	0.1	0.5	1.1	0	0.8	9.6	11.9	0.2	4.5	8.9	31.2	1.6	5.4	19	44.2	1.8
398	0	0.3	0.5	0	0.8	8.9	11.2	0.2	4.5	8.9	31.2	1.6	5.3	18.1	42.9	1.8
399	0	0.2	0.3	0	0.8	8.2	10.4	0.2	4.5	8.9	31.2	1.6	5.3	17.3	41.9	1.8
400	0	0.1	0.2	0	0.7	7.4	9.3	0.1	4.5	8.9	31.2	1.6	5.2	16.4	40.7	1.7
402	0	0.1	0.3	0	0.8	8.3	10.3	0.1	4.5	8.9	31.2	1.6	5.3	17.3	41.8	1.7
403	0	0.2	0.3	0	0.8	8.6	10.9	0.1	4.5	8.9	31.2	1.6	5.3	17.7	42.4	1.7
404	0	0.1	0.2	0	0.7	7.9	9.9	0.1	4.5	8.9	31.2	1.6	5.2	16.9	41.3	1.7
410	0.1	0.5	0.8	0	0.8	8.8	11.2	0.1	4.5	8.9	31.2	1.6	5.4	18.2	43.2	1.7
411	0.1	0.5	0.7	0	0.7	8.3	10.5	0.1	4.5	8.9	31.2	1.6	5.3	17.7	42.4	1.7
418	0.1	0.5	0.7	0	0.7	7.8	10	0.1	4.5	8.9	31.2	1.6	5.3	17.2	41.9	1.7

Receptor ID	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)	TSP (µg/m³)	DD (g/m²/mth)	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)	TSP (µg/m³)	DD (g/m²/mth)	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)	TSP (µg/m³)	DD (g/m²/mth)	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)	TSP (µg/m³)	DD (g/m²/mth)
	Project alone				Other modelled sources				Background/ 'residual dust level'				Total impact			
	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.
	Air quality impact criteria															
	-	-	-	2	-	-	-	-	-	-	-	-	8	25	90	4
419	0.1	0.4	0.6	0	0.6	7.4	9.4	0.1	4.5	8.9	31.2	1.6	5.2	16.7	41.2	1.7
420	0	0.3	0.5	0	0.7	7.1	9	0.1	4.5	8.9	31.2	1.6	5.2	16.3	40.7	1.7
421	0	0.2	0.3	0	0.7	7.1	9	0.1	4.5	8.9	31.2	1.6	5.2	16.2	40.5	1.7
423	0	0.2	0.3	0	0.7	7.2	9.1	0.1	4.5	8.9	31.2	1.6	5.2	16.3	40.6	1.7
424	0	0.1	0.2	0	0.7	7.2	9	0.1	4.5	8.9	31.2	1.6	5.2	16.2	40.4	1.7
425	0	0.2	0.2	0	0.6	6.8	8.6	0.1	4.5	8.9	31.2	1.6	5.1	15.9	40	1.7
427	0	0.1	0.2	0	0.6	7	8.7	0.1	4.5	8.9	31.2	1.6	5.1	16	40.1	1.7
429	0	0.1	0.1	0	0.6	6.4	8.2	0.1	4.5	8.9	31.2	1.6	5.1	15.4	39.5	1.7
432	0	0.1	0.1	0	0.6	6	7.7	0.1	4.5	8.9	31.2	1.6	5.1	15	39	1.7
433a	0	0.1	0.2	0	0.6	6.1	7.7	0.1	4.5	8.9	31.2	1.6	5.1	15.1	39.1	1.7
433b	0	0.1	0.1	0	0.5	5.6	7.2	0.1	4.5	8.9	31.2	1.6	5	14.6	38.5	1.7
435a	0	0.1	0.1	0	0.5	5.6	7.1	0.1	4.5	8.9	31.2	1.6	5	14.6	38.4	1.7
435b	0	0.1	0.1	0	0.6	5.9	7.6	0.1	4.5	8.9	31.2	1.6	5.1	14.9	38.9	1.7
438	0	0	0.1	0	0.4	4.7	5.8	0.1	4.5	8.9	31.2	1.6	4.9	13.6	37.1	1.7
440	0	0.1	0.1	0	0.5	5.8	7.4	0.1	4.5	8.9	31.2	1.6	5	14.8	38.7	1.7
441a	0	0.1	0.2	0	0.5	4.9	6.1	0.1	4.5	8.9	31.2	1.6	5	13.9	37.5	1.7
441b	0	0.1	0.2	0	0.5	4.8	6	0.1	4.5	8.9	31.2	1.6	5	13.8	37.4	1.7
443	0	0.2	0.3	0	0.5	5.4	6.9	0.1	4.5	8.9	31.2	1.6	5	14.5	38.4	1.7
444	0	0.2	0.4	0	0.6	6.2	7.7	0.1	4.5	8.9	31.2	1.6	5.1	15.3	39.3	1.7
446a	0	0.3	0.4	0	0.6	5.7	7.2	0.1	4.5	8.9	31.2	1.6	5.1	14.9	38.8	1.7
451	0	0.1	0.2	0	0.5	4.9	6.1	0.1	4.5	8.9	31.2	1.6	5	13.9	37.5	1.7
455	0	0.1	0.2	0	0.4	4.7	5.9	0.1	4.5	8.9	31.2	1.6	4.9	13.7	37.3	1.7
456	0	0.1	0.2	0	0.4	4.7	5.8	0.1	4.5	8.9	31.2	1.6	4.9	13.7	37.2	1.7
460	0	0.1	0.1	0	0.5	5.8	7.3	0.1	4.5	8.9	31.2	1.6	5	14.8	38.6	1.7
500	0	0	0.1	0	0.5	5.4	6.8	0.1	4.5	8.9	31.2	1.6	5	14.3	38.1	1.7
507	0	0.1	0.1	0	0.5	5.5	7	0.1	4.5	8.9	31.2	1.6	5	14.5	38.3	1.7
508	0	0.1	0.1	0	0.5	5.2	6.7	0.1	4.5	8.9	31.2	1.6	5	14.2	38	1.7
509	0	0	0.1	0	0.5	5	6.3	0.1	4.5	8.9	31.2	1.6	5	13.9	37.6	1.7

Receptor ID	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)	TSP (µg/m³)	DD (g/m²/mth)	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)	TSP (µg/m³)	DD (g/m²/mth)	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)	TSP (µg/m³)	DD (g/m²/mth)	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)	TSP (µg/m³)	DD (g/m²/mth)
	Project alone				Other modelled sources				Background/ 'residual dust level'				Total impact			
	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.
	Air quality impact criteria															
	-	-	-	2	-	-	-	-	-	-	-	-	8	25	90	4
527	0	0	0	0	0.2	1.8	2.1	0	4.5	8.9	31.2	1.6	4.7	10.7	33.3	1.6
528	0	0	0	0	0.2	2.4	2.9	0	4.5	8.9	31.2	1.6	4.7	11.3	34.1	1.6
532	0	0	0	0	0.1	1.2	1.4	0	4.5	8.9	31.2	1.6	4.6	10.1	32.6	1.6
536	0	0	0.1	0	0.4	4.3	5.3	0.1	4.5	8.9	31.2	1.6	4.9	13.2	36.6	1.7
537	0	0.2	0.4	0	0.8	9.1	11.5	0.2	4.5	8.9	31.2	1.6	5.3	18.2	43.1	1.8
538	0	0.1	0.2	0	0.7	7.7	9.7	0.1	4.5	8.9	31.2	1.6	5.2	16.7	41.1	1.7
539	0	0.3	0.4	0	0.7	7.2	9.1	0.1	4.5	8.9	31.2	1.6	5.2	16.4	40.7	1.7

The EPA also requested further detail on the cumulative 24-hour results for Receptor 389 (mine-owned receptor), which was predicted to have the highest Project increments in some cases. The locations of the closest receptors to the Maxwell Infrastructure, which were assessed in detail in the AQIA, are set out in **Figure 1**, along with the location of all other receptors in proximity to the Maxwell Infrastructure, including Receptor 389.

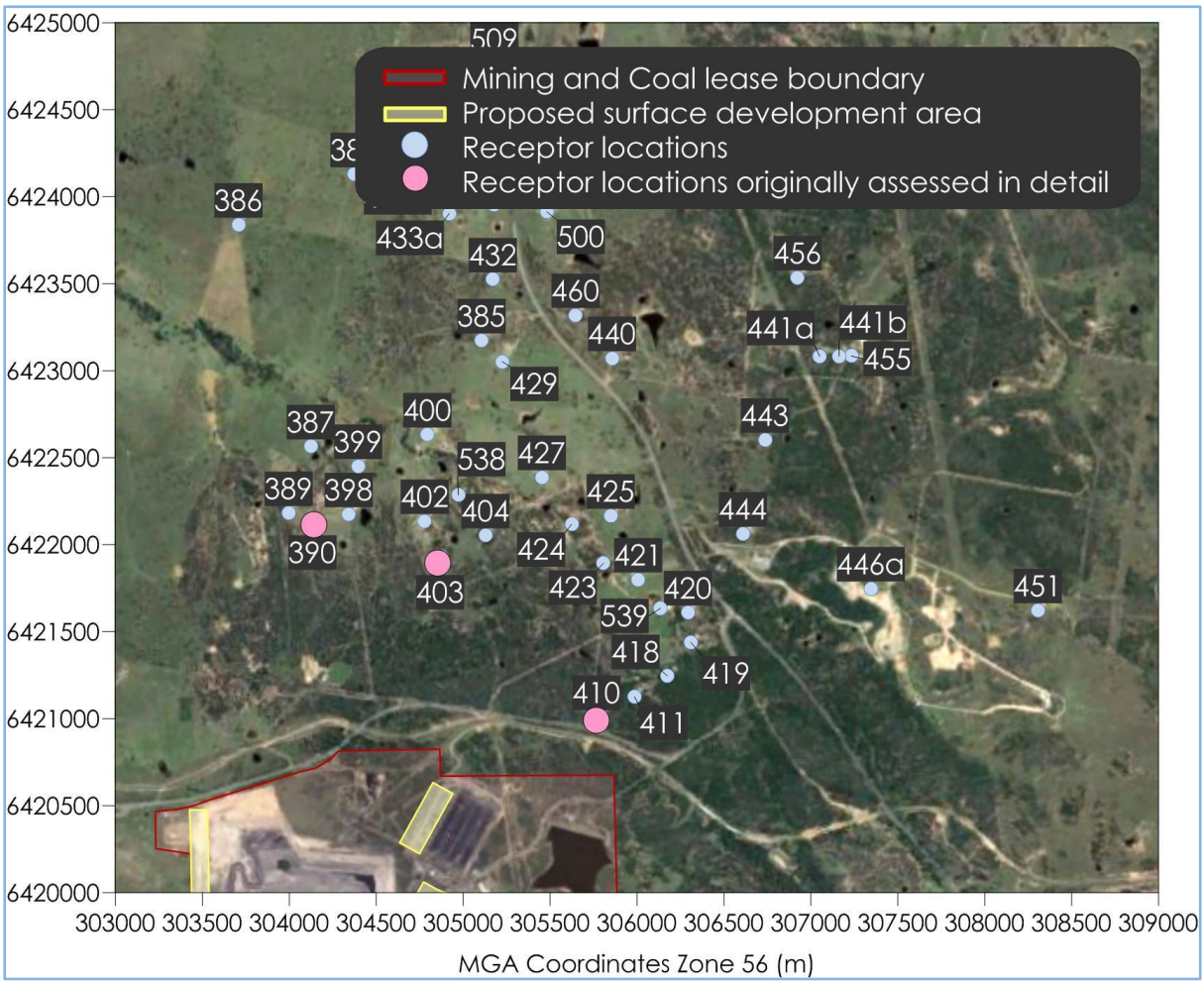


Figure 1: Location of Receptor 389 and receptors assessed in detail

The EPA is correct that Receptor 389 has higher dust levels predicted in some cases than one of the receptors assessed in detail - Receptor 390. Privately-owned Receptor 390 is closer to the Maxwell Infrastructure than mine-owned Receptor 389 and was therefore expected to experience greater Project increments (note receivers were selected for the 24-hour average cumulative assessment prior to results of the dispersion modelling being available).

As requested, a Level 2 assessment – Contemporaneous impact and background approach for Receptor 389 is presented in **Table 4** to **Table 9**.

As would be expected the operation of the Project does not give rise to additional exceedances of the cumulative 24-hour average $PM_{2.5}$ and PM_{10} criteria.

Table 4: Scenario 1 ($PM_{2.5}$ 24-hr average concentration) – Receptor location 389

Ranked by Highest to Lowest Background Concentration				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level	Predicted increment	Total cumulative 24-hr average level	Date	Measured background level	Predicted increment	Total cumulative 24-hr average level
11/03/2015	21.4	0.0	21.4	24/09/2015	4.2	0.7	4.9
10/03/2015	19.9	0.0	19.9	23/05/2015	2.5	0.4	2.9
12/03/2015	19.8	0.0	19.9	19/07/2015	2.9	0.4	3.3
28/03/2015	19.2	0.1	19.3	3/07/2015	3.9	0.4	4.3
13/03/2015	16.5	0.0	16.5	26/05/2015	6.2	0.4	6.6
15/12/2015	15.8	0.0	15.8	2/04/2015	6.0	0.4	6.4
26/03/2015	15.5	0.0	15.5	10/10/2015	7.4	0.4	7.8
27/03/2015	15.0	0.0	15.0	4/01/2015	5.8	0.4	6.2
16/12/2015	13.0	0.2	13.2	28/09/2015	5.3	0.3	5.7
18/10/2015	12.6	0.0	12.6	24/03/2015	4.3	0.3	4.6

Table 5: Scenario 2 ($PM_{2.5}$ 24-hr average concentration) – Receptor location 389

Ranked by Highest to Lowest Background Concentration				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level	Predicted increment	Total cumulative 24-hr average level	Date	Measured background level	Predicted increment	Total cumulative 24-hr average level
11/03/2015	21.4	0.0	21.4	24/09/2015	4.2	0.7	4.9
10/03/2015	19.9	0.0	19.9	23/05/2015	2.5	0.4	2.9
12/03/2015	19.8	0.0	19.9	26/05/2015	6.2	0.4	6.6
28/03/2015	19.2	0.1	19.3	19/07/2015	2.9	0.4	3.3
13/03/2015	16.5	0.0	16.5	2/04/2015	6.0	0.4	6.4
15/12/2015	15.8	0.0	15.8	4/01/2015	5.8	0.4	6.2
26/03/2015	15.5	0.0	15.5	3/07/2015	3.9	0.4	4.3
27/03/2015	15.0	0.0	15.0	24/03/2015	4.3	0.4	4.6
16/12/2015	13.0	0.3	13.2	10/10/2015	7.4	0.3	7.8
18/10/2015	12.6	0.0	12.6	28/09/2015	5.3	0.3	5.7

Table 6: Scenario 3 ($PM_{2.5}$ 24-hr average concentration) – Receptor location 389

Ranked by Highest to Lowest Background Concentration				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level	Predicted increment	Total cumulative 24-hr average level	Date	Measured background level	Predicted increment	Total cumulative 24-hr average level
11/03/2015	21.4	0.1	21.4	24/09/2015	4.2	0.7	4.9
10/03/2015	19.9	0.0	19.9	23/05/2015	2.5	0.5	3.0
12/03/2015	19.8	0.1	19.9	2/04/2015	6.0	0.4	6.5
28/03/2015	19.2	0.1	19.3	4/01/2015	5.8	0.4	6.2
13/03/2015	16.5	0.1	16.6	20/04/2015	6.0	0.4	6.4
15/12/2015	15.8	0.1	15.8	28/09/2015	5.3	0.4	5.7
26/03/2015	15.5	0.0	15.5	24/03/2015	4.3	0.4	4.6
27/03/2015	15.0	0.0	15.0	19/07/2015	2.9	0.4	3.2
16/12/2015	13.0	0.2	13.2	26/05/2015	6.2	0.3	6.6
18/10/2015	12.6	0.0	12.6	10/10/2015	7.4	0.3	7.8

Table 7: Scenario 1 (PM_{10} 24-hr average concentration) – Receptor location 389

Ranked by Highest to Lowest Background Concentration				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level	Predicted increment	Total cumulative 24-hr average level	Date	Measured background level	Predicted increment	Total cumulative 24-hr average level
6/05/2015	56.9	0.0	56.9				
7/03/2015	50.6	0.4	50.9				
15/12/2015	46.9	0.1	47.0	24/09/2015	8.8	2.9	11.7
10/03/2015	46.4	0.0	46.4	23/05/2015	7.7	1.7	9.4
12/12/2015	38.4	0.4	38.8	19/07/2015	11.5	1.5	13.0
28/02/2015	37.5	0.2	37.6	2/04/2015	21.2	1.5	22.7
9/02/2015	37.1	0.0	37.1	4/01/2015	12.6	1.5	14.1
26/11/2015	36.1	0.3	36.3	3/07/2015	18.3	1.5	19.8
11/03/2015	33.4	0.2	33.6	21/04/2015	3.3	1.4	4.7
7/10/2015	33.1	0.0	33.1	10/10/2015	24.4	1.4	25.9
17/04/2015	32.8	0.1	32.9	26/05/2015	9.5	1.4	11.0
17/03/2015	31.9	0.3	32.2	28/09/2015	11.1	1.3	12.4

Table 8: Scenario 2 (PM_{10} 24-hr average concentration) – Receptor location 389

Ranked by Highest to Lowest Background Concentration				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level	Predicted increment	Total cumulative 24-hr average level	Date	Measured background level	Predicted increment	Total cumulative 24-hr average level
6/05/2015	56.9	0.0	56.9				
7/03/2015	50.6	0.4	50.9				
15/12/2015	46.9	0.2	47.1	24/09/2015	8.8	3.3	12.0
10/03/2015	46.4	0.1	46.4	23/05/2015	7.7	2.0	9.7
12/12/2015	38.4	0.4	38.8	2/04/2015	21.2	1.8	23.0
28/02/2015	37.5	0.2	37.7	4/01/2015	12.6	1.7	14.3
9/02/2015	37.1	0.1	37.2	21/04/2015	3.3	1.7	5.0
26/11/2015	36.1	0.3	36.4	19/07/2015	11.5	1.6	13.2
11/03/2015	33.4	0.2	33.7	26/05/2015	9.5	1.6	11.1
7/10/2015	33.1	0.0	33.1	28/09/2015	11.1	1.5	12.6
17/04/2015	32.8	0.2	33.0	10/10/2015	24.4	1.5	25.9
17/03/2015	31.9	0.3	32.2	24/03/2015	20.5	1.5	22.0

Table 9: Scenario 3 (PM_{10} 24-hr average concentration) – Receptor location 389

Ranked by Highest to Lowest Background Concentration				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level	Predicted increment	Total cumulative 24-hr average level	Date	Measured background level	Predicted increment	Total cumulative 24-hr average level
6/05/2015	56.9	0.0	56.9				
7/03/2015	50.6	0.7	51.3				
15/12/2015	46.9	0.5	47.4	24/09/2015	8.8	6.2	14.9
10/03/2015	46.4	0.2	46.6	23/05/2015	7.7	4.6	12.3
12/12/2015	38.4	0.6	39.0	2/04/2015	21.2	3.7	24.9
28/02/2015	37.5	0.7	38.2	4/01/2015	12.6	3.4	16.1
9/02/2015	37.1	0.4	37.5	28/09/2015	11.1	3.2	14.3
26/11/2015	36.1	0.5	36.6	18/07/2015	8.0	3.2	11.1
11/03/2015	33.4	0.7	34.1	24/03/2015	20.5	3.1	23.6
7/10/2015	33.1	0.1	33.2	19/07/2015	11.5	3.1	14.6
17/04/2015	32.8	0.4	33.2	10/10/2015	24.4	3.0	27.5
17/03/2015	31.9	0.8	32.8	20/04/2015	5.4	3.0	8.4

Please feel free to contact us if you would like to clarify any aspect of this letter.

Yours faithfully,
Todoroski Air Sciences

Aleks Todoroski

Philip Henschke

References

Todoroski Air Sciences (2019)

"Maxwell Project Air Quality and Greenhouse Gas Assessment", prepared for Malabar Coal Limited by Todoroski Air Sciences, July 2019.

ATTACHMENT 4

WILKINSON MURRAY PTY LTD –
SUPPORTING INFORMATION FOR RESPONSE TO EPA SUBMISSION

WILKINSON MURRAY

1 November 2019

WM Project Number: 18226-C
Our Ref: MCL_011119RH_ltr
Email: wdean@malabarcoal.com.au

Bill Dean
Malabar Coal Limited
PO Box R864 Royal Exchange
SYDNEY NSW 1225

Dear Bill

Re: Maxwell Project - Noise Impact Assessment - Supporting Information for Response to EPA Submission

This letter report was prepared by Wilkinson Murray (WM) to provide supporting information assisting Malabar Coal Limited in responding to comments raised by the Environment Protection Authority (EPA) in relation to the Noise Impact Assessment (NIA) prepared for the proposed Maxwell Project (the Project) (*Maxwell Project – Noise Impact Assessment*, Wilkinson Murray, dated June 2019).

Low-Frequency Noise Assessment

This section of the letter report provides supporting information in relation to the low-frequency noise (LFN) assessment.

All predicted operational noise levels reported in the NIA are based on octave band noise predictions ranging between 31.5 Hz to 16 kHz. As such, predictions do not provide third octave band levels and do not include frequency bands between 10 Hz and 160 Hz as required for comparison with the relevant LFN threshold levels provided in Table C2 of the *Noise Policy for Industry (NPfI)*.

In order to estimate levels at those lower frequencies (10 Hz - 160 Hz), a typical low frequency spectrum measured as part of the Bulga Village Noise Audit was normalised to the 63 Hz octave component of the predicted noise levels at each of the representative receivers. Table 1 presents the typical spectrum used for the LFN assessment.

Table 1 Bulga Village Noise Audit - Typical Measured Low-Frequency Noise Spectrum

	Third Octave Band Centre Frequency, Hz												
	10	**12.5**	**16**	**20**	**25**	**31.5**	**40**	**50**	**63**	**80**	**100**	**125**	**160**
Measured level (dBZ)	49	55	57	52	52	52	51	52	49	50	48	45	40

The three third octave bands contained within the 63 Hz octave band (i.e. 50 Hz, 63 Hz and 80 Hz) of the spectrum presented in Table 1 were summed logarithmically to calculate the overall level for the octave band. This level (calculated at 55.3 dBZ) was then compared with the 63 Hz octave band predicted for each of the representative receivers and the difference in levels was applied to all third octave band levels included in the typical LFN spectrum shape (Table 1) to estimate the LFN third octave band levels for frequencies 10 Hz and 160 Hz at the receivers.

In response to the request for quantitative data showing predicted LFN level curves (down to 10 Hz) at all representative receivers and comparison with the *NPfI* low-frequency noise thresholds, WM has prepared the graphs presented in Figures 1 to 3. The graphs show third octave band LFN spectra representative of night time predictions. Note that levels for third octave bands above 160 Hz are based on octave band results and the assumption that the energy in each octave band level is spread out evenly across its three third octave band components.

Figure 1 Low-Frequency Spectra at Representative Receivers - Year 1

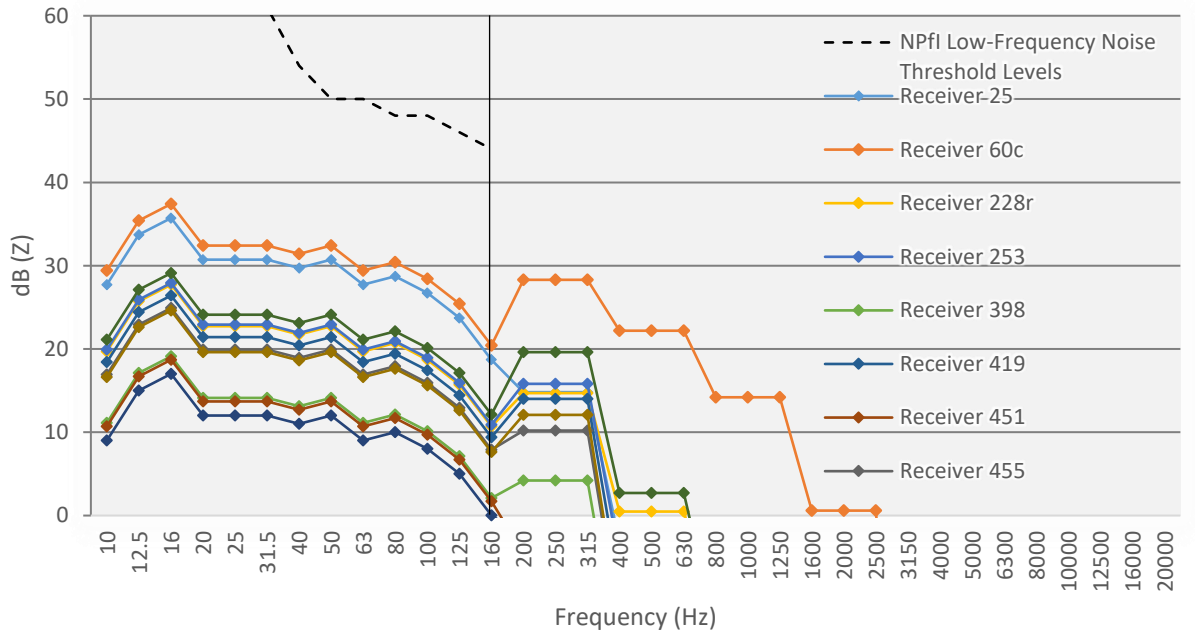


Figure 2 Low-Frequency Spectra at Representative Receivers - Year 3

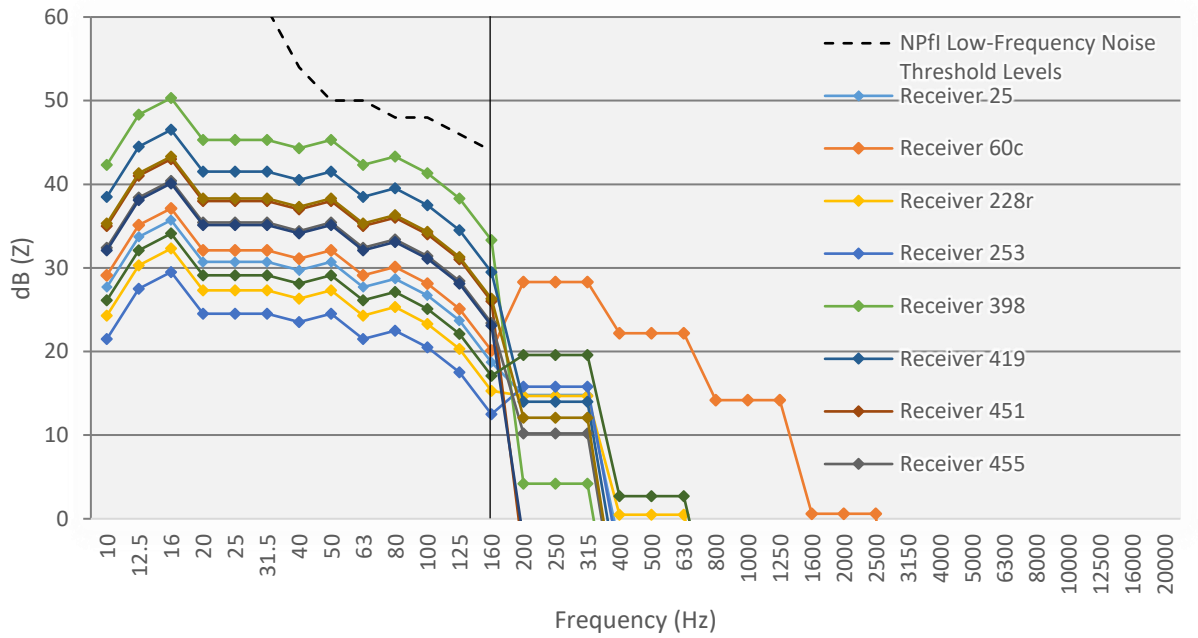
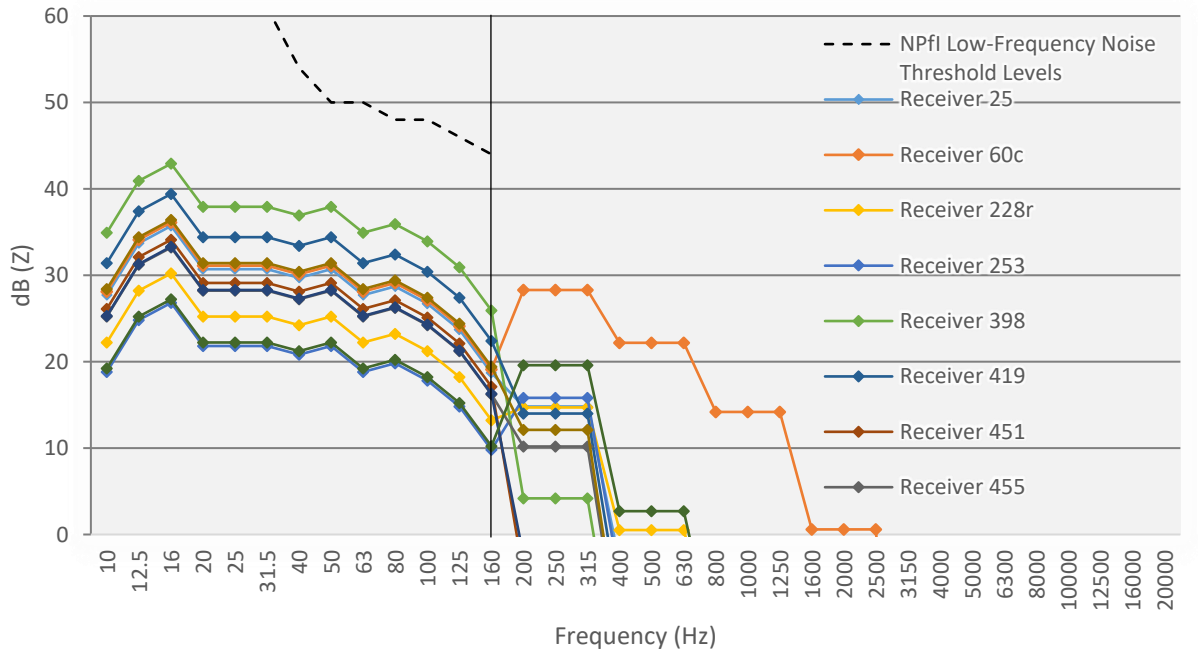


Figure 3 Low-Frequency Spectra at Representative Receivers - Year 4



For the Project's LFN noise assessment, 37 measurements captured as part of the noise audit conducted at Bulga Village (Wilkinson Murray, 2016) were normalised to a broadband level of 35 dBA (i.e. the spectra were shifted up or down until their equivalent broadband level equates to 35 dBA) and are summarised in Table 2.

The typical low frequency spectrum presented in Table 1 was determined by arithmetically averaging all 37 normalised spectra in each third octave band and rounding each level to the closest integer.

Table 2 Bulga Village Noise Audit – 37 Low-Frequency Noise Spectrum Measurements Normalised to 35 dBA Broadband Level

	Third Octave Band Centre Frequency, Hz												
	10	**12.5**	**16**	**20**	**25**	**31.5**	**40**	**50**	**63**	**80**	**100**	**125**	**160**
Measurement 1 (dBZ)	47.0	59.7	58.0	47.0	52.4	50.6	50.8	50.7	47.7	48.5	47.9	45.4	42.6
Measurement 2 (dBZ)	46.6	55.1	54.4	53.7	54.0	50.1	50.7	51.4	48.8	50.6	48.6	45.1	40.0
Measurement 3 (dBZ)	46.1	53.8	55.0	54.6	52.1	49.1	47.8	49.3	46.6	49.3	48.6	46.9	39.1
Measurement 4 (dBZ)	47.4	57.4	57.2	51.7	52.5	49.3	50.0	51.7	48.0	50.9	47.4	45.7	40.8
Measurement 5 (dBZ)	63.1	61.3	60.0	56.1	56.1	52.3	51.3	51.8	49.9	49.7	47.3	45.7	41.0
Measurement 6 (dBZ)	48.7	53.5	55.1	54.9	51.4	51.6	50.5	51.5	48.5	50.0	49.1	45.1	39.5
Measurement 7 (dBZ)	53.9	55.7	60.1	48.7	51.4	52.7	51.5	52.6	50.1	48.3	49.8	43.8	40.3
Measurement 8 (dBZ)	56.3	61.3	60.8	59.9	57.2	55.3	53.7	56.2	51.6	51.0	47.1	43.8	39.0
Measurement 9 (dBZ)	46.6	55.0	55.0	48.2	50.2	48.8	48.0	49.6	46.7	46.9	45.1	48.1	41.6
Measurement 10 (dBZ)	59.6	60.6	59.2	52.0	53.3	50.5	50.8	52.5	49.5	48.8	47.1	46.6	40.4
Measurement 11 (dBZ)	63.5	60.6	60.4	55.3	54.9	54.1	52.8	53.7	50.6	50.2	48.3	44.7	39.5
Measurement 12 (dBZ)	50.6	55.7	59.5	53.1	54.7	54.2	52.1	53.5	50.5	50.5	47.9	44.9	39.9
Measurement 13 (dBZ)	50.5	58.0	61.2	55.5	56.9	53.9	55.1	52.6	49.8	49.1	48.6	45.1	39.7
Measurement 14 (dBZ)	47.8	55.1	58.3	55.0	54.6	53.7	52.9	52.1	49.7	50.6	48.0	44.9	40.5
Measurement 15 (dBZ)	46.7	53.3	54.7	51.6	51.2	49.7	50.7	49.8	47.9	49.9	48.1	46.3	40.0
Measurement 16 (dBZ)	45.1	51.5	53.9	54.0	49.3	51.8	49.5	50.1	47.7	50.1	49.4	45.8	38.2
Measurement 17 (dBZ)	51.1	60.3	63.7	52.5	56.9	53.5	53.7	53.6	50.1	50.3	48.5	44.5	39.8
Measurement 18 (dBZ)	46.4	50.6	53.6	52.2	50.1	51.8	49.8	52.2	47.9	49.7	48.0	46.1	40.3
Measurement 19 (dBZ)	51.7	57.7	60.0	55.6	56.2	56.2	53.1	53.0	50.5	50.4	48.2	44.6	40.0
Measurement 20 (dBZ)	56.6	57.4	58.5	51.3	54.2	51.6	51.4	52.6	48.9	49.3	48.3	45.2	41.0
Measurement 21 (dBZ)	50.5	56.6	56.3	49.8	52.7	49.8	51.6	52.8	49.0	49.4	47.7	46.1	40.6
Measurement 22 (dBZ)	51.9	54.6	57.6	54.3	53.3	53.7	52.3	52.8	50.0	50.8	47.0	45.5	40.2
Measurement 23 (dBZ)	44.6	51.9	55.2	51.3	50.5	50.6	50.2	50.5	48.2	50.6	48.4	45.4	40.2
Measurement 24 (dBZ)	48.2	52.6	57.4	52.2	51.0	51.0	50.4	51.4	48.6	50.8	48.2	45.5	40.1
Measurement 25 (dBZ)	46.5	49.0	55.5	52.5	48.2	51.3	50.6	52.2	48.6	51.1	48.9	44.9	38.5
Measurement 26 (dBZ)	53.7	56.4	56.5	52.6	52.6	51.7	50.8	51.6	48.2	50.3	47.6	45.9	40.4
Measurement 27 (dBZ)	44.2	49.2	54.2	51.3	50.9	50.4	50.2	50.4	48.7	51.3	48.0	45.3	40.1
Measurement 28 (dBZ)	46.9	51.4	55.1	52.7	49.2	54.3	50.5	52.0	49.1	51.0	49.1	44.6	38.1
Measurement 29 (dBZ)	44.5	50.9	55.3	52.3	51.5	50.0	51.1	51.4	48.5	50.0	47.5	46.4	40.3
Measurement 30 (dBZ)	44.5	52.0	54.9	49.2	48.5	49.2	50.2	51.4	48.6	51.8	48.0	45.0	39.3
Measurement 31 (dBZ)	46.3	52.9	54.9	52.5	51.8	52.3	52.2	52.7	50.1	51.6	47.9	44.9	38.9
Measurement 32 (dBZ)	47.0	54.8	52.9	50.5	49.2	49.8	49.2	50.5	48.2	52.6	47.6	45.1	38.5
Measurement 33 (dBZ)	46.9	55.4	52.0	49.7	51.1	50.3	50.5	51.3	47.9	51.2	47.4	46.3	39.3

	Third Octave Band Centre Frequency, Hz												
	10	**12.5**	**16**	**20**	**25**	**31.5**	**40**	**50**	**63**	**80**	**100**	**125**	**160**
Measurement 34 (dBZ)	45.0	51.4	52.8	50.0	49.1	50.9	51.0	51.7	49.1	51.2	48.1	45.3	39.0
Measurement 35 (dBZ)	45.7	51.7	54.7	52.7	48.2	49.8	49.1	50.9	49.1	51.8	48.3	44.6	39.4
Measurement 36 (dBZ)	43.9	52.7	52.6	49.6	47.6	48.7	49.3	50.5	49.2	52.7	47.6	44.1	39.6
Measurement 37 (dBZ)	47.8	57.9	55.9	51.9	50.4	50.9	51.0	52.3	50.3	52.2	47.3	44.8	38.4
Average (dBZ)	49.3	55.0	56.6	52.4	52.0	51.5	51.0	51.8	49.0	50.4	48.0	45.4	39.8
Rounded Average (dBZ)	49	55	57	52	52	52	51	52	49	50	48	45	40

Operational Noise Predictions With and Without Proposed Pro-Active Noise Management Measures

This section provides a summary of all predicted operational noise levels for the Project, without and with the proposed pro-active noise management measures (Table 3 and Table 4, respectively).

Table 3 Predicted $L_{Aeq,15min}$ Operational Noise Levels - <u>Without</u> Pro-Active Noise Management Measures

Receiver Group	Receiver ID	$L_{Aeq,15min}$ Noise Level (dBA)[1]									Noise Trigger Level Day/Eve/ Night (dBA)
		Year 1			Year 3			Year 4			
		Day	Eve	Night	Day	Eve	Night	Day	Eve	Night	
Privately-owned Dwellings											
South	24a	<20	<20	20	<20	<20	<20	<20	<20	<20	40 / 35 / 35
South	24b	<20	<20	20	<20	<20	<20	<20	<20	<20	40 / 35 / 35
South	25	<20	<20	20	<20	<20	<20	<20	<20	<20	40 / 35 / 35
South	172	<20	<20	23	<20	<20	20	<20	<20	<20	40 / 38 / 38
South	207	22	<20	23	<20	<20	20	<20	<20	<20	40 / 38 / 38
South	209	21	<20	24	<20	<20	21	<20	<20	<20	40 / 38 / 38
South	211a	22	<20	24	<20	<20	21	<20	<20	<20	40 / 38 / 38
South	211b	20	<20	24	<20	<20	20	<20	<20	<20	40 / 38 / 38
South	211c	<20	<20	24	<20	<20	21	<20	<20	<20	40 / 38 / 38
South	217c	22	<20	25	<20	<20	22	<20	<20	22	40 / 38 / 38
South	217d	22	<20	25	<20	<20	22	<20	<20	22	40 / 38 / 38
South	217e	22	<20	26	<20	<20	22	<20	<20	22	40 / 38 / 38
South	217f	22	<20	25	<20	<20	22	<20	<20	22	40 / 38 / 38
South	219a	21	<20	27	<20	<20	23	<20	<20	24	40 / 38 / 38
South	219b	22	<20	23	<20	<20	23	<20	<20	24	40 / 38 / 38
South	219c	21	<20	26	<20	<20	23	<20	<20	24	40 / 38 / 38
South	219d	21	<20	27	<20	<20	23	<20	<20	24	40 / 38 / 38
South	219e	21	<20	20	<20	<20	24	<20	<20	24	40 / 38 / 38
South	226a	<20	<20	<20	<20	<20	<20	<20	<20	<20	40 / 38 / 38
South	226b	<20	<20	<20	<20	<20	<20	<20	<20	<20	40 / 38 / 38
South	226c	<20	<20	<20	<20	<20	<20	<20	<20	<20	40 / 38 / 38
South	226d	20	<20	<20	<20	<20	<20	<20	<20	<20	40 / 38 / 38
South	227a	23	<20	<20	<20	<20	<20	<20	<20	<20	40 / 38 / 38
South	227b	22	<20	<20	<20	<20	<20	<20	<20	<20	40 / 38 / 38
South	227c	21	<20	<20	<20	<20	<20	<20	<20	<20	40 / 38 / 38
South	227d	22	<20	<20	<20	<20	23	<20	<20	23	40 / 38 / 38
South	227e	22	<20	<20	<20	<20	22	<20	<20	23	40 / 38 / 38

Receiver Group	Receiver ID	$L_{Aeq,15min}$ Noise Level (dBA)[1]									Noise Trigger Level Day/Eve/ Night (dBA)
		Year 1			Year 3			Year 4			
		Day	Eve	Night	Day	Eve	Night	Day	Eve	Night	
South	227f	20	<20	<20	<20	<20	<20	<20	<20	<20	40 / 38 / 38
South	228a	25	<20	24	<20	<20	22	<20	<20	22	40 / 38 / 38
South	228b	25	<20	24	<20	<20	22	<20	<20	22	40 / 38 / 38
South	228c	25	<20	24	<20	<20	22	<20	<20	22	40 / 38 / 38
South	228e	25	<20	24	<20	<20	22	<20	<20	22	40 / 38 / 38
South	228f	25	<20	24	<20	<20	22	<20	<20	22	40 / 38 / 38
South	228g	25	<20	24	<20	<20	22	<20	<20	22	40 / 38 / 38
South	228h	25	<20	24	<20	<20	22	<20	<20	22	40 / 38 / 38
South	228i	25	<20	24	<20	<20	22	<20	<20	22	40 / 38 / 38
South	228j	<20	<20	<20	<20	<20	<20	<20	<20	<20	40 / 38 / 38
South	228k	26	<20	24	<20	<20	22	<20	<20	22	40 / 38 / 38
South	228l	23	<20	26	<20	<20	23	<20	<20	23	40 / 38 / 38
South	228m	23	<20	<20	<20	<20	23	<20	<20	23	40 / 38 / 38
South	228n	20	<20	<20	<20	<20	22	<20	<20	22	40 / 38 / 38
South	228o	23	<20	26	<20	<20	24	<20	<20	23	40 / 38 / 38
South	228p	25	<20	25	20	<20	23	<20	<20	22	40 / 38 / 38
South	228q	25	<20	26	20	<20	23	<20	<20	23	40 / 38 / 38
South	228r	23	<20	<20	<20	<20	23	<20	<20	24	40 / 38 / 38
South	230a	25	<20	23	<20	<20	21	<20	<20	20	40 / 35 / 35
South	230b	23	<20	21	<20	<20	<20	<20	<20	<20	40 / 35 / 35
South	238a	<20	<20	<20	<20	<20	<20	<20	<20	<20	40 / 35 / 35
South	238b	<20	<20	<20	<20	<20	<20	<20	<20	<20	40 / 35 / 35
South	238c	<20	<20	<20	<20	<20	<20	<20	<20	<20	40 / 35 / 35
South	238d	<20	<20	<20	<20	<20	<20	<20	<20	<20	40 / 35 / 35
South	238e	<20	<20	<20	<20	<20	<20	<20	<20	<20	40 / 35 / 35
South	238f	<20	<20	<20	<20	<20	<20	<20	<20	<20	40 / 35 / 35
South	238g	<20	<20	<20	<20	<20	<20	<20	<20	<20	40 / 35 / 35
South	238h	<20	<20	<20	<20	<20	<20	<20	<20	<20	40 / 35 / 35
South	239a	<20	<20	<20	<20	<20	<20	<20	<20	<20	40 / 35 / 35
South	239b	22	<20	<20	<20	<20	<20	<20	<20	<20	40 / 35 / 35
South	239c	22	<20	<20	<20	<20	<20	<20	<20	<20	40 / 35 / 35
South	239d	22	<20	<20	<20	<20	<20	<20	<20	<20	40 / 35 / 35
South	239e	22	<20	<20	<20	<20	<20	<20	<20	<20	40 / 35 / 35
South	239f	22	<20	<20	<20	<20	<20	<20	<20	<20	40 / 35 / 35
South	239g	<20	<20	<20	<20	<20	<20	<20	<20	<20	40 / 35 / 35
South	239h	<20	<20	<20	<20	<20	<20	<20	<20	<20	40 / 35 / 35
South	239i	<20	<20	<20	<20	<20	<20	<20	<20	<20	40 / 35 / 35
South	239j	<20	<20	<20	<20	<20	<20	<20	<20	<20	40 / 35 / 35
South	239k	<20	<20	<20	<20	<20	<20	<20	<20	<20	40 / 35 / 35
South	240a	<20	<20	<20	<20	<20	21	<20	<20	20	40 / 35 / 35
South	240b	<20	<20	20	<20	<20	21	<20	<20	21	40 / 35 / 35
South	240c	<20	<20	20	<20	<20	21	<20	<20	21	40 / 35 / 35
South	240d	<20	<20	20	<20	<20	21	<20	<20	21	40 / 35 / 35
South	240e	<20	<20	20	<20	<20	21	<20	<20	21	40 / 35 / 35
South	250a	24	<20	22	<20	<20	20	<20	<20	<20	40 / 35 / 35
South	250b	24	<20	22	<20	<20	<20	<20	<20	<20	40 / 35 / 35
South	253	21	<20	<20	<20	<20	<20	<20	<20	<20	40 / 35 / 35
South	254a	20	<20	20	<20	<20	<20	<20	<20	<20	40 / 35 / 35
South	254b	20	<20	20	<20	<20	<20	<20	<20	<20	40 / 35 / 35
South	254c	20	<20	20	<20	<20	<20	<20	<20	<20	40 / 35 / 35

Receiver Group	Receiver ID	$L_{Aeq,15min}$ Noise Level (dBA)[1]									Noise Trigger Level Day/Eve/ Night (dBA)
		Year 1			Year 3			Year 4			
		Day	Eve	Night	Day	Eve	Night	Day	Eve	Night	
South	255	21	<20	20	<20	<20	<20	<20	<20	<20	40 / 35 / 35
South	279	24	<20	20	<20	<20	<20	<20	<20	<20	40 / 35 / 35
South	284	23	<20	20	<20	<20	<20	<20	<20	<20	40 / 35 / 35
South	285	23	<20	20	<20	<20	<20	<20	<20	<20	40 / 35 / 35
South	287	23	<20	20	<20	<20	<20	<20	<20	<20	40 / 35 / 35
South	298a	<20	<20	<20	<20	<20	<20	<20	<20	<20	40 / 35 / 35
South	298b	<20	<20	<20	<20	<20	<20	<20	<20	<20	40 / 35 / 35
South	299	23	<20	<20	<20	<20	<20	<20	<20	<20	40 / 35 / 35
South	306	26	20	21	<20	<20	<20	<20	<20	<20	40 / 35 / 35
South	527	23	<20	24	<20	<20	21	<20	<20	21	40 / 35 / 35
South	528	20	<20	23	<20	<20	20	<20	<20	<20	40 / 38 / 38
South	532	23	<20	20	<20	<20	<20	<20	<20	<20	40 / 35 / 35
North	384	33	<20	<20	32	23	29	30	22	28	40 / 35 / 35
North	385	36	<20	<20	36	29	34	37	30	35	40 / 37 / 37
North	386	34	<20	<20	33	28	31	33	27	31	40 / 35 / 35
North	387[3]	38	<20	<20	37	28	34	38	29	35	40 / 37 / 37
North	390	43	<20	<20	43	35	40	44	36	41	40 / 37 / 37
North	398	42	<20	<20	42	34	39	43	36	40	40 / 37 / 37
North	399	41	<20	<20	41	33	38	41	34	39	40 / 37 / 37
North	400	40	<20	<20	39	31	37	40	33	38	40 / 35 / 35
North	402	42	<20	<20	42	32	39	43	35	41	40 / 35 / 35
North	403	43	<20	<20	43	32	40	45	36	42	40 / 35 / 35
North	411	44	<20	<20	44	35	41	42	34	40	40 / 37 / 37
North	418	42	<20	<20	42	35	40	40	33	38	40 / 37 / 37
North	419	41	<20	<20	41	34	39	39	32	38	40 / 37 / 37
North	420	40	<20	<20	40	34	38	38	32	37	40 / 37 / 37
North	421	40	<20	<20	39	33	39	38	33	38	40 / 37 / 37
North	423	40	<20	<20	40	32	39	40	32	40	40 / 37 / 37
North	424	40	<20	<20	40	31	38	39	31	38	40 / 37 / 37
North	425	39	<20	<20	39	31	38	37	31	38	40 / 37 / 37
North	427	39	<20	<20	39	30	37	38	30	37	40 / 37 / 37
North	429	37	<20	<20	36	29	34	37	31	35	40 / 37 / 37
North	432	35	<20	<20	34	28	32	35	29	33	40 / 37 / 37
North	433a	34	<20	<20	33	27	31	33	28	32	40 / 37 / 37
North	433b	33	<20	<20	32	26	30	33	27	31	40 / 37 / 37
North	435a	32	<20	<20	31	25	29	32	26	30	40 / 37 / 37
North	435b	32	<20	<20	32	26	29	32	26	30	40 / 37 / 37
North	438	31	<20	<20	30	25	28	28	24	27	40 / 37 / 37
North	440	36	<20	<20	35	30	34	33	30	33	40 / 37 / 37
North	441a	33	<20	<20	32	29	31	30	27	30	40 / 35 / 35
North	441b	33	<20	<20	32	28	31	29	27	29	40 / 35 / 35
North	443	35	<20	<20	34	30	34	32	29	32	40 / 37 / 37
North	444	37	<20	<20	37	32	35	34	29	34	40 / 37 / 37
North	446a	36	<20	<20	36	29	33	33	26	31	40 / 37 / 37
North	451	32	<20	<20	32	<20	29	28	<20	26	40 / 35 / 35
North	455	33	<20	<20	32	28	31	29	26	29	40 / 35 / 35
North	456	32	<20	<20	32	28	30	28	26	29	40 / 35 / 35
North	460	35	<20	<20	35	29	33	34	28	33	40 / 37 / 37
North	507	32	<20	<20	31	25	29	31	26	30	40 / 35 / 35
North	508	31	<20	<20	30	25	28	30	25	29	40 / 35 / 35

Receiver Group	Receiver ID	$L_{Aeq,15min}$ Noise Level (dBA)[1]									Noise Trigger Level Day/Eve/ Night (dBA)
		Year 1			Year 3			Year 4			
		Day	Eve	Night	Day	Eve	Night	Day	Eve	Night	
North	509	30	<20	<20	29	24	27	30	24	28	40 / 35 / 35
North	537	30	<20	<20	28	23	25	28	24	27	40 / 35 / 35
North	538	41	<20	<20	41	31	38	42	34	40	40 / 35 / 35
North	539	41	<20	<20	40	32	39	38	31	38	40 / 37 / 37
Mine-owned Dwellings											
South	57	26	20	26	20	<20	21	20	20	22	n/a[2]
South	58a	<20	<20	<20	<20	<20	<20	<20	<20	<20	n/a[2]
South	58b	<20	<20	<20	<20	<20	<20	<20	<20	<20	n/a[2]
South	60a	38	30	33	31	29	30	31	31	32	n/a[2]
South	60b	37	31	34	30	28	31	31	31	33	n/a[2]
South	60c	34	27	33	26	24	30	26	26	33	n/a[2]
South	60d	37	31	32	28	27	30	29	29	32	n/a[2]
South	145a	22	<20	29	<20	<20	25	<20	<20	27	n/a[2]
South	145b	<20	<20	<20	<20	<20	<20	<20	<20	<20	n/a[2]
South	145c	<20	<20	<20	<20	<20	20	<20	<20	23	n/a[2]
South	536	23	<20	25	<20	<20	25	<20	<20	28	n/a[2]
North	389	42	<20	<20	42	35	39	43	37	40	n/a[2]
North	404	42	<20	<20	41	30	39	43	33	42	n/a[2]
North	410	45	<20	<20	45	36	42	43	35	41	n/a[2]
North	500	33	<20	<20	32	26	30	32	27	31	n/a[2]

Notes:

1. Levels highlighted indicate predictions under the relevant Fact Sheet D meteorological conditions in excess of the Project noise trigger levels at privately-owned receivers.
2. Project noise trigger levels do not apply to mine-owned receivers.
3. Previously categorised as a mine-owned receiver in the *Maxwell Project - Noise Impact Assessment* (Wilkinson Murray,2019).

Table 4 Predicted $L_{Aeq,15min}$ Operational Noise Levels - <u>With</u> Pro-Active Noise Management Measures

Receiver Group	Receiver ID	$L_{Aeq,15min}$ Noise Level (dBA)[1]									Noise Trigger Level Day/Eve/ Night (dBA)
		Year 1			Year 3			Year 4			
		Day	Eve	Night	Day	Eve	Night	Day	Eve	Night	
Privately-owned Dwellings											
South	24a	<20	<20	20	<20	<20	<20	<20	<20	<20	40 / 35 / 35
South	24b	<20	<20	20	<20	<20	<20	<20	<20	<20	40 / 35 / 35
South	25	<20	<20	20	<20	<20	<20	<20	<20	<20	40 / 35 / 35
South	172	<20	<20	23	<20	<20	20	<20	<20	<20	40 / 38 / 38
South	207	22	<20	23	<20	<20	20	<20	<20	<20	40 / 38 / 38
South	209	21	<20	24	<20	<20	20	<20	<20	<20	40 / 38 / 38
South	211a	22	<20	24	<20	<20	21	<20	<20	<20	40 / 38 / 38
South	211b	<20	<20	24	<20	<20	20	<20	<20	<20	40 / 38 / 38
South	211c	<20	<20	24	<20	<20	21	<20	<20	<20	40 / 38 / 38
South	217c	22	<20	25	<20	<20	22	<20	<20	22	40 / 38 / 38
South	217d	22	<20	25	<20	<20	22	<20	<20	22	40 / 38 / 38
South	217e	22	<20	26	<20	<20	22	<20	<20	22	40 / 38 / 38
South	217f	22	<20	25	<20	<20	22	<20	<20	22	40 / 38 / 38
South	219a	21	<20	27	<20	<20	23	<20	<20	24	40 / 38 / 38
South	219b	22	<20	23	<20	<20	23	<20	<20	24	40 / 38 / 38

Receiver Group	Receiver ID	$L_{Aeq,15min}$ Noise Level (dBA)[1]									Noise Trigger Level Day/Eve/ Night (dBA)
		Year 1			Year 3			Year 4			
		Day	Eve	Night	Day	Eve	Night	Day	Eve	Night	
South	219c	20	<20	26	<20	<20	23	<20	<20	24	40 / 38 / 38
South	219d	21	<20	27	<20	<20	23	<20	<20	24	40 / 38 / 38
South	219e	21	<20	20	<20	<20	24	<20	<20	24	40 / 38 / 38
South	226a	<20	<20	<20	<20	<20	<20	<20	<20	<20	40 / 38 / 38
South	226b	<20	<20	<20	<20	<20	<20	<20	<20	<20	40 / 38 / 38
South	226c	<20	<20	<20	<20	<20	<20	<20	<20	<20	40 / 38 / 38
South	226d	20	<20	<20	<20	<20	<20	<20	<20	<20	40 / 38 / 38
South	227a	23	<20	<20	<20	<20	<20	<20	<20	<20	40 / 38 / 38
South	227b	22	<20	<20	<20	<20	<20	<20	<20	<20	40 / 38 / 38
South	227c	21	<20	<20	<20	<20	<20	<20	<20	<20	40 / 38 / 38
South	227d	22	<20	<20	<20	<20	23	<20	<20	23	40 / 38 / 38
South	227e	22	<20	<20	<20	<20	22	<20	<20	23	40 / 38 / 38
South	227f	20	<20	<20	<20	<20	<20	<20	<20	<20	40 / 38 / 38
South	228a	25	<20	24	<20	<20	22	<20	<20	22	40 / 38 / 38
South	228b	25	<20	24	<20	<20	22	<20	<20	22	40 / 38 / 38
South	228c	25	<20	24	<20	<20	22	<20	<20	22	40 / 38 / 38
South	228e	25	<20	24	<20	<20	22	<20	<20	22	40 / 38 / 38
South	228f	25	<20	24	<20	<20	22	<20	<20	22	40 / 38 / 38
South	228g	25	<20	24	<20	<20	22	<20	<20	22	40 / 38 / 38
South	228h	25	<20	24	<20	<20	22	<20	<20	22	40 / 38 / 38
South	228i	25	<20	24	<20	<20	22	<20	<20	22	40 / 38 / 38
South	228j	<20	<20	<20	<20	<20	<20	<20	<20	<20	40 / 38 / 38
South	228k	26	<20	24	<20	<20	22	<20	<20	22	40 / 38 / 38
South	228l	23	<20	26	<20	<20	23	<20	<20	22	40 / 38 / 38
South	228m	23	<20	<20	<20	<20	23	<20	<20	23	40 / 38 / 38
South	228n	20	<20	<20	<20	<20	22	<20	<20	22	40 / 38 / 38
South	228o	23	<20	26	<20	<20	24	<20	<20	23	40 / 38 / 38
South	228p	25	<20	25	<20	<20	23	<20	<20	22	40 / 38 / 38
South	228q	25	<20	26	20	<20	23	<20	<20	23	40 / 38 / 38
South	228r	23	<20	<20	<20	<20	23	<20	<20	24	40 / 38 / 38
South	230a	25	<20	23	<20	<20	21	<20	<20	20	40 / 35 / 35
South	230b	23	<20	21	<20	<20	<20	<20	<20	<20	40 / 35 / 35
South	238a	<20	<20	<20	<20	<20	<20	<20	<20	<20	40 / 35 / 35
South	238b	<20	<20	<20	<20	<20	<20	<20	<20	<20	40 / 35 / 35
South	238c	<20	<20	<20	<20	<20	<20	<20	<20	<20	40 / 35 / 35
South	238d	<20	<20	<20	<20	<20	<20	<20	<20	<20	40 / 35 / 35
South	238e	<20	<20	<20	<20	<20	<20	<20	<20	<20	40 / 35 / 35
South	238f	<20	<20	<20	<20	<20	<20	<20	<20	<20	40 / 35 / 35
South	238g	<20	<20	<20	<20	<20	<20	<20	<20	<20	40 / 35 / 35
South	238h	<20	<20	<20	<20	<20	<20	<20	<20	<20	40 / 35 / 35
South	239a	<20	<20	<20	<20	<20	<20	<20	<20	<20	40 / 35 / 35
South	239b	22	<20	<20	<20	<20	<20	<20	<20	<20	40 / 35 / 35
South	239c	22	<20	<20	<20	<20	<20	<20	<20	<20	40 / 35 / 35
South	239d	22	<20	<20	<20	<20	<20	<20	<20	<20	40 / 35 / 35
South	239e	22	<20	<20	<20	<20	<20	<20	<20	<20	40 / 35 / 35
South	239f	22	<20	<20	<20	<20	<20	<20	<20	<20	40 / 35 / 35
South	239g	<20	<20	<20	<20	<20	<20	<20	<20	<20	40 / 35 / 35
South	239h	<20	<20	<20	<20	<20	<20	<20	<20	<20	40 / 35 / 35
South	239i	<20	<20	<20	<20	<20	<20	<20	<20	<20	40 / 35 / 35
South	239j	<20	<20	<20	<20	<20	<20	<20	<20	<20	40 / 35 / 35

Receiver Group	Receiver ID	$L_{Aeq,15min}$ Noise Level (dBA)[1]									Noise Trigger Level Day/Eve/ Night (dBA)
		Year 1			Year 3			Year 4			
		Day	Eve	Night	Day	Eve	Night	Day	Eve	Night	
South	239k	<20	<20	<20	<20	<20	<20	<20	<20	<20	40 / 35 / 35
South	240a	<20	<20	<20	<20	<20	21	<20	<20	20	40 / 35 / 35
South	240b	<20	<20	20	<20	<20	21	<20	<20	20	40 / 35 / 35
South	240c	<20	<20	20	<20	<20	21	<20	<20	21	40 / 35 / 35
South	240d	<20	<20	20	<20	<20	21	<20	<20	21	40 / 35 / 35
South	240e	<20	<20	20	<20	<20	21	<20	<20	21	40 / 35 / 35
South	250a	24	<20	22	<20	<20	20	<20	<20	<20	40 / 35 / 35
South	250b	24	<20	22	<20	<20	<20	<20	<20	<20	40 / 35 / 35
South	253	21	<20	<20	<20	<20	<20	<20	<20	<20	40 / 35 / 35
South	254a	20	<20	20	<20	<20	<20	<20	<20	<20	40 / 35 / 35
South	254b	20	<20	20	<20	<20	<20	<20	<20	<20	40 / 35 / 35
South	254c	20	<20	20	<20	<20	<20	<20	<20	<20	40 / 35 / 35
South	255	21	<20	20	<20	<20	<20	<20	<20	<20	40 / 35 / 35
South	279	24	<20	20	<20	<20	<20	<20	<20	<20	40 / 35 / 35
South	284	23	<20	20	<20	<20	<20	<20	<20	<20	40 / 35 / 35
South	285	23	<20	20	<20	<20	<20	<20	<20	<20	40 / 35 / 35
South	287	23	<20	20	<20	<20	<20	<20	<20	<20	40 / 35 / 35
South	298a	<20	<20	<20	<20	<20	<20	<20	<20	<20	40 / 35 / 35
South	298b	<20	<20	<20	<20	<20	<20	<20	<20	<20	40 / 35 / 35
South	299	23	<20	<20	<20	<20	<20	<20	<20	<20	40 / 35 / 35
South	306	26	20	21	<20	<20	<20	<20	<20	<20	40 / 35 / 35
South	527	23	<20	24	<20	<20	21	<20	<20	21	40 / 35 / 35
South	528	<20	<20	23	<20	<20	20	<20	<20	<20	40 / 38 / 38
South	532	23	<20	20	<20	<20	<20	<20	<20	<20	40 / 35 / 35
North	384	31	<20	<20	32	23	28	29	21	24	40 / 35 / 35
North	385	35	<20	<20	35	29	33	35	30	31	40 / 37 / 37
North	386	33	<20	<20	32	28	29	32	26	28	40 / 35 / 35
North	387[3]	37	<20	<20	37	28	34	37	28	29	40 / 37 / 37
North	390	42	<20	<20	42	35	39	42	36	39	40 / 37 / 37
North	398	41	<20	<20	42	34	39	42	35	39	40 / 37 / 37
North	399	40	<20	<20	40	33	37	40	34	37	40 / 37 / 37
North	400	39	<20	<20	39	31	36	39	33	36	40 / 35 / 35
North	402	42	<20	<20	42	32	39	42	35	39	40 / 35 / 35
North	403	43	<20	<20	43	32	40	43	35	40	40 / 35 / 35
North	411	43	<20	<20	43	35	41	42	30	40	40 / 37 / 37
North	418	42	<20	<20	42	35	39	39	29	38	40 / 37 / 37
North	419	40	<20	<20	40	34	38	37	28	37	40 / 37 / 37
North	420	39	<20	<20	40	34	38	37	28	35	40 / 37 / 37
North	421	38	<20	<20	39	33	38	38	32	38	40 / 37 / 37
North	423	39	<20	<20	40	32	39	39	32	39	40 / 37 / 37
North	424	39	<20	<20	39	31	38	39	31	38	40 / 37 / 37
North	425	38	<20	<20	38	31	37	37	30	37	40 / 37 / 37
North	427	38	<20	<20	39	30	37	38	30	34	40 / 37 / 37
North	429	35	<20	<20	36	29	33	36	30	31	40 / 37 / 37
North	432	33	<20	<20	34	28	31	33	28	29	40 / 37 / 37
North	433a	32	<20	<20	32	27	30	32	27	28	40 / 37 / 37
North	433b	32	<20	<20	32	26	29	31	26	27	40 / 37 / 37
North	435a	30	<20	<20	31	25	28	30	25	26	40 / 37 / 37
North	435b	31	<20	<20	31	26	29	31	25	26	40 / 37 / 37
North	438	30	<20	<20	30	25	27	28	24	25	40 / 37 / 37

Receiver Group	Receiver ID	$L_{Aeq,15min}$ Noise Level (dBA)[1]									Noise Trigger Level Day/Eve/ Night (dBA)
		Year 1			Year 3			Year 4			
		Day	Eve	Night	Day	Eve	Night	Day	Eve	Night	
North	440	35	<20	<20	34	30	33	33	30	30	40 / 37 / 37
North	441a	32	<20	<20	31	29	30	30	27	27	40 / 35 / 35
North	441b	32	<20	<20	31	28	30	29	27	27	40 / 35 / 35
North	443	34	<20	<20	34	30	32	32	29	30	40 / 37 / 37
North	444	36	<20	<20	36	32	34	34	26	32	40 / 37 / 37
North	446a	35	<20	<20	35	29	32	33	25	30	40 / 37 / 37
North	451	30	<20	<20	31	<20	27	26	<20	24	40 / 35 / 35
North	455	31	<20	<20	32	28	29	29	26	27	40 / 35 / 35
North	456	31	<20	<20	30	28	29	28	26	26	40 / 35 / 35
North	460	34	<20	<20	34	29	32	32	27	29	40 / 37 / 37
North	507	30	<20	<20	30	25	28	30	25	26	40 / 35 / 35
North	508	29	<20	<20	29	25	27	29	24	25	40 / 35 / 35
North	509	29	<20	<20	29	24	26	28	23	24	40 / 35 / 35
North	537	28	<20	<20	28	23	25	27	22	24	40 / 35 / 35
North	538	40	<20	<20	40	31	38	41	34	38	40 / 35 / 35
North	539	40	<20	<20	40	32	38	37	28	38	40 / 37 / 37
Mine-owned Dwellings											
South	57	26	20	26	20	<20	21	20	20	22	n/a[2]
South	58a	<20	<20	<20	<20	<20	<20	<20	<20	<20	n/a[2]
South	58b	<20	<20	<20	<20	<20	<20	<20	<20	<20	n/a[2]
South	60a	38	30	33	31	29	30	30	31	31	n/a[2]
South	60b	36	31	34	29	28	30	31	31	32	n/a[2]
South	60c	33	27	33	25	24	30	25	25	32	n/a[2]
South	60d	37	31	32	28	27	30	29	29	32	n/a[2]
South	145a	22	<20	29	<20	<20	25	<20	<20	27	n/a[2]
South	145b	<20	<20	<20	<20	<20	<20	<20	<20	<20	n/a[2]
South	145c	<20	<20	<20	<20	<20	20	<20	<20	23	n/a[2]
South	536	23	<20	25	<20	<20	25	<20	<20	28	n/a[2]
North	389	41	<20	<20	41	35	38	42	35	36	n/a[2]
North	404	41	<20	<20	41	30	38	42	31	35	n/a[2]
North	410	44	<20	<20	45	36	41	39	31	35	n/a[2]
North	500	31	<20	<20	31	26	29	31	26	27	n/a[2]

Notes:

1. Levels highlighted indicate predictions under the relevant Fact Sheet D meteorological conditions in excess of the Project noise trigger levels at privately-owned receivers.
2. Project noise trigger levels do not apply to mine-owned receivers.
3. Previously categorised as a mine-owned receiver in the *Maxwell Project - Noise Impact Assessment* (Wilkinson Murray,2019).

In summary, the implementation of the pro-active noise management measures reduces the number of predicted exceedances and reduces the magnitude of the exceedances at some receivers.

I trust this information is sufficient. Please contact us if you have any further queries.

Yours faithfully
WILKINSON MURRAY

Roman Haverkamp
Senior Engineer

ATTACHMENT 5

MAXWELL PROJECT CONSIDERATION OF FIRST HAND VIEWS IN PUBLIC SUBMISSIONS REPORT

MAXWELL PROJECT

CONSIDERATION OF FIRST HAND VIEWS IN PUBLIC SUBMISSIONS

SUPPLEMENTARY INFORMATION TO THE SOCIAL IMPACT ASSESSMENT

MALABAR COAL

NOVEMBER 2019

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1 INTRODUCTION

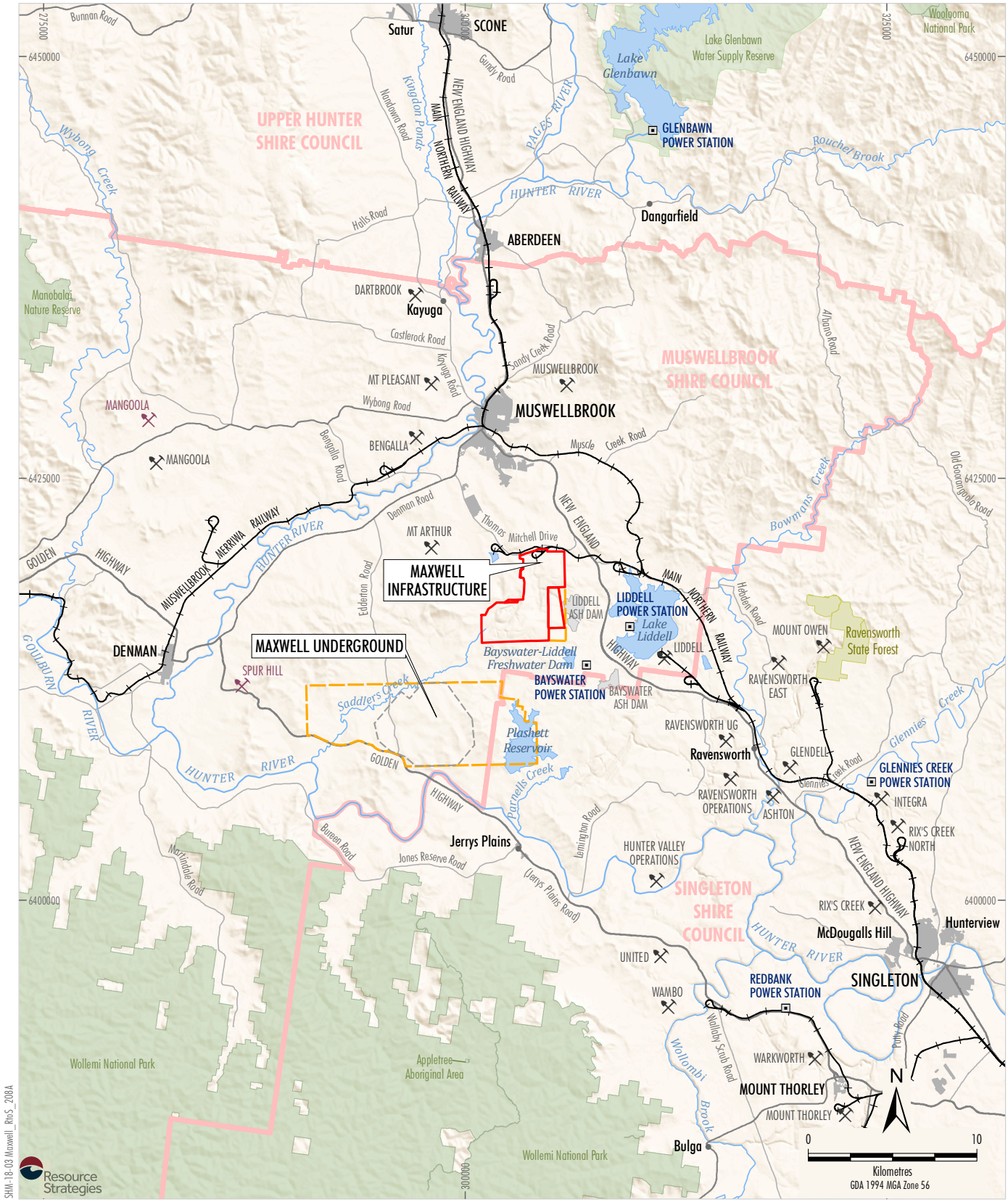
The Maxwell Project (the Project) is in the Upper Hunter Valley of New South Wales (NSW), east-southeast of Denman and south-southwest of Muswellbrook (Figure 1), within the Muswellbrook Shire Council (MSC) Local Government Area (LGA).

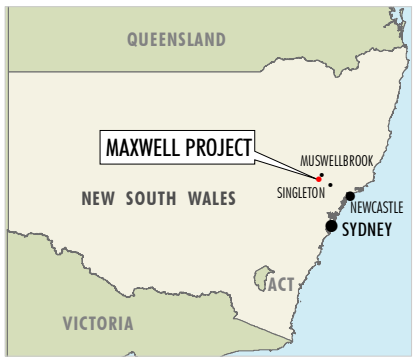
The Project would involve an underground mining operation that would produce high-quality coals over a period of approximately 26 years.

Maxwell Ventures (Management) Pty Ltd, a wholly owned subsidiary of Malabar Coal Limited (Malabar), is seeking consent to develop the Project. Malabar (2019) prepared the *Maxwell Project Environmental Impact Statement* (the EIS) for the Project to support the assessment process under the NSW *Environmental Planning and Assessment Act, 1979* (EP&A Act).

The EIS was placed on public exhibition by the Department of Planning, Industry and Environment (DPIE) from 14 August 2019 to 24 September 2019. During this period, government agencies, organisations and members of the public were invited to provide submissions on the EIS to the DPIE.

The purpose of this report is to analyse and describe the first hand views provided in the submissions received on the EIS and consider how these views align with the residual social issues identified in the Social Impact Assessment (SIA).





LEGEND

- Mining Operation
- Proposed Mining Operation
- Railway
- Local Government Boundary
- State Forest
- National Parks and Wildlife Service Estate
- Maxwell Project Exploration Licence Boundary
- Maxwell Project Mining and Coal Lease Boundary
- Indicative Extent of Underground Development

Source: © NSW Department of Planning and Environment (2019); NSW Department of Finance, Services and Innovation (2019); Office of Environment and Heritage NSW (2019)

MALABAR COAL

MAXWELL PROJECT

Regional Location

Figure 1

2 OVERVIEW OF THE PROJECT

The Project would involve extraction of run-of-mine (ROM) coal from four seams within the Wittingham Coal Measures, using the following underground mining methods:

- underground bord and pillar mining with partial pillar extraction in the Whynot Seam; and
- underground longwall extraction in the Woodlands Hill Seam, Arrowfield Seam and Bowfield Seam.

The substantial existing Maxwell Infrastructure would be used for handling, processing and transportation of coal for the life of the Project. The Maxwell Infrastructure includes existing coal handling and preparation plant (CHPP), train load-out facilities and other infrastructure and services (including water management infrastructure, administration buildings, workshops and services).

A mine entry area (MEA) would be developed for the Project in a natural valley in the north of Exploration Licence (EL) 5460 to support underground mining and coal handling activities and provide for personnel and materials access.

ROM coal brought to the surface at the MEA would be transported to the Maxwell Infrastructure area. Early ROM coal would be transported via internal roads during the construction and commissioning of a covered, overland conveyor system. Subsequently, ROM coal would be transported via the covered, overland conveyor system.

The Project would support continued rehabilitation of previously mined areas and overburden emplacement areas within Coal Lease (CL) 229, Mining Lease (ML) 1531 and CL 395. The volume of the East Void would be reduced through the emplacement of reject material generated from processing activities, and would be capped and rehabilitated at the completion of mining.

The Project area comprises the following main domains:

- Maxwell Underground – comprising the proposed area of underground mining operations and the MEA within EL 5460.
- Maxwell Infrastructure – the area within existing mining leases comprising the substantial existing infrastructure (including the CHPP) and previous mining areas.
- The transport and services corridor between the Maxwell Underground and Maxwell Infrastructure – comprising the proposed site access road, a covered, overland conveyor, power supply and other ancillary infrastructure and services.
- A potential realignment of Edderton Road.

Table 1 provides a tabulated summary of the key characteristics of the Project.

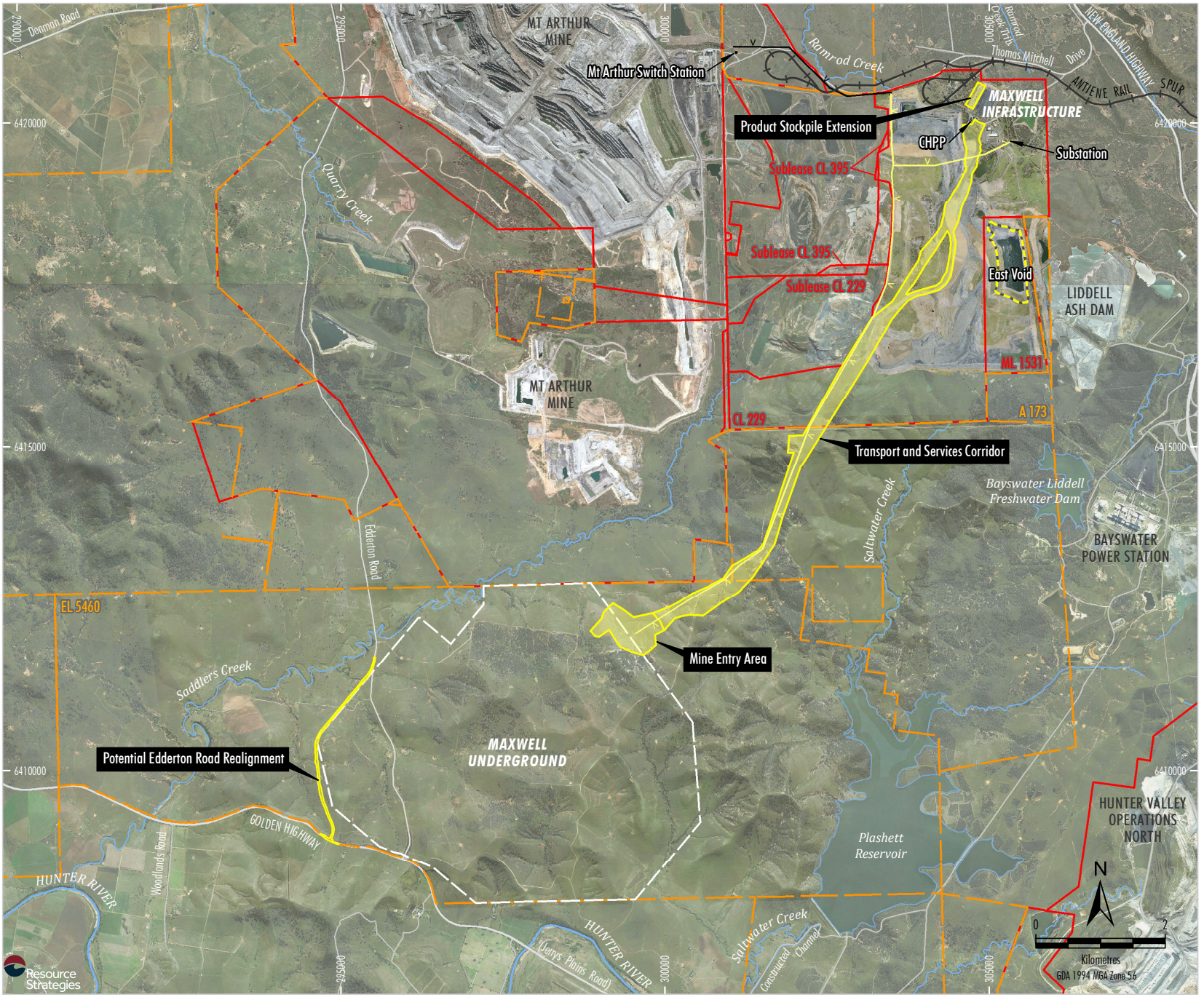
An indicative Project general arrangement showing the key components of the Project is provided in Figure 2.

Malabar is seeking Development Consent under the State Significant Development provisions (Division 4.7) under Part 4 of the EP&A Act. If granted, the Development Consent would incorporate the development authorised under the existing approval for the Maxwell Infrastructure, Project Approval 06_0202. As such, Project Approval 06_0202 would be surrendered following the grant of Development Consent.

Table 1
Overview of the Project

Component	Description
Mining Method	Underground extraction using “bord and pillar” and “longwall” mining methods.
Resource	Coal seams in the Wittingham Coal Measures within EL 5460 (Whynot Seam, Woodlands Hill Seam, Arrowfield Seam and Bowfield Seam).
Annual Production	Up to 8 million tonnes of ROM coal per annum. At least 75% of product coal produced by the Project would be capable of being used in the making of steel (coking coals). The balance would be export thermal coals suitable for the new-generation High Efficiency, Low Emissions power generators.
Mine Life	26 years of coal extraction.
Total Resource Recovered	Approximately 148 million tonnes of ROM coal (i.e. an annual average of approximately 5.7 million tonnes of ROM coal, yielding an annual average of approximately 4.8 million tonnes of product coal).
Coal Handling and Preparation	Handling and processing of up to 8 million tonnes of ROM coal per annum. Transport of coal from underground faces to the MEA (mine entry area) via an underground conveyor network. Use of a surge stockpile and coal sizing facilities at the underground MEA prior to transporting ROM coal to the Maxwell Infrastructure CHPP. Transportation of early ROM coal via internal roads to the Maxwell Infrastructure CHPP, while a covered, overland conveyor is constructed and commissioned. Subsequently, ROM coal would be transported via the covered, overland conveyor system. Use of the existing Maxwell Infrastructure CHPP with upgrades to coal handling and processing infrastructure.
Management of Reject Material (i.e. Stone-derived Material)	Emplacement of coarse rejects and tailings primarily within the existing “East Void” in ML 1531 at the Maxwell Infrastructure precinct.
General Infrastructure	Use of the existing Maxwell Infrastructure with upgrades. Development of an underground MEA and associated facilities that support the underground mining activities and provide for personnel and materials access to the underground mine. Development of infrastructure for power supply, ventilation and gas management for the underground mine.
Product Transport	Transport of product coal to market or to the Port of Newcastle for export via the existing Antiene Rail Spur and Main Northern Railway or via conveyor to the Bayswater and/or Liddell Power Stations.[1] Transport of up to 7 million tonnes of product coal per annum along the rail loop (up to 12 train movements per day).
Water Management	On-site water management system, including: recycling of water on-site; storage of water on-site (including in voids); water treatment; irrigation; and sharing of water with Mt Arthur Mine and other users. Augmentations and extensions to existing water management infrastructure and development of new water management storages, sumps, pumps, pipelines, sediment control, mine dewatering, water treatment and wastewater treatment infrastructure.
Workforce	During operation, the Project would directly employ approximately 350 personnel. Initial construction activities would require an average of approximately 90 personnel, and a maximum of approximately 250 personnel. Additional contractors would also be required during short periods over the life of the Project; for example, during longwall change-outs, periods of higher underground development activities, scheduled plant shutdowns or other maintenance programs. These activities may require up to approximately 80 additional personnel.
Hours of Operation	Operated on a continuous basis, 24 hours per day, seven days per week.
Capital Investment Value	$509,000,000.

1 Consistent with the current approval for the Antiene Rail Spur (DA 106-04-00), coal may be hauled on public roads under emergency or special situations with the prior written permission of the Secretary of the DPIE, NSW Roads and Maritime Services (RMS) and MSC.



LEGEND

- Railway
- Exploration Licence Boundary
- Mining and Coal Lease Boundary
- Indicative Extent of Underground Development
- Indicative Surface Development Area
- CHPP Reject Emplacement Area
- Proposed 66 kV Power Supply
- Proposed Ausgrid 66 kV Power Supply Extension#

Subject to separate assessment and approval.

Source: © NSW Department of Planning and Environment (2019); NSW Department of Finance, Services & Innovation (2019)
Orthophoto Mosaic: 2018, 2016, 2011

MALABAR COAL

MAXWELL PROJECT

Project General Arrangement

Figure 2

SHM-18-03 Maxwell_RtoS_209A

3 STAKEHOLDER ENGAGEMENT

3.1 SOCIAL IMPACT ASSESSMENT ENGAGEMENT

Malabar regularly engages with local stakeholders regarding the ongoing rehabilitation of the Maxwell Infrastructure, and the progress of the Project through a variety of communication platforms including the Maxwell Infrastructure Community Consultative Committee (CCC), the Spur Hill CCC and the Antiene Rail Spur CCC. In addition, Malabar undertook a consultation program to facilitate stakeholder inputs to the EIS.

Consultation for the SIA was integrated where possible with the consultation undertaken for the EIS, supported by a targeted enquiry framework for each consultation activity. Table 2 identifies the stakeholders and the engagement mechanisms used to inform the SIA for the Project.

Table 2
Summary of SIA Stakeholder Engagement and Consultation

Stakeholder	SIA Engagement Method (in addition to other engagement activities)
Community members	• Distribution of Project newsletter and SIA scoping survey with website link to provide feedback. • Community information sessions held at the Maxwell Infrastructure and Jerrys Plains. • Presentations to the Maxwell Infrastructure CCC and Spur Hill CCC. • Consultation with Aboriginal peoples through the Aboriginal Cultural Heritage Assessment process.
Muswellbrook Shire Council	• Email to the Mayor providing a briefing on the current status of the Project and the SIA. • Project briefing and discussion of SIA scope. • Meeting to discuss key issues raised in relation to the SIA. • Meetings and other engagement conducted by Malabar.
Singleton Shire Council	• Project overview to the Director of Planning and Infrastructure Services and discussion of growth opportunities for Singleton LGA. • Meeting to discuss potential social impacts and opportunities in the Singleton LGA. • Meetings and other engagement conducted by Malabar.
Local businesses and business associations	• Community information sessions held at the Maxwell Infrastructure and Jerrys Plains. • Muswellbrook Chamber of Commerce and Industry participation in SIA workshop. • Interview with Hollydene Estate Wines. • Consultation through representation on the Spur Hill CCC (Upper Hunter Winemakers' Association).
Equine industry	• Distribution of Project newsletter and SIA scoping survey with website link to provide feedback. • Community information sessions held at the Maxwell Infrastructure and Jerrys Plains. • Offer of options for face-to-face or phone SIA interviews with operators of Coolmore and Godolphin Woodlands Studs (not taken up). • Letter requesting responses to questions about potential impacts (one written response received, and one email received deferring the response to the EIS public exhibition). • Meetings and other engagement conducted by Malabar.
Social infrastructure providers	• Social infrastructure providers workshop held in Muswellbrook (including Council representatives, Muswellbrook Police, NSW TAFE [Muswellbrook campus], Muswellbrook Chamber of Commerce and Industry, Wanaruah Local Aboriginal Land Council [LALC], Joblink Plus [Singleton] and Denman News). • Face-to-face meetings with Muswellbrook Public School and Muswellbrook South Public School. • Phone interviews with Jerrys Plains Public School, Muswellbrook Hospital, Singleton Hospital and NSW Rural Fire Service.

Table 2 (continued)
Summary of SIA Stakeholder Engagement and Consultation

Stakeholder	SIA Engagement Method (in addition to other engagement activities)
Workforce representatives	• Construction, Forestry, Maritime, Mining and Energy Union (CFMMEU) representatives attended the community information sessions.
Community and environmental groups	• Interview with NSW Farmers Association at the Maxwell Infrastructure community information session. • Invitations for interviews were provided to Singleton Shire Healthy Environment Group and Landcare but were not taken up.

3.1.1 Council Engagement

Malabar has established relationships with MSC and Singleton Council and held regular meetings throughout the EIS process.

An SIA-specific meeting with MSC representatives was held as part of the SIA scoping process in July 2018. The SIA team also met with each Council in November 2018 to discuss potential impacts and benefits, and to identify additional information pertinent to the SIA.

A summary of SIA findings was provided to MSC and Singleton Council for their feedback prior to finalisation of the SIA.

3.1.2 Landholders and Community Members

During November 2018, Malabar hosted two local community information sessions:

- Jerrys Plains on Wednesday 21 November 4.00 pm – 6.30 pm at the Jerrys Plains School of Arts Hall; and
- Muswellbrook on Thursday 22 November 12.00 pm – 2.30 pm at Maxwell Infrastructure, Thomas Mitchell Drive, Muswellbrook.

The community information sessions were structured to provide community members with access to a range of Project information and technical expertise, including representatives from the EIS team for groundwater, subsidence, air quality and social impact assessment. Malabar's executive staff also attended to provide community members with an opportunity to discuss their concerns with Project personnel.

Community information sessions and the opportunity to provide input to the SIA were promoted via:

- direct mail to approximately 150 local landowners near the Project;
- advertising in local newspapers including *Denman News*, *Hunter Valley News* and *The Singleton Argus*;
- emails to the Chairs of the Maxwell Infrastructure and Spur Hill CCCs, for distribution to their members;
- direct email invitations to key industry and business stakeholders (such as Councils, adjacent landholders, Chambers of Commerce and the CFMMEU); and
- through the Jerrys Plains Public School Newsletter.

Approximately 40 local stakeholders attended the Jerrys Plains session and eight stakeholders attended the Maxwell Infrastructure session. Attendance across the two sessions included:

- twenty-four personnel from neighbouring equine operations;
- six residents from the Jerrys Plains area (town and surrounding properties);
- eight residents from the Denman area (town and surrounding properties);
- three residents from the Muswellbrook postcode;

- two residents from the Singleton postcode;
- a representative of the Wanaruah LALC;
- two representatives of the CFMMEU; and
- two other interested stakeholders.

Information on the Project and a feedback form were made available online and at the information sessions to facilitate broader input on the Project's potential impacts and benefits. One feedback form was received and the results have been integrated into the SIA.

During the information sessions, the SIA team facilitated engagement to collect community feedback on the scope of social impacts and benefits being assessed, and to seek their input on the impacts and opportunities of most importance to them.

In addition to discussions with SIA team members and access to feedback forms, A1 posters listing the Project's scope of potential social impacts and benefits were provided and participants were invited to use sticky dots to identify which impacts and benefits were of most importance, using two dots to signify issues of high importance and one dot for issues of moderate importance. Approximately 26 participants provided input to the poster activity across the two sessions.

Stakeholders were able to comment on multiple issues, provide comments and identify other issues not already listed. This provided an indication of overall views on the level of importance of each issue. These inputs were contextualised through conversations with participants, and were summarised in the SIA.

3.1.3 Community Consultative Committees

Maxwell Infrastructure CCC

In March 2018, the former Drayton Mine CCC was renamed with a mandate to provide ongoing community representation for the Maxwell Infrastructure. Presentation materials and minutes from this meeting are published online, with a focus on:

- establishing new local relationships with Malabar;
- noting train noise, particularly idling trains, has been a historic issue for nearby residents which would require mitigation; and
- a review of environmental performance indicators for the former Drayton Mine, including enquiries and complaints, rainfall history, blasting, air quality, attended noise monitoring, water storage and waste management.

An SIA team member attended the July 2018 CCC to discuss the scope of the SIA and receive inputs from members on the impacts and benefits they anticipated would occur as a result of the Project.

On 6 September 2018, the Department of Planning and Environment (DP&E) provided a letter to Malabar which outlined that the continued operation of the Maxwell Infrastructure CCC would satisfy the CCC requirements for the Project outlined in the SEARs.

A summary of draft SIA findings was prepared by Elliott Whiteing and presented by Malabar to CCC members at the June 2019 meeting. No specific feedback on the findings was received.

Spur Hill CCC

SIA team members attended the July 2018 meeting of the Spur Hill CCC meeting to introduce, and invite input on, the scope of the SIA. In October 2018, the Spur Hill CCC members were provided with an update on the Spur Hill Underground Coking Coal Project, as well as an overview of the Project, Maxwell Infrastructure rehabilitation works and the proposed Maxwell Solar Project.

A summary of draft SIA findings was prepared by Elliott Whiteing and presented by Malabar to CCC members at the May 2019 meeting.

At the meeting, the CCC members discussed Malabar's local recruitment strategies. Other existing baseline issues already discussed in the SIA were also raised by CCC members at this meeting, including Muswellbrook's retail offering and the availability of rental housing.

3.1.4 Indigenous Stakeholders

An Aboriginal Cultural Heritage Assessment (ACHA) was prepared for the Project by AECOM Australia Pty Ltd (2019). The consultation process for the ACHA acknowledged the right of Aboriginal people to be involved, through direct participation, in matters that directly affect their heritage.

Aboriginal community consultation for the ACHA was undertaken in accordance with *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (Department of Environment, Climate Change and Water, 2010) (Consultation Requirements) and clause 80C of the NSW *National Parks and Wildlife Regulation, 2009*. The ACHA consultation process involved:

- consultation with regulatory agencies to assist in identifying Aboriginal people who may hold cultural knowledge relevant to determining the cultural significance of Aboriginal objects and/or places;
- writing to the Aboriginal people identified by the regulatory agencies, and placing a notice in the local newspaper, to invite Aboriginal people to be involved in the consultation process;
- notification of the names of each Aboriginal person who registered an interest for the Project and LALC. Aboriginal people were also offered the option to withhold their details from being forwarded to these parties;
- presentation of information about the ACHA study area and proposed development to registered Aboriginal parties, including an information session open to all registered Aboriginal parties held on 10 August 2018;
- consultation with registered Aboriginal parties to gather information about the cultural significance of the site, including:
  - a request with the draft assessment methodology for any initial comments regarding the Aboriginal cultural heritage values of the ACHA study area;
  - a request during the information session held on 10 August 2018 for any information regarding the Aboriginal cultural heritage values of the ACHA study area;
  - participation by some registered Aboriginal parties in the fieldwork component of the ACHA;
  - offers made to registered Aboriginal parties for private interviews, in case the information is considered culturally sensitive; and
  - provision of a draft report to all registered Aboriginal parties for comment prior to finalisation.

The SIA team cooperated with the ACHA team to provide registered Aboriginal parties with an opportunity to provide input specifically to the SIA. This included an introduction to the SIA in October 2018, and a written invitation to participate in consultation for the ACHA and SIA in early December 2018. All registered Aboriginal parties were invited to the ACHA session; however, no-one attended the session. Each registered Aboriginal party was subsequently contacted by phone in the following weeks to capture verbal comments and encourage written comments.

Consultation for the SIA also occurred with a representative of the Wanaruah LALC based in Muswellbrook, which delivers a range of support services to protect the interests of local Aboriginal people. This included provision of information about the Project and a discussion with an LALC representative as part of the community information session at Maxwell Infrastructure.

3.1.5 Equine Industry

A total of 24 personnel from the Coolmore and Godolphin Woodlands Studs attended the Community Information Sessions at Jerrys Plains and Maxwell Infrastructure in November 2018.

During November 2018, the SIA team wrote to the two horse studs' management teams inviting further input to the SIA process through either a face-to-face meeting, a phone interview or response in writing to SIA questions. Concerns identified through one written response are summarised in SIA, along with the potential for impacts on the horse studs.

3.1.6 Viticulture Industry

Consultation with a neighbouring business operator, Hollydene Estate Wines, indicated that no social impacts were anticipated as a result of the Project. Hollydene Estate Wines anticipates some increase in traffic from the Project, but no significant change to the local landscape, the winery's tourism values, or existing local air quality or noise conditions. Representatives from Hollydene Estate Wines identified examples of how the Project was maximising local benefits through local stakeholder engagement and local contracting opportunities. Hollydene Estate Wines commended the Malabar team for their approach to stakeholder engagement and relationship development.

3.1.7 Agriculture Industry

Consultation with a representative from the NSW Farmers Association (Wybong) in an interview conducted as part of the community information session at Maxwell Infrastructure highlighted a number of concerns and key considerations for the Project in relation to the potential for effects on groundwater, air quality, the landscape and use of agricultural land, which are summarised in the SIA.

3.1.8 Regional Workforce and Union Stakeholders

The community information sessions held at Jerrys Plains and the Maxwell Infrastructure were attended by a small number of local mining industry workers who were interested in understanding the Project's plans, workforce requirements and timeframes. The Jerrys Plains and Maxwell Infrastructure sessions were also attended by representatives from the CFMMEU who were supportive of the Project, noting its positive contribution to local employment, particularly in the context of potential future mine closures in the region.

3.1.9 Community and Government Agencies

An SIA workshop was held on Wednesday 21 November 2018 to seek input from key community, business, health and emergency service providers to the assessment process. The workshop was attended by nine local stakeholders with representation from:

- MSC and Singleton Council;
- Muswellbrook Police;
- NSW TAFE, Muswellbrook campus;
- Muswellbrook Chamber of Commerce and Industry;
- Wanaruah Local Aboriginal Land Council;
- JoblinkPlus Singleton; and
- Denman News.

Face-to-face meetings were also held with Muswellbrook and Muswellbrook South Public Schools. Phone interviews were held with Jerrys Plains Public School, Muswellbrook Hospital, Singleton Hospital, NSW RFS Hunter Valley Operations and Dalswinton Rural Fire Brigade. Detailed results were incorporated in relevant sections of the SIA.

3.2 ENGAGEMENT ACTIVITIES FOLLOWING LODGEMENT OF THE EIS

Since the lodgement of the EIS, Malabar has continued to engage with key stakeholders, including government agencies, local organisations and community members regarding the Project. The consultation with each of these stakeholders is summarised in the following sections.

3.2.1 Consultation with Government Agencies

Since receiving submissions on the EIS from the DPIE, the following additional consultation with government agencies has been conducted by Malabar:

- Following the receipt of the Resources Regulator's submission on the Project, Malabar invited the Resources Regulator to an on-site meeting to discuss the comments in their submission and to provide a tour of the existing rehabilitation completed to date.
- Following the receipt of the (Biodiversity and Conservation Division's (BCD's) submission on the Project, Malabar offered to meet with the BCD to discuss their comments on the EIS; however, the BCD advised they did not wish to meet at this stage.
- On 1 November 2019, following the receipt of the Environment Protection Authority's (EPA's) submission on the Project, Malabar provided a letter to the EPA with the additional information requested in their submission.
- On 5 November 2019, Malabar met with DPIE to discuss the draft Submissions Report.

3.2.2 Consultation with Equine Industry

Prior to the lodgement of the EIS, Malabar hosted a site visited for Coolmore Stud senior executives, plus senior executives from Malabar visited Coolmore Stud.

Following the lodgement of the EIS, Malabar continued consultation with key stakeholders in the equine industry, including the Coolmore Stud and the Godolphin Woodlands Stud. Malabar hosted another site visit for two senior executives from the Coolmore Stud. A property-specific briefing booklet was provided to both the Coolmore Stud and Godolphin Woodlands Stud during the exhibition period, which included:

- a description of the key Project design measures that Malabar has implemented to address previous stakeholder concerns;
- an overview of how Malabar has addressed previous concerns raised during the assessment of the Drayton South Project, including concerns related to air quality, noise, vibration and reputational risk;
- a summary of key impact assessment outcomes related to concerns raised during the consultation process for the Project (including consideration of potential visual impacts, subsidence, traffic and transport and water resources); and
- an offer for further consultation.

Further to this, Malabar committed to:

- make senior and executive staff available for consultation with Coolmore Stud and Godolphin Woodlands Stud at all times;
- offered a site visit to representatives of the Coolmore Stud and Godolphin Woodlands Stud during the exhibition period; and
- offered to continue to consult with Coolmore Stud and Godolphin Woodlands Stud throughout the EIS assessment process to respond to any subsequent queries.

3.2.3 Consultation with Surrounding Landowners

Following the lodgement of the EIS, Malabar conducted further direct engagement with surrounding landowners. Property-specific information booklets were prepared for all landowners within 2.5 km of the Project. Subsequently, Malabar attempted to contact each landowner and, where the landowner was available, presented an overview of their booklet to the respective landowners.
Each booklet included:

- a map showing the location of the Project relative to their property;
- a description of the key Project design measures that Malabar has implemented to address previous stakeholder concerns;
- a description of potential impacts of the Project in plain English, including potential impacts related to noise, air quality and visual amenity;
- contact information for a Malabar representative to provide an opportunity to discuss any residual concerns.

3.2.4 Other Community Consultation

Subsequent to the lodgement of the EIS, Malabar gave notice of a Development Application for consent to carry out the Project under Part 4 of the EP&A Act in accordance with clause 49(2)(b) of the *Environmental Planning and Assessment Regulation 2000*, which were published in *The Muswellbrook Chronicle* (9 August 2019), *Hunter Valley News* (7 August 2019), *Denman News* (8 August 2019) and *The Singleton Argus* (7 August 2019).

On 14 August 2019, Malabar notified the members of the Maxwell Infrastructure and Spur Hill CCCs that DPIE had placed the EIS on public exhibition.

On 4 September 2019, Malabar met with the Spur Hill CCC members for the quarterly session. The meeting provided an update following lodgement of the EIS, and an update on the status of rehabilitation at the Maxwell Infrastructure. As an outcome of the Spur Hill CCC meeting, EIS summary booklets were provided to members of the Spur Hill CCC and Councillors at the MSC.

Malabar has also updated their website, providing facts sheets about the Project and a link to the EIS, along with an explanation on how feedback can be given on the Project.

4 COMMUNITY PERCEPTIONS OF THE PROJECT

4.1 PUBLIC EXHIBITION AND RESPONSE TO SUBMISSION PROCESS

The EIS was placed on public exhibition by the DPIE from 14 August 2019 to 24 September 2019. During this period, government agencies, organisations and members of the public were invited to provide submissions on the EIS to the DPIE.

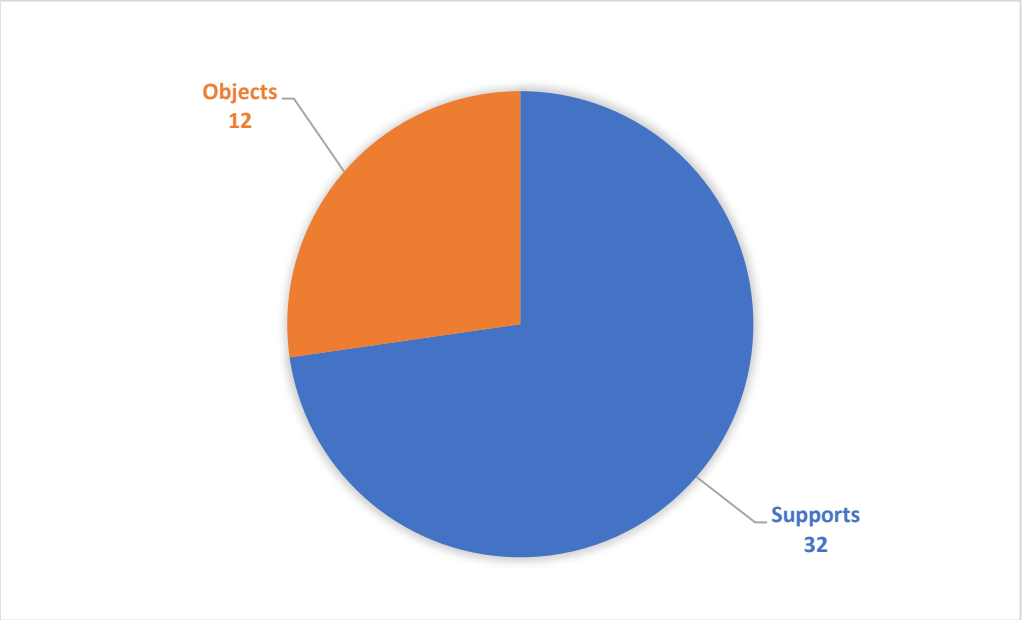
Following the conclusion of the public exhibition period, the DPIE published all the submissions from government agencies, organisations and members of the public on the DPIE website.

On 26 September 2019, the DPIE requested that Malabar prepare and submit a Submissions Report for the Project in accordance with clause 85A(2) of the EP&A Act. The process for responding to submission is shown on Figure 3.

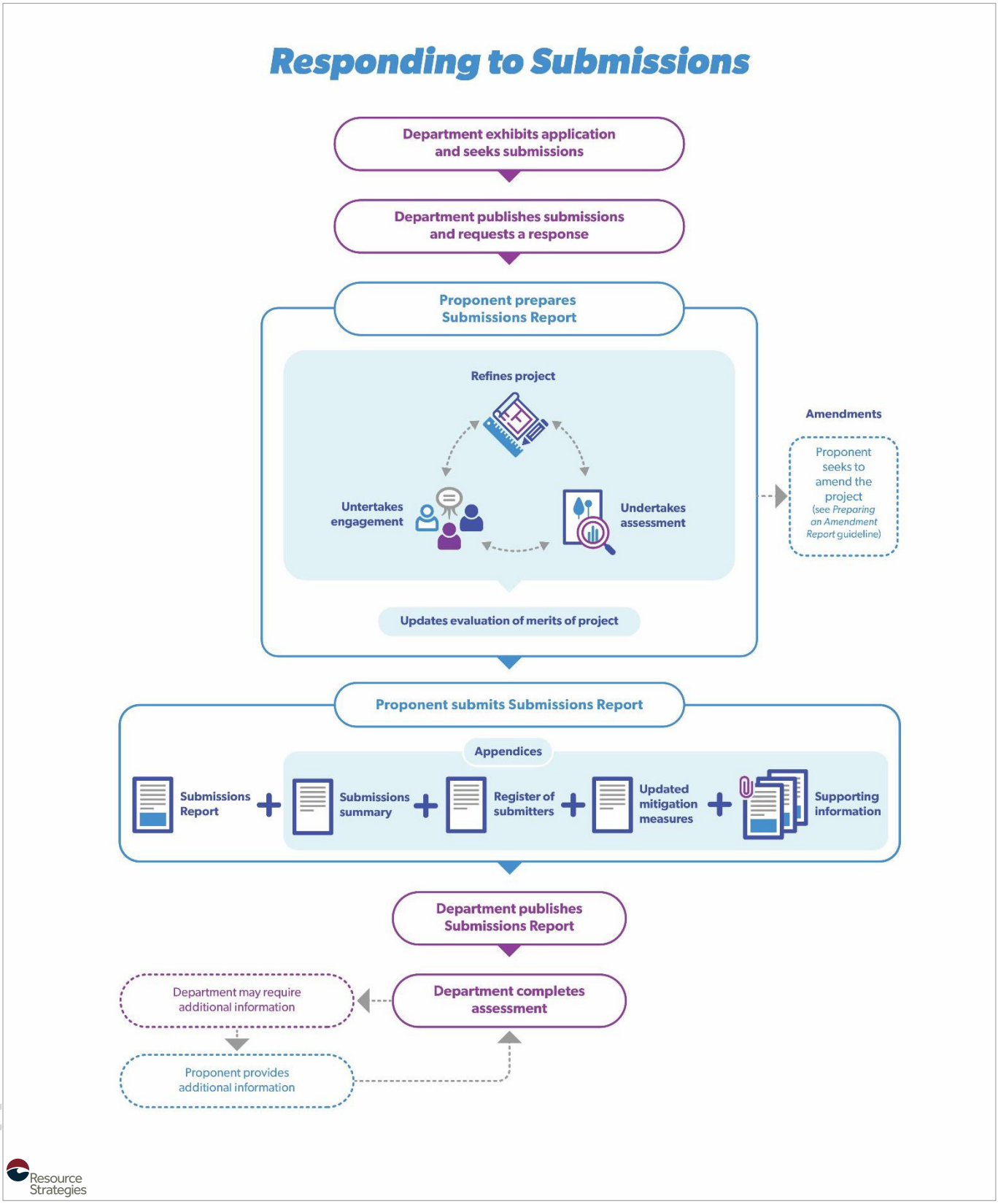
4.2 ANALYSIS OF PUBLIC SUBMISSIONS

A total of 44 submissions were received from organisations. Thirty-two of the organisations supported the Project and 12 objected to the Project (Chart 1).

Chart 1
Summary of Organisation Submissions



A total of 187 submissions were received from members of the public. Some 146 of the public submissions supported the Project, some 39 of the public submissions objected to the Project and two of the public submissions provided comments on the Project (Chart 2).



Source: Department of Planning, Industry and Environment (2019)

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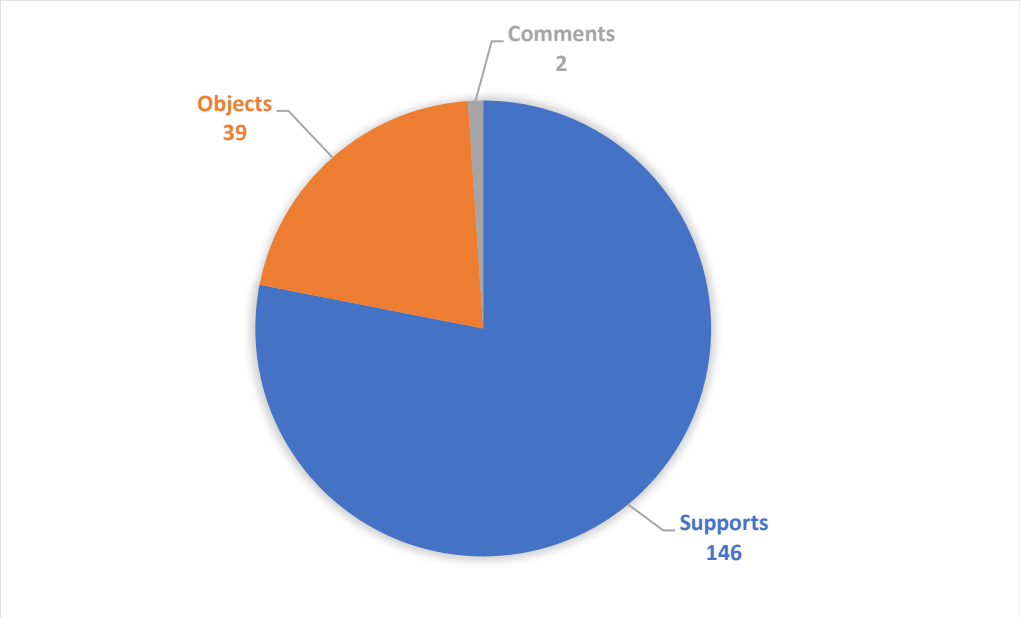
MAXWELL PROJECT

Response to Submissions Process

Figure 3

Chart 2
Summary of Public Submissions



The nature of submissions received from organisations and members of the public in the Project region is shown on Figures 4a and 4b.

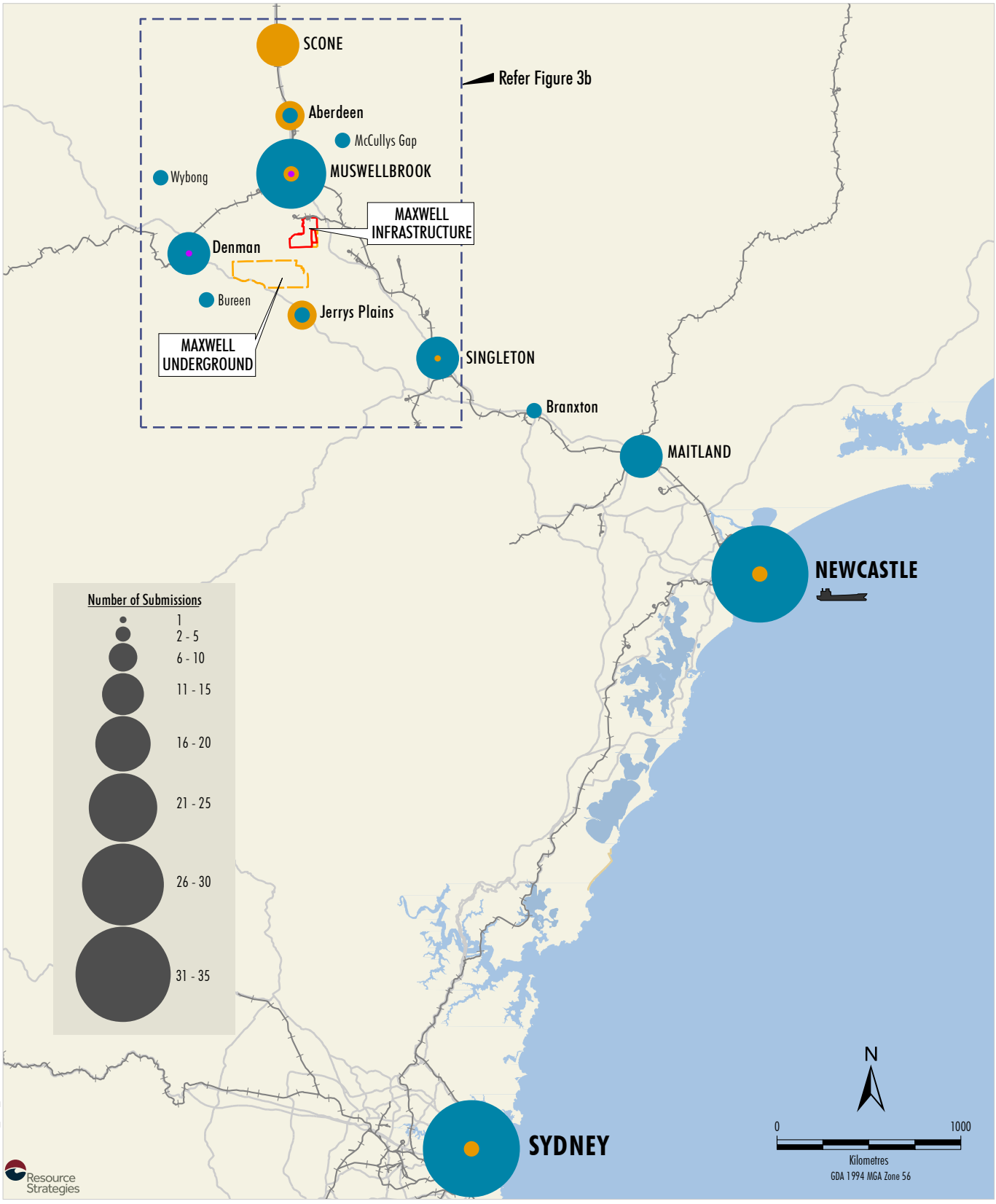
4.3 KEY ISSUES

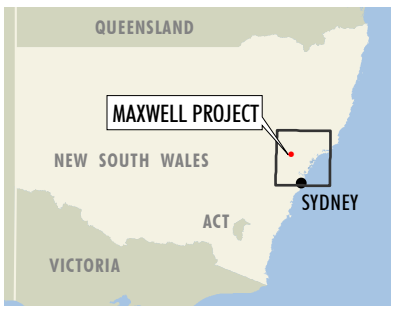
The purpose of this section is to describe the community perceptions raised in the submissions, including the perceived positive and negative impacts of the Project.

The most commonly raised matters in relation to the Project are illustrated in Chart 3. As shown, the most comments pertained to the following matters:

- socio-economic benefits;
- benefits of rehabilitation at the Maxwell Infrastructure;
- potential land use incompatibility with other surrounding industries;
- potential impacts to groundwater and surface water;
- potential impacts to amenity (e.g. potential noise, air quality and visual impacts);
- potential cumulative impacts of the Project and surrounding mining operations; and
- greenhouse gas emissions associated with the Project.

Examples of the first-hand views of the stakeholders, as they pertain to the matters above, are provided in the following sub-sections.





LEGEND

Railway

Maxwell Project Exploration Licence Boundary

Maxwell Project Mining and Coal Lease Boundary

Nature of Submissions

Comment

Support

Objection

Source: Geoscience Australia (2016); Malabar (2019)

MALABAR COAL

MAXWELL PROJECT

Submission Locations

Figure 4a

LEGEND

- Mining Operation
- Proposed Mining Operation
- Railway
- Local Government Boundary
- State Forest
- National Parks and Wildlife Service Estate
- Maxwell Project Exploration Licence Boundary
- Maxwell Project Mining and Coal Lease Boundary
- Indicative Extent of Underground Development

Nature of Submissions

- Comment
- Support
- Objection

Number of Submissions

- 1
- 2 - 5
- 6 - 10
- 11 - 15
- 16 - 20
- 21 - 25

Source: © NSW Department of Planning and Environment (2019); NSW Department of Finance, Services and Innovation (2019); Office of Environment and Heritage NSW (2019)

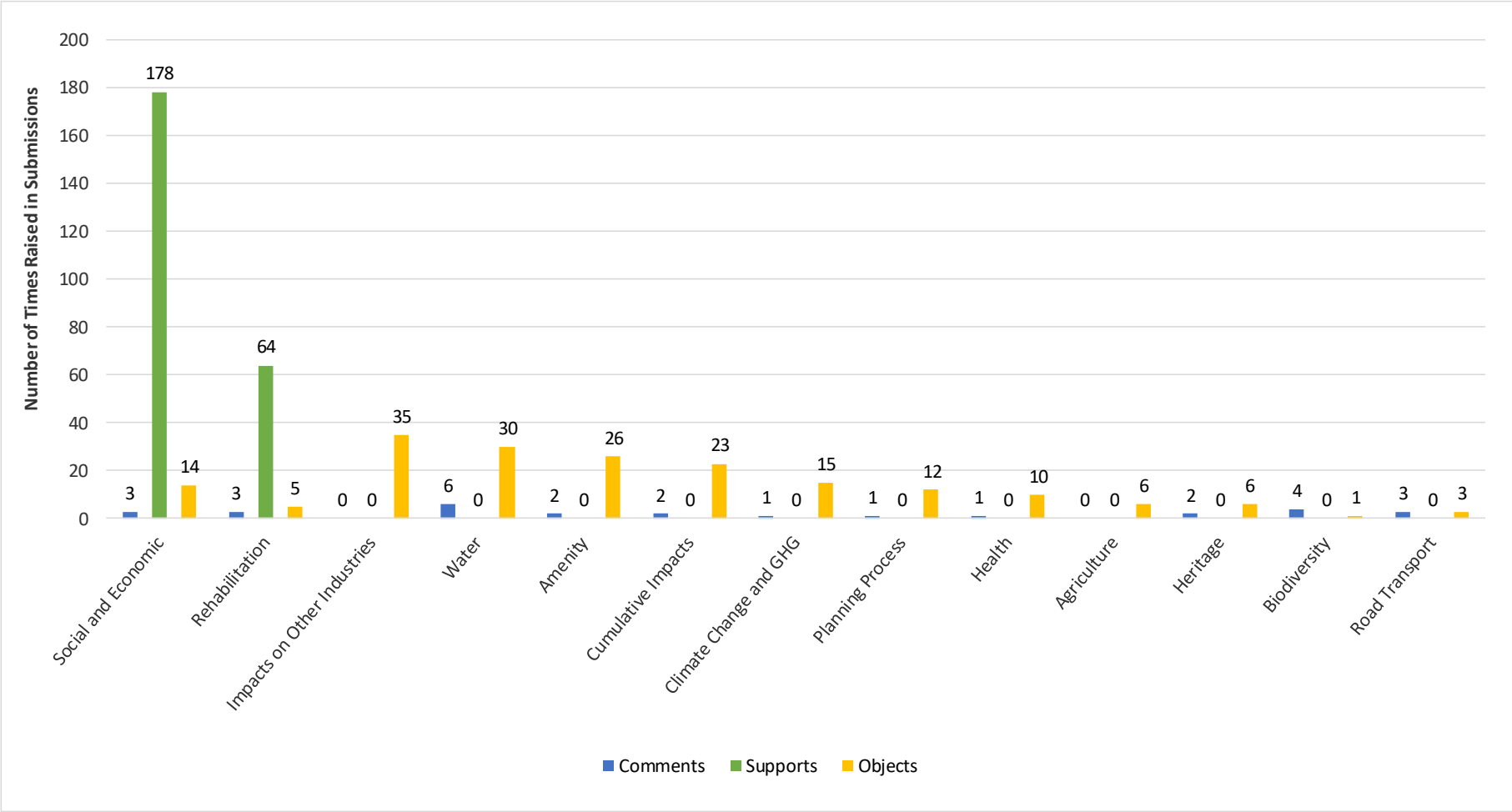
MALABAR COAL

MAXWELL PROJECT

Submission Locations - Inset

Figure 4b

Chart 3
Key Matters Raised in Submissions



GHG = greenhouse gases.

4.3.1 Socio-Economic Matters

Benefits Raised in Public Submissions

A number of submissions supporting the Project identified the benefits associated with long-term employment as a benefit to the local community, expressing views such as:

> *"I am resident of Muswellbrook with very young family, Muswellbrook is a mining town and as a mining town the ongoing support and approval of mining in Muswellbrook is a must, for the local community and residents like my family to sustain our way of life. The infrastructure provided in the form of upgraded roads and community assets is unrivaled* [sic] *by any other industry in the area. Therefore i strongly support the Maxwell underground project."*

> *"The Maxwell Underground Coal Mine Project will provide much needed employment opportunities for the local community and also support local business."*

A number of submissions (including a submission from Hollydene Estate Wines) described the flow-on benefits of the Project through the utilisation of local services and local employment, such as:

> *"The project as proposed provides significant benefits to the community and in turn Hollydene Estate Wines as a local business reliant on a strong local economy. With the Maxwell Project providing long term local employment aligned with committed local expenditure and utilisation of local services there is no doubt this mine will be a key economic driver in the Muswellbrook Shire. To this end Hollydene Estate Wines fully supports the Maxwell Project and we look forward to the timely approval, development and ultimate production."*

> *"Our business was a long term supplier to Anglo American Drayton mine, benefiting from the sale of new vehicles to the mine, and the continued service and parts supply in support of those vehicles over many years. When the Drayton South proposal did not gain approval, and with the cessation of mining activities, we were forced to cut our workforce by 50%, such was the amount of work we were afforded by our relationship to the mine. As a smaller, family based business, this was a very hard decision to come to terms with."*

> *"It will create jobs for many people not just the 350 stated, the flow on effect is quite significant. Other business get a chance to grow and flourish because of extra money coming into the area. As I am sure you are all aware their is a history making drought we are in the middle of and this mine will be contributing to help farmers, and other families by giving employment to their children / grandchildren, employment for themselves in many ways not just in the underground. This area would not be surviving if it weren't for the mining industry! That's just fact.*
>
> *As other business grow so does the employment opportunities. this hugely impacts on mental health / wellbeing. the more jobs available the better. Also local schools, sporting clubs, charities and volunteers all benefit from this aswell* [sic]*. So as there are no negatives to this mine being approved - only positives."*

> *"I am a Muswellbrook resident and Service Manager at Muswellbrook Nissan. I fully support Malabar Coal's Maxwell Underground Project. The project will be a fantastic, much needed boost to our local economy, supporting local businesses and offering employment opportunities to local residents for decades to come."*

> *"I support the Maxwell Underground project, as it is going to greatly benefit Muswellbrook and the surrounding community. The large contingent of new jobs will help the local economy to flourish. As a local resident, it is important to see potential for positive influx and growth."*

> *"As a small local landowner in the midst of the mining areas, I find that the local economic benefits received by the communities from Maxwell Underground are generous and in keeping with the local requirements. The changes to the project to ensure that their neighbours are not impacted, only shows Maxwell Undergrounds' committment* [sic] *to the local community. My husband and sons all work within the mining sector, and the approval of this project will continue to benefit not only our family, but the families of many of the local residents in the Muswellbrook and Singleton Shires."*

> *"Malabar has supported me and my business and invested time and resources to maintain the Merton Vineyard. They have also provided funding to local community groups for over six years. The Maxwell Project will mean continued support for a range of organisations and groups for more than 25 years."*

> *"I support this project because of the future jobs it will open up for the Hunter Region and the benefits to the community. It will bring more money into the towns supporting the businesses and local sports. It will also create economic benefits for the Hunter Region."*

> *"I support the plan of this mine. As an undergound* [sic] *mine this will not aestheically* [sic] *affect the local Denman district. This will be a great jobs bonus for the local economies."*

Concerns Raised in Public Submissions

Key concerns raised in relation to the potential negative social consequences of the Project included potential disruption to community cohesion and a perceived lack of community consultation, for example:

> *"I am worried about the health and well being of our community (both physical and mental) resulting from poor air quality, mining related stress, uncertainty and community division."*
>
> *"The social impacts of this project are significant and obvious to someone who lives here and is familiar with the issues of a large DIDO workforce and of the increasing concentration of economic activity on a single industry with a limited lifespan - yet the proponents have come to the extraordinary conclusion that none of these things is an issue."*
>
> *"Community/Social - the project will contribute to the ongoing degradation of the local community – in both numbers and spirit. Many residents will leave the area due to the negative environmental, air quality and noise impacts. For those who are unable to sell their properties (due to decreased land values or lack of buyers due to the impact of a mine being in close proximity), as well as those that feel they have no choice but to move away, this will lead to solastalgia (a form of mental or existential distress caused by the negative transformation of one's environment)."*
>
> *"`Consultation` which is based on such slight information might be discarded as ill-informed?"*
>
> *"I object to the Maxwell Underground Mine. They clearly spent a long time writing their EIS documents but maybe they should have spent a bit less time padding out reports and a bit more time talking to local people."*
>
> *"We note that social impact concerns raised by the local community as part of this proposal are similar to those expressed for the previous Drayton South mine – including but not limited to, concerns relating to air quality, water security, noise, future land use, visual amenity, increases in traffic, extra pressure on community services, including already stretched local health services, and impacts on housing prices."*

4.3.2 Rehabilitation at the Maxwell Infrastructure

Benefits Raised in Public Submissions

A number of submissions supporting the Project commended Malabar on the rehabilitation activities undertaken to date at the Maxwell Infrastructure and the potential beneficial final land uses of the rehabilitated landforms, such as:

> *"Malabar takes mine rehabilitation seriously. They started rehabilitating the old Drayton open cut straight away and have made great progress so far. It is great to see a business take this job so seriously. I appreciate that they have already opened up some of the land for cattle to graze on. This shows a commitment to coexistence with other local industries. I also note that the Maxwell Project will deliver a better rehabilitation outcome in the long term by filling voids at the former Drayton Mine with reject stone and rock. This will mean a much better outcome for our community."*
>
> *"After visiting the Maxwell Infrastructure site, I have witnessed the extensive rehabilitation being conducted to reverse the previous effects of an open cut mine. The land is flourishing and early rehabilitated sites are now capable of supporting livestock."*
>
> *"I have been on a lot of mine sites across the Hunter Valley and can honestly say the rehab Malabar Coal are doing on the site currently is the best I have ever seen and is a true credit to the owners of the site. I was directly involved in rehab in the late 1990's at various sites across the valley and rehab techniques and methods have come alone* [sic] *way since then, all for the better."*
>
> *"Over time all sites will be rehabilitated to safe and sustainable landforms, similar to the surrounding areas through active environmental management. Malabar is also investigating the option of building a 25MW solar farm on already rehabilitated land, which could provide clean energy to the local area."*
>
> *"They are proactive for the future of mining in all aspects from the sourcing of coal to the rehabilition* [sic] *of the land to planning of solar to create a more self sustainable cleaner future."*

Concerns Raised in Public Submissions

Concern was raised with rehabilitation at the site and how the rehabilitation liability is managed, such as:

> *"Rehabilitation is a related concern. How is the Dept and the Government managing its liability in this respect? The scope and cost of rehabilitation work requires close interrogation and, in our opinion, regular external auditing."*

"The analysis we have received thus far indicates that the existing security deposit for rehabilitation is likely to be inadequate. This opinion is rooted in previous estimates that had been attached to previous proposals for the site and the long term responsibilities attached to it. Impacts from subsidence on Malabar land are expected to be significant and render the land there unfit for agricultural pursuit and pasture development for grazing in the short to medium term. The proponent has committed to rehabilitation monitoring for two to five years after mining cessation however subsidence could occur for decades after and more then [sic] *five years will be required to return the area to an acceptable sustainable post mine landform."*

"We note that the concept of major and more natural re-¬shaping (geofluvial methods) of the previously Anglo mined areas has been rejected by the Applicant due, primarily, to the costs of major earthworks that would be involved. This is a disappointing outcome and discordant with "best practice" being undertaken by other major mining companies in the Upper Hunter."

4.3.3 Land Use Incompatibility with Other Surrounding Industries

Benefits Raised in Public Submissions

A number of submissions raised the potential benefits of the Project, which as an underground mine allows for co-existence with surrounding industries, such as:

"Over many years Hollydene Estate Wines has had to contend with then proposed Anglo Coal's Drayton South project. Here we submitted three successive very detailed formal objections and at substantial cost engaging our own experts. Our principle objection was large open cut mine literally at our front gate which would have been seriously detrimental to our award-winning tourism and wine business.

The Maxwell Underground Coal Mine Project although within the same exploration licensed area as Drayton South now as an underground mine development eliminates all of our real concerns and will enable Hollydene Estate Wines to completely co-exist sustainably with the Maxwell Project."

"This project represents a good compromise between mining and the equine industries of the Hunter Valley. Both industries can coexist if they are willing to work together for the betterment of the region. The Maxwell Project signals the company's commitment to work with their neighbours so mining, agriculture, horse breeding, tourism, etc can all continue to thrive in the region."

Concerns Raised in Public Submissions

Concerns that the Project is incompatible with the equine, agriculture and tourism industries in the Hunter region, for example:

"We would ask that you note that the dominant competing land use in the region is agriculture (most notably the beef and equine industries) and further recognise the critical mass of thoroughbred breeding ventures and interrelated services located within the region; brought to the area because of the once pristine natural environment which supported those industries and enhanced the region as a preferred place to live and work."

"The Maxwell project anticipates that blasting may occur in several scenarios throughout the mine's life. However the noise or blasting impacts on the nearby thoroughbred community do not appear to be have been considered or assessed at all. Whilst the charges will be smaller than for an open cut mine, one would have expected to see a more thorough analysis than the reference to "human annoyance criteria" given the well-established sensitivity of the operations here."

"Horses are flight creatures. They are particularly sensitive to sudden noise, and blasting. Noise and blasting has the potential to place both valuable livestock and our employees who handle them at risk."

"It is not a sustainable proposition for proximate studs and those who rely on them or tourism based businesses, to suggest that these businesses will not be impacted by noise, blasting, associated dust deposition and vibration, or subsidence for a period of 3 years or longer."

"The impact of this mine on clients or guests, including real and perceived impacts, has the potential to damage our businesses, our reputation and that of our industry. In our business reputation is everything and perception is reality."

Concern that development of a mining operation does not provide for the sustainability of other industries in the Hunter region, such as:

> *"There are too many mines already operating in the Upper Hunter creeping ever closer to our towns and agricultural industries - the mines arleady* [sic] *operating satify* [sic] *the current demand - don't need new mines. We need more balance in the Upper Hunter not more mines."*

Concerns were raised the Project would result in visual impacts to the landscape, with particular reference to reputational damage to the nearby equine enterprises, such as:

> *"We note the Applicant has acknowledged there will be visual impacts associated with their proposed underground operations which will be visible to and from the studs located directly opposed the proposed mine, their clients and to other travellers and tourists."*

> *"Visual impacts are important to our industry. In addition to landscape changes and visual reminders of mining, an approval of yet another mine creates uncertainty and negativity in people's minds when they see this mine's proximity to key horse studs and potential threats to vital water resources."*

4.3.4 Water Resources

Concerns Raised in Public Submissions

Various concerns were raised regarding potential impacts of mining on water resources, with many submitters concerned about current drought conditions, for example:

> *"Prior to the drought, we already had stressed systems, flooding of mines, excess water generation of water by mines...drawing away from the water table - ask the farmers about their wells and bores and creeks. Now this is compounded / suffering badly from regular and long periods of drought."*

> *"We are in the middle of a drought which has highlighted the importance of our water resources and this project will most likely have an effect on the river and some of the streams on Malabar property."*

> *"I also worry about the impact on local water supplies and how it will affect the local agriculture industry especially under the current drought conditions."*

> *"Our region like many others has been hit hard by water stress over the past few years, any further impacts on that highly stressed system could see catastrophic results across many facets of life. Malabar's groundwater modelling predicts a 2-metre drawdown of the hunter river alluvium thus having an effect of groundwater availability and surface water flows."*

> *"my particular worry about the effects of underground mining on our stressed water systems (Hunter River, Sadlers Creek* [sic] *etc) especially when we are suffering badly from regular and prolonged periods of drought."*

> *"The close proximity of the Maxwell Project to the Hunter River is also a major concern; there are major concerns that the Hunter River water could be lost into the Underground Mine."*

> *"The Hunter River crosses our Woodlands stud farm. Saddlers Creek, after leaving the Maxwell footprint is a boundary to Woodlands and enters the Hunter upstream from our farm. Any deleterious impacts (short or long term, current and future) on water quality and quantity will have significant impacts on our operations, business model and reputation. These concerns are further heightened during prolonged periods of drought as we are currently and more frequently experiencing."*

> *"Water security can never be taken for granted, particularly given the risks associated with water availability and allocations during drought conditions, which unfortunately are becoming more regular and prolonged."*

> *"Preliminary analysis of the impact of this proposal on ground and surface water has revealed serious risks and threats to the Hunter's water systems, which are the lifeblood of our industry and a critical water source for the Upper Hunter community."*

> *"We accept and acknowledge the company's commitment to underground mining to reduce air pollution and amenity impacts of the mine but a longwall mining operation in this location will inflict unacceptable impacts on water resources."*

4.3.5 Amenity and Health Impacts

Concerns Raised in Public Submissions

Various concerns were raised regarding potential impacts of the Project on amenity and community health, for example:

> *"The Mount Pleasant mine has had a dramatic effect on the region's air quality, you can see the dust coming out of it from many parts of Muswellbrook. It is hard to justify any project that will add any additional dust to the overburdened air-shed. I believe the situation is even worse further down the valley, the air quality network data says so."*
>
> *"The air quality in the valley has deteriorated to an alarming level with not enough research into the actual effect on human health."*
>
> *"Our airshed is already overburdened by existing mining operations with cumulative impacts including increased incidence of respiratory disease (especially asthma) and low birthweights for babies."*
>
> *"I am worried about the health and well being of our community (both physical and mental) resulting from poor air quality, mining related stress, uncertainty and community division."*
>
> *"In addition, the Drayton coal measures, now Maxwell, are renowned as one Australia's worst for spontaneous combustion site which will compound an already existing issue at this location currently with sulphur dioxide and nitrous gas expelled into atmosphere in unprecedented amounts drift across the neighbouring horse studs and function centres"*
>
> *"Anyone from state planning who thinks it is valid to approve more mining in the hunter valley should have to move here, and see how their sinuses, and their lungs, and their overall health and well being is affected from long term exposure."*
>
> *"We all lived through the previous mine applications on this same site and feel that these continued mine applications are unjust and continue to provide increasing stress to my family and our community. We talk regularly as a family unit and my sons in particular show heightened stress levels when the mining proposal is mentioned."*
>
> *"Dust emissions and air quality therefore are critical concerns for our operations given this business model. Any adverse impacts resulting in increases in dust deposition or the further worsening of the area's air quality will severely affect our business and reputation. The proposal should therefore be judged, not by the "Project Alone", but against existing mine impacts, current air quality levels in the Upper Hunter and its cumulative effects."*

4.3.6 Cumulative Impacts

Concerns Raised in Public Submissions

Concerns were raised in a number of public submissions that the potential cumulative impacts of the Project and other mines have not been sufficiently considered (including air quality and water impacts), such as:

> *"The minefield in totality is already creating unacceptable impacts on air quality and water supply. Cumulative impacts are not studied or shown because they are so damning. Adding more to the cumulation to date, without assessing the effects of doing so, is unscientific, unethical and irresponsible."*
>
> *"The cumulative impacts of mining on our businesses, environment and community have not been fully examined, explained or costed. How can anyone assess the impacts of this mining proposal without this information?"*
>
> *"There is advice that the cumulative impacts of mining on our businesses, environment and community have not been fully examined, explained or costed. therefore who can make an adequate assessment of the proposal."*
>
> *"Cumulative impacts of this mine and all the other mines in the area have not been adequately assessed. Given the serious concerns regarding water and air quality alone, it is critical that a cumulative assessment of the impacts of all stages and all impacts of this proposal is undertaken as required by the Secretary's Environmental Assessment Requirements."*

4.3.7 Climate Change and Greenhouse Gas Emissions

Concerns Raised in Public Submissions

Concerns were raised in a number of public submissions that greenhouse gas emissions associated with the Project are not consistent with Australian Government commitments, and global efforts to reduce greenhouse gas emissions, such as:

> *"We note that the greenhouse assessment of the project makes no mention of global efforts to reduce greenhouse gas emissions in line with the commitments of the Paris climate agreement over the time frame that this mine is proposed to operate and how these related to the 326 million tonnes of carbon dioxide that will be produced from burning coal from the project. This is crucial context that must be provided for the assessment to be undertaken for the project to be adequately assessed. Similarly, there is no assessment provided against the principle of inter-generational equity."*
>
> *"According to the EIS, the project is anticipated to produce 8000 tonnes coal/annum, producing an equivalent of 146 000 tonnes of carbon dioxide over its 26-year lifetime. This represents 0.08% of Australia's annual emissions (on 2016 levels), which I argue is not a negligible amount, given that we need to reduce our emissions by 45% by 2030 to limit warming to 1.5 degrees (IPCC, 2018)."*
>
> *"At this time, the commencement of new coal mining operations is no longer in line with the preservation of society and a safe climate in which human civilization can survive. This is abundantly clear in the many many reports from the Intergovernmental Panel on Climate Change, and many others besides. It is also not in line with the Paris Agreement, to which Australia is a signatory."*
>
> *"The project also necessitates the clearing of 146 ha of threatened native vegetation, and the land-use change emissions from this activity have also not been addressed. 1 hectare of mature trees can store as much as 100-300 tonnes of C02 (Carbon Neutral)."*
>
> *"Cressfield acknowledges the coal mining industry has played an integral and pivotal role in the growth of this region, and that this will continue to be the case for some years to come. We also acknowledge that other industries are every bit as important, and when they are sustainable into the future as well as being far less harmful to our environment, we believe that they should be protected with vigour. There is no doubt fossil fuels are a finite energy source and that we must continue to focus elsewhere for our energy needs, instead of doggedly extracting every ton of coal available at the expense of the environment and competing for land use."*
>
> *"We also question the underlying assumptions and basis upon which Scope 1, 2 and 3 emissions are calculated and therefore the veracity of the conclusions reached by the Applicant."*

4.3.8 Agriculture

Concerns Raised in Public Submissions

Concerns were raised in a number of public submissions that the Project would impact on agricultural land, and subsidence as a result of the Project mining activities would impact on the capability of agricultural land above the mining operations, for example:

> *"We believe this country needs mining, however it should not be allowed to destroy and impact on high quality agricultural land and our most precious resource of all, our water, without water this country will be doomed."*
>
> *"Another of our major concerns is the huge amount of high quality agricultural land that is endangered of being lost forever to the coal industry, either by been destroyed by mining, locked up by mining companies, and not used to its full potential, or by Agricultural Enterprises and Thoroughbred Studs like Coolmore and Godolpin* [sic] *who realize that it will be impossible for them to continue in the area, if this Coal Project is allowed to proceed."*
>
> *"I object to the Maxwell Underground Coal Mine Project because; 1) of the high risk posed by this proposal to our air quality, water, productive agricultural land, critical industry clusters and tourism industries"*
>
> *"The subsidence from this underground mine that will occur will destroy this prime agricultural land."*
>
> *"Impacts from subsidence on Malabar land are expected to be significant and render the land there unfit for agricultural pursuit and pasture development for grazing in the short to medium term."*
>
> *"…impacts of subsidence on the rural landscape which could adversely affect the suitability of lands for subsequent rural uses"*

4.3.9 Other Matters

Concerns Raised in Public Submissions

Concerns were raised in the public submissions regarding the potential impacts to Aboriginal cultural heritage, such as:

> *"We have some of the oldest living cultures in the world and this valley has a rich indigenous history and it's being lost forever to create large open wounds in the ground. An emphasis on cultural heritage whether it is indigenous or not needs to take place."*

> *"And apparently we're also supposed to believe that all the Aboriginal artefacts stop at the project boundary? I actually care about our indigenous heritage... would be nice if it got a proper look in in this assessment."*

> *"No connection between Aboriginal artefacts and stone sites, their use and the wider landscape connections are made. There has been no attempt to understand how this landscape formed and functioned as part of the region – including its importance to the Indigenous and cultural history of the region."*

> *"Maxwell Ventures (Management) Pty Ltd, has submitted an EIS that has failed to address the impact on the Aboriginal heritage contained with in the Registered native title claimed area of Scott Franks and anor on the behalf of the Wonnarua people."*

Concern was raised in one public submission that the EIS did not include sufficient information regarding the proposed biodiversity offsets for the Project, such as:

> *"The EIS also fails to adequately describe in detail the exact nature of biodiversity offsets that Malabar Coal will pursue, including what sites will be determined as 'like' vegetation and whether the offset will include the required component of 'additionally'."*

Concern was raised in one public submission that the clearance of native vegetation for the Project would result in loss of habitat for species, for example:

> *"The clearing of this vegetation will also mean a loss of habitat for species"*

Concerns were raised in the public submissions that the Project would contribute to additional traffic in the area, which was seen to add to the cumulative impact on the transport pathways in the region, such as:

> *"The roads already have too much traffic on them from contract Mineworkers"*

> *"we need space on our roads and our railway lines we need long term local families to stay in the area"*

> *"The Edderton Road is an important route from Coolmore to other stud farms and critically the Scone Equine Clinic, particularly in the event of a stallion colicking and requiring urgent surgery. Colic is the leading cause of premature death in horses. Severe cases demand surgery and without treatment can kill a horse within a few hours. Coolmore manages its transport fleet to ensure there is a horse float available at the farm 24/7, 365 days a year expressly if needed for a stallion or broodmare with colic. The proposed realignment of the Edderton Road and the potential for further delays or roadworks is a cause for concern."*

5 RESPONSES TO SUBMISSIONS

This attachment forms part of the Maxwell Project Submissions Report. The Submissions Report provides detailed responses to the concerns raised in the submissions from government agencies, organisations and members of the public.

Many of the submissions have reiterated the design commitments imposed by Malabar and described in the EIS. Malabar is committed to developing the Project **solely as an underground mining operation** capable of producing predominantly coking coal products. Underground mining methods significantly reduce environmental impacts, including dust, noise and surface disturbance, in comparison to open cut mining methods.

In addition to the proposed mining method, the following key Project design measures and constraints have been incorporated by Malabar in response to stakeholder feedback:

- limiting the requirement to develop new infrastructure through the use of the substantial existing Maxwell Infrastructure;
- placement of the MEA in a natural valley, and reducing the height of infrastructure components, to restrict direct views of the MEA from the Golden Highway and neighbouring horse studs;
- use of the existing site access to the Maxwell Infrastructure from Thomas Mitchell Drive, to limit Project traffic movements on the Golden Highway and Edderton Road;
- sealing the extended site access road to the MEA during the first year of mining operations;
- use of a covered overland conveyor to transport coal extracted by longwall mining machinery to further reduce potential dust and noise impacts;
- voluntary relinquishment of the portion of EL 5460 that extended south of the Golden Highway beneath the neighbouring Godolphin Woodlands Stud;
- avoiding direct subsidence impacts on the Hunter River, the Hunter River alluvium and Saddlers Creek by imposing constraints on the design of the mine layout;
- limiting the extent of the underground mine layout to beneath freehold land owned by Malabar (i.e. there would be no direct subsidence impacts to land owned by neighbouring horse studs);
- use of water treatment systems that maximise the re-use of water on-site and remove any requirement to source water externally for mining operations (e.g. from the Hunter River); and
- development of a site water management system that avoids the need for controlled release of mine-affected water to the Hunter River.

In response to submissions received on the EIS, Malabar has committed to the following additional management and monitoring measures:

- Malabar would consult with MSC regarding the post-mining use of the site access road prior to mine closure, including consideration of dedicating the site access road as a public road post-mining.
- Malabar would implement a monitoring program for the riparian vegetation along Saddlers Creek and outcomes would be reported in the Annual Review.
- Prior to operating the water treatment facility, Malabar would prepare a Brine Management Plan for the Project in consultation with the EPA.
- Malabar would include the additional surface water monitoring sites requested by the MSC, to monitor for potential off-site sediment generation due to subsidence.

- Malabar would maintain a file of historical information regarding the former Drayton Mine on-site. Malabar would make the information available to the public upon request (e.g. for students completing research projects). Malabar would also make the material available to MSC should it wish to establish a permanent memorial to the former Drayton Mine.
- In the event of a groundwater-related complaint from a local landholder in relation to a potential mine-related effect on their groundwater supply, Malabar would facilitate the provision of temporary water supply to provide immediate relief while an impact investigation is undertaken.
- Malabar would consult with Division of Resources and Geoscience within DPIE (DRG) regarding potential resource sterilisation in biodiversity offset areas that are identified for the Project.
- If, by the end of 2025, no clear resolution is reached with other mining and industrial facilities in the region, Malabar would rehabilitate the South Void highwall and North Void low wall in accordance with the approved Final Void Management Plan, unless otherwise agreed with the Resources Regulator. The North Void highwall works would be completed once the rail and CHPP infrastructure are no longer required.
- Malabar supports the establishment of a working party to be established by 2035 to plan for the transition to an alternative post-mining land use. Malabar would also continue to consult with the Aboriginal community as part of the final land use planning for the Project.

6 RESIDUAL SOCIAL IMPACTS

6.1 OVERVIEW OF RESIDUAL SOCIAL IMPACTS IDENTIFIED IN THE SIA

The SIA identified residual social impacts that may remain for the Project following the implementation of the commitments and social impact management strategies (Sections 6.1 to 6.7 of the SIA), which included:

- emerging or unanticipated environmental impacts at individual neighbouring properties, to be identified and addressed through regular engagement;
- potential for residual levels of anxiety or stress among individual neighbouring landowners regarding property-specific or more general environmental impacts, to be addressed through ongoing and adaptive management strategies;
- potential for ongoing reservation, negative perception or opposing community views about the compatibility of the Project with the equine and viticulture industries in the region, or perceived conflict with regional economic transition goals; and
- cumulative impacts on housing affordability, social infrastructure capacity, local labour and skill shortages, to be addressed through a cumulative impact monitoring framework with local and state agencies and other nearby operations.

An update regarding these residual social impacts, in consideration of the first hand views provided by stakeholders in their submissions on the EIS, is provided below.

6.2 UNANTICIPATED ENVIRONMENTAL IMPACTS

In response to public feedback, Malabar has reiterated that the underground mining methods proposed for the Project significantly reduce environmental impacts, including dust, noise and surface disturbance, in comparison to open cut mining methods. Malabar has also provided additional information regarding the uncertainty analysis that has been undertaken with respect to potential impacts on groundwater, including benchmarking the performance of previous groundwater models for similar underground projects in the Hunter Valley.

Some members of the community may hold residual concerns regarding unanticipated environmental impacts. However, the majority of public submissions on the Project have been in support, including from members of the community that previously objected to the Drayton South Coal Project (e.g. Hollydene Estate Wines).

Malabar has committed to a number of mitigation measures to alleviate concerns regarding unanticipated environmental impacts raised in the public submissions. For example, in the event that a reasonable groundwater-related complaint is received from a local landowner in relation to a potential mine-related effect on their groundwater supply, Malabar would facilitate the provision of temporary water supply to provide immediate relief while an impact investigation is undertaken.

6.3 POTENTIAL STRESS AND ANXIETY OF NEIGHBOURING LANDOWNERS

As described in Section 4.3.5, a number of submissions on the EIS raised concerns regarding residual levels of anxiety or stress.

The Social Impact Assessment prepared by Elliott Whiteing (2019) acknowledges the Project could contribute to stress and anxiety for some neighbouring landowners due to uncertainties or concerns about environmental or social impacts of the Project. Malabar would manage these concerns through ongoing and adaptive management including engagement and information provision relating to specific areas of community concerns.

Malabar will continue to engage with near neighbours and the local community to respond to any concerns or reservations about potential Project impacts prior to and throughout the life of the Project, and to lessen the potential for stress and anxiety. However, it is noted that some concerns may persist for some community members, regardless of these strategies.

6.4 PERCEIVED INCOMPATIBILITY OF PROJECT WITH EQUINE AND VITICULTURE INDUSTRIES

A number of submissions (primarily from Aberdeen and Scone) had concerns about the perceived incompatibility of the Project and the equine and viticulture industries as described in Section 4.3.3.

It is noted that previous open cut mining proposals in EL 5460 have been considered to be incompatible with nearby equine land uses, notably the Coolmore and Godolphin Woodlands Studs.

This Project is for an **underground** mining operation that is unlike previous proposals in EL 5460. Stakeholder concerns and perceptions of previous proposals have been considered and incorporated into the Project design and Malabar's operating philosophy.

Malabar has approached the design of this Project and its relationship with nearby equine enterprises with the following aims:

- being aware of the points of view and perceptions of nearby equine enterprises;
- making key senior Malabar personnel approachable and available for consultation to allow for direct consideration of stakeholder feedback;
- incorporating significant design measures into the Project to avoid and mitigate potential direct impacts on nearby equine enterprises; and
- developing an operating philosophy that also addresses the perceptions of stakeholders associated with nearby equine enterprises (including customers).

In addition to the Project design measures already incorporated and the engagement conducted to date, Malabar would implement the following measures to address perceptions and queries of stakeholders associated with nearby equine enterprises (including customers):

- Malabar would offer to meet regularly with representatives of the Coolmore Stud and Godolphin Woodlands Stud over the life of the Project.
- Malabar would maintain fence lines, entrances and roadside plantings within Malabar-owned properties to present a visually pleasing appearance that is congruent and sympathetic with the appearance of surrounding rural properties.
- Malabar would discourage workers from wearing high-visibility clothing when travelling to public places in Jerrys Plains.
- When and where appropriate, Malabar would:
  - Use appropriate media platforms to disseminate current Project information that outlines the relative benefits of underground mining and the beneficial outcomes of the Project.
  - Offer to release joint media with horse studs or other sensitive receptors regarding the potential for co-existence between underground mining and other local industries (including equine, viticulture and agriculture).

Potential impacts on Hollydene Estate Wines have been avoided or mitigated through the significant design measures incorporated into the Project. The compatibility between the Project and other land uses is acknowledged by Hollydene Estate Wines' supporting submission, which states:

> *My name is Karen Williams and I am the Managing Director and founder of United Pastoral Pty Limited which operate Hollydene Estate Wines at 3483 Golden Highway Jerrys Plains which directly neighbours the proposed Maxwell Underground Coal Project.*
>
> *Over many years Hollydene Estate Wines has had to contend with then proposed Anglo Coal's Drayton South project. Here we submitted three successive very detailed formal objections and at substantial cost engaging our own experts. Our principle objection was large open cut mine literally at our front gate which would have been seriously detrimental to our award-winning tourism and wine business.*

The Maxwell Underground Coal Mine Project although within the same exploration licensed area as Drayton South now as an underground mine development eliminates all of our real concerns and will enable Hollydene Estate Wines to completely co-exist sustainably with the Maxwell Project.

The project as proposed provides significant benefits to the community and in turn Hollydene Estate Wines as a local business reliant on a strong local economy. With the Maxwell Project providing long term local employment aligned with committed local expenditure and utilisation of local services there is no doubt this mine will be a key economic driver in the Muswellbrook Shire.

To this end Hollydene Estate Wines fully supports the Maxwell Project and we look forward to the timely approval, development and ultimate production.

6.5 CUMULATIVE IMPACTS ON SOCIAL AND COMMUNITY INFRASTRUCTURE

No organisation or public submissions raised concerns regarding potential impacts on housing affordability, social infrastructure capacity, local labour or skill shortages.

Malabar has entered into negotiations for a Voluntary Planning Agreement with MSC.

In addition, consistent with recommendations made by the MSC in its submission on the Project, Malabar would:

- Establish partnerships with Muswellbrook and Singleton High Schools to initiate training, apprenticeship, cadetship and/or intern programs that would provide pathways for local students to Project employment.
- Establish partnerships with University of Newcastle, Muswellbrook TAFE Campus (Hunter TAFE) and Mining Skills Centre to develop Project-specific training programs and identify local young people with an interest in Project employment.
- Use its best endeavours to provide employment for four apprentices or trainees per year for the life of the mine sourced from residents within the Muswellbrook LGA.
- Focus recruitment on hiring residents of the Muswellbrook and Singleton LGAs, including local Indigenous people, young people, and local women.
- Encourage construction contractors and suppliers to hire locally where practical through contractual terms.
- Require construction contractors to engage with businesses in the Project region.
- Promote availability of Project employment and application arrangements in *The Muswellbrook Chronicle*, *Hunter Valley News*, *Denman News*, *Scone Advocate* and *The Singleton Argus*.
- Maintain regular engagement with local employment agencies to advise of opportunities for training and employment.
- Promote available services to assist candidates in preparing their applications and supporting documentation.

7 REFERENCES

AECOM Australia Pty Ltd (2019) *Maxwell Project Aboriginal Cultural Heritage Assessment*.

Department of Environment, Climate Change and Water (2010) *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010.*

Elliott Whiteing Pty Ltd (2019) *Maxwell Project Social Impact Assessment.*

Malabar Coal Limited (2019) *Maxwell Project Environmental Impact Statement*.