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# **Document Control Sheet**

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Α	Draft	26/04/2022	AS	MR
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С	Final	27/06/2022	AS	MR

#### <u>Limitations Statement</u>

This report has been prepared in accordance with and for the purposes outlined in the scope of services agreed between ADW Johnson Pty Ltd and the Client. It has been prepared based on the information supplied by the Client, as well as investigation undertaken by ADW Johnson and the sub-consultants engaged by the Client for the project.

Unless otherwise specified in this report, information and advice received from external parties during the course of this project was not independently verified. However, any such information was, in our opinion, deemed to be current and relevant prior to its use. Whilst all reasonable skill, diligence and care have been taken to provide accurate information and appropriate recommendations, it is not warranted or guaranteed and no responsibility or liability for any information, opinion or commentary contained herein or for any consequences of its use will be accepted by ADW Johnson or by any person involved in the preparation of this assessment and report.

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The Client should be aware that this report does not guarantee the approval of any application by any Council, Government agency or any other regulatory authority.



# **Executive Summary**

Karuah East Quarry Pty Ltd (KEQPL) operate the Karuah East Quarry (KEQ), located approximately 5km northeast of the township of Karuah, in the Mid Coast local government area. KEQ supplies hard rock quarry products to the construction industry, with markets in the Lower & Upper Hunter and Mid Coast regions and emerging markets in the Greater Sydney region.

KEQPL are seeking to modify the State Significant Development (SSD) consent 09\_0175 for the KEQ under the provisions of Section 4.55(2) of the NSW Environmental Planning and Assessment Act 1979 to increase the approved disturbance area of the KEQ primarily to establish additional stockpiling areas.

## **Background**

Project Approval 09\_0175 was granted for the KEQ on 17 June 2014 under the provisions of Section 75J of the EP&A Act 1979. Key features of the Project Approval include:

- Quarrying operation is permitted on the site until 31 December 2034;
- Establishment and use of quarry plant and associated infrastructure;
- The extraction (excluding overburden), processing, stockpiling and transport of quarry products is limited to 1.5 million tonnes in any calendar year;
- Roadworks to secure access to the site including upgrade and extension of Blue Rock Close, realignment of the Andesite Road and Blue Rock Close intersection and adjust road markings at Branch Lane and Andesite Road intersection;
- A total permitted disturbance area of 33.01 ha;
- Establishment of a biodiversity offset area on lands adjacent to the quarry (Part Lot 13 DP 1024564, Lot 14 DP 1024564 and Lot 5 DP 838128);
- Conditions apply to manage / mitigate potential impacts associated with a range
  of environmental conditions including noise; blasting; air quality; soil and water;
  transport; biodiversity; heritage; emergency and hazards management and waste;
  and
- Progressive rehabilitation of the subject site.

The project was transitioned to a State Significant Development (SSD) under the provisions of Clause 6 Schedule 2 of the Environmental Planning and Assessment (Savings, Transitional and other Provisions) Regulation 2017 on 25 January 2019. The consent has been modified on four (4) previous occasions.

Since the time of the original approval, the customer and project base of the KEQ has evolved, with the quarry now servicing a number of large public infrastructure projects. The evolving customer base includes Transport for NSW, Port Authority and several local Councils. When tendering for large infrastructure projects, KEQPL are required to demonstrate proof of stockpiling capacity, which is subject to a quality testing process to demonstrate Quality Assurance. This typically requires up to three stockpiles of 4,000m³ of product to demonstrate compliance with various Australian Standards and TfNSW specifications. Given that the KEQ stocks up to 15 different types of product, KEQPL are facing a significant problem in that the available stockpiling areas are insufficient in size. This is highly problematic because:

 The KEQ will be unsuccessful with tenders purely because it cannot comply with tender requirements relating to demonstrated stockpiling capacities and Quality Assurance requirements; and



 The lack of stockpiling area will have flow on effects that will affect the overall KEQ operation.

To address this issue, additional land is required for stockpiling of material.

#### **Proposal**

The proposed modification (MOD 10) seeks to increase the approved disturbance area of the Karuah East Quarry from 33.01ha to 40.18ha (a 7.17ha increase). In addition to establishing additional stockpiling areas, MOD 10 will also facilitate improved surface water management, a new two storey administrative building and improved areas for vehicle manoeuvring and parking.

The total proposed additional disturbance area of 7.17ha is comprised of the following three (3) areas:

- Northern Disturbance Area A nominal area of 0.166ha adjacent to the crushing plant / processing area;
- Central Disturbance Area An area of approximately 4.911ha positioned north of the established southern stockpile area; and
- Southern Disturbance Area An area of approximately 2.093ha positioned to the south of the established southern stockpile area.

Vegetation clearing and bulk earthworks will be completed to establish workable areas.

Within the proposed 7.17ha disturbance area, 6.98ha of vegetation is proposed to be cleared. 0.19ha of the proposed disturbance area is cleared land comprised of existing tracks from historical uses.

The SSD approval as it relates to extraction area, extraction rates, quarrying activity, hours of operation and vehicle movements will not be affected by the proposed modification.

Environmental safeguards incorporated into Management Plans that are in place for the KEQ operation will be expanded where appropriate to accommodate the proposed modification.

The proposed increase to KEQ's disturbance area is predominantly located within areas of the site currently approved and managed as a biodiversity offset area on Lot 13 1024564 (established as part of the original KEQ approval). In order to offset the impacts of disturbing land within the biodiversity offset area, the applicant proposes to:

- Replace the existing offset area being directly impacted by proposed MOD 10 with 'like-for-like' biodiversity values; and
- Offset the impact of MOD 10.

This matter has been discussed in detail with the NSW Department of Planning & Environment's Biodiversity Conservation Division; the Australian Government Department of Agriculture Water & Energy and the NSW Biodiversity Conservation Trust. The proposed approach is consistent with the outcomes of these discussions.



#### **Key Environmental Investigations**

Detailed investigations of the existing environment and potential impacts of the proposed modification have been undertaken consistent with those confirmed with the NSW DPE during the proposed modification's scoping process. Specialist consultant reports were commissioned where necessary. The following is a summary of the key matters investigated:

- Flora and fauna;
- Surface water:
- Groundwater;
- Air quality and greenhouse gas;
- Aboriginal archaeology;
- Noise:
- Land resources and rehabilitation; and
- Visual.

The findings of the environmental assessments undertaken confirm that the site is suitable to accommodate proposed modification.

#### Consultation

In establishing the environmental parameters and scope of the proposed modification, consultation has been undertaken with key public authorities including:

- NSW Department of Planning and Environment;
- NSW DPE Biodiversity Conservation Division;
- NSW Biodiversity Conservation Trust; and
- Australian Government Department of Agriculture, Water & Environment.

In addition to authority consultation, the Applicant has also consulted with the Karuah East Quarry Community Consultative Committee regarding the proposed modification.

Further opportunity for involvement of both government authorities and the community will occur during the public exhibition phase of the assessment.



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# 1.0 Introduction

#### 1.1 INTRODUCTION

ADW Johnson has been commissioned by Karuah East Quarry Pty Ltd (KEQPL) to prepare a Section 4.55(2) application to modify the State Significant Development (SSD) approval for the Karuah East Quarry (SSD Approval 09\_0175).

The proposed modification (MOD 10) seeks to increase the approved disturbance area of the Karuah East Quarry (KEQ) from 33.01ha to 40.18ha (a 7.17ha increase) primarily to establish additional stockpiling areas. MOD 10 will also facilitate improved surface water management, a new two story administrative building and improved areas for vehicle manoeuvring and parking.

The approved extraction area, extraction rates, quarrying activity, hours of operation and vehicle movements will not be affected by the proposal.

This application seeks to modify the project approval under Section 4.55(2) of the Environmental Planning and Assessment Act 1979 (EP&A Act).

#### 1.2 APPLICATION DETAILS

**Table 1 - Application Details** 

REPORT PREPARED BY:			
Name:	ADW Johnson Pty Ltd		
Mat Radnidge – Senior Town Planner Ph: (02) 4978 5100  Fax: (02) 4978 5199 Email: mathewr@adwjohnson.com.au Website:www.adwjohnson.com.au			
PROJECT DETAILS:			
Description of Proposal:	Modification (MOD 10) under Section \$4.55(2) of the Environmental Planning and Assessment Act 1979 to Project Approval 09_0175 (as Modified).  Proposed increase to disturbance area of 7.17ha, primarily to establish additional stockpile areas. MOD 10 will also facilitate improved surface water management, a new administrative building and improved areas for vehicle manoeuvring and parking.		
Applicant Name:	Karuah East Quarry Pty Limited		
Applicant Address:	Karuah East Quarry Pty Limited C/- ADW Johnson Pty Ltd Unit 7, 335 Hillsborough Road WARNERS BAY NSW 2282		
Property Description:	Lot 12 DP 1024564 (Karuah East Quarry site). Lot 13 DP1024564 (Karuah East Quarry site). Lot 202 DP1042537 (approved roadworks). Lots 26 and 27 DP1024341 (approved roadworks). Lots 16 and 17 DP 1024564 (approved roadworks).		



#### 1.3 SUMMARY OF APPROVED PROJECT

## 1.3.1 The Site and Locality

The Karuah East Quarry (KEQ) is located off the Pacific Highway (Blue Rock Close), approximately 5km northeast of Karuah on the following lands:

- Lot 12 & Lot 13 DP 1024564 (the KEQ site);
- Lot 202 DP 1042537, Lots 26 & 27 DP 1024341 and Lots 16 & 17 DP 1024564 (quarry access via an extension of Blue Rock Close); and
- Lot 14 & Part Lot 13 DP 1024564 and Lot 5 DP 838128 (biodiversity offset area).

**Figure 1** below shows the location of the site in its regional and local context.



Figure 1: Location Plan Showing Site in a Broad Regional Context.

**Figure 2** below shows the location of the Karuah East Quarry in its local context. In particular the figure shows:

- The Karuah East Quarry (SSD 09\_0175);
- The Karuah Quarry (DA 265-10-2004);
- The conservation offset area established for the Karuah Quarry;
- The conservation offset area established for the Karuah East Quarry;
- The proposed extension area of the Karuah East Quarry, primarily for additional stockpiling area (MOD 10);
- The proposed footprint of the new Karuah Red Quarry (an Environmental Impact Statement for this project is underway (the project is a Designated Development)).
   This quarry is proposed to be owned and operated by Hunter Quarries Pty Ltd, a company affiliated with Karuah East Quarry Pty Ltd; and
- The indicative location of the Karuah South Quarry proposal (SSD 17\_8795). This proposal is not related to the Karuah East Quarry or Karuah Quarry (i.e. it is not affiliated with KEQ Pty Ltd or Hunter Quarries Pty Ltd).



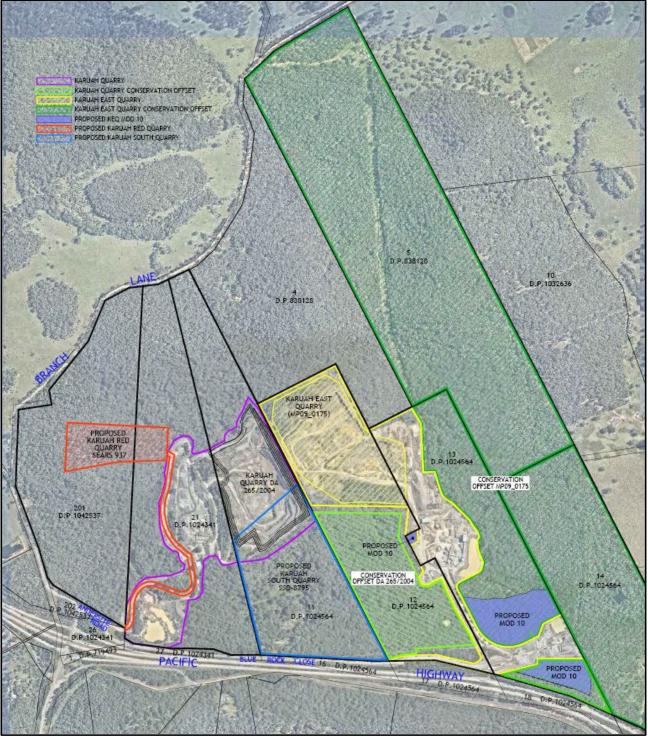


Figure 2: Location Plan in Context of Surrounding Lands, Existing Development & Other Proposed Development.

# 1.3.2 Summary of Project Approval

Project Approval 09\_0175 was granted for the KEQ on 17 June 2014 under the provisions of Section 75J of the EP&A Act 1979. Key features of the Project Approval include:

- Quarrying operation is permitted on the site until 31 December 2034;
- Establishment and use of quarry plant and associated infrastructure;
- The extraction (excluding overburden), processing, stockpiling and transport of quarry products is limited to 1.5 million tonnes in any calendar year;



- Roadworks to secure access to the site including upgrade and extension of Blue Rock Close, realignment of the Andesite Road and Blue Rock Close intersection and adjust road markings at Branch Lane and Andesite Road intersection;
- A total permitted disturbance area of 33.01 ha;
- Establishment of a biodiversity offset area on lands adjacent to the quarry (Part Lot 13 DP 1024564, Lot 14 DP 1024564 and Lot 5 DP 838128);
- Conditions apply to manage / mitigate potential impacts associated with a range
  of environmental conditions including noise; blasting; air quality; soil and water;
  transport; biodiversity; heritage; emergency and hazards management and waste;
  and
- Progressive rehabilitation of the subject site.

Modification (MOD 1) to the Project Approval was approved on 27 April 2018 under the provisions of Section 75W of the EP&A Act. The modification approved a nominal expansion to the approved area of disturbance by 2,500m² to allow for improved vehicle manoeuvring in proximity of the crushing plant and processing area.

Modification (MOD 2) to the Project Approval was granted consent on 19 December 2018 under the provisions of Section 75W of the EP&A Act. MOD 2 approved a 1.133ha increase to the site disturbance area to allow for improved environmental management and improved operational safety (for quarry vehicles).

Modifications 3 – 7 were withdrawn.

On 25 January 2019 the KEQ project was transitioned to a State Significant Development (SSD) under the provisions of Schedule 2 Clause 6(1) of the Environmental Planning and Assessment (Savings, Transitional and other Provisions) Regulation 2017.

A third modification (MOD 8) to the Project Approval was granted consent on 22 December 2020 under the provisions of \$4.55(1A) of the EP&A Act. MOD 8 approved revised operational acoustic criteria in line with the NSW Noise Policy for Industry 2017. MOD 8 also formalised a number of industry best practice acoustic mitigation measures that have been installed at the quarry.

A fourth modification (MOD 9) to the Project Approval was granted consent on 2 December 2021 under the provisions of Section 4.55(1A) of the EP&A Act. MOD 9 extended the approved operating hours of the KEQ.

# 1.3.3 Overview of Karuah East Quarry Operations

#### **Quarry Operations**

Approved quarrying activities undertaken on the site generally include:

- Drilling and blasting of rock material within the quarry pit;
- Collection and transportation of blasted material to the crushing & processing area using mobile equipment;
- Crushing, processing and screening of quarried material is undertaken using fixed and mobile equipment;
- Stockpiling of processed material; and
- Stockpiled material is loaded onto trucks and exits the site to market via the weighbridge.



### **Existing Site Improvements**

Existing site improvements include:

- Quarry pit (extraction area);
- Crushing plant and processing infrastructure;
- Stockpiling areas;
- Internal haulage roads;
- Weighbridge office;
- Weighbridge;
- Stormwater management infrastructure including three (3) dams;
- Parking areas for light vehicles;
- Amenity facilities;
- Other minor structures; and
- Fencing.

Figure 3 below shows the existing configuration of the site.

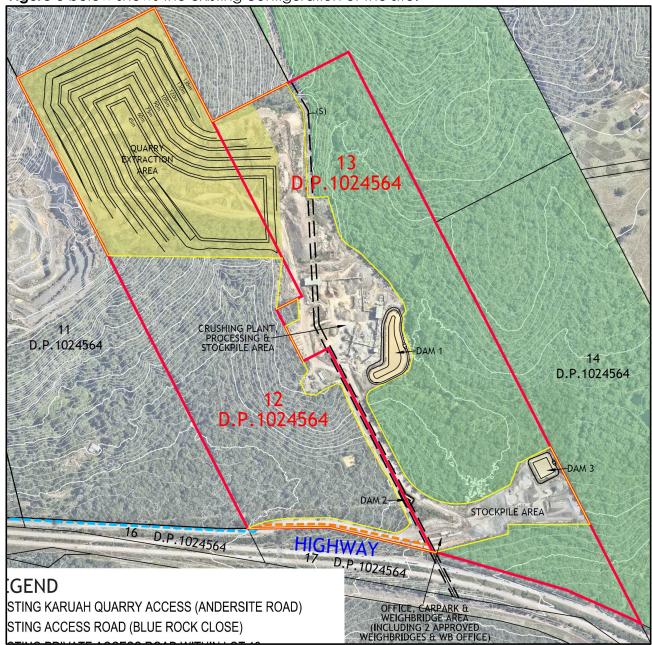


Figure 3: Existing Site Plan.



#### **Environmental Management and Monitoring**

The operation of KEQ is undertaken in accordance with the Project Approval (09\_0175), EPBC Approval 2014/7282 and Environment Protection License (EPL 12133).

A number of management plans are in place at KEQ including to ensure satisfactory environmental performance and these include:

- Biodiversity Offset Area Management Plan;
- Air Quality & Greenhouse Gas Management Plan;
- Blasting Management Plan;
- Environmental Management Strategy;
- Heritage Management Plan;
- Landscape & Rehabilitation Management Plan;
- Noise Management Plan;
- Pollution Incident Response Management Plan;
- Traffic Management Plan;
- Water Management Plan; and
- Waste Management Plan.

#### 1.4 BACKGROUND TO PROPOSED MODIFICATION & WHY MODIFICATION IS REQUIRED

Management of KEQPL have identified that additional disturbance area for stockpiling is essential for the ongoing long term efficient operation of the KEQ.

Since the time of approval of the KEQ, the customer and project base of the KEQ has evolved, with the quarry now servicing a number of large public infrastructure projects. The evolving customer base includes Transport for NSW, Port Authority and several local Councils. When tendering for large infrastructure projects, KEQPL are required to demonstrate proof of stockpiling capacity, which is subject to a quality testing process to demonstrate Quality Assurance. This typically requires up to three stockpiles of 4,000m³ of product to demonstrate compliance with various Australian Standards and TfNSW specifications. Given that the KEQ stocks up to 15 different types of product, KEQPL are facing a significant problem in that the available stockpiling areas are insufficient in size. This is highly problematic because:

- The KEQ will be unsuccessful with tenders purely because it cannot comply with tender requirements relating to demonstrated stockpiling capacities and Quality Assurance requirements; and
- The lack of stockpiling area will have flow on effects that will effect the overall KEQ operation.

To address this issue, a modification to the KEQ Project Approval is necessary to increase the disturbance area to allow additional stockpiling area to be established.

Additionally, the following is noted:

- KEQ does not currently have a high quality administration building for staff and site
  visitors (the weighbridge office is used for this purpose). MOD 10 will provide sufficient
  space for the establishment of an office commensurate with the scale of the KEQ
  operation; and
- There is an irregular shaped 'indent' into the site adjacent to the western side of the



crushing plant. This generates a vehicle manoeuvrability and safety issue, which will be resolved by MOD 10.

Plans of the proposed additional disturbance area are enclosed within **Appendix E**.

The project approval as it relates to extraction rates, quarrying activity, hours of operation and vehicle frequency does not need to be modified.

#### 1.5 FINDINGS OF ANALYSIS OF ALTERNATIVES CONSIDERED

The alternative to the proposal is to source, secure and disturb land elsewhere which will lead to negative outcomes including:

- Inefficient double handling of material; and
- Increased traffic and fuel usage, which also leads to increased noise and air quality impact.

This outcome is not feasible.

The 'do nothing' option will not allow the applicant to resolve the important shortage in stockpiling area issue. This outcome is not feasible.

Alternate footprints for MOD 10 were also considered. The design of the MOD 10 footprint was selected because:

- It will allow additional stockpiling area to be established adjacent the existing stockpile area in one managed operation;
- It was designed with respect to 'avoid and minimise' ecological considerations;
- It will not fragment vegetation; and
- It will allow surface water management improvements (in particular through the relocation and resizing of Dam 2 and resizing of Dam 3).

# 1.6 STRUCTURE OF REPORT

This S4.55(2) Assessment Report has been prepared in accordance with NSW DPE's State Significant Development Guidelines – Preparing a Modification Report. The format is as follows:

- Section 1: Introduction to the proposal;
- **Section 2**: Strategic Context;
- **Section 3**: Description of the proposed modification;
- **Section 4**: Statutory Context;
- Section 5: Engagement with the community and relevant government authorities;
- Section 6: Environmental assessment of the proposed modification;
- **Section 7**: Project justification; and
- Section 8: Conclusion.



# 2.0 Strategic Context

The KEQ site is strategically located with excellent access to major development centres such as Newcastle, Port Stephens and the broader Hunter Valley and Mid Coast areas. Additionally, the KEQ has emerging markets in Sydney and the Upper Hunter areas.

The site has excellent access available to the M1 Pacific Motorway (via the Branch Lane interchange) and the site is well separated from any areas of significant urban development.

There is a known high quality hard rock resource on the site and the KEQ is important for the delivery of key infrastructure projects being undertaken by TfNSW, the Port of Newcastle and local Councils as well as the provision of quality hard rock to support the building industry.

MOD 10 to the KEQ is consistent with key strategies that apply to the site including the Hunter Regional Plan 2036, the Mid Coast Local Strategic Planning Statement and the Draft Hunter Regional Plan 2041.

KEQPL management also observe that as Australia, and in particular the State of NSW, recovers from the Covid-19 pandemic, as an economic stimulus measure, the NSW Government is placing significant emphasis on supporting infrastructure and construction projects including the announcement of new key infrastructure projects such as the M1 Pacific Motorway extension to Raymond Terrace. Proposed MOD 10 is consistent with the intent of the NSW Governments' initiative and will support the development of construction and infrastructure projects.

#### 2.1 HUNTER REGIONAL PLAN

The Hunter Regional Plan 2036 is an overarching framework to guide land use planning priorities and infrastructure funding decisions in the Hunter region over the next 20 years.

The Plan sets priorities and provides a direction for regional planning decisions. It focuses on new housing and jobs, and targets growth in strategic centres and renewal corridors close to transport to deliver social and economic benefits. It sets in place line-of-sight land use planning for the region, regional districts like the Greater Newcastle metropolitan area and each Council area.

The vision of the Hunter Regional Plan 2036 is for the Hunter to be the leading regional economy in Australia with a vibrant new metropolitan city at its heart. To achieve this vision, the NSW Government has set the following regionally focussed goals:

- The leading regional economy in Australia;
- A biodiversity-rich natural environment;
- Thriving communities; and
- Greater housing choice and jobs.

The proposal is consistent with the Hunter Regional Plan, in particular noting the following:

 The proposal will support the efficient long-term operation of the KEQ. In particular, proposed MOD 10 will substantially improve the capability of the KEQ to tender for important construction and infrastructure projects within the Hunter and Mid Coast regions and in particular comply with tender requirements of agencies such as TfNSW



- and local Council's. An example of this is the Motorway upgrades identified within Goal 1 Direction 4 of the plan;
- MOD 10 will allow KEQ to be commercially competitive in terms of product availability when tendering for large construction / infrastructure projects. A number of other quarry operations in the region have much larger stockpiling areas available, KEQ has approximately 27,000m² and by comparison other competitors with similar extraction rates have available stockpiling areas in excess of 100,000m². This places KEQ at a direct commercial disadvantage when competitively tendering for substantial projects. MOD 10 will resolve this issue and generate a positive public outcome that will result in a more competitive tendering process for local and regional projects which will benefit the regional economy;
- Improving operational efficiencies will lead to positive flow on effects to the local economy and will generate ongoing employment opportunities; and
- MOD 10 can be undertaken satisfactorily with regard to key environmental considerations.

#### 2.2 MID COAST LOCAL STRATEGIC PLANNING STATEMENT

The Mid Coast Local Strategic Planning Statement (LSPS) sets out a vision for land use planning across the Mid Coast. The LSPS is used to guide future planning, to achieve the community's vision and values.

The vision set out in the LSPS is:

We strive to be recognised as a place of unique environmental and cultural significance.

Our strong community connection, coupled with our innovative development and growing economy, builds the quality of life we value.

The LSPS identifies planning priorities to achieve the vision outlined in the plan, along with short, medium, long term, and ongoing actions to monitor and report on the progress of implementation.

Planning priority 9 seeks to improve infrastructure within the Mid Coast LGA. Proposed MOD 10 will improve access to valuable construction materials for key infrastructure projects within the LGA.

The proposed modification will contribute to the thriving and growing economy through contributing to providing ongoing jobs within the quarry and contribution to infrastructure projects.

The proposed modification is consistent with the relevant sections of the Mid Coast LSPS.

#### 2.3 DRAFT HUNTER REGIONAL PLAN 2041

The Draft Hunter Regional Plan 2041 forms part of the five (5) year review of the Hunter Regional Plan 2036, and resets priorities for the area to ensure continued progress and prosperity for the Hunter community for the next 20 years. The Plan sets the strategic land use framework for continued economic transformation in one of Australia's most diverse and liveable regions.

Under this Plan, the regional vision for the Hunter is as follows:



"The leading regional economy in Australia, connected to and caring for Country, with a vibrant metropolitan city and sustainable 15-minute neighbourhoods at its heart."

Proposed MOD 10 aligns with this vision, noting that it will substantially improve operational efficiencies at the KEQ, which will:

- Allow KEQ to comply with tender requirements for important infrastructure projects and contribute to a more competitive tendering process which will benefit the regional economy;
- Further facilitate the availability of a proven hard rock product to be made available for important infrastructure and building projects; and
- Provide ongoing and long term employment opportunity.

The proposal remains consistent with the vision of the Draft Hunter Regional Plan 2041.



# 3.0 Description of Modifications

#### 3.1 PROPOSED MODIFICATIONS

The proposal seeks to modify Project Approval 09\_0175 to increase the approved disturbance area of the Karuah East Quarry from 33.01ha to 40.18ha (a 7.17ha increase) primarily to establish additional stockpiling areas. MOD 10 will also facilitate improved surface water management, a new two storey administrative building and improved areas for vehicle manoeuvring and parking.

The total proposed additional disturbance area of 7.17ha is comprised of the following three (3) areas:

- Northern Disturbance Area A nominal area of 0.166ha adjacent to the crushing plant / processing area;
- Central Disturbance Area An area of approximately 4.911ha positioned north of the established southern stockpile area; and
- Southern Disturbance Area An area of approximately 2.093ha positioned to the south of the established southern stockpile area.

Vegetation clearing and bulk earthworks will be completed to establish workable areas.

Within the proposed 7.17ha disturbance area, 6.98ha of vegetation is proposed to be cleared. 0.19ha of the proposed disturbance area is cleared land comprised of existing tracks from historical uses.

The project approval as it relates to extraction rates, quarrying activity, hours of operation and vehicle movements will not be affected by the proposal.

Environmental safeguards incorporated into Management Plans that are in place for the KEQ operation will be expanded where appropriate to accommodate the proposal.

Plans of the proposed additional disturbance area are enclosed in **Appendix E** and reproduced below.



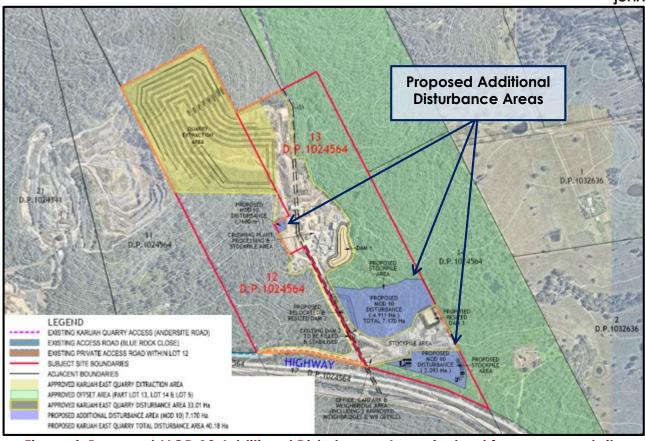


Figure 4: Proposed MOD 10 Additional Disturbance Areas (extract from proposed site plan).

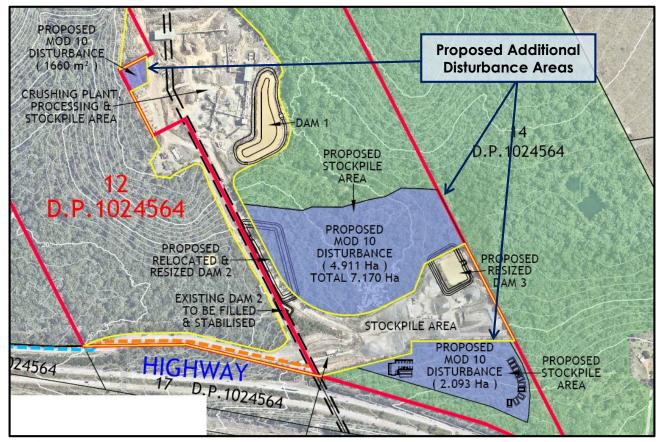


Figure 5: Proposed MOD 10 Additional Disturbance Areas (extract from proposed site plan).



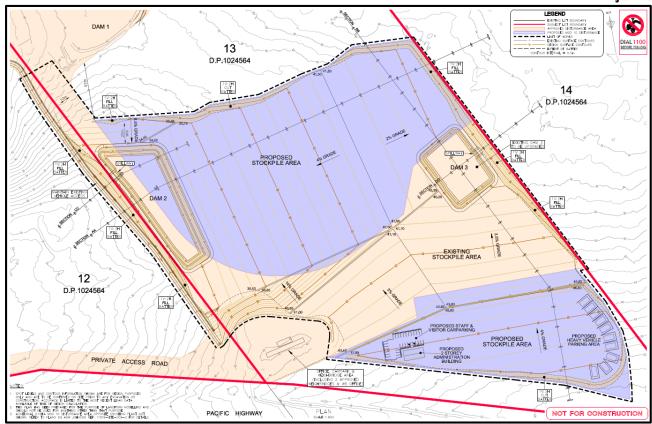


Figure 6: Proposed Central & Southern Additional Disturbance Areas in Purple (extract from Concept Civil Plans).

# 3.1.1 Proposed Northern Disturbance Area

A nominal 0.166ha additional disturbance area is proposed adjacent to the existing crushing plant processing area. This additional disturbance area is to facilitate improved vehicle manoeuvrability and operational safety in proximity to the crushing / processing area.

No additional infrastructure is proposed within the area.

This area can be readily accommodated into the existing stormwater management system.

The area will be cleared and stabilised to accommodate vehicle movements.

#### 3.1.2 Proposed Central & Southern Disturbance Areas

The proposed central and southern disturbance areas are positioned to the north and south of the existing stockpiling area located at the southern end of the KEQ.

The proposed central disturbance area will have an area of 4.91ha and the proposed southern disturbance area will have an area of 2.09ha.

These areas will be cleared and subject to bulk earthworks to establish workable areas.

The proposed central and southern disturbance areas are located within the existing biodiversity offset area for the KEQ. This matter is discussed further in **Section 6.1**, and **Appendix G** of this report.



A 30m wide buffer of established vegetation is proposed to be retained along the southern boundary of Lot 13 DP1024564 to maintain visual screening from the M1 Pacific Motorway.

The following is proposed to occur within the central and southern stockpile areas:

#### **Stockpiling Activity**

The central and southern disturbance areas will be predominately used for stockpiling of processed material that is ready for sale. The additional disturbance areas have been designed to provide appropriate space to accommodate required stockpiling needs and to facilitate the safe and efficient movement of quarry material.

The extraction and processing of materials within the crushing/site occurs in a linear manner, progressing south from the extraction area, through the processing area to the stockpile area for storage prior to dispatch via the weighbridge. The extension of the stockpile area in the location proposed is logical and will allow the established linear movement of materials through the site to be maintained.

#### **Administration Building**

An administration building forms part of the existing Project Approval, however to date is has not been constructed. At present, KEQPL utilise the weighbridge office for administrative functions.

It is proposed to construct a two (2) storey administration building and associated staff/visitor carpark within the southern disturbance area.

The administration building has been logically positioned at the entry of the site to minimise any potential for conflict between staff and visitor light vehicles with heavy vehicles.

#### **Heavy Vehicle parking**

A heavy vehicle parking area is proposed to be formalised in the south eastern corner of the southern disturbance area. The parking area will be used for parking of KEQPL trucks only.

#### **Stormwater Management**

A Surface Water Management Assessment to accommodate the proposed MOD 10 development has been prepared (refer to **Section 6.2** and **Appendix H**).

The proposed stormwater strategy seeks to regulate and improve site discharges, while maintaining water security for quarry operations and minimising impacts on downstream environments. The proposed modification will improve surface water management at KEQ.

The majority of the proposed MOD 10 additional disturbance area drains westwards. The following is proposed:

 Existing Dam 2, located on the western side of the KEQ site will be relocated and increased in size by 4.9ML (excluding additional storage for water harvesting and reuse). Dam 2 will have a new total capacity of 8.2 ml. Dam 2 will be partially located within the proposed central disturbance footprint.



Proposed Dam 2 will receive runoff from the proposed additional disturbance area in addition to its existing catchment. Proposed Dam 2 will incorporate additional storage to facilitate the reuse of stormwater for dust suppression of haul roads and stockpile areas.

• Existing Dam 3, positioned adjacent to the eastern boundary is proposed to be increased in size by 1.5ML for runoff storage. Dam 3 will have a new total capacity of 4.7 ml. Dam 3 will be extended into the central disturbance area.

Dam 3 will incorporate additional water storage and some water stored within this dam will be used for dust suppression within the surrounding stockpile area.

#### 3.1.3 Biodiversity Offsets

The proposed central and southern disturbance areas are positioned within areas of the site currently approved as a biodiversity offset area on Lot 13 DP1024564 (established as part of the original KEQ approval). In response to this, MOD 10 proposes to:

- Replace the existing offset area being directly impacted by proposed MOD 10 with like-for-like biodiversity values; and
- Offset the impact of MOD 10.

This matter has been discussed in detail with the NSW Department of Planning & Environment's Biodiversity Conservation Division (BCD); the Federal Department of Agriculture Water & Energy and the NSW Biodiversity Conservation Trust (BCT) prior to lodgement of MOD 10 and the proposed approach is consistent with the outcomes of these discussions (refer to **Section 5** of this modification report).

The applicant seeks to provide offsets as follows:

- Use of part of Lot 201 DP1042537 (using the area not subject to the separate Karuah Red proposal (SEAR 937) and the northern portion of Lot 21 DP1024341 not subject to the Karuah Quarry approval as a 'like for like' replacement offset (to be secured under a Biodiversity Stewardship); plus
- Purchase additional land with the required ecology values; and/or
- Purchase credits on the BCD database or payment into the BCD Conservation Fund.

Figure 13 of this report shows the location of the land based replacement offset.

Monitoring consistent with the Biodiversity Offset Area Management Plan (BOAMP) will continue and be expanded for the proposed additional biodiversity offset area.

#### 3.1.4 Other Environmental Safeguards

Environmental safeguards incorporated into existing Management Plans that are in place at the Karuah East Quarry operation will be expanded to accommodate the proposal. Management Plans that will be updated include:

- Water Management Plan;
- Biodiversity Offset Area Management Plan;
- Air Quality & Greenhouse Gas Management Plan;
- Noise Management Plan;
- Heritage Management Plan;



- Landscape & Rehabilitation Management Plan;
- Traffic Management Plan; and
- Environmental Management Strategy.

Environmental Safeguards required to accommodate the proposed development are discussed in detail in **Section 6 and Appendix C**.

# 3.1.5 Quarry Operational Arrangements

The project approval as it relates to extraction rates, quarrying activity, hours of operation and vehicle frequency will not be affected by the proposal.

# 3.1.6 Modification Summary

**Table 2** below provides a comparison of the approved development with the proposed development. A consolidated project description is enclosed as **Appendix A**.

Table 2 - Modified Project Summary Table.

Element	Origino	al Project (as amended)	Modified Project (inclusive of MOD 10)		
Quarry Operations					
Quarry life	31 December	2034	No change.		
Production limit	1.5 million tonn	es of andesite per annum	No change.		
Operating hours	Quarrying operations	<ul> <li>7:00am to 9:00pm, Monday to Friday</li> <li>7:00am to 10:00pm Monday to Friday on 50 calendar days per year</li> <li>7:00am to 6:00pm Saturday</li> <li>No drilling 6:00pm to 10:00pm Monday to Friday or 1:00pm to 6:00pm Saturday</li> <li>No quarrying operations on Sundays or Public Holidays</li> </ul>	No change.		
	Product loading and dispatch	<ul> <li>5:00am to 9:00pm Monday to Friday</li> <li>5:00am to 10:00pm Monday to Friday on 50 calendar days per year</li> <li>6:00am to 6:00pm Saturday</li> <li>No product loading and dispatch on Sundays or Public Holidays</li> </ul>	No change.		
	Construction activities	7:00am and 6:00pm Monday to Friday and 8:00am to 1:00pm Saturdays, unless noise from these activities does not exceed 40dB(A) LAeq(15 min) at any privately-owned residence	No change.		



			JOHH
	Maintenance activities	24 hours a day, 7 days per week, providing maintenance activities are inaudible at any privately-owned residence	No change.
Blasting	9:00am to 4:00pm Monday to Friday, with no more than two (2) blasts per week		No change.
Extraction Method	Drilling and blo	sting	No change.
Vehicle Movements	216 laden mov	rements per day	No change.
Haulage	via Blue Rock Branch Lane.	cess to the M1 pacific Motorway Close, Andersite Road and	
Employment	Approximately	30 staft.	Approximately 35 staff (ie. 5 additional staff).
Project Area			
Total Disturbance Footprint	33.01ha		40.18ha
Native Vegetation Clearance	28.3ha		35.28ha
Biodiversity offsets	lands adjacen 1024564, Lot 838128.	of a biodiversity offset area on t to the quarry (Part Lot 13 DP 14 DP 1024564 and Lot 5 DP	Establishment of a biodiversity offset area on the following lands:  Part Lot 13 DP 1024564, Lot 14 DP 1024564 and Lot 5 DP 838128; and Part Lot 21 DP1024341 and Part Lot 201 DP 1042537.  Any remaining credits to be purchased from the market or through payment into the Biodiversity Conservation Fund.
Physical Layou			A 1.1212
Plant and infrastructure		areas Ulage roads eighbridges and weighbridge ion Office cilities	Additional stockpile areas to be established.  Two storey administration office proposed.



		jonn
	Fencing	
Stormwater infrastructure	Stormwater management infrastructure including three (3) on site dams.  Dam 1 Volume – 12.4ML Dam 2 Volume – 1.3ML Dam 3 Volume – 2.3ML	Stormwater management infrastructure including three (3) on site dams. Overall capacity to be increased by (Dam 2 to be relocated and enlarged and Dam 3 to be enlarged.
Parking	Light vehicle – Sufficient parking for development related traffic provided.	Dam 1 Volume – 12.4ML (unchanged) Dam 2 Volume – 8.18ML Dam 3 Volume – 4.68ML Additional light vehicle parking to be provided (28 spaces).
	Heavy vehicle – informal parking on site.	Ten (10) heavy vehicle parking spaces to be provided.
Access	<ul> <li>Upgrade and extension of Blue Rock Close</li> <li>Realignment of the Blue Rock Close and Andesite Road intersection</li> <li>Adjustment of road markings at the Andesite Road and Branch Lane intersection</li> </ul>	No change.
Rehabilitation	Progressive rehabilitation of the site.	No change. The Landscape and Rehabilitation Management Plan will be extended to cover the MOD 10 additional disturbance areas.



# PROJECT APPROVAL 09\_0175 CONDITIONS TO BE MODIFIED

To facilitate the proposal, a number of conditions of the Project Approval are required to be modified. Table 3 below identifies the conditions requiring modification (with suggested edits (in red) where appropriate).

Table 3 - Conditions to be Modified in Project Approval 09 0175

Condition	Comment
Definitions	It is necessary to update the definitions to include reference to this Modification Report.
	Suggested text:
	MR (MOD 10) – The Modification Report titled S4.55(2) Modification Report Proposed Increase to Approved Disturbance Area Project Approval 09_0175, dated March 2022 prepared by ADW Johnson.
Schedule 2 Condition 2	It is necessary to update condition 2(d)
2. The Applicant must carry out the development:	to make reference to this Modification
<ul><li>2. The Applicant must carry out the development:</li><li>(a) in compliance with the conditions of this consent;</li><li>(b) in accordance with the statement of commitments in Appendix 6;</li></ul>	Report, MR (MOD 10).  Suggested text:
(c) in accordance with all written directions of the	2(d) generally in accordance with the
Planning Secretary; and	EA, EA (MOD1), EA (MOD 2), SEE (MOD
(d) generally in accordance with the EA, EA (MOD1), EA (MOD 2), SEE (MOD 8) and MR (MOD 9).	8), MR (MOD 9) and MR (MOD 10).
Schedule 3 Condition 13 (Air Quality Criteria)	In order to ensure that the air quality criteria is consistent with latest policy, it
13 The applicant must ensure that all reasonable	l is necessary to:

13. The applicant must ensure that all reasonable is necessary to: and feasible avoidance and mitigation measures are employed so that particulate matter emissions generated by the development do not exceed the criteria in Tables 7 to 9 at any residence on privatelyowned land.

Table 7: Long-term impact assessment criteria for particulate matter

Pollutant	Averaging Period	<sup>d</sup> Criterion
Total suspended particulates (TSP)	Annual	a 90µg/m³
Particulate matter < 10 µm (PM10)	Annual	a 30µg/m³

Table 8: Short-term impact assessment criteria for particulate matter

Pollutant	Averaging Period	<sup>d</sup> Criterion
Particulate matter < 10 µm (PM <sub>10</sub> )	24 hour	<sup>a</sup> 50µg/m³

In Table 7, update the long term PM<sub>10</sub> criteria to 25 µg/m<sup>3</sup> as follows:

Table 7: Long-term impact assessment criteria for particulate matter

Pollutant	Averaging Period	<sup>d</sup> Criterion
Total suspended particulate s (TSP)	Annual	<sup>а</sup> 90µg/m <sup>3</sup>
Particulate matter < 10 µm (PM <sub>10</sub> )	Annual	<sup>a</sup> 25µg/m <sup>3</sup>



Table 9: Long-term impact assessment criteria for Deposited Dust

Pollutant	Averaging Period	Maximum Maximum increase in deposited deposited dust level dust level
<sup>c</sup> Deposited	Annual	b 2 g/m <sup>2</sup> a 4 g/m <sup>2</sup>
dust		/month /month

Notes to Tables 7-9:

- a Total impact (i.e. incremental increase in concentrations due to the development plus background concentrations due to all other sources);
- b Incremental impact (i.e. incremental increase in concentrations due to the development on its own);
- Deposited dust is to be assessed as insoluble solids as defined by Standards Australia, AS/NZS3580.10.1:2003 Methods for Sampling and Analysis of Ambient Air – Determination of Particulate Matter – Deposited Matter – Gravimetric Method; and
- d Excludes extraordinary events such as bushfires, prescribed burning, dust storms, sea fog, fire incidents, illegal activities or any other activity agreed by the Planning Secretary in consultation with EPA.

Schedule 3 Condition 28 (Biodiversity Offset Strategy)

28. The Applicant must, prior to the commencement of vegetation clearing activities, finalise the Biodiversity Offset Strategy, as described in documents listed in Condition 2 of Schedule 2, summarised in table 10 and shown conceptually in Figure 1 of Appendix 4, in consultation with BCD and Council, and to the satisfaction of the Planning Secretary.

Table 10: Biodiversity Offset Strategy

Area	Offset Type	Minimum Size(ha)
Offset	Area Existing vegetation to be managed and	130.36 ha
	enhanced	

Note: The Biodiversity Offset Strategy must direct that the land proposed as the Biodiversity Offset must be free of any dwelling-houses and associated sheds, bushfire asset protection zones and other related utilities or structures so as to preserve the integrity and function of that offset area. The Biodiversity Offset Strategy must also provide details of the revegetation of any parts of the offset area that are cleared of native

Noting that MOD 10 proposes to modify the approved offset area, conditions 28 and 29 will need to be deleted and replaced with revised offsetting obligations consistent with the Biodiversity Assessment Report provided in **Appendix G**.

Additionally, Figure 1 of Appendix 4 (Conceptual Biodiversity Offset Area) is recommended to be deleted and replaced with **Figure 7** below.



vegetation or are in an otherwise substantially modified state, other than required management trails and boundary fencing buffer distances.

The applicant must implement the strategy as approved by the Planning Secretary.

Schedule 3 Condition 29 (Long Term Security of Offsets)

29. The Applicant must, within 12 months of the finalisation of the Biodiversity Offset Strategy, make suitable arrangements to provide appropriate long-term security for the offset area, in consultation with BCD and Council, and to the satisfaction of the Planning Secretary.

Note: In order of preference, mechanisms to provide appropriate long-term security to the land within the Biodiversity Offset Strategy include transfer to the National Park Estate, Biobanking Agreement, Voluntary Conservation Agreement, or restrictive covenant on land titles.

Schedule 3 Condition 30

- 30. The Applicant must rehabilitate the site to the satisfaction of the Planning Secretary. This rehabilitation must:
- (a) be consistent with the rehabilitation strategy as described in the EA and shown conceptually in Figure 1 in Appendix 5; and
- (b) comply with the objectives in Table 11.

Table 11: Rehabilitation Objectives

Feature	Objective
Site (as a whole)	Safe, stable & non-polluting.
Surface Infrastructure	To be decommissioned and removed, unless the Planning Secretary agrees otherwise.
Quarry Wall Benches	Landscaped and revegetated utilising native tree and understorey species, ensuring that the tree canopy is restored and integrated with the surrounding tree canopy.
Quarry Pit Floor	Landscaped and revegetated with wetland vegetation.

that MOD 10 proposes additional disturbance area that will be subject to rehabilitation following cessation of the KEQ, recommended that Condition 30 be modified to include reference to this Modification Report and delete reference to Figure 1 in Appendix 5 as follows:

- 30. The Applicant must rehabilitate the site to the satisfaction of the Planning Secretary. This rehabilitation must:
- (a) be consistent with the rehabilitation strategy as described in the EA and MR (MOD 10) and shown conceptually in Figure 1 in Appendix 5; and
- (b) comply with the objectives in Table 11.
- It is recommended that Figure 1 in Appendix 5 be deleted as MOD 10 enlarges the disturbance area subject to rehabilitation. Reference to the Rehabilitation Strategy in the EA and well as MR (MOD 10) is considered sufficient.

Table 11 does not need to be modified.



		<b>3</b> 000000000000000000000000000000000000
Other land affected by the development	Restore ecosystem function, including maintaining or establishing self-sustaining ecosystems comprised of:	
	<ul> <li>native endemic species; and</li> <li>a landform consistent with the surrounding environment.</li> </ul>	
Community	Ensure public safety.  Minimise the adverse socioeconomic effects associated with quarry closure.	
Appendix 1 Develo	pment Layout	Appendix 1 will need to be updated to include the proposed MOD 10 development layout (as shown in <b>Figure 3</b> and provided within <b>Appendix E</b> )

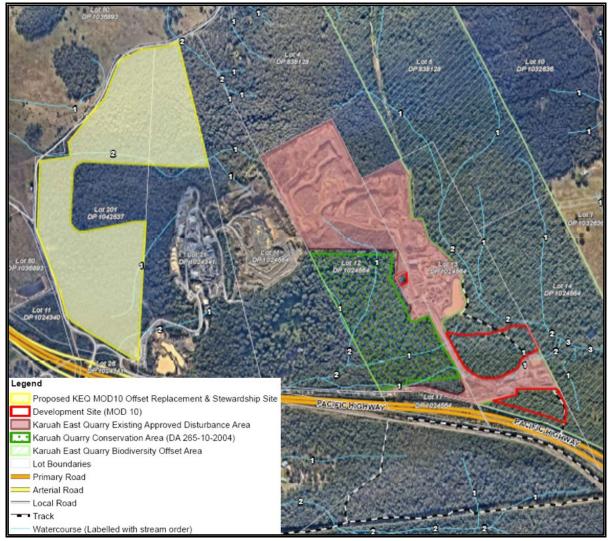


Figure 7: Proposed MOD 10 Offset Replacement / Stewardship Site Location.



# 4.0 Statutory Context

# 4.1 APPROVAL PATHWAY AND PERMISSIBILITY

Schedule 2 of the Environmental Planning and Assessment (Savings, Transitional and Other Provisions) Regulation 2017 (Transitional Regulation) provides transitional arrangements for development approved under former Part 3A of the EP&A Act 1979 including winding up of transitional Part 3A Modification Provisions.

In accordance with Schedule 2, Clause 6 of the Transitional Regulation, the Karuah East Quarry Project (09-0175) was declared a State Significant Development (SSD) for the purposes of the EP&A Act 1979 in January 2019, by order published in the NSW Government Gazette No 5 of 25 January 2019 (notice reference n2019-124).

Accordingly, the Karuah East Quarry is now subject to the modification provisions of Section 4.55 of the EP&A Act 1979. This application seeks to amend the approved development in accordance with Section 4.55(2) of the EP&A Act.

It is necessary to give consideration to Schedule 2 Clause 3BA(6) of the Transitional Regulation, which states:

- (6) In the application of section 4.55 (1A) or (2) or 4.56 (1) of the Act to the following development, the consent authority need only be satisfied that the development to which the consent as modified relates is substantially the same development as the development authorised by the consent (as last modified under section 75W):
  - (a) development that was previously a transitional Part 3A project and whose approval was modified under section 75W....

The proposal will remain substantially the same as the development last modified under Section 75W of the EP&A Act 1979 (MOD 2 of MP 09\_0175). The following is noted in this regard:

- The modification primarily consists of an increase to the approved disturbance area to establish larger stockpiling areas to support operations of the KEQ;
- The project approval as it relates to extraction rates, quarrying activity, vehicle movements, hours of operation or the operational life of the quarry will not be affected by the proposal; and
- The proposal will not result in any significant changes to the nature of the development or introduce any new uses which were not previously considered or already being undertaken within the site.

The modified development is considered to be substantially the same development as that approved under MP 09\_0175 (MOD 2).

It is noted that during Scoping Meetings with the NSW DPE, the Section 4.55(2) pathway was confirmed. Following the Scoping Meetings, the DPE issued correspondence dated 24 February 2021 (refer **Appendix O**) that confirmed:

'The Department has reviewed the proposed approach to preparing a modification application and is satisfied that the application may be progressed.

Your next step will be to lodge your modification application through your dashboard on the new major projects website'.



# 4.2 RELEVANT ISSUES UNDER SECTION 4.55 OF THE EP&A ACT 1979

Under Section 4.55(2) of the EP&A Act, the consent authority needs to be satisfied that the modified development is substantially the same as the development last modified under former Section 75W of the EP&A Act (refer **Section 4.1** below) as follows:

A consent authority may, on application being made by the applicant or any other person entitled to act on a consent granted by the consent authority and subject to and in accordance with the regulations, modify the consent if:

(a) it is satisfied that the development to which the consent as modified relates is substantially the same development as the development for which consent was originally granted and before that consent as originally granted was modified (if at all),

**Comment:** The proposal will remain substantially the same development. Refer to **Section 4.1** above.

(b) it has consulted with the relevant Minister, public authority or approval body (within the meaning of Division 4.8) in respect of a condition imposed as a requirement of a concurrence to the consent or in accordance with the general terms of an approval proposed to be granted by the approval body and that Minister, authority or body has not, within 21 days after being consulted, objected to the modification of that consent, and

**Comment:** It is understood that the NSW DPE will refer the application to relevant public authorities as required.

- (c) it has notified the application in accordance with:
  - (i) the regulations, if the regulations so require, or
  - (ii) a development control plan, if the consent authority is a council that has made a development control plan that requires the notification or advertising of applications for modification of a development consent, and
- (d) it has considered any submissions made concerning the proposed modification within the period prescribed by the regulations or provided by the development control plan, as the case may be.

**Comment:** It is understood that NSW DPE will publicly exhibit the proposal and invite public feedback.

Given the above, it is clear that the request to modify the consent can be assessed under the parameters of Section 4.55(2) of the EP&A Act and is therefore submitted to NSW DPE for approval on this basis.

#### 4.3 RELEVANT ISSUES UNDER THE EP&A REGULATION (2021)

Part 5, Division 1 of the Environmental Planning and Assessment Regulation 2021 (EP&A Regulation 2021) sets out additional requirements that all applications for modifications of consent under Section 4.55 of the EP&A Act must comply with. The relevant requirements and how they have been complied with are set out in the following table:



Table 4 - Division 1, Section 99 and 100 Requirements

		1, Section 99 and 100 R	equirements
	Section 99	REQUIREMENTS	COMMENT
(1) A r	nodification	on application must—	
( )	1		The application has been prepared in
(a)	pe in the	approved form, and	accordance with the approved form.
(b)	contain d	all the information and	
(~)		nts required by—	
			The application has been prepared in the
	(i) the a	pproved form, and	approved form.
	(ii) the A	Act or this Regulation,	The application contains all the relevant information and documents required by the Act and Regulation.
(c)	be subr	nitted on the NSW portal	The Modification Application will be submitted via the NSW Planning Portal.
(2) If th		•	State significant development—
	the applinclude	olication must also particulars of the the modification, and	Provided within relevant sections of this Section 4.55(2) Report.
, ,	the Developr preparing	licant must consider State Significant ment Guidelines in g the application.	This \$4.55(2) Report is prepared in accordance with the SSD Guidelines for preparing a Modification Report.
	Section 10	0 REQUIREMENTS	COMMENT
(1) A r	nodification	on application must co	ntain the following information—
(a)	the name	e and address of the t,	Provided within this Section 4.55(2) Modification Report and as part of the application on the NSW Planning Portal.
(b)	a des developr carried developr		Discussed within relevant sections of this Section 4.55(2) Modification Report.
(c)	of the	ess and folio identifier land on which the ment will be carried	Provided within this Section 4.55(2) Modification Report and as part of the application on the NSW Planning Portal.
(d)	modifica developr including and date changed consent	ment consent, the name, number e of plans that have l, to enable the authority to compare relopment with the ment originally	Discussed within relevant sections of this Section 4.55(2) Modification Report.
(e)	whether intended (i) mere error, misco (ii) have spec	the modification is to— ly correct a minor misdescription or alculation, or another effect	Discussed within relevant sections of this Section 4.55(2) Modification Report.



(f) a description of the expected impacts of the modification,	Discussed within relevant sections of this Section 4.55(2) Modification Report.
(g) an undertaking that the modified development will remain substantially the same as the development originally approved,	Discussed within relevant sections of this Section 4.55(2) Modification Report.
(h) for a modification application that is accompanied by a biodiversity development assessment report—the biodiversity credits information,	Discussed within Section 6 of this report and the BDAR enclosed as <b>Appendix G</b> .
(i) if the applicant is not the owner of the land—a statement that the owner consents to the making of the modification application,	Owners consent for all parcels of land subject to the proposed modification are provided as part of this application.
(j) whether the modification application is being made to— (i) the Court under the Act, section 4.55, or (ii) the consent authority under the Act, section 4.56.	N/A

#### 4.4 RELEVANT ISSUES UNDER SECTION 4.15 OF THE EP&A ACT 1979

Under Section 4.15 of the EP&A Act 1979, the following matters are required to be considered as part of the assessment of the application:

#### (a) (i) The Provisions of any Environmental Planning Instrument

Consideration has been given to the provisions of all relevant environmental planning instruments (EPIs). The EP&A Act 1979 is addressed in earlier sections of this report. Other EPIs applicable to the proposed amendments are discussed below:

#### State Environmental Planning Policy (Transport and Infrastructure) 2021

State Environmental Planning Policy (Transport and Infrastructure) 2021 commenced on 1 March 2022 and consolidated the following:

- SEPP (Infrastructure 2007);
- SEPP (Educational Establishments and Childcare Facilities) 2017);
- SEPP (Major Infrastructure Corridors) 2020; and
- SEPP (Three Ports) 2013.

#### Chapter 2 - Infrastructure

SEPP (Transport and Infrastructure) Chapter 2 provides a consistent planning regime for infrastructure and the provision of services across NSW, along with providing for consultation with relevant public authorities during the assessment process. The Chapter supports greater flexibility in the location of infrastructure and services along with improved regulatory certainty and efficiency.



Section 2.121 and Schedule 3 of the SEPP (Transport and infrastructure) identify traffic generating development that requires referral to Transport for NSW (TfNSW).

The proposal does not involve any change to extraction and transportation rates, quarrying activities or the operational life of the quarry. Accordingly, the proposed development is not categorised as traffic generating development that requires referral to TfNSW.

### State Environmental Planning Policy (Resources and Energy) 2021

SEPP (Resources and Energy) 2021 commenced on March 2022 and consolidated the following SEPPs:

- SEPP (Mining, Petroleum Production and Extractive Industries) 2007; and
- Sydney Regional Environmental Plan No.9 Extractive Industries (No.2 1995)

### Chapter 2 – Mining, Petroleum Production and Extractive Industries

Chapter 2 of SEPP (Resources and energy) aims to provide for the proper management and development of mineral, petroleum and extractive material resources for the social and economic welfare of the State. It establishes appropriate planning controls to encourage ecologically sustainable development.

Former SEPP (Mining Petroleum and Extractive Industries) (now Chapter 2 of SEPP (Resources and Energy)) was considered during the assessment process for the Karuah East Quarry. In addition to providing permissibility for the KEQ (under clause 2.9(3)(a)) and extinguishing any LEP provisions (Clause 2.10), Part 2.3 of the SEPP provides that the DPE may additional matters be considered by the consent authority relating to:

- Compatibility with other land uses;
- Compatibility with mining, petroleum production or extractive industry;
- Natural resource management and environmental management;
- Resource recovery;
- Transport; and
- Rehabilitation.

These matters were satisfactorily addressed as part of the KEQ approval.

Of particular relevance to MOD 10, environmental management and rehabilitation are necessary to be addressed. **Section 6** of this 4.55 Modification Report address all key environmental management considerations as well as rehabilitation. Management Plans will be updated, as necessary, to ensure the long term management of key environmental considerations and rehabilitation.

Proposed MOD 10 is considered to be acceptable in terms of the each of the above listed considerations.

### State Environmental Planning Policy (Resilience and Hazards) 2021

State Environmental Planning Policy (Resilience and Hazards) 2021 (Resilience and Hazards SEPP) consolidates, transfers and repeals the provisions of three (3) SEPPs into a single environmental planning instrument, including;

- SEPP (Coastal Management) 2018;
- SEPP 33 Hazardous and Offensive Development (SEPP 33); and



• SEPP 55 – Remediation of Land.

The Resilience and Hazards SEPP aims to promote the protection and improvement of key environmental assets for their intrinsic value and the social and economic benefits they provide. Relevant chapters of SEPP Resilience and Hazards are considered below:

### Chapter 2 - Coastal Management

The aim of this chapter is to promote an integrated and co-ordinated approach to land use planning in the coastal zone in a manner consistent with the objects of the Coastal Management Act 2016, including the management objectives for each coastal management area.

The four coastal management areas are:

- Coastal wetlands and littoral rainforests area:
- Coastal vulnerability area;
- Coastal environment area; and
- Coastal use area.

The subject site does not contain any areas mapped as any of the four coastal management areas.

Areas of mapped Coastal Wetland occur approximately 1.3kms to the south-west of the subject site, on the southern side of the Pacific Highway. This Coastal Wetland is associated with riparian areas of Yalimbah Creek and Karuah River.

A Surface Water Impact Assessment relevant to MOD 10 has been prepared by ADW Johnson is enclosed as **Appendix H.** The Surface Water Assessment recommends a number of measures which will be implemented during the construction and operation of proposed MOD 10 which will regulate and improve the quality of water discharged from the site. Implementation of the proposed mitigation measures will ensure that any adverse impacts of downstream coastal environments are avoided.

### Chapter 3 – Hazardous and Offensive Development

Chapter 3 of SEPP (Resilience and Hazards) contains the provisions of former SEPP 33 (Hazardous and Offensive Development) and provides definitions for 'hazardous industry', 'hazardous storage establishment', 'offensive industry' and 'offensive storage establishment'. The definitions apply to all planning instruments, existing and future. The definitions enable decisions to approve or refuse a development to be based on the merit of a proposal. The SEPP requires specified matters to be considered for proposals that are 'potentially hazardous' or 'potentially offensive' as defined in the SEPP.

Storage of minor amounts of fuel and oil were addressed as part of the existing project approval. This modification does not seek to change the location or amounts of fuel and oil stored on the site.

Accordingly, it is considered that the proposal does not trigger the provisions of this chapter.



### State Environmental Planning Policy (Biodiversity and Conservation) 2021

State Environmental Planning Policy (Biodiversity and Conservation) 2021 (Biodiversity and Conservation SEPP) consolidates, transfers and repeals the provisions of eleven (11) SEPPs into a single environmental planning instrument. The Biodiversity and Conservation SEPP aims to promote the protection and improvement of key environmental assets for their intrinsic value and the social and economic benefits they provide. Relevant chapters of the Biodiversity and Conservation SEPP are considered below:

### Chapter 3 – Koala Habitat Protection 2020

Chapter 3 of the Biodiversity and Conservation SEPP incorporates the provisions of the now repealed State Environmental Planning Policy (Koala Habitat Protection) 2020. This Chapter aims to encourage the proper conservation and management of areas of natural vegetation that provide habitat for koalas to ensure a permanent free-living population over their present range and reverse the current trend of koala population decline.

Given that MOD 10 is for KEQ, which is a SSD, and does not require consent from Council, Chapter 3 and Chapter 4 of the Biodiversity and Conservation SEPP do not apply. Consideration of impacts to Koala are included in **Section 6.1** of this Modification Report and the BDAR attached within **Appendix G**.

### Great Lakes Local Environmental Plan 2014

The site is zoned RU2 Rural Landscape under the Great Lake Local Environmental Plan 2014 (GLLEP 2014). An extract of the zoning plan is shown in **Figure 8**.

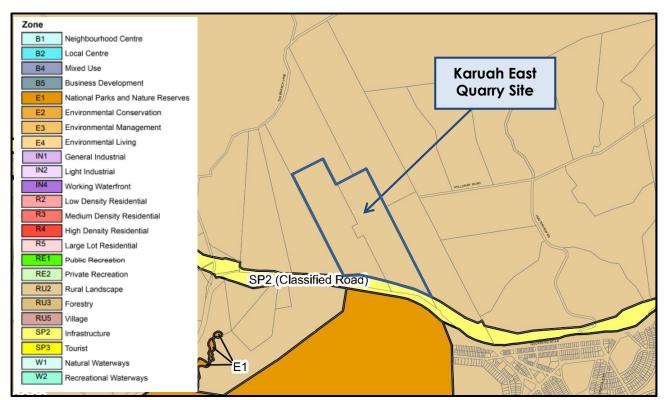


Figure 8: GLLEP 2014 Zoning Plan.



# **Permissibility**

The proposal forms part of an 'extractive industry' under the GLLEP 2014. An extractive industry is defined below.

**extractive industry** means the winning or removal of extractive materials (otherwise than from a mine) by methods such as excavating, dredging, tunnelling or quarrying, including the storing, stockpiling or processing of extractive materials by methods such as recycling, washing, crushing, sawing or separating, but does not include turf farming.

An extractive industry is permissible in the RU2 Rural Landscape zone.

### (a) (ii) The Provisions of any Draft Environmental Planning Instruments

There are no draft environmental planning instruments relevant to the application.

# (a) (iii) Any Development Control Plans

Not Applicable.

(a) (iiia) Any Planning Agreement that has been entered into Under Section 7.4, or any Draft Planning Agreement that a Developer has Offered to enter into Under Section 7.4, and

Not applicable.

# (a) (iv) Any Matters Prescribed by the Regulations

Part 5, Division 1 of the EP&A Regulation 2021 is addressed in the earlier sections of this report. There are no other matters prescribed by the regulations relevant to the application.

(b) The Likely Impacts of the Development, Including Environmental Impacts on both the Natural and Built Environments, and Social and Economic Impacts in the Locality,

An environmental assessment of the proposal is provided within **Section 6** of this report that addresses all potential impacts of the proposed modification.

### (c) The Suitability of the Site for the Development

The subject site is suitable for the proposed development.

MOD 10 proposes to increase the disturbance area of the KEQ, primarily to establish additional stockpiling areas adjacent to the existing southern stockpile area on the site. The proposed additional disturbance areas are logically located.

The approved biodiversity offset area that MOD 10 will impact upon can be readily replaced with local 'like for like' land based offsets and the MOD disturbance area itself can be appropriately offset. A range of other environmental investigations have been undertaken (refer to **Section 6** of this Modification Report) and it has been confirmed that the site is suitable to accommodate proposed MOD 10. The range of Management Plan that apply to the KEQ operation can be readily updated to accommodate the proposed development.



# (d) Any Submissions made in Accordance with the Act or Regulations

Any public submissions will be considered by the NSW DPIE and the proponent.

### (e) The Public Interest

The purpose of proposed MOD 10 is to increase the approved disturbance area of the quarry, primarily to establish additional stockpiling areas. This is considered to be in the public interest, noting the following:

 MOD 10 will support the efficient long-term operation of the KEQ. KEQ contains a known resource of high quality hard rock, and MOD 10 will substantially improve KEQPL's ability to supply this product to market.

This is particularly important as the State of NSW recovers from the Covid-19 pandemic, where the NSW Government is placing significant emphasis on supporting infrastructure and construction projects, including the announcement of new key infrastructure projects such as the M1 Pacific Motorway extension to Raymond Terrace. MOD 10 will support the development of such construction and infrastructure projects;

- The proposed modification will substantially improve the capability of the KEQ to tender for important construction and infrastructure projects within the Hunter and Mid Coast regions and in particular comply with tender requirements of agencies such as TfNSW and local Council's. In the event that KEQ cannot comply with tender requirements for such projects, this is detrimental to the public interest;
- MOD 10 will allow KEQ to be commercially competitive in terms of product availability when tendering for large construction / infrastructure projects. KEQ currently has substantially smaller stockpiling areas when compared with other quarry operations in the locality which places KEQ at a direct commercial disadvantage when competitively tendering for substantial projects. MOD 10 will resolve this issue and generate a positive public outcome that will result in a more competitive tendering process for local and regional projects which will benefit the regional economy;
- Improving operational efficiencies will lead to positive flow on effects to the local economy and will generate ongoing employment opportunities; and
- MOD 10 can be undertaken satisfactorily with regard to key environmental considerations.

### 4.5 OTHER LEGISLATIVE MATTERS

### 4.5.1 Environment Protection and Biodiversity Conservation Act 1999

EPBC Act Approval 2014/7282 for the KEQ was granted on 20 March 2015 and this approval was subject to a variation on 4 October 2018.

The applicant is fully aware of its obligations under EPBC Approval 2014/7282 and has maintained contact with the Federal Department of Agriculture, Water & Energy (DAWE) staff during the development of the KEQ to date. Refer to **Section 5.4** for consultation completed directly in relation to proposed MOD 10.



The EPBC Act requires that developments or undertakings that are likely to have a significant impact on matters of national environmental significance (MNES) be referred for a determination as to whether they are a controlled action which requires approval under the EPBC Act.

An EPBC referral for the proposed modification was submitted to the DAWE (EPBC 2022/9164) on 29 March 2022 (consistent with direction from DAWE staff during consultation undertaken) and on 2 May 2022, a delegate of the Commonwealth Minister for the Environment determined that the project is a Controlled Action under Part 7 of the EPBC Act 1999. The EPBC Act controlling provisions for the proposal are listed threatened species and communities.

The project will be assessed under the Bilateral Agreement (Amending Agreement No. 1, 2020) between the Commonwealth and NSW Governments and 'Supplementary Environmental Assessment Requirements – Matters of National Environmental Significance (including 'Project Assessment Notes') were issued by the NSW DPE on 23 May 2022 (refer to **Appendix P**).

Provided in **Appendix G** is a Biodiversity Assessment Report prepared by Kleinfelder that addresses the Supplementary Environmental Assessment Requirements (specifically Section 7). This is also detailed within Section 6.1.5 of this Modification Report.

Potential impacts to threatened species for which DAWE considers that there is likely to be a significant impact have been addressed with the Significant Impact Guidelines 1.1 – Matters of National Environmental Significance (DoE, 2013) (provided in Appendix 7 of the BDAR). The species include:

- Black-eyed Susan (Tetratheca juncea) Vulnerable.
- Koala (*Phascolarctos cinereus* (combined populations of Queensland, New South Wales and the Australian Capital Territory)) Endangered.
- Small-flower Grevillea (Grevillea parviflora subsp. parviflora) Vulnerable.
- Trailing Woodruff (Asperula asthenes) vulnerable.
- Grey-headed Flying-fox (Pteropus poliocephalus) Vulnerable.

It was concluded that, for the majority of the threatened species and migratory species identified within the development site or identified as having suitable habitat within the disturbance footprint, the proposal is unlikely to have a significant impact.

# 4.5.2 Protection of the Environment Operations Act 1997

An Environmental Protection License (EPL) (No. 20611) applies to the Karuah East Quarry.

Upon determination of MOD 10, a variation to the EPL will be necessary. Any variation to the EPL will be undertaken in consultation with the NSW Environment Protection Authority.

### 4.5.3 National Parks and Wildlife Act 1974

The National Parks and Wildlife Act 1974 (NPW Act) is the primary state legislation relating to Aboriginal cultural heritage in NSW.

Under the NPW Act, it is an offence to harm an Aboriginal object or place. However, it is a defense from prosecution if the proponent can demonstrate that harm was authorised under Section 90 of the NPW Act, or the proponent exercised due diligence in respect to



Aboriginal cultural heritage.

An Aboriginal Heritage Due Diligence Heritage Assessment relevant to the proposed additional disturbance area has been prepared by RPS (**Appendix L**). Aboriginal cultural heritage is discussed further in **Section 6**.

## 4.5.4 NSW Heritage Act 1977

Historical archaeological relics, buildings, structures, archaeological deposits and features are protected under the *Heritage Act 1977* and may be identified on the State Heritage Register (SHR) or by an active Interim Heritage Order.

The proposed modification will have no impact on heritage.

### 4.5.5 Biodiversity Conservation Act 2016

The Biodiversity Conservation Act 2016 (BC Act), the Biodiversity Conservation Regulation 2017 (BC Regulation) and amendments to the NSW Local Land Services Act 2013 (LLS Act) commenced on 25 August 2017. The legislation aims to maintain a healthy, productive and resilient environment for the greatest well-being of the community, now and into the future, consistent with the principles of ecologically sustainable development. The BC Act repeals several pre-existing Acts, most notably the NSW Threatened Species Conservation Act 1995 (TSC), the NSW Nature Conservation Trust Act 2001 and the NSW Native Vegetation Act 2003.

The BC Act together with the BC Regulation outlines the framework for addressing impacts on biodiversity from development and clearing. The framework details a pathway to avoid, minimise and offset impacts on biodiversity from development through the Biodiversity Offset Scheme (The BOS).

Entry into the BOS is triggered by developments, projects and activities that meet criteria or certain thresholds for significant impacts on biodiversity in accordance with Section 6.3 of the BC Act. Alternatively, the BOS can be entered into on an opt-in basis.

Criteria to which the BOS applies includes the following:

 State Significant Development (SSD) and State Significant Infrastructure projects (SSI), unless "the Secretary of the Department of Planning, Industry and Environment and the environment agency head determine that the project is not likely to have a significant impact".

As previously noted, the KEQ Project was declared a State Significant Development (SSD) on 25<sup>th</sup> January 2019 (notice reference n2019-124). As such, the BOS applies to the proposed modification and the Preparation of a Biodiversity Development Assessment Report (BDAR) is required.

A BDAR has been prepared by Kleinfelder for the proposed development and is enclosed as **Appendix G**.



# 4.5.6 National Greenhouse and Energy Reporting Act

The National Greenhouse and Energy Reporting Act (the NGER Act) established a mandatory reporting system for company greenhouse gas emissions and energy production and consumption.

The proposed modification does not involve any change to extraction and transportation rates, quarrying activities or the operational life of the quarry. It is not anticipated that there will be any additional greenhouse gases generated.

An air quality and greenhouse gas has been prepared to accompany this modification assessment and it detailed in **Section 6.4** of this report and provided within **Appendix K.** 

### 4.5.7 Water Management Act

The Water Management Act (2000) (WM Act), as well as the Water Act (1912) establish requirements for water harvesting and reuse. The WM Act defines licensing requirements for water storages which exceed maximum harvestable rights.

The proposal does not generate the requirement for any separate approvals under the provisions of the WM Act.

A surface water assessment has been prepared as part of this Modification Application, refer to **Section 6.2** and **Appendix H**.



# 5.0 Engagement

Prior to lodgement of the MOD 10 application, substantial engagement has been undertaken with key government agencies and the local community. Consultation has occurred with the NSW Department of Planning & Environment (DPE), the NSW Biodiversity Conservation Trust (BCT), the NSW DPE Biodiversity & Conservation Division (BCD), the Federal Department of Agriculture, Water & Energy (DAWE) and the Karuah East Quarry Community Consultative Committee (KEQ CCC).

### 5.1 NSW DEPARTMENT OF PLANNING AND ENVIRONMENT

Following is a summary of consultation undertaken with the NSW DPE:

- 5 March 2019 NSW DPE staff (resource assessments team) attended the Karuah East Quarry site for a general site inspection. During this inspection, predominantly MOD 8 (acoustic) matters were discussed. However, the MOD 10 proposal was introduced to DPE staff and the areas of proposed disturbance;
- 3 July 2019 Phone consultation was held between NSW DPE staff (resource assessments team) and Mr Mat Radnidge (ADW Johnson). Mr Radnidge provided NSW DPE staff with a preliminary summary of the MOD 10 proposal and requested direction on how to proceed, in particular whether a 'Scoping Meeting' with the DPE should be requested. Advice from the DPE was as follows:
  - The applicant should seek early advice from the Biodiversity Conservation Division (BCD) in the first instance. Given that the MOD 10 proposal will impact on the biodiversity offset area established for the KEQ on part Lot 13 DP 1024564, early advice from the BCD is essential. DPE staff advised that the DPE's assessment of MOD 10 in terms of ecological considerations will be guided by BCD's position on the application;
  - The applicant should also seek early advice from the Federal Department of Agriculture, Water and the Environment (DAWE) in relation to the EPBC Approval (2014/7282) that applies to the Karuah East Quarry; and
  - Following consultation with BCD, provided that agreement on a pathway
    forward in terms of ecology assessment is achieved, the proponent should then
    make a Scoping Request to the NSW DPE to discuss the proposal in more detail
    and confirm other requirements such as necessary specialist consultant inputs
    and the level of stakeholder engagement necessary.
- Scoping meetings were held with NSW DPE staff (resource assessments team) on 8th February 2021 and 16th February 2021. Key items discussed included:
  - The preliminary details of MOD 10 and the project justification was discussed;
  - The approval pathway was confirmed, being a Section 4.55(2) modification;
  - DPE staff asked how ecology is proposed to be addressed. The applicant noted:
    - This item was originally discussed with DPE staff (resource assessments team) in 2019. DPE's advice was that their assessment will be guided by BCD's assessment and DPE staff recommended early consultation with BCD and also the DAWE regarding the EPBC approval (2014/7282);
    - Two (2) meetings have been held with BCD and two (2) meetings have been held with the Federal DAWE. (Details of these meetings are provided in Sections 5.2 and 5.3 below);
    - o In summary, both agencies identified that impacting on an offset has been done in the past and can be done again, provided that a suitable ecological outcome can be achieved that includes:



- 1. Replacement of the offset area being impacted (preferably with a 'like for like' land solution); and
- 2. Offset the impact of the development.
- The applicant's ecologist (Kleinfelder) has undertaken necessary fieldwork, prepared draft reports and identified that the offsetting obligations could be addressed as follows:
  - 1. The use of part Lot 201 DP1042537 (using the area not subject to the separate Karuah Red proposal (SEAR 937) and the northern portion of Lot 21 DP1024341 as a 'like for like' offset (this area is approx. 38ha); plus
  - 2. Purchase additional land with the required ecology values (approx. 50ha); and/or
  - 3. Purchase credits on the BCD database or payment into the BCD Conservation Fund.
- BCD staff have considered this approach and have indicated agreement with Kleinfelder's methodology. BCD staff indicated that the next step is for the MOD 10 application to be lodged; and
- DAWE staff directed KEQPL to lodge a new EPBC referral and potentially run the process under the Bilateral agreement in place.
- The Karuah East Quarry Biodiversity offset area was discussed. The following was noted:
  - The land (comprised of part Lot 13 DP 1024564, Lot 14 DP 1024564 & Lot 5 DP 838128) is managed as a Biodiversity Offset Area in line with the approved Biodiversity Offset Area Management Plan (BOAMP).
  - KEQPL & its ecologist (Kleinfelder) previously met with staff from the Biodiversity Conservation Trust (BCT) in November 2020. BCT staff noted that as new offsets are required as a result of proposed MOD 10, these additional lands will need to be integrated into Conservation Agreements relevant to individual land ownerships and it is BCT's strong preference that this occur after MOD 10 has been determined. The applicant is supportive of this approach.
- MOD 10 has been discussed a number of times with the KEQ Community Consultative Committee. Details of the CCC feedback is provided in **Section 5.4** below.
- In addition to ecology, MOD 10 is proposed to be accompanied by the following specialist inputs:
  - o Plans;
  - Surface water assessment;
  - Consideration of groundwater impact;
  - Air Quality & Greenhouse Gas;
  - Acoustic Impact;
  - o Aboriginal Archaeology (due diligence);
  - Visual Impact Assessment;
  - Soil & land resource assessment; and
  - Rehabilitation.



• Relative to the MOD 10 proposed additional disturbance area, DPE staff indicated that the applicant should consider widening the fauna linkage at the northern edge of the proposed MOD 10 area (please note that at this time an earlier version of the MOD 10 proposal was presented). This matter was reviewed in the context of MOD 10 footprint and the fauna linkage has been increased from approximately 32m in width to approximately 57m in width (and also a reduction the disturbance footprint by approximately 2,007m²). This matter is discussed further in **Section 6.1** of this report. This outcome achieves the additional benefit of reducing impact on tetratheca juncea, grevillea parviflora and squirrel glider.

Following completion of the Scoping Meetings, the NSW DPE (resource assessments team) issued correspondence dated 24 February 2021 confirming that it is satisfied with the proposed Modification Report approach and instructed the applicant to prepare and lodge the MOD 10 application. The correspondence also confirms that it is the proponent's responsibility to contact the DAWE in relation to the EPBC Act. This correspondence is provided in **Appendix O**.

- Ongoing discussions have occurred with NSW DPE staff (resource assessments team) since February 2021 regarding the status of MOD 10. The following is noted:
  - It was considered appropriate to wait for determination of MOD 9 prior to lodgement of MOD 10 (noting that MOD 9 established revised acoustic criteria in the Project Approval that is relevant to the acoustic assessment for MOD 10);
  - Updated ecological fieldwork was necessary to be completed to satisfy recently updated survey guidelines for frogs, the brush tailed phascogale and the common planigale;
  - Lodgement of the EPBC referral for MOD 10 (EPBC reference 2022/9164) was confirmed on 22/2/22 (consistent with pre lodgement consultation with the DAWE);
  - Confirmation of the applicant's preference to progress assessment of the proposed under the Bilateral Agreement between the state and Commonwealth was provided on 8<sup>th</sup> April 2022; and
  - Confirmation that the project had been determined to be a Controlled Action under the EPBC Act 1999 and the process for the issue of 'Supplementary Environmental Assessment Requirements' to be considered in the MOD 10 modification report.

A general site inspection was also completed by DPE staff on 9 December 2021. An update on the status of the MOD 10 application was provided by the proponent to the DPE staff at this meeting.

# 5.2 NSW BIODIVERITY CONSERVATION TRUST

Details of consultation with the NSW BCT is provided in **Section 5.1** above.

### 5.3 BIODIVERSITY CONSERVATION DIVISION (BCD)

Prior to lodgement of MOD 10, consultation with NSW DPE Biodiversity Conservation Division (BCD) was undertaken. The following is noted.



- 8 August 2019 and 25 February 2020 BCD. The applicant, ADW Johnson and its ecologist Kleinfelder met with BCD assessment staff. The key items resolved were:
  - o From a BCD perspective there are no immediate red flags that prohibit impacting on an offset site provided that a suitable ecological outcome can be achieved. BCD will expect:
    - Replacement of the offset to be impacted (preferably by a 'like for like' land solution); and
    - Offset the impacts of the proposed MOD 10 development (i.e. as would be the case if there was no offset area being impacted upon). There are three (3) options available for this (including a combination):
      - 1. Secure land based offsets that generate credits;
      - 2. Purchase credits from the Biodiversity Credits Register (an open market database); and/or
      - 3. Payment into the OEH Biodiversity Conservation Fund.
  - Directed the applicant to lodge the MOD application and it will be referred to and assessed by the BCD. In principle, BCD is happy with the methodology proposed by Kleinfelder.

It is noted that the Biodiversity Assessment Report (refer to **Section 6.1** and **Appendix G**) has adopted the above methodology regarding proposed offset replacement and offsetting the impacts of MOD 10.

### 5.4 AUSTRALIAN GOVERNMENT DEPARTMENT OF AGRICULTURE, WATER & ENVIRONMENT

The applicant has consulted with the Federal Department of Agriculture, Water & Environment (DAWE) staff regarding the proposal. In particular the following is noted:

- 18 July 2019 and 8 April 2020 Federal DAWE. The applicant, ADW Johnson and Kleinfelder undertook meetings with DAWE staff on 18 July 2019 and on 8 April 2020). The key items resolved were:
  - o Impacting on an offset site can be done and has been done before;
  - o The proponent will be required to (1) replace the offset and (2) offset the impact;
  - Based on the proposed boundary of MOD 10 when compared with the existing boundary of the approval for EPBC 2014/7282, the proposal should be progressed as a new action (as opposed to a variation of the existing approval);
  - o A new referral under the EPBC Act is recommended;
  - The issue of finding a compensatory offset for the original approval will need to be worked through with DAWE's post-approval's team;
  - There is now a Bilateral agreement between the Commonwealth and NSW Governments about streamlining environmental assessments. Given that Karuah East Quarry is a SSD, the Bilateral Agreement process may apply, however this decision lies with the NSW DPE; and
  - If MOD 10 is assessed under the Bilateral Agreement, the NSW DPE undertakes its assessment following the decision on the EPBC referral. It was recommended that the referral be submitted to DAWE 4-5 weeks prior to lodgement with the NSW DPE). The EPBC Act becomes involved again at the end of the NSW process.
- 22 February 2022 The EPBC referral was submitted to the DAWE by the applicant;
- 29 March 2022 The EPBC referral was formally accepted by the DAWE. Following acceptance, a ten day notification period was completed between 30 March 2022 and 12 April 2022; and
- 2 May 2022 Delegate of the Commonwealth Minister for Environment determined that the project is a Controlled Action under Part 7 of the EPBC Act.



### 5.5 KARUAH EAST QUARRY COMMUNITY CONSULTATIVE COMMITTEE

Proposed MOD 10 was first introduced to the KEQ CCC on 4 March 2019 and has been a regular agenda item since that time with the most recent meeting held on 14 March 2022. At the CCC meetings the applicant has provided regular updates to the CCC on the status of the application, the justification for MOD 10 and the inputs being prepared as part of the MOD 10 application (consistent with those confirmed in the Scoping Meetings with the NSW DPE resource assessments team).

To date there has been no objection from any members of the CCC and the CCC have recognised the need for MOD 10 as well as the required location of proposed MOD 10 (being adjacent to the existing stockpiling area to form a logical extension and allow linear movement of quarry product through the site).

The questions that have arisen to date are:

 Q: How will compensatory offsets be secured? Mid Coast Council has a preference for local offsets to be secured.

A:

- 1. The use of part of Lot 201 DP 1042537 (using the area not subject to the Karuah Red proposal) and the northern portion of Lot 21 DP 1024341 as a 'like for like' offset (this is approx. 38ha); plus
- 2. Purchase additional land with the required ecology values; AND/OR
- Purchase credits on the BCD database or payment into the BCD Conservation Fund.
- Q: Will the fauna crossing across the north / south haul road be maintained?
  - A: Response yes, to be maintained.
- o Q: Is the proposed heavy vehicle parking for customers?
  - A: No, KEQ vehicles only.
- Q: Does MOD 10 propose extended hours of operation?
  - A: No. Hours of operation were addressed in the MOD 9 approval.

Post lodgement of the MOD 10 application, the proponent will notify the CCC that the application has been lodged. Furthermore, exhibition details (when available) will also be confirmed with the CCC.



# **6.0** Assessment of Impacts

This section provides an assessment of the key environmental issues associated with the proposed modification.

### 6.1 FLORA AND FAUNA

Kleinfelder were commissioned by the applicant to prepare a Biodiversity Development Assessment Report (BDAR) for the proposed Modification. The BDAR is enclosed as **Appendix G**.

The assessment was conducted in accordance with the Biodiversity Assessment Method (BAM) to assess the biodiversity impact and offsetting obligation of the Project under the Biodiversity Conservation Act 2016 and Biodiversity Conservation Regulation. The BDAR was also produced to address the 'Supplementary Environmental Assessment Requirements – Matters of National Environmental Significance' (for assessment under the Environment & Biodiversity Conservation Act 1999), issued by the NSW DPE on 23 May 2023 noting that the project will be assessed under the Bilateral Agreement between the Commonwealth and NSW Governments.

Native vegetation across the site was assessed in accordance with Section 5 of the BAM. Investigations involved a review of previously conducted vegetation mapping, and vegetation surveys.

Fieldwork included an assessment of the development site (i.e. the MOD 10 proposed disturbance areas) as well as a 30m buffer from the edge of the MOD 10 proposed disturbance areas (identified as the study area) to account for biodiversity values in close proximity to the proposed MOD 10 disturbance areas.

### 6.1.1 Flora and Fauna Survey Results

# **Plant Community Types**

Native vegetation surveys conducted within the proposed MOD 10 development site identified the following two (2) Plant Community Types (PCT):

- 6.68 ha of PCT 1619 Smooth-barked Apple Red Bloodwood Brown Stringybark Hairpin Banksia heathy open forest of coastal lowlands in two vegetation zones; and
- 0.30 ha of PCT 695 Blackbutt -Turpentine Tallowwood shrubby open forest of the coastal foothills of the central NSW North Coast Bioregion within one vegetation zone.

Neither of the above PCT's constitute Threatened Ecological Communities (TEC) under the BC Act or the FPBC Act.

The MOD 10 development site also comprises of 0.19ha of cleared areas which include existing tracks resulting from previous disturbances at the site.

Three (3) constructed dams also occur in proximity to the MOD 10 additional disturbance area which capture runoff from the quarry area. The dams represent low habitat suitability for most fauna species.

Figure 9 below shows the location of the mapped vegetation zones.



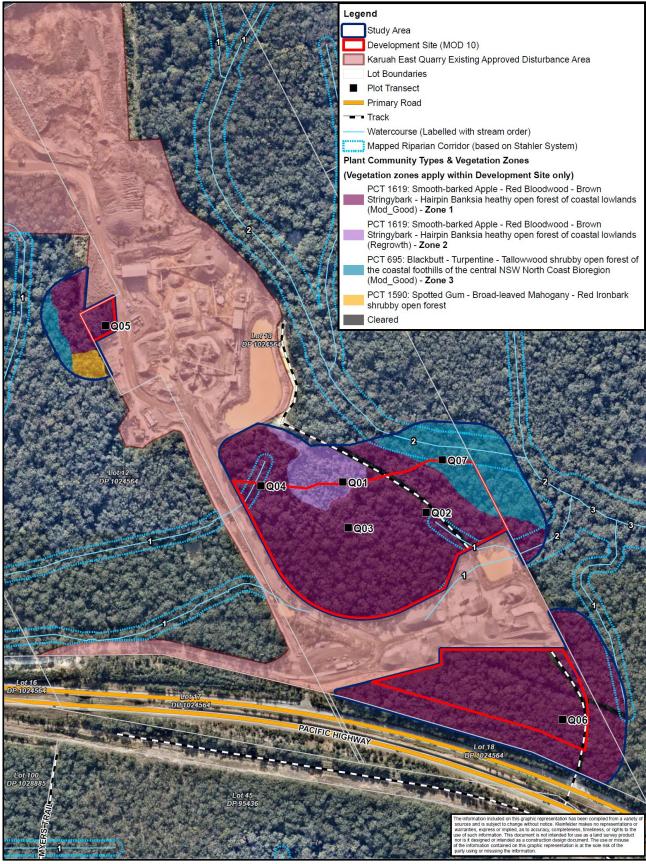


Figure 9: Plant Community Types, Vegetation Zones and Plot Transect Locations.



### **Flora**

A total of 129 flora species were identified during field surveys. Four (4) of these species are considered exotic, of which three (3) are listed under the Biosecurity Act 2015 (NSW).

Two (2) threatened flora species were recorded within the proposed MOD 10 development site as follows:

Tetratheca juncea (Black-eyed Susan)

A total of 2,102 *Tetratheca juncea* clumps were identified within the proposed MOD 10 additional disturbance area including:

- 48 in the northern disturbance area;
- o 1,670 in the central disturbance area; and
- 384 in the southern disturbance area.

An additional 804 *Tetratheca juncea* clumps were identified within a 30m buffer from the edge of the MOD 10 additional disturbance area.

 One (1) Grevillea parviflora subsp. Parviflora (Small-flowered Grevillea) individual was detected within the proposed MOD 10 site.

An additional 241 Grevillea parviflora subsp. Parviflora individuals were detected within a 30m buffer from the edge of the MOD 10 additional disturbance area.

Tetratheca juncea (Black-eyed Susan) and Grevillea parviflora subsp. parviflora (Small-flower Grevillea) are both Species Credit Species.

**Figure 10** below shows the location of the mapped *Tetratheca juncea* (Black-eyed Susan) and *Grevillea parviflora subsp. parviflora* (Small-flower Grevillea).



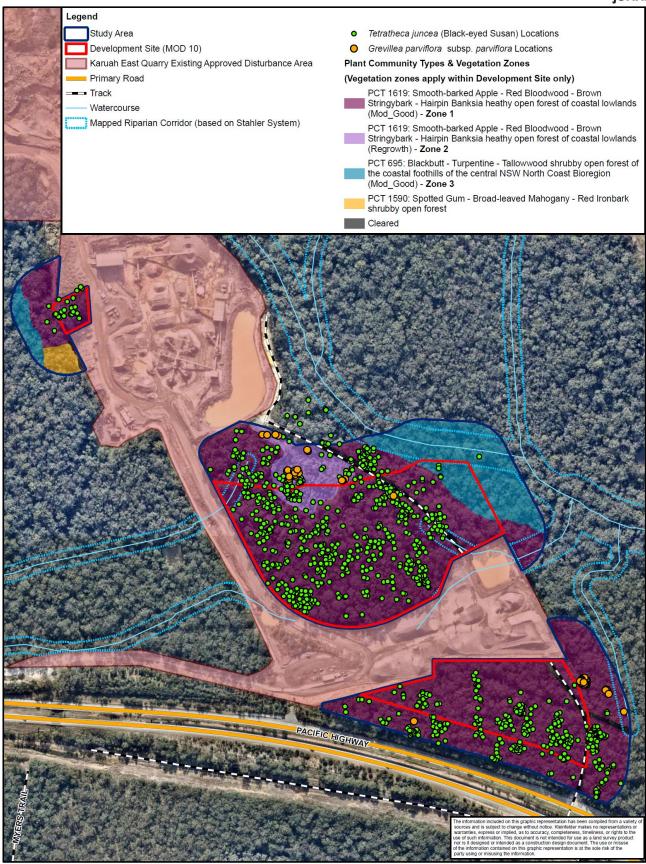


Figure 10: Threatened Flora Locations.



### **Fauna**

A total of 65 species of fauna were detected during field surveys. This included three (3) amphibian, 35 bird, 24 mammal and three (3) reptile species. Of these species, two (2) are considered to be feral / introduced being the Black Rat (Rattus rattus), and Red Fox (Vulpes vulpes).

Five (5) mammals and three (3) bird species detected within the study area are listed as vulnerable under the BC Act. These include:

- Little Bent-winged Bat (Miniopterus australis) was identified via anabat detection;
- Southern Myotis (Myotis macropus) was detected via anabat survey adjacent to the MOD 10 development site (within the 30m buffer), along a watercourse;
- East-coast Free-tailed Bat (*Micronomus norfolkensis*) was detected via anabat survey within the development site;
- Squirrel Glider (*Petaurus norfolcensis*) was identified within one location within the 30m buffer area from the edge of the MOD 10 site;
- Grey-headed Flying-Fox (*Pteropus poliocephalus*) was detected foraging within the MOD 10 site. No breeding camps were identified;
- Little Lorikeet (Glossopsitta pusilla) was detected foraging within the MOD 10 development site;
- Varied Sittella (Daphoenositta chrysoptera) was detected foraging within the MOD 10 development site; and
- Glossy Black Cockatoo (Calyptorhynchus lathami) was detected outside the Study Area and flying over the MOD 10 development site. Surveys did not identify any signs of breeding.

The Little Bentwing-bat is a dual Species and Ecosystem Credit Species. This is a Species Credit species for breeding habitat, and an Ecosystem Credit species for foraging habitat. The habitat constraint listed for this species in the Threatened Biodiversity Data Collection (habitat constraint: Cave, tunnel, mine, culvert or other structure known or suspected to be used for breeding), is not present on or within 100m of the MOD 10 development site. As such, breeding habitats of the Little Bentwing-bat do not occur within or in proximity to the MOD 10 development site which does not require the generation of Species Credits. Ecosystem credits are generated for foraging habitat.

Similarly, the Glossy Black Cockatoo and Grey-headed Flying Fox are dual Species and Ecosystem Credit species. These species are Species Credit species for 'breeding', and an Ecosystem Credit species for 'foraging' Given that no breeding was identified, no Species Credits were generated for the Glossy Black Cockatoo or Grey-headed Flying-Fox. Ecosystem credits are generated for foraging habitat.

The Little Lorikeet, Varied Sitella and East-coast Free-tailed Bat are all Ecosystem Credit species which were confirmed as predicted species. The Southern Myotis and Squirrel Glider are detected Species Credit species.

Figure 11 below shows the threatened fauna locations.



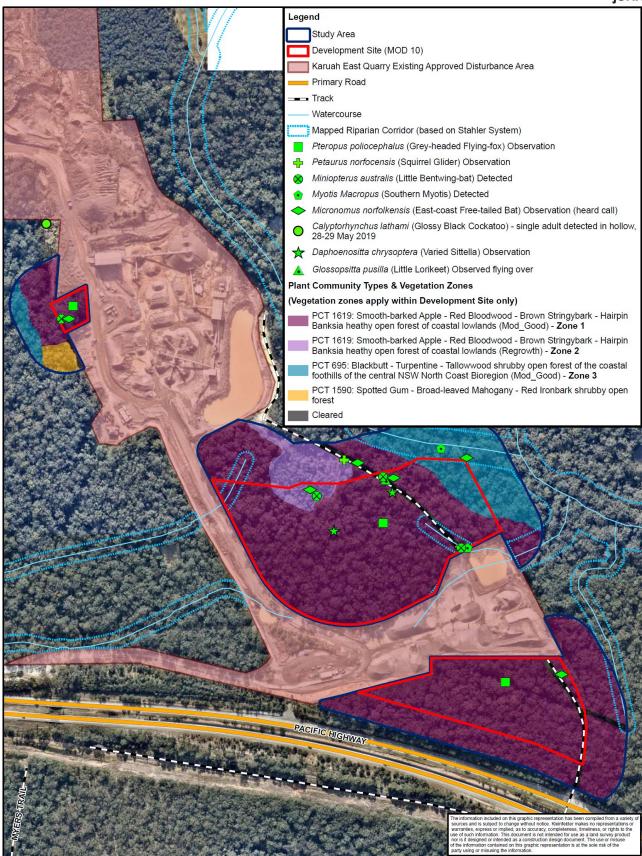


Figure 11: Threatened Fauna Locations.



### 6.1.2 Avoiding and Minimising Impacts

## Avoid & Minimising Impacts on Native Vegetation & Habitat

The proposed MOD 10 additional disturbance area has been designed in consideration of the principles of avoid and minimise. Through the design phase, several iterations of the development footprint were undertaken to avoid biodiversity values and maintain ecosystem functionality, including four (4) iterations (refer to **Figure 12** below). The 'donothing' option was also considered. A range of mitigation and management measures will also be incorporated into the project to reduce impacts on biodiversity during construction and operation.

The four (4) design iterations undertaken are described as follows

- 1. A reduction of impacts (1.07 ha) to vegetation to the north of the central disturbance area which contains high numbers of *Tetratheca juncea* and *Grevillea parviflora* subsp. parviflora. The initial MOD 10 design proposed that the boundary of the central disturbance area would extend to the southern edge of Dam 1 (adjacent to the crushing facilities/processing facilities). Following consideration of the impacts on biodiversity values in this area, the proponent amended the design of the central disturbance area, which resulted in approximately 300 clumps of *Tetratheca juncea* being avoided/retained and 167 individuals of *Grevillea parviflora* subsp. parviflora being avoided/retained;
- 2. A reduction of impacts to vegetation (0.99 ha) within a 30m strip along the southern edge of southern disturbance area (southern extent of Lot 13). This reduction of the impact area resulted in a further avoidance of approximately 100 clumps of *Tetratheca juncea* and 1 individual *Grevillea parviflora* subsp. parviflora. Avoidance of this 30m wide strip of vegetation also ensured connectivity was maintained eastwest along vegetation adjacent to the M1 Pacific Motorway;
- 3. Avoidance of a 20m wide Vegetated Riparian associated with the second order stream located north-east of the central disturbance area. The proposed MOD 10 additional disturbance area was set back to avoid any direct impact to the Vegetated Riparian Zone. Field surveys indicated that riparian vegetation is limited to within a few meters along the edge of the watercourse, however, a 20m buffer between the MOD 10 development footprint and the watercourse was implemented in the design; and
- 4. A reduction of impacts to the vegetation directly north of the central disturbance area (reduction of approximately 2,007m²). This area provides connectivity from vegetation to the east (Biodiversity Offset Area established as part of the Karuah East Quarry approval) and the aerial fauna crossing which provides linkage over the KEQ haul road (to the Conservation Area within Lot 12 established as part of the separate Karuah Quarry approval). Impacts to this area of vegetation were scaled back to increase the width of the retained vegetation leading to the aerial fauna crossing (from approximately 32m in width to approximately 57m in width). This also resulted in a reduction to previously impacted individuals of *Tetratheca juncea* and *Grevillea parviflora* subsp. parviflora. This change is consistent with a suggestion from NSW DPE staff at a scoping meeting held in February 2021.

The above described design amendments are shown in Figure 12 below:



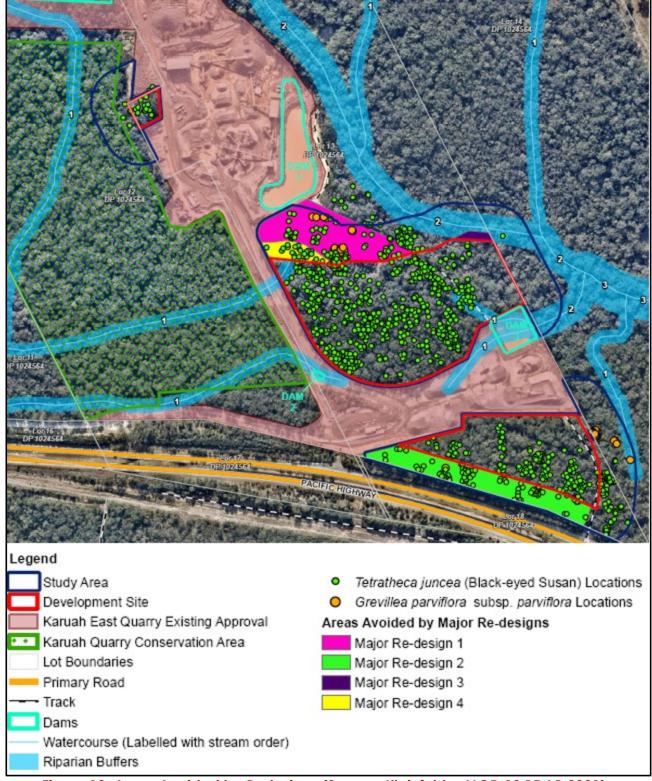


Figure 12: Areas Avoided by Redesigns (Source: Kleinfelder MOD 10 BDAR 2021).

It is acknowledged that the proposal extends into a portion of an existing biodiversity offset area on Lot 13 DP 1024564 (established as part of the original KEQ approval); however, no fragmentation of the offset area will occur. To compensate for the impact on the biodiversity offset area, KEQ Pty Ltd will provide a like for like replacement offset as well as an offset for the proposed MOD 10 development. This methodology has been discussed with both the NSW DPE Biodiversity Conservation Division (BCD) and Commonwealth Department of Agriculture, Water and the Environment (DAWE). Both agencies have



indicated support for this methodology. In summary, the following avoid and minimise measures have been implemented / are proposed:

- Four (4) genuine design iterations have occurred prior to arriving at the proposed layout which has resulted in significant reduction in the impact on biodiversity values; and
- Measures to protect threatened flora and fauna will be implemented, including the provision of compensatory biodiversity offsets to:
  - Replace the existing offset area being directly impacted by proposed MOD
     10 with like for like biodiversity values;
  - o Offset the impact of MOD 10; and
  - Environmental management / monitoring will be implemented to ensure that the mitigation measures continue to be effective.

The 'Do Nothing' option was considered; however, this would significantly impact the long-term efficient operation of KEQ because the essential stockpiling space that is required would not be achieved. The following is noted:

- KEQ's client and project base has evolved since the time of the original approval.
   KEQ has a proven high quality hard rock product. Clients now include Transport for NSW, Port Authority and several local Council's;
- When tendering for large infrastructure projects, KEQPL are required to demonstrate proof of stockpiling capacity, which is subject to a quality testing process to demonstrate Quality Assurance;
- This typically requires 4,000m³ of product to demonstrate compliance with various Australia Standards and TfNSW specifications; and
- Noting that KEQ stocks up to 15 different types of products, KEQPL are facing a significant problem in that the available stockpiling areas are insufficient in size. This is highly problematic because the quarry will be unsuccessful with tenders purely because it cannot comply with tender requirements relating to demonstrated stockpiling capacities and Quality Assurance requirements.

Accordingly, the 'do nothing' option is not a feasible alternative.

For the quarry to operate efficiently, additional land is required for stockpiling of material. The proposed additional disturbance areas for stockpiling (i.e. the central and southern proposed disturbance areas) were selected based on the following considerations:

- The proposed locations lie adjacent to the established southern stockpile area;
- The extraction and processing of materials within the site occurs in a lineal manner, progressing south from the extraction area through the processing area to the stockpile area for storage prior to dispatch via the weighbridge. The extension of the existing stockpiling area will allow the established linear movement of material through the site to be maintained; and
- The approved stockpiling area at KEQ is approximately 27,000m<sup>2</sup>. By comparison, this is significant less than other quarries in the area, which have similar extraction rates yet have available stockpiling areas in excess of 100,000m<sup>2</sup>. MOD 10 will have the effect that the KEQ is commercially competitive in terms of product availability when tendering for construction / infrastructure projects. This will generate a positive public outcome that will result in a more competitive tendering process for local and regional projects.



The alternate option is to source, secure and disturb land elsewhere which will lead to inefficient double handling of material and increased traffic and fuel usage, which also will lead to increased noise and air quality impact. It is considered most logical to keep the proposed stockpile areas adjacent to the existing stockpile area and in the one managed operation.

Further project justification is provided in **Section 7**.

# 6.1.3 Impacts on Native Vegetation, Threatened Ecological Communities and Threatened Species Habitat

No serious or irreversible impacts were identified within the MOD 10 development site.

Direct impacts of proposed MOD 10 are expected to occur during vegetation clearing works. Within the site, the Project will require the complete removal of 6.98 ha of native vegetation.

The proposed development has the potential to cause indirect impacts on land adjacent to the additional disturbance area as a result of potential increased levels of dust, noise, erosion and sedimentation, modification to hydrology and transfer of weeds and pathogens. Environmental safeguards already implemented at the KEQ can be readily expanded to accommodate the proposed MOD 10 additional disturbance area and control any indirect environmental impacts.

It is important to note that ongoing biodiversity monitoring (undertaken within the established KEQ biodiversity offset area) does not indicate that any potential indirect disturbance on threatened flora species, as a result of edge effects, are occurring.

The proposed development is unlikely to lead to any major separation or disconnection between areas of vegetation. The proposed development is unlikely to impact on the movement of fauna in the local area.

The Project will not cause the fragmentation of the local landscape, such that areas of habitat for threatened species would become isolated and the life cycle of a local population would be placed at the risk of extinction.

### **Environmental Safeguards**

Environmental safeguards incorporated in Management Plans that are in place for the existing KEQ operation will be expanded to accommodate the MOD 10 proposal. Management plans that will be updated include:

- Biodiversity offset area management plan;
- Water management plan;
- Air quality and greenhouse gas management plan;
- Noise management plan;
- Heritage management plan;
- Landscape & rehabilitation management plan;
- Traffic management plan; and
- Environmental management strategy.

Environment safeguards specifically required for MOD 10 are detailed in **Appendix C** of this report.



The residual impacts of the proposed development which require offsetting include:

- Impacts on 6.68 ha of PCT 1619, generating a credit obligation of 193 ecosystem credits;
- Impacts on 0.30 ha of PCT 695, generating a credit obligation of 7 ecosystem credits;
- Impacts on 6.98 ha of *Tetratheca juncea* habitat, generating a credit obligation of 267 species credits;
- Impacts on 6.68 ha of Grevillea parviflora subsp. parviflora habitat, generating a credit obligation of 257 species credits;
- Impacts on 6.98 ha of Squirrel Glider habitat, generating a credit obligation of 267 species credits; and
- Impacts on 2.90 ha of Southern Myotis habitat, generating a credit obligation of 110 species credits.

### 6.1.4 Biodiversity Offsets

Retirement of biodiversity credits is required to:

- Replace the existing offset area being directly impacted by proposed MOD 10 with like for like biodiversity values; and
- Offset the impact of MOD 10.

An onsite offset investigation has been undertaken which has identified suitable areas to the west of KEQ. Areas of Lots 21 DP 1024341 and 201 DP 1042537 (owned by Hunter Quarries) have been proposed to fulfil the 'like for like' replacement offset requirement and partially fulfil the offset obligation for MOD 10 (refer to **Figures 13** and **14** below).

Land-based offsets will be prioritised, with any remaining credits being purchased from existing credit holders (from the market) or through payment into the Biodiversity Conservation Fund.

A Biodiversity Stewardship Site Assessment Report and management plan will be prepared and implemented for the proposed part Lot 21 DP 1024341 and part Lot 201 DP 1042537 offset site. Monitoring will continue for the expanded offset area.





Figure 13: Proposed KEQ MOD 10 Offset Replacement.



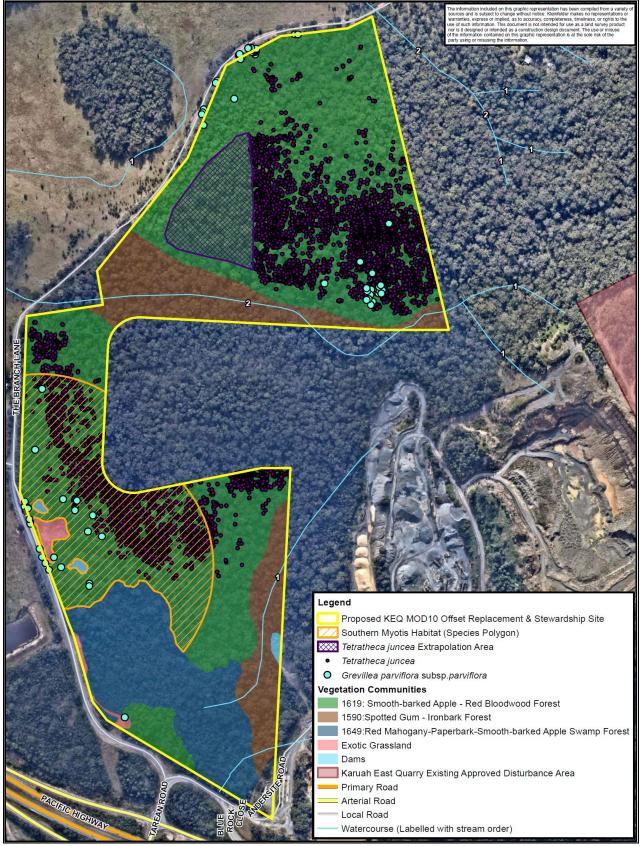


Figure 14: Proposed KEQ MOD 10 Offset Replacement – Biodiversity Values.



# 6.1.5 Environment and Biodiversity Conservation Act 1999

On 2 May 2022, a delegate of the Commonwealth Minister for Environment determined that the project is a controlled action under Part 7 of the EPBC Act 1999. The EPBC controlling provisions for the proposed action are listed threatened species and communities. The project will be assessed under the Bilateral Agreement (Amending Agreement No.1, 2020) between the Commonwealth and NSW Governments. The BDAR (specifically Section 7.1), refer to **Appendix G** of this Modification Report has been prepared to specifically address the 'Supplementary Environmental Assessment Requirements – Matters of National Environmental Significance' (including the 'Project Assessment Notes') issued by the NSW DPE on 23 May 2022 (refer to **Appendix P**).

Potential impacts to threatened species for which DAWE considers that there is likely to be a significant impact have been addressed with the Significant Impact Guidelines 1.1 – Matters of National Environmental Significance (DoE, 2013) (provided in Appendix 7 of the BDAR). The species include:

- Black-eyed Susan (Tetratheca juncea) Vulnerable; and
- Koala (*Phascolarctos cinereus* (combined populations of Queensland, New South Wales and the Australian Capital Territory)) Endangered.
- Small-flower Grevillea (Grevillea parviflora subsp. parviflora) Vulnerable;
- Trailing Woodruff (Asperula asthenes) vulnerable; and
- Grey-headed Flying-fox (Pteropus poliocephalus) Vulnerable.

The below section provides a summary of the assessment of the relevant EPBC listed threatened species identified in the 'Supplementary Environmental Assessment Requirements'.

# 6.1.5.1 Black Eyed Susan (Tetratheca juncea) – Vulnerable

Targeted surveys were undertaken during the flowering period of the species to increase detectability (September to October). Surveys (5m parallel transects) were undertaken in September 2018, and September - October 2019 throughout the Study Area (**Figure 15**).

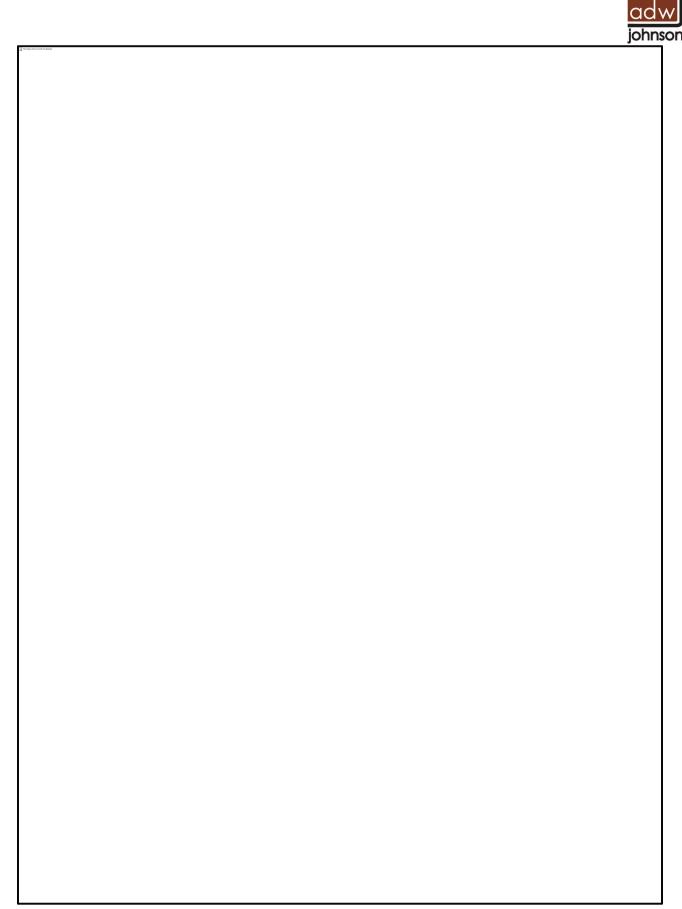


Figure 15: Tetratheca juncea (Black – eyed Susan) Targeted Survey.

A total of 2,906 *Tetratheca juncea* clumps were identified within the Study Area, of which 2,102 are within the Development Site (48 in the northern disturbance area, 1,670 in the central disturbance area and 384 in the southern disturbance area) (**Figure 16**). A total of



804 clumps are located in the buffer areas. The number of *Tetratheca juncea* plant clumps within Lots 5, 13 and 14 (KEQ owned land) is calculated to be approximately 6,907.

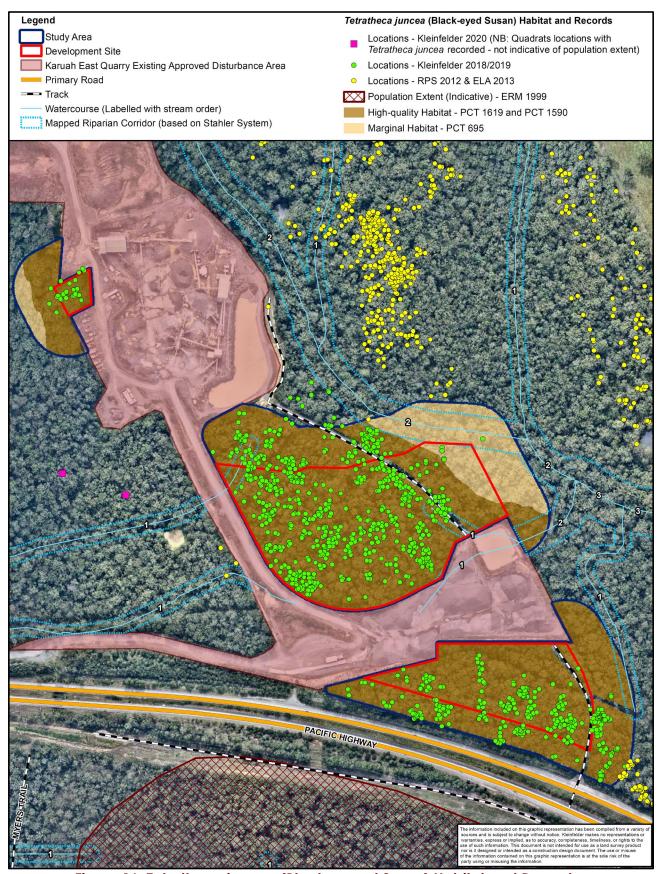


Figure 16: Tetratheca juncea (Black – eyed Susan) Habitat and Records.



Within the immediate vicinity, there are approximately 13,439 clumps of *Tetratheca juncea* located within Lot 21 DP1042537 and Lot 201 DP1024564; Lot 12 DP 1024564, Lot 11 DP1024564 and approximately 12,215 clumps of *Tetratheca juncea* have been previously recorded on the southern side of Pacific Motorway (**Figure 17**). *Tetratheca juncea* are also suspected to occur with Lot 4 DP838128 (however direct counts of plant clumps have not been undertaken). Given this, the *Tetratheca juncea* plant clumps within MOD10 form part of an important population (greater than 1000 plant clumps).

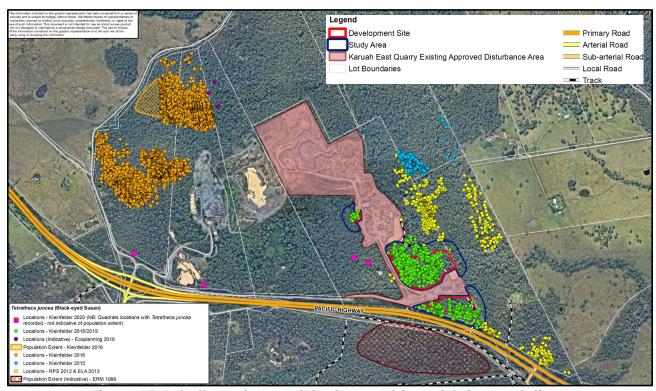


Figure 17: Tetratheca juncea (Black – eyed Susan) Sub-population.

All patches of Tetratheca juncea within land surrounding KEQ are considered to comprise a single subpopulation. Subpopulations of Tetratheca juncea are defined as plant clump groups separated by distances of less than 500m within suitable habitat of native vegetation or by less than 100m within unsuitable degraded/developed habitat or non-native vegetation. The distance between subpopulations allows for regular transfer of genetic material between subpopulations within a population. As such, the subpopulation is calculated to comprise approximately 32,561 plant clumps. Proposed MOD 10 will result in the direct removal of 2,102 clumps, equating to 6.4% of the subpopulation, while 93.6% or 30,459 plant clumps will be avoided/retained. High quality areas of known habitat to be avoided include the KEQ BOA (which is proposed to be placed under a Conservation Agreement following MOD10 determination (refer to Section 5.1) and land within Part Lot 201 and Part Lot 21 to the west (owned by Hunter Quarries Pty Ltd). Tetratheca juncea plant clumps within Karuah Nature Reserve to the south of the Pacific Motorway will also remain. MOD10 impacts are unlikely to fragment any subpopulations that would result in gaps of greater than 500m (within native vegetation) or gaps of (100m within degraded/developed habitat or non-native vegetation). The native vegetation corridor width necessary for connecting subpopulations will not be reduced to less than 20m, thus maintaining pollinator movement and buffer zones around known habitat. Given the proportional impacts to the subpopulation and the avoidance/retention of 93.6% (30,459 individual plant clumps) within the subpopulation, impacts are unlikely to compromise the local population such that it would be at risk of extinction.



In addition, the footprint of MOD 10 was subject to four re-designs (as noted within Section 6.1.2) which resulted in greater numbers of *Tetratheca juncea* being retained. These redesigns were primarily undertaken to avoid individuals of *Tetratheca juncea* and *Grevillea parviflora* subsp. parviflora which, at the time, were located within the impact area.

Environmental safeguards incorporated into Management Plans that are in place for the KEQ operation will be expanded to accommodate the proposal. Specifically, these plans ensure that indirect impacts to biodiversity values (including Tetratheca juncea) surrounding the operational areas of KEQ are mitigated. Prior to construction all areas regarded as 'nogo areas' will be fenced and have signage erected to reduce the potential for any adverse impact to Tetratheca juncea or its habitat, beyond the disturbance footprint. In particular, the Air Quality Management Plan will be extended and updated to include MOD 10 to assist in monitoring and minimising the potential for stigma clogging of all plant populations in retained bushland habitats with emphasis regarding threatened flora. While Tetratheca iuncea within the buffer areas of MOD10 are potentially susceptible to edge effects, current monitoring of Tetratheca juncea within the BOA has indicated that abundance has remained relatively stable since 2015 (i.e. post quarry establishment and implementation of ongoing mitigation measures). As such, there is no evidence of any significant indirect disturbance on the species that has been recorded, indicating that edge effects are minimal provided that mitigation measures are implemented. All retained areas of the BOA will be placed under a Conservation Agreement following the MOD10 determination and the KEQ BOA management plan will be updated accordingly.

All native vegetation within the MOD10 footprint is proposed to be cleared. This area contains 6.98 ha of suitable habitat for *Tetratheca juncea*. Rehabilitation of KEQ, inclusive of the MOD10, will occur following extraction and closure of the quarry. A revegetation program will re-establish native tree/shrub/ground cover with the objective of providing suitable habitat for threatened species, including *Tetratheca juncea*.

Measures to protect threatened flora and fauna will be implemented, including the provision of compensatory biodiversity offsets to:

- Replace the portion of the BOA being directly impacted by proposed MOD10 with like-for-like biodiversity values; and
- Offset the impact of MOD10 (under the Biodiversity Offset Scheme).

A portion of Lot 201 DP1042537 and Lot 21 DP 1024341 (owned by Hunter Quarries Pty Ltd) is proposed to be utilised as the replacement offset area necessary to offset impacts of MOD10 on the existing KEQ BOA. The portion of the BOA which is proposed to be impacted by MOD10 contains 6.51 ha of PCT1619 and 0.36 of PCT 695 (suitable habitat for *Tetratheca juncea*) and 2054 individual plant clumps. The proposed offset replacement will contain a minimum of 6.81 ha of suitable habitat for *Tetratheca juncea* (PCT1619 and PCT1590) and a minimum of 2054 individual plant clumps.

In addition, like-for-like offsets for *Tetratheca juncea* will be sought to offset the impact of MOD10 on the species (260 Species credits) under the Biodiversity Conservation Act. Landbased offsets will be prioritised, with any remaining *Tetratheca juncea* species credits being purchased from existing credit holders or via payment into the Biodiversity Conservation Fund.



# 6.1.5.2 Koala (Phascolarctos cinereus (combined populations of Queensland, New South Wales and the Australian Capital Territory) - Endangered

Targeted surveys for the Koala were undertaken throughout the Study Area in 2019, 2020 and 2021 including arboreal remote camera trapping (368 trap nights), spotlighting/call playback (14 nights) and five scat searches (Spot Assessment Technique) (refer to **Figure 18**).



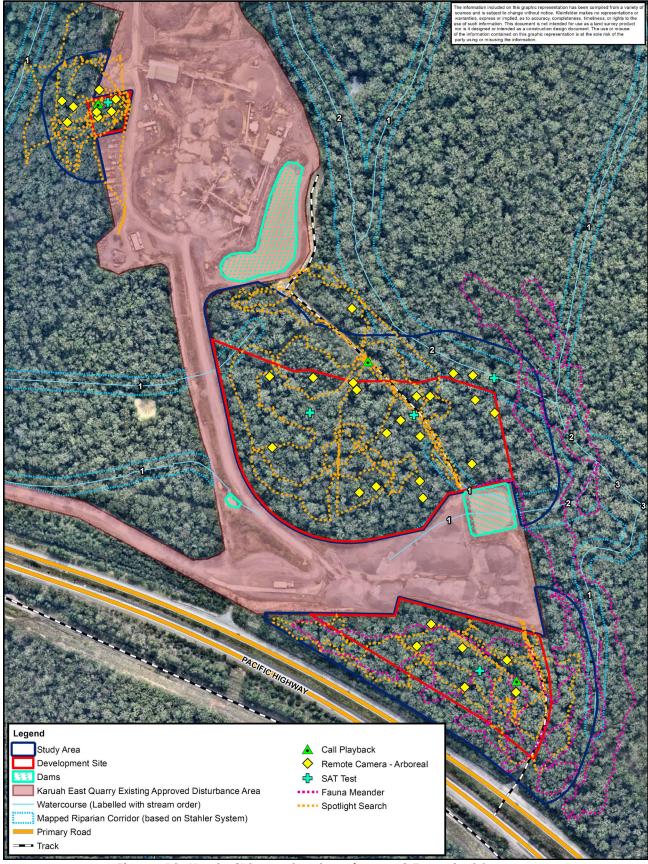


Figure 18: Koala (Phascolarctos cinereus) Targeted Survey.



No Koalas, or evidence thereof, were detected during surveys. Previous targeted surveys (in 2010, 2017 and 2018) for Koalas within KEQ owned land (including Lots 5, 13 and 14) have also failed to detect the species. Very few records of Koalas exist within the broader 530 hapatch of native vegetation that KEQ lies within (north of the Pacific Motorway). Greater numbers of Koala records exist to the south of the Pacific Motorway (connected via underground fauna crossing). Of the 49 records of Koala within 5kms of the Study Area, 37 occur to the south of the Pacific Motorway, while 12 records of Koala occur along the Pacific Motorway or within the 530 hapatch to the north of the Pacific Motorway. The nearest confirmed Koala sighting is from Lot 11 DP1024564 (Wedgerock 2018), approximately 900m to the west of the KEQ.

A review of the Koala tree use across New South Wales (OEH, 2018) shows that the North Coast Koala Management Area (in which the Development Site occurs) contains the following Koala Use in order of importance: 'Regional High Use' trees include E. tereticornis; E. microcorys; E. propinqua and E. robusta. 'Local High Use' trees include Red Mahogany (E. resinifera), Orange Gum (E. bancroftii), Parramatta Red Gum (E. parramattensis), Slaty Red Gum (E. glaucina), Cabbage Gum (E. amplifolia) and Smooth-barked Apple (A. costata). 'Significant use' trees include Flooded Gum (E. grandis), Sydney Blue Gum (E. saligna), Grey Box (E. moluccana), Grey Ironbark (E. siderophloia), White Mahogany (E. acmenoides), Blackbutt (E. pilularis), White Stringybark (E. globoidea), Thin-leaved Stringybark (E. eugenoides), Tindale's Stringybark (E. tindaliae), Scribbly Gum (E. signata / E. racemosa), Turpentine (S. glomulifera), Forest Oak (A. torulosa) and Broad-leaved Paperbark (M. quinquinervia).

A total of 0.30 ha of habitat has been mapped within the Development Site (PCT 695 - Turpentine - Tallowwood shrubby open forest of the coastal foothills of the central NSW North Coast Bioregion) which contains a regional high use tree (E. microcorys), a local high use tree (A. costata) and a number of significant use trees (A. torulosa, E. saligna, E. acmenoides, E. pilularis, S. glomulifera) (Figure 19). A total of 6.68 ha of habitat is also within the Development Site (PCT 1619 - Red Bloodwood - Brown Stringybark - Hairpin Banksia heathy open forest of coastal lowlands) which contains a local high use tree species (A. costata) and a two significant use trees (E. globoidea, E. pilularis) (Figure 19).



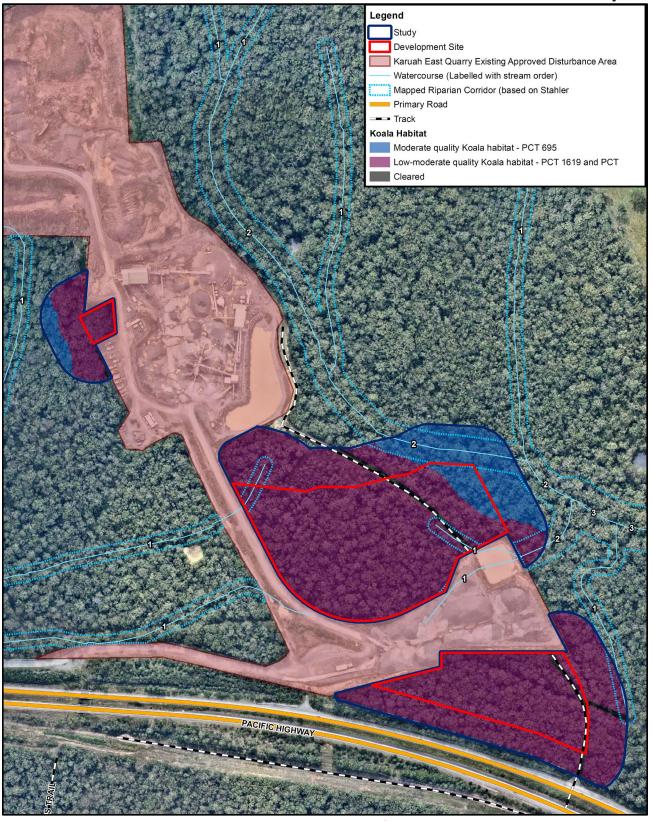


Figure 19: Koala (Phascolarctos cinereus) Habitat.

Given the low number of Koalas recorded within the locality (particularly within continuous habitats), and lack of evidence of Koalas being detected during the extensive targeted surveys undertaken within KEQ land (thus, no evidence of breeding individuals), the Study Area is highly unlikely to be important for breeding and most likely forms a small portion of the potential range of the regional population.



In addition, the majority of the proposed MOD10 impacts are limited to PCT 1619 which does not contain any regional high use trees, while impacts to PCT 695 are minimal (which contains a regional high use tree - E. microcorys). Within PCT 695, E. microcorys (primary Koala food tree) is a subdominant species representing a small proportion of the overstorey species (>5%) and was not recorded during the vegetation plot within the vegetation community. Within PCT 1619, A. costata (secondary Koala feed tree) is a subdominant species comprising around 15% of the overstorey species.

While the Koala has not been detected within areas of native vegetation owned by KEQ (Lot 13, Lot 14 and Lot 5), the majority of habitats will be avoided and retained. Specifically, within the KEQ BOA, 28.0 ha of PCT 695 will be retained (98.9%) while 24.83 ha of PCT 1619 will be retained (79.2%). The KEQ BOA will also continue to support various other vegetation communities (total of 76.56 ha) which contain Koala feed trees such as A. costata, E. pilularis, E. piperita, Corymbia maculata, C. gummifera, Syncarpia glomulifera and Lophostemon confertus. Land within Lot 12 DP1024564 (directly the west of KEQ) will also continue to provide suitable habitat for the Koala within the Karuah Quarry Conservation Area (16ha in total). The Karuah Quarry Conservation Area adjoins Lot 11, where a single Koala was recorded in 2018. Currently, native vegetation does not provide connection between MOD 10 and Lot 11, other than via an aerial fauna crossing which has been installed over the KEQ north south haul road.

All native vegetation within the MOD10 footprint is proposed to be cleared. This area contains 6.98 ha of suitable habitat for the Koala. Rehabilitation of KEQ, inclusive of the MOD10, will occur following extraction and closure of the quarry. A revegetation program will re-establish native tree/shrub/ground cover with the objective of providing suitable habitat for threatened species, including the Koala.

Environmental safeguards incorporated into Management Plans that are in place for the KEQ operation will be expanded to accommodate the proposal. Specifically, these plans ensure that indirect impacts to biodiversity values (including the Koala) surrounding the operational areas of KEQ are mitigated. Prior to construction all areas regarded as 'no-go areas' will be fenced and have signage erected to reduce the potential for any adverse impact to suitable Koala habitat, beyond the disturbance footprint. Measures to protect threatened flora and fauna will be implemented, including the provision of compensatory biodiversity offsets to:

- Replace the portion of the BOA being directly impacted by proposed MOD10 with like-for-like biodiversity values; and
- Offset the impact of MOD10 (under the Biodiversity Offset Scheme).

A portion of Lot 201 DP1042537 and Lot 21 DP 1024341 (owned by Hunter Quarries Pty Ltd) is proposed to be utilised as the replacement offset area necessary to offset impacts of MOD10 on the existing KEQ BOA. The portion of the BOA which is proposed to be impacted by MOD10 contains 6.51 ha of PCT1619 and 0.36 of PCT 695 (suitable habitat for the Koala). The proposed offset replacement will contain a minimum of 6.81 ha of suitable habitat for the Koala (PCT1619 and PCT1590).

In addition, like-for-like offsets for PCT 1619 and PCT 695 (for which the Koala is an ecosystem credit species) will be sought to offset the impact of MOD10 on the species under the BC Act. Given the absence of the Koala during targeted surveys within MOD10, a species credit obligation for the species will not be generated. To meet the ecosystem credit obligation, land-based offsets will be prioritised, with any remaining ecosystem credits being purchased from existing credit holders or via payment into the Biodiversity Conservation Fund.



# 6.1.5.3 Small-flower Grevillea (Grevillea parviflora subsp. parviflora) - Vulnerable

Targeted surveys were undertaken during the flowering period of the species to increase detectability (August to November). Surveys (5m parallel transects) were undertaken in September 2018, and September - October 2019 throughout the Study Area (**Figure 20**).

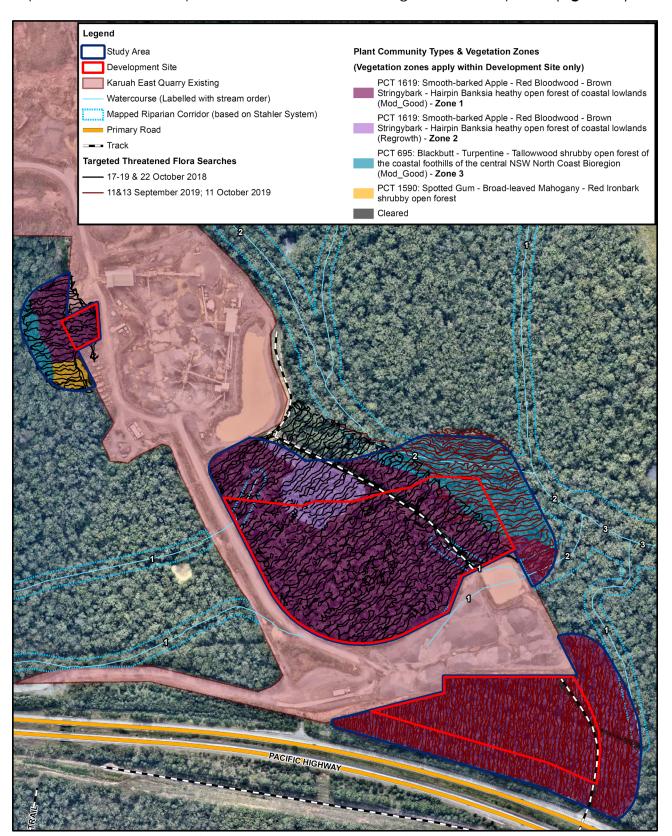


Figure 20: Grevillea parviflora subsp. parviflora (Small-flower Grevillea) Targeted Survey.



While the species occurs in a range of vegetation types from health and scrubby open forest, the species is primarily associated with PCT 1619 (Smooth-barked Apple - Red Bloodwood - Brown Stringybark - Hairpin Banksia heathy open forest) within the MOD10 Study Area and Sydney Peppermint – Smooth-barked Apple shrubby open forest within the adjacent KEQ BOA (likely to be variant of PCT 1619). The results of the targeted searches showed that one individual Grevillea parviflora subsp. parviflora is located within the MOD10 footprint, while 241 individuals are located within the Study Area (but with no direct impact) (Figure 21). Overall, the MOD10 Development Site will require the removal of 6.68 ha of PCT 1619, which is known habitat for the G. parviflora.



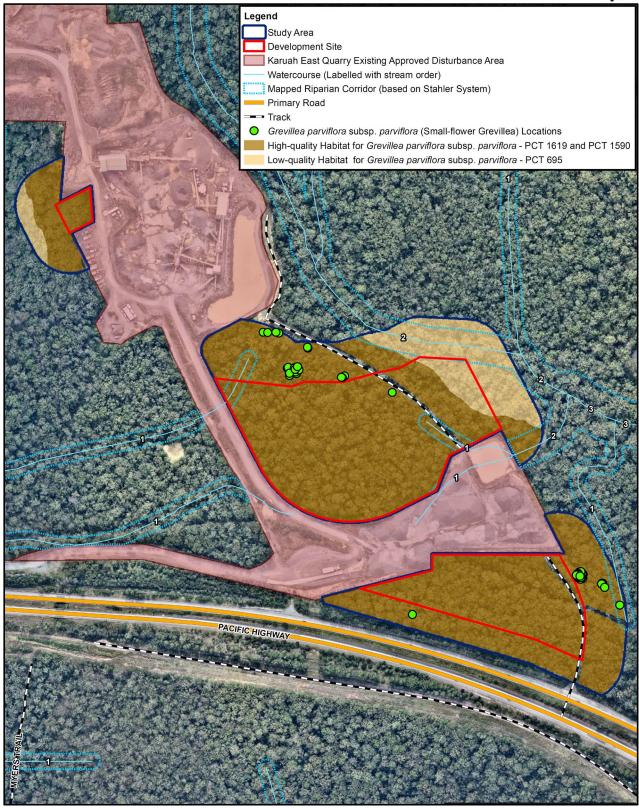


Figure 21: Grevillea parviflora subsp. parviflora (Small-flower Grevillea) Habitat and Records.

Within Lots 13, Lot 14 and Lot 5, the KEQ BOA currently contains over 340 Grevillea parviflora subsp. parviflora, of which, all but one will be retained. The individuals located within the KEQ BOA all occur within PCT 1619 (total of 30.54 ha). While 6.51 ha of PCT 1619 (which currently forms part of the KEQ BOA) is proposed to be impacted, 24.83 ha of PCT 1619 will be retained (79.2%) within the BOA. Additionally, a number of individual Grevillea parviflora subsp. parviflora occur to the west within Lot 21 and 201 (owned by Hunter Quarries Pty Ltd).



More broadly, at least eight populations of Grevillea parviflora subsp. parviflora have been recorded within 10 km of the Study Area with approximately 500 populations identified across the species distribution in NSW. According to the Environmental Impact Assessment Guidelines for Grevillea parviflora subsp. parviflora (NSW NPWS 2002), sites containing greater than 50 plants are significant. As such, the one individual to be impacted by MOD10 comprises part of a significant site for the species. However, given the proportion of retained individuals (99.7%) and the area of suitable habitat retained (24.83 ha), the Grevillea parviflora subsp. parviflora important site is highly unlikely to be significantly impacted.

Environmental safeguards incorporated into Management Plans that are in place for the KEQ operation will be expanded to accommodate the proposal. Specifically, these plans ensure that indirect impacts to biodiversity values (including Grevillea parviflora subsp. parviflora) surrounding the operational areas of KEQ are mitigated. Prior to construction all areas regarded as 'no-go areas' will be fenced and have signage erected to reduce the potential for any adverse impact to Grevillea parviflora subsp. parviflora or its habitat, beyond the disturbance footprint. In particular, the Air Quality Management Plan will be extended and updated to include MOD10 to assist in monitoring and minimising the potential for stigma clogging of all plant populations in retained bushland habitats with emphasis regarding threatened flora. While Grevillea parviflora subsp. parviflora that occur within the buffer areas of MOD10 are potentially susceptible to edge effects, current monitoring of Grevillea parviflora subsp. parviflora within the BOA has indicated that abundance has remained relatively stable since 2015 (i.e. post quarry establishment and implementation of ongoing mitigation measures). As such, there is no evidence of any significant indirect disturbance on the species that has been recorded, indicating that edge effects are minimal provided that mitigation measures are implemented. All retained areas of the BOA will be placed under a Conservation Agreement following the MOD10 determination and the KEQ BOA management plan will be updated accordingly.

All native vegetation within the MOD10 footprint is proposed to be cleared. This area contains 6.68 ha of suitable habitat for *Grevillea parviflora* subsp. parviflora. Rehabilitation of KEQ, inclusive of the MOD10, would occur following extraction and closure of the quarry. A revegetation program will re-establish native tree/shrub/ground cover with the objective of providing suitable habitat for threatened species, including *Grevillea parviflora* subsp. parviflora.

Measures to protect threatened flora and fauna will be implemented, including the provision of compensatory biodiversity offsets to:

- Replace the portion of the BOA being directly impacted by proposed MOD10 with like-for-like biodiversity values.
- Offset the impact of MOD10 (under the Biodiversity Offset Scheme).

A portion of Lot 201 DP1042537 and Lot 21 DP 1024341 (owned by Hunter Quarries Pty Ltd) is proposed to be utilised as the replacement offset area necessary to offset impacts of MOD10 on the existing KEQ BOA. The portion of the BOA which is proposed to be impacted by MOD10 contains 6.51 ha of PCT1619 (suitable habitat for Grevillea parviflora subsp. parviflora) and 1 individual. The proposed offset replacement will contain a minimum of 6.51 ha of suitable habitat for Grevillea parviflora subsp. parviflora (PCT1619) and a minimum of 1 individual (though preliminary surveys indicate that many individuals are likely to be conserved within the replacement offset area).



In addition, like-for-like offsets for *Grevillea parviflora* subsp. parviflora will be sought to offset the impact of MOD10 on the species (250 Species credits) under the BC Act. Land-based offsets will be prioritised, with any remaining *Grevillea parviflora* subsp. parviflora species credits being purchased from existing credit holders or via payment into the Biodiversity Conservation Fund.

# 6.1.5.4 Trailing Woodruff (Asperula asthenes) - Vulnerable

Targeted surveys were undertaken during the flowering period of the species to increase detectability (October to December). Surveys (5m parallel transects) were undertaken in October and November 2019 throughout the Study Area (**Figure 22**).



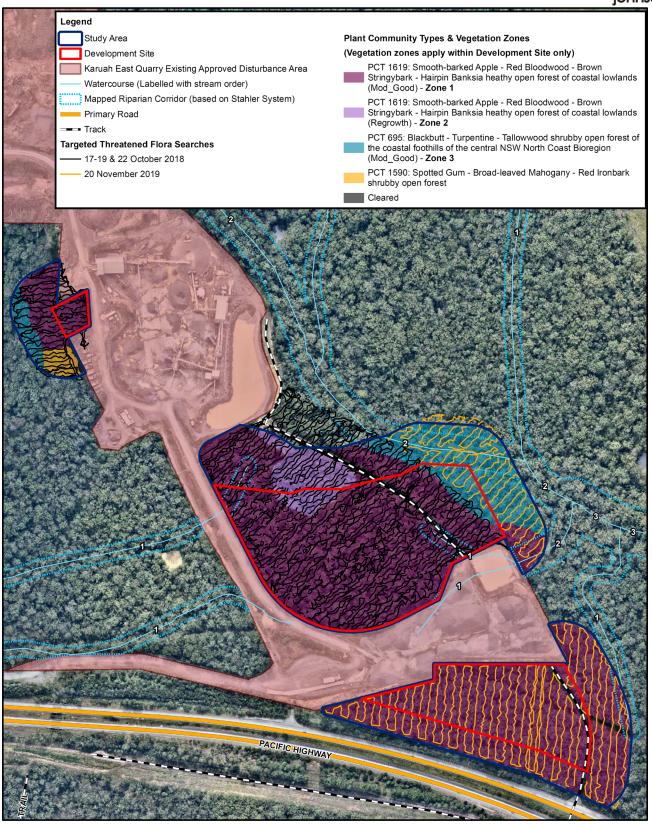


Figure 22: Asperula asthenes (Trailing Woodruff) Targeted Survey.

Asperula asthenes is found in habitats that are generally in association with alluvial riparian habitats along small creeks and watercourses, often in vegetation having rainforest and paperbark forest elements. The species can also be found in and adjacent to stands of swamp forest which are periodically inundated. As such the most suitable habitat within the MOD10 footprint comprises PCT 695 (Blackbutt - Turpentine - Tallowwood shrubby open forest) (Figure 23).



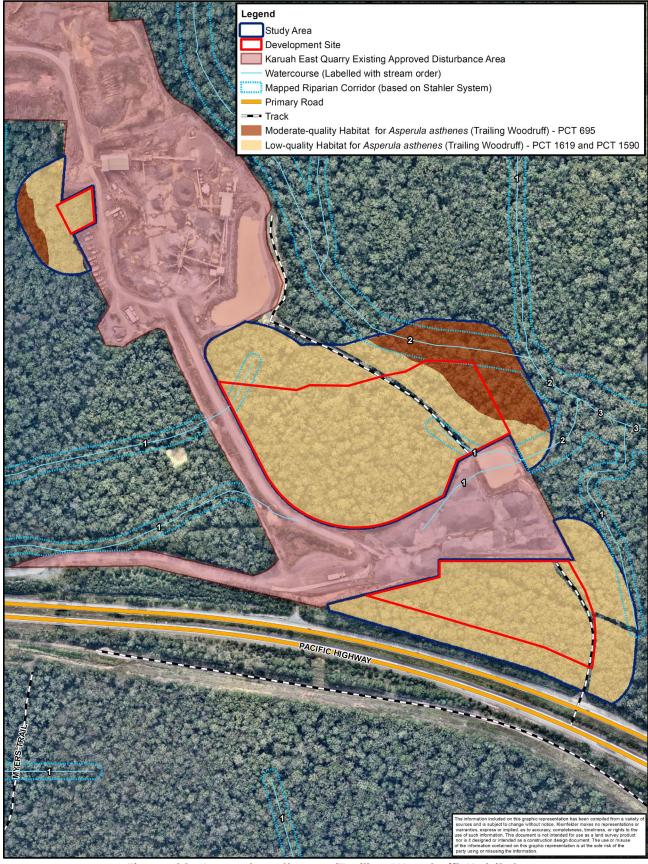


Figure 23: Asperula asthenes (Trailing Woodruff) Habitat.



While no individuals were detected during targeted searches within the Study Area, the species is known to occur in more suitable habitat contained within the KEQ BOA. The species shows a distinct association for the community - Brush Box - Turpentine shrubby open forest which is concentrated along a drainage line (riparian habitat). Similarly, the species is also known to occur within wetter habitats within the Karuah Quarry Conservation Area (Lot 12), which lies directly to the west of KEQ. All known areas of habitat will be avoided and are to be conserved through existing conservation offset provisions (associated with established Karuah Quarry conservation area) or via a proposed Conservation Agreement (KEQ).

Environmental safeguards incorporated into Management Plans that are in place for the KEQ operation will be expanded to accommodate the proposal. Specifically, these plans ensure that indirect impacts to biodiversity values (including Asperula asthenes) surrounding the operational areas of KEQ are mitigated. Prior to construction all areas regarded as 'nogo areas' will be fenced and have signage erected to reduce the potential for any adverse impact to Asperula asthenes or its habitat, beyond the disturbance footprint. In particular, the Air Quality Management Plan will be extended and updated to include MOD 10 to assist in monitoring and minimising the potential for stigma clogging of all plant populations in retained bushland habitats with emphasis regarding threatened flora. Current monitoring of Asperula asthenes within the KEQ BOA and Karuah Quarry Conservation Area has indicated that abundance has remained relatively stable since 2015 (i.e. post quarry establishment and implementation of ongoing mitigation measures). As such, there is no evidence of any significant indirect disturbance on the species that has been recorded, indicating that edge effects are minimal provided that mitigation measures are implemented. All retained areas of the BOA will be placed under a Conservation Agreement following the MOD10 determination and the KEQ BOA management plan will be updated accordingly.

All native vegetation within the MOD10 footprint is proposed to be cleared. This area contains 0.3 ha of suitable habitat for Asperula asthenes. Rehabilitation of KEQ, inclusive of the MOD10, would occur following extraction and closure of the quarry. A revegetation program will re-establish native tree/shrub/ground cover with the objective of providing suitable habitat for threatened species, including Asperula asthenes.

Measures to protect threatened flora and fauna will be implemented, including the provision of compensatory biodiversity offsets to:

- Replace the portion of the BOA being directly impacted by proposed MOD 10 with like-for-like biodiversity values; and
- Offset the impact of MOD10 (under the Biodiversity Offset Scheme).

A portion of Lot 201 DP1042537 and Lot 21 DP 1024341 (owned by Hunter Quarries Pty Ltd) is proposed to be utilised as the replacement offset area necessary to offset impacts of MOD10 on the existing KEQ BOA. The portion of the BOA which is proposed to be impacted by MOD10 contains 0.3 ha of PCT695 (suitable habitat for Asperula asthenes). Given that no areas of high-quality habitat (which support Asperula asthenes) is proposed to be impacted, the proposed offset replacement is not anticipated to require any high-quality habitat for the species.

Like-for-like offsets for Asperula asthenes will be sought to offset the impact of MOD10 on the species (Ecosystem credits) under the BC Act. Land-based offsets will be prioritised, with any remaining ecosystem credits being purchased from existing credit holders or via payment into the Biodiversity Conservation Fund.



# 6.1.5.5 Grey-headed Flying-fox (Pteropus poliocephalus) - Vulnerable

Targeted surveys were undertaken during the breeding period of the species to increase detectability (October to December). Diurnal camp surveys (November and December 2019) and nocturnal spotlighting surveys (March, June 2019; August 2020) were undertaken through the Study Area (**Figure 24**). No roosts were detected during surveys; however, a number of individuals were observed foraging amongst flowering *Eucalyptus*. The nearest mapped Grey-headed Flying-fox camp is located on Snapper Island, 7.8kms to the south of KEQ while the nearest mapped Nationally Important Flying-fox camp is at Raymond Terrace, 28kms to the south-west of KEQ. As such foraging individuals detected within MOD10 are likely to have originated from Snapper Island, however, Grey-headed Flying-foxes can forage over long distances (up to 50km) but generally roost camps are within 20km of a regular food source.



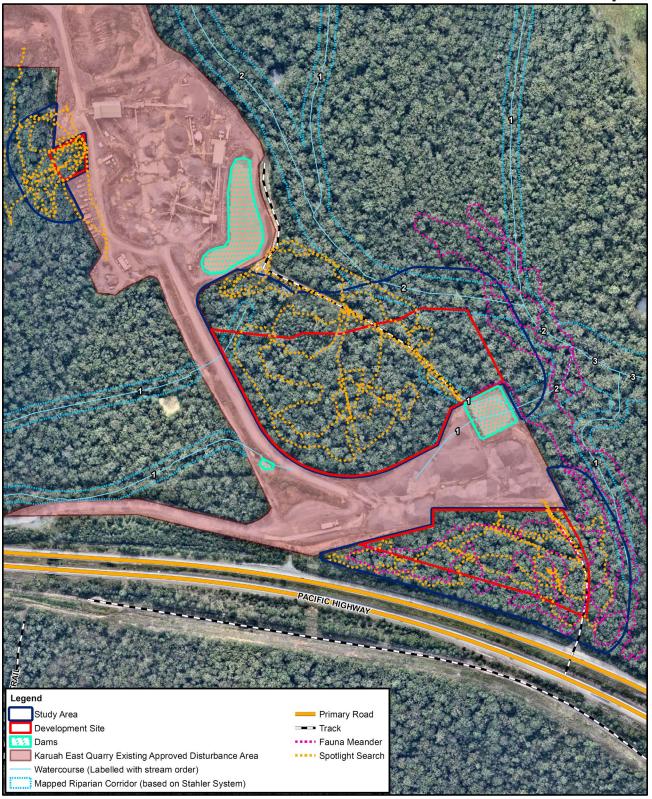


Figure 24: Grey-headed Flying-fox (Pteropus poliocephalus) Targeted Survey.

Within the MOD10 footprint, Grey-headed Flying-foxes are likely to forage amongst flowering Eucalypts within all vegetation types (6.98 ha): PCT 1619 (Smooth-barked Apple - Red Bloodwood - Brown Stringybark - Hairpin Banksia heathy open forest), and PCT 695 (Blackbutt - Turpentine - Tallowwood shrubby open forest) (**Figure 25**). Large areas of suitable foraging habitat for the species will be avoided and retained within Lots 13, Lot 14 and Lot 5 (KEQ BOA) and are to be placed under a Conservation Agreement following the MOD10 determination.



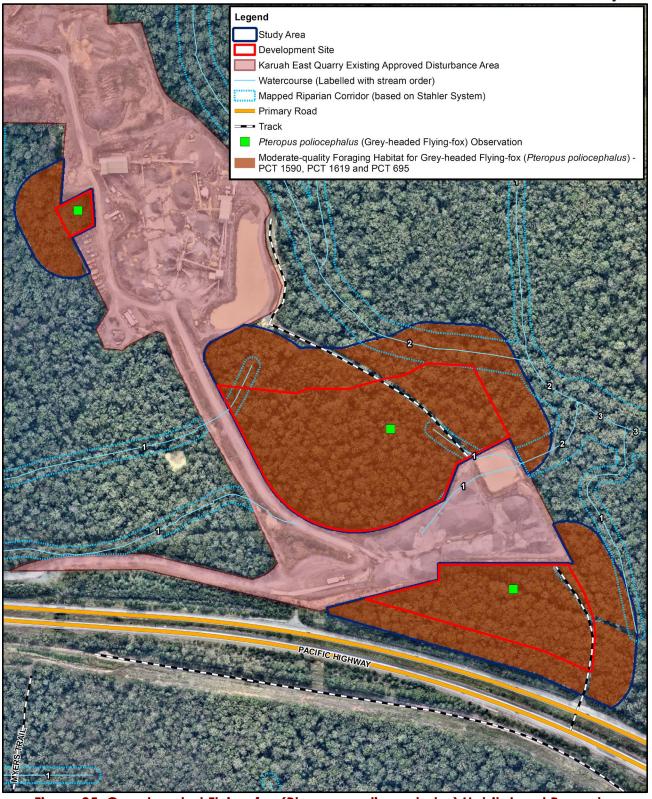


Figure 25: Grey-headed Flying-fox (Pteropus poliocephalus) Habitat and Records.

Environmental safeguards incorporated into Management Plans that are in place for the KEQ operation will be expanded to accommodate the proposal. Specifically, these plans ensure that indirect impacts to biodiversity values (including Grey-headed Flying-fox foraging habitat) that occur around the operational areas of KEQ are mitigated. Prior to construction all areas regarded as 'no-go areas' will be fenced and have signage erected to reduce the potential for any adverse impact to Grey-headed Flying-fox foraging habitat (such as unintentional clearing), beyond the disturbance footprint. All retained areas of the



BOA will be placed under a Conservation Agreement following the MOD10 determination and the KEQ BOA management plan will be updated accordingly.

All native vegetation within the MOD10 footprint is proposed to be cleared. This area contains 6.98 ha of known foraging habitat for the Grey-headed Flying-fox. Rehabilitation of KEQ, inclusive of the MOD10, will occur following extraction and closure of the quarry. The revegetation program will re-establish native tree/shrub/ground cover with the objective of providing suitable habitat for threatened species, including the Grey-headed Flying-fox.

Measures to protect threatened flora and fauna will be implemented, including the provision of compensatory biodiversity offsets to:

- Replace the portion of the BOA being directly impacted by proposed MOD10 with like-for-like biodiversity values; and
- Offset the impact of MOD10 (under the Biodiversity Offset Scheme).

A portion of Lot 201 DP1042537 and Lot 21 DP 1024341 (owned by Hunter Quarries Pty Ltd) is proposed to be utilised as the replacement offset area necessary to offset impacts of MOD10 on the existing KEQ BOA. The portion of the BOA which is proposed to be impacted by MOD10 contains 6.81 ha of PCT 1619 and PCT 695 (known foraging habitat for the Greyheaded Flying-fox). While the KEQ BOA was not established as a means to offset for impacts to the Greyheaded Flying-fox as part of the initial development (the Greyheaded Flying-fox did not form part of the Offset Strategy because an offset obligation for the species was not incurred), the KEQ BOA supports moderate quality foraging habitat for the Greyheaded Flying-fox (as shown by this assessment). As such, the proposed offset replacement will contain a minimum of 6.81 ha of suitable foraging habitat for the Greyheaded Flying-fox (PCT1619 and PCT1590). Like-for-like offsets for the Greyheaded Flying-fox will be sought to offset the impact of MOD10 on the species (Ecosystem credits) under the BC Act. Landbased offsets will be prioritised, with any remaining Ecosystem credits being purchased from existing credit holders or via payment into the Biodiversity Conservation Fund.

# 6.1.6 Conclusion and Mitigation and Management Measures

Overall, it is considered the proposed MOD 10 development is acceptable in terms of ecological considerations.

The assessment concludes that no serious or irreversible impacts were identified within the MOD 10 development site.

Direct impacts, indirect impacts and impacts on prescribed matters have been avoided and minimised through various design changes (including multiple design alterations from the initial KEQ concept through to the proposed MOD 10 design). Residual impacts of the project that require offsetting have been identified and an onsite offset investigation has been completed which has identified suitable areas to the west of the Karuah East Quarry. Areas of part Lot 201 DP 1042537 and Lot 21 DP 1024341 (owned by the applicant) are proposed to fulfill the replacement offset requirement and the offset obligation. Land based offsets are preferred, with any remaining credits to be purchased from the market or through payment into the Biodiversity Conservation Fund.

In addition, the BDAR has also addressed the 'Supplementary Environmental Assessment Requirements – Matters of National Environmental Significance'. Potential impacts to threatened species for which DAWE considers that there is likely to be a significant impact



have been assessed. It is concluded that the majority of EPBC listed threatened species and migratory species identified within the subject site or having suitable habitat within the proposed disturbance footprint is unlikely to have a significant impact. Relevant to tetratheca juncea, given the proportional impacts to the subpopulation and the avoidance / retention of 93.6% (30,459 individual plant clumps) within the subpopulation, impacts are unlikely to compromise the local population.

Apart from completing a Biodiversity Stewardship Site Assessment Report and management plan for the proposed part Lot 21 DP 1024341 and part Lot 201 DP 1042537 offset site, the BOAMP will be updated to ensure that any impacts associated with proposed MOD 10 are minimised. This will include the measures specified in **Table 5** below (which are detailed further in **Appendix C** of this Modification Report).

Table 5 – Summary Mitigation and Management Measures for the Project

	A clien
Impact	Action
Clearing of native vegetation	Pre-clearance protocol will be implemented in accordance with the Landscape and Rehabilitation Management Plan. Mitigation measures will be implemented for:
	<ul> <li>Protection of Vegetation and Threatened Flora;</li> <li>Fauna;</li> <li>Weeds; and</li> <li>Additional Pre-clearing Surveys.</li> </ul>
Removal of hollow- bearing trees / habitat trees, resulting in fauna injury and mortality.	Vegetation clearing protocol will be implemented in accordance with the Landscape and Rehabilitation Management Plan. Measures will include:  • Clearing Protocol and Salvage of Resources; and
	Habitat Tree Removal Protocol.
Impacts to surface and quantity due to sediment run-off and/or contaminant runoff into adjacent watercourses	The mitigation measures detailed in the Surface Water Assessment (ADWJ 2022) will be implemented.
Vehicle collision with fauna	<ul> <li>A maximum speed limit of 20 km/hr will be signposted (10km/hr in plant/processing areas) and adhered to in the vicinity of potential fauna and crossing areas; and</li> <li>This limit will be stated in the CEMP and be communicated in site inductions.</li> </ul>
Rehabilitation	Rehabilitation Management as detailed within the Landscape and Rehabilitation Management Plan will be implemented which includes:
	<ul><li>Landform Design and Planning;</li><li>Progressive Rehabilitation;</li></ul>
	Soil and Vegetation Management;
	<ul> <li>Water Management and Erosion and Sediment Controls for Rehabilitation Areas; and</li> </ul>
	Species Selection (seed collection and propagation).



Impact	Action
Transfer of weeds and pathogens to and from site.	Weed and Pest Control measures are to be implemented in accordance with the Landscape and Rehabilitation Management Plan to minimise habitat degradation, encourage growth of native species, and protect native fauna within retained vegetation and rehabilitation areas in KEQ.
Noise, vibration, waste and air pollution impacts to adjacent sensitive habitat areas.	The CEMP will include management strategies to mitigate work-site lighting, dust suppression and noise associated with the construction phase of the project that could impact on native flora and fauna.

# 6.2 SURFACE WATER

ADW Johnson was commissioned to prepare a Surface Water Management Assessment (SWMA) for the proposed Modification. The SWMA is enclosed as **Appendix H**. The SWMA addresses the stormwater management requirements for the proposed increase to the KEQ disturbance area.

KEQ has been the subject of extensive previous surface water assessment. The original Surface Water Assessment to inform the Project Approval was undertaken by GSSE (2013), and that Surface Water Assessment informed the Surface Water Management Plan developed for the site. The latest version of the Surface Water Management Plan (SLR) includes the MOD 1 and MOD 2 modification approvals.

The site is currently serviced by three sediment dams in accordance with the Surface Water Management Plan.

The ADW Johnson surface water assessment has been prepared as an addendum to the existing surface water assessment as it focusses exclusively on surface water catchments impacted by proposed MOD 10.

# 6.2.1 Existing Hydrology

Regionally, the site exists within the lower reaches of the Karuah River catchment as shown in **Figure 15** below.



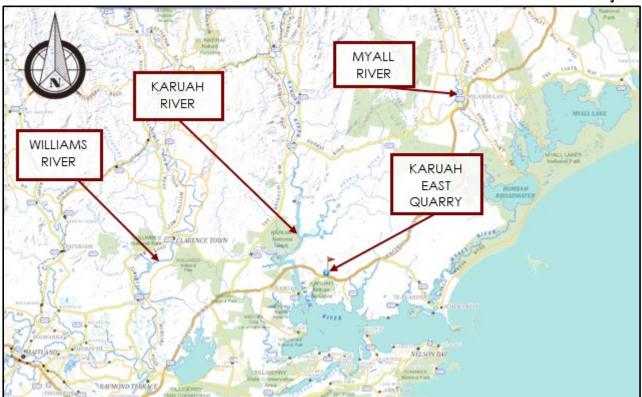


Figure 26: Regional Hydrology.

Locally, the hydrologic regime is characterised by an existing ridgeline which extends northwest-southeast through the site. The eastern portion of the site, including the processing plant area, stockpile area and existing biodiversity offset land drain eastwards via tributaries of Bulga Creek. Bulga Creek meanders to the southeast and joins Karuah River at North Arm Cove.

The western portion of the site, including existing biodiversity offset land on Lot 12 DP 1024564 (established as part of the separate Karuah Quarry approval), the haul road and weighbridge office area drain westwards via tributaries of Yalimbah Creek. Yalimbah Creek meanders southwards and discharges to Karuah River at Number One Cove. Mapped coastal wetlands occur on the banks of Yalimbah Creek approximately 1km south of the site. Bulga Creek contains wetlands approximately 3.5km downstream to the south west and are separated from the site by existing agricultural land.

Figure 16 presents the site's existing drainage lines.





Figure 27: Existing Drainage Lines.

The site's existing drainage lines are detailed below:

#### Drainage Line 1 (Yalimbah Creek)

Drainage Line 1 is an ephemeral watercourse draining through Lot 12 DP 1024564. It is a first order watercourse with no discernible banks. MOD 10 proposes no changes to Drainage Line 1's catchment, alignment or shape.

# Drainage Line 2 (Yalimbah Creek Tributary)

Drainage Line 2 is an ephemeral watercourse which receives runoff predominantly from existing biodiversity offset land in Lot 13 DP 1024564. It is a first order watercourse with poorly-defined banks.

Runoff from the offset land is conveyed beneath the established haul road via an existing circular culvert and headwall which is estimated to be a DN2100 reinforced concrete pipe.

Outflow is conveyed westward over an existing light vehicle access. There is an existing farm dam on Drainage Line 2 approximately 40m downstream of vehicle access. This dam is located within a biodiversity offset area established as part of the separate Karuah Quarry and does not form part of KEQ's surface water management system.

# Drainage Line 3 (Yalimbah Creek Tributary)

Drainage Line 3 is an ephemeral first order watercourse which joins Yalimbah Creek (Line 1) approximately 550m downstream of the haul road. Consistent with the site's established surface water management plan, a stormwater dam (Dam 2) has been constructed on Line 3's upper reach. Dam 2 receives a small catchment comprising the car park and undisturbed land totalling approximately 0.7 Ha.



Figure 17 shows existing Dam 2.



Figure 28: Existing Dam 2.

# • Drainage Line 4 (Bulga Creek Tributary)

Drainage Line 4 is an ephemeral watercourse which receives runoff from existing biodiversity offset land in Lot 13 DP 1024564, as well as the existing stockpile area. It is a first order watercourse with poorly-defined banks.

Consistent with the site's established surface water management plan, a stormwater dam (Dam 3) has been constructed on Line 4 upstream of the cadastral boundary. It receives runoff from approximately 2.40 Ha of hardstand used for stockpiling. A clean water diversion drain has been provided to ensure that runoff from the unimproved land to the north bypasses Dam 3.

Dam 3 is shown in **Figure 18**.





Figure 29: Existing Dam 3.

# • Drainage Line 5 (Bulga Creek Tributary)

Drainage Line 5 is a second order watercourse located in the eastern extents of Lot 13 DP 1024564. It receives releases from the existing Dam 1 which controls runoff from KEQ's crushing plant and processing areas. Drainage Line 5 also receives runoff from vegetated land within the site and to the east.

Drainage Line 5 is ephemeral. It incorporates a series of poorly-defined channels which drain eastwards through a wide floodplain to the east. Standing water was observed within the drainage line during a site inspection which occurred approximately five days after significant rainfall. This was consistent with the findings of GSSE 2013.

Drainage Line 5 is shown in Figure 19.

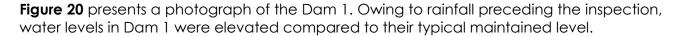




Figure 30: Drainage Line 5.

As described in the Surface Water Management Plan, an offline stormwater dam (Dam 1) captures runoff from the crushing plant area prior to discharge into Drainage Line 5. As the extraction area evolves, Dam 1 will eventually receive pumped flows from an in-pit sump.

Dam 1 was designed with a minimum total capacity of 12.4 ML, including 3.6 ML for water storage in addition to 8.8 ML required for runoff quality improvement. Controlled releases are controlled via a pump system, whilst uncontrolled flows are disposed of via an existing spillway weir.



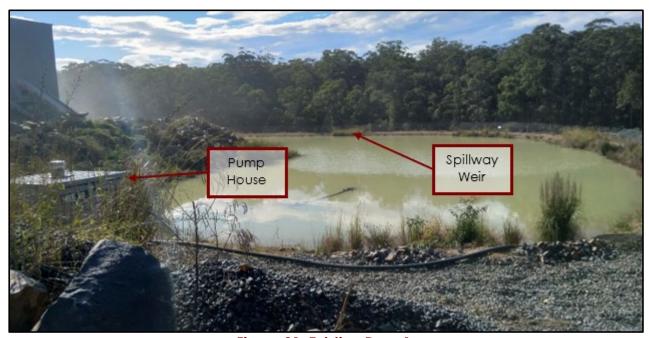


Figure 31: Existing Dam 1.



# 6.2.2 Surface Water Management Strategy

The proposed surface water management strategy is provided in Figure 21 below.

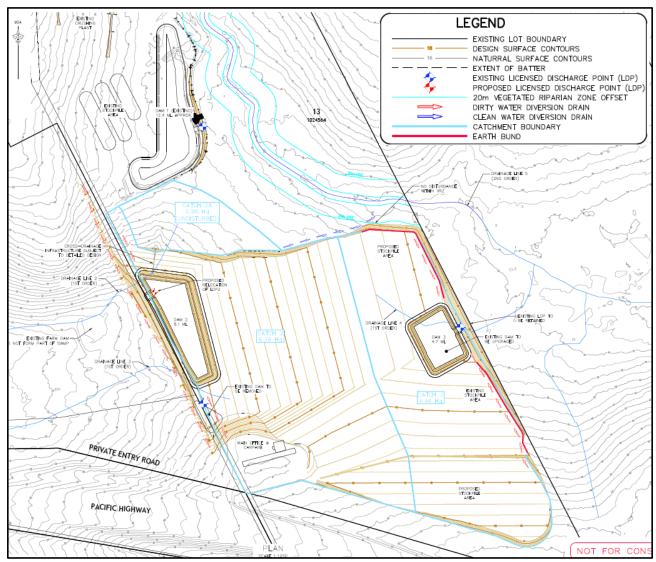


Figure 32: Proposed MOD 10 Surface Water Management Plan.

The proposed Surface Water Strategy seeks to regulate and improve site discharges whilst providing an appropriate degree of water security for quarry operations. The strategy has also been designed to ensure minimal impact on sensitive downstream environments.

The majority of MOD 10's disturbance area drains westwards towards the existing Drainage lines 2 and 3. Existing Dam 2 has proven to be inefficient in size and location, and there is opportunity for its relocation and resizing. The upgraded Dam 2 will receive runoff from the proposed MOD 10 disturbance area in addition to its existing catchment. The existing structure will be filled and stabilised, whilst the existing Licensed Discharge Point (LDP) will be relocated to the new location accordingly.

In addition to satisfying runoff quality obligations, Dam 2 will incorporate additional storage to facilitate the reuse of stormwater for dust suppression of haul roads and stockpile areas. The relocated / resized Dam 2 will connect to Dams 1 via a pump system to optimise security of supply.



MOD 10 will increase the disturbed catchment reporting to the existing Dam 3, which therefore requires redesign and uprating. The upgraded Dam 3 will also incorporate an additional water store, intended for dust suppression of the surrounding stockpile area. Consistent with the existing Surface Water Management Plan, diversion drains are proposed to route clean runoff around the disturbance area, thus remaining clean.

Proposed MOD 10 will create additional opportunities for fine aggregate stockpiling, which is likely to increase KEQ's water demands. 2.9 ML of additional storage is proposed for MOD 10 in addition to the existing 3.6ML of storage provided by Dam 1. This will improve KEQ's capacity to control discharges whilst minimising its reliance on external water sources. The additional stores have been considered in the context of maximum harvestable rights.

As both Yalimbah and Bulga Creeks drain to coastal wetlands (separated approximately 1k and 3.5km from the site respectively), stormwater dams have been sized to the Blue Book's specific requirements for sensitive downstream environments. Provision of additional storage in both dams enhances their capacity to capture large runoff events and reduces the frequency of uncontrolled release. Special consideration has been given to Drainage Line 2, given its closer proximity to coastal wetlands. It is recommended that controlled releases from Dam 2 are pumped to and released from Dam 1 (where practical).

In relation to riparian land, MOD 10 proposes the filling/realignment of the upper reaches of Drainage Lines 2 and 4. Both watercourses are mapped as first order, ephemeral and poorly defined. The proposed development is fully compliant with the requirements of the Natural Resource Access Regulator.

Specific consideration will be given to the management of sediment-laden runoff during construction sequences. Erosion and Sediment Controls will be implemented in accordance with Landcom's 'Blue Book'.

### 6.2.2.1 Sediment Control Dams

As noted above, the MOD 10 additional disturbance areas will report to sedimentation dams. Sediment dams have been sized according to the provisions of Landcom's Managing Urban Stormwater – Soils and Construction Volume 2E: Mines and Quarries (the 'Blue Book'). The 'Blue Book' implements a Revised Universal Soil Loss Equation (RUSLE) to estimate soil loss from a disturbed area which informs dam sizing.

Dam 3's capacity must be increased by approximately 1.5 ML to accommodate the proposed additional stockpile area. Dam 2's existing capacity needs to be increased by 4.9 ML, excluding additional storage for water harvesting and reuse.

Dam 1 was designed with a minimum total capacity of 12.4 ML, including 3.6 ML for water storage in addition to 8.8 ML required for runoff quality improvement. Dam 1 is not proposed to be modified by the MOD 10 application.

**Table 6A** shows the minimum volumes for the upgrade of Dam 2 and Dam 3.

Table 6A - Minimum Sediment Dam Sizes

DAM	PREDICTED SOIL LOSS (M³/HA/YEAR)	STORAGE ZONE <sup>1</sup> (ML)	SETTLING ZONE (ML)	VOLUME (ML)
Dam 2	209	1.01 (0.4)	5.17 (0.9)	6.18 (1.3)
Dam 3	169	0.58 (0.6)	3.20 (1.7)	3.78 (2.3)

Selected to provide 12 months' sediment storage.

<sup>(--)</sup> Represents Dam 3 volumes previously designed for existing catchment (GSSE 2013).



From **Table 6A**, it is evident that Dam 3's capacity must be increased by approximately 1.5 ml to accommodate the proposed additional stockpiling areas. Dam 2's existing capacity is required to be increased by 4.9 ml, excluding additional storage for water harvesting and re-use.

#### 6.2.2.2 Proposed Northern Disturbance Area

Relevant to the proposed northern additional disturbance area (0.166ha) proposed by MOD 10, it is noted that this area drains westwards away from Dam 1. Calculations completed have projected an annual soil loss of less than 12 m³ from this small disturbance area. Section 6.3.2 of the Blue Book notes that sediment basins may not be required for catchments whose annual soil loss is 150 m³; in such scenarios, other erosion and sediment control devices may be utilised instead.

It is considered that a new sediment basin would be inefficient for the proposed northern disturbance area. Sediment fencing is proposed to be installed around the disturbance area's perimeter, and will be the subject of routine inspection and maintenance.

#### 6.2.2.3 Site Water Balance

A site water balance was prepared to assess KEQ's water demands against water availability and environmental obligations.

MUSIC modelling of KEQs water balance confirms that the proposed 2.9 ML of additional storage, apportioned across Dams 2 and 3, achieves a high degree of water security within the bounds of Maximum Harvestable Rights. Water shortage occurred in 3% of simulated years given a 50% extraction footprint, improving to 2% of simulated years given a full extraction footprint. **Table 6B** below presents the total Storage capacity for each dam inclusive of storage and settling zones:

Table 6B – Dam Storages

DAM	STORAGE ZONE (ML)	ADDITIONAL STORAGE (ML)	SETTLING ZONE (ML)	VOLUME (ML)
Dam 1	3.4	3.6	5.4	12.4
Dam 2	1.01(0.4)	2.00 (0.0)	5.17 (0.9)	8.18 (1.3)
Dam 3	0.58 (0.6)	0.90 (0.0)	3.20 (1.7)	4.68 (2.3)
TOTAL	4.99	6.50	13.77	25.26

<sup>(--)</sup> Represents dam volumes previously designed for existing catchment.

Modelling indicates that uncontrolled discharges from the two proposed dams will be rare, with an average of 0.2 days of flow observed for each year. Volumetrically, less than 1.2% of release from each dam was uncontrolled. This is a favourable outcome given the presence of sensitive downstream environments, and demonstrates that KEQ's runoff improvement obligations can be met.

#### 6.2.2.4 Licensing and Approvals

KEQPL currently possesses an EPL (20611) which established LDPs at each of its three existing dams' outlets.

It is proposed that the upgraded Dam 3 will retain its existing LDP. It will be necessary to relocate Dam 2's LDP from its present location on Drainage Line 3 to the new spillway on Drainage Line 2. This will require an update to the EPL 20611. **Figure 22** presents the existing and proposed LDPs.



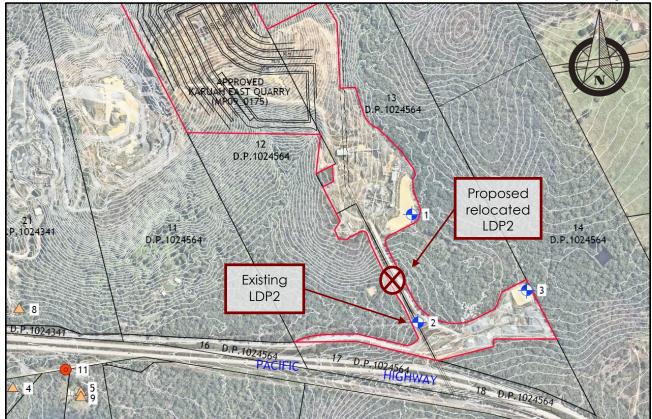


Figure 33: Existing & Proposed Licensed Discharge Points.

# 6.2.2.5 Surface Water Monitoring Program

The existing KEQ Surface Water Management Plan will be updated to accommodate the additional disturbance area.

The following is noted in relation to the revision of the existing Surface Water Management Plan to accommodate MOD 10:

- No additional baseline data is required for MOD 10;
- The approved trigger values be retained for MOD 10 and applied to the proposed relocated LDP at Dam 2;
- Monitoring locations and frequency are not required to be updated; and
- Water quality results are to continue to be incorporated into the site's Annual Environmental Management Report (AEMR).

#### 6.2.2.6 Erosion & Sediment Control

The below erosion and sediment control principles will be considered during development of an erosion and sediment control plan for the construction of the proposed development:

# **Erosion and Sediment Controls**

Controls such as sediment fences and access points are to be installed prior to the commencement of earth-breaking activities. The proposed sediment Dams 2 and 3 are to be constructed prior to any disturbance of their respective catchments and shall be utilised as sediment basins throughout construction. Clean water drains will be constructed to route run-on around disturbed catchments, whilst dirty water drains shall direct runoff from disturbed areas towards sediment basins.



During bulk earthworks, specific attention must be given to maintaining established controls and refining the ESC strategy to suit the site's evolving requirements. Regular inspections should confirm whether control devices are operational and clear of sediment and debris.

At the completion of bulk earthworks, permanent batters are to be seeded and stabilised. It is recommended that sediment basins are to be desilted in preparation for use as permanent water quality controls.

#### **Bulk Earthworks Management**

Some stockpiling of material will be required during stages of construction. The following measures will be implemented in accordance with Landcom's Blue Book:

- a. Stockpiles are to be constructed as low, flat, elongated mounds, perpendicular to the direction of flow and protected from upstream flows by diversion banks where necessary;
- b. Sediment fencing is to placed downstream of stockpiles and with stabilisation required if the stockpile is in place for more than 10 days;
- c. Temporary stockpiles should not be placed within 5 metres of existing vegetation, concentrated flows and impervious areas;
- d. Stockpiles shall not be placed within a 1V:5H projection from the toe of any excavations or embankments; and
- e. Routine dust suppression is to be undertaken.

#### **Erosion Hazard**

EMM's Land Resources Assessment (refer to **Appendix M**) estimated Soil Loss Classes ranging from 1 (very low) to 7 (extremely high) dependent on catchment size and grade. Accordingly, the Erosion and Sediment Control Plan will mitigate erosion hazard, including:

- Sequencing earthworks to minimise disturbance areas;
- Reducing catchment length through provision of dirty water drains;
- Controlling temporary batter slopes; and
- Stabilisation of batters with vegetation on completion of earthworks.

Lands with Soil Loss Classes (SLC) 4 or greater will be subject to Landcom 2004's specific requirements for high erosion hazard. Where SLCs of 5 or 6 cannot be avoided, disturbance activities will be scheduled for periods when rainfall erosivity is low.

# 6.2.3 Conclusion and Mitigation and Management Measures

The surface water management plan incorporates best-practice stormwater management principles and it is concluded that MOD 10 will result in improved water management when compared with the existing situation on site.

The following mitigation and management measures are recommended:

- An updated Surface Water Management Plan (SWMP) reflecting the proposed modification is to be prepared;
- A variation to Environmental Protection Licence (EPL) 20611 reflecting the revised point of discharge from Dam 2 is to be obtained;
- The existing Dam 2 is to be filled and stabilised. An upgraded Dam 2 shall intercept additional disturbed catchment;



 Dam 2 and existing Dam 3 will be upgraded to accommodate the additional disturbed catchment as follows:

DAM	STORAGE ZONE (ML)	ADDITIONAL STORAGE (ML)	SETTLING ZONE (ML)	VOLUME (ML)
Dam 1	3.4	3.6	5.4	12.4
Dam 2	1.01(0.4)	2.00 (0.0)	5.17 (0.9)	8.18 (1.3)
Dam 3	0.58 (0.6)	0.90 (0.0)	3.20 (1.7)	4.68 (2.3)
TOTAL	4.99	6.50	13.77	25.26

- Diversion drains will be constructed to divert clean water away from the proposed disturbance area;
- Diversion drains and earth bunds shall be constructed to ensure that runoff from disturbed catchments is directed to the site's sediment dams:
- The proposed (upgraded) Dams 2 and 3 are to be sized according to the Blue Book's criteria for sensitive downstream environments;
- The proposed (upgraded) Dams 2 and 3 are to incorporate additional storage volumes for security of water supply;
- A system of pumps will connect the site's sediment dams to enhance security of water supply;
- Where practical, controlled discharge from Dam 2 is to be pumped and released from Dam 1;
- The total volume of proposed and existing stormwater stores is to comply with Maximum Harvestable Rights;
- No works are to occur within the Vegetated Riparian Zone (VRZ) of the second order watercourse located in the site's eastern extents;
- Surface water monitoring is to be undertaken according to the SWMP. Exceedances
  of the adopted trigger values are to be reported in accordance with the site's EPL;
  and
- Erosion and sediment controls are to be employed during construction activities.

# 6.3 GROUNDWATER

EMM was commissioned engaged by the applicant to undertake a groundwater assessment for proposed MOD 10. This assessment is provided within **Appendix I**.

Given the proposed modification involves surface and shallow workings only, the proposal is highly unlikely to result in any groundwater impact.

# 6.3.1 Existing Hydrogeology and Groundwater Monitoring Network

The principal groundwater system is fractured and of low-moderate productivity. Groundwater in the fractured rock groundwater system is present in discrete (secondary porosity) fractures and fissures within the rhyodacite. This is consistent with the observed site geology identified in previous investigations (Coffey, 2012) completed to inform the original KEQ approval.

Fractured rock aquifers are generally highly heterogenous in nature and tend to exhibit discontinuous fracture networks, resulting in highly variable groundwater flow, storage and quality. Recharge is by rainfall infiltration and topographic depressions where surface water can pool. Discharges where depressions, rivers or creeks intercept the groundwater table and where geology outcrops and / or sub crops.



KEQ's groundwater monitoring bore network is detailed in the below **Table 7**. The groundwater monitoring network is designed to identify long term groundwater level and water quality trends. Consistent with the Project Approval, monitoring occurs on a quarterly basis for groundwater levels and bi-annually for groundwater quality.

**Table 7 - Groundwater Monitoring Bores** 

· · · · · · · · · · · · · · · · · · ·								
Station	Elevation (mAHD) <sup>1</sup>	Total Depth (m)	Screened Geology	Screen Interval (mbgl)²	Standing water level (mbgl)	Standing water level (mAHD)		
BOH GW205	56.87	40	Hornbelnde Dacite	31-37	23.3	33.6		
BOH GW207	32.06	30	Sandstone	10.6 – 28.6	11.5	20.6		
BOH GW208	52.56	30	Rhyolite	17.5 – 20.5	18.9	33.6		
BOH GW303	57.06	35.5	Rhyodacite & conglomerate	28.5 – 33.5	29.9	27.1		

Notes: 1. mAHD – metres Australian Height Datum; 2. Mbgl – metres below ground level.

# 6.3.2 Impact Assessment

#### **Aquifer Interference**

Proposed MOD 10 will not result in any excavation of any material below the groundwater table level.

The concept engineering plans provided in **Appendix F** places the inert levels of resized Dam 2 and Dam 3 at IL 29.3 mAHD and IL 37.05 mAHD which is well above the groundwater table.

#### **Groundwater Quality**

The key risk for consideration of potential impacts from MOD 10 is potential groundwater contamination resulting from quarry operations (e.g. potential diesel spills).

Mitigation measures can be readily implemented to minimise any risk and is provided in **Section 6.3.3** below.

#### **Groundwater Dependent Ecosystems**

The works associated with MOD 10 will not intercept groundwater and is not expected to impact the ability for the mapped coastal wetlands (Yalimbah Creek, approximately 1km from the subject site and Bulga Creek, approximately 3.5km from the subject site) or terrestrial groundwater dependent ecosystems to access groundwater.

#### Other Groundwater Users

The closest registered private landholder bore (GW201611) is located approximately 3.5km to the northwest of the MOD 10 project. The works associated with MOD 10 will not intercept groundwater and is not expected to impact the supply of this bore.



# 6.3.3 Mitigation and Management Measures

The groundwater assessment confirms that the MOD 10 project is acceptable in terms of groundwater considerations and recommends the following mitigation measures be implemented:

- Minor seepage and ponding of water resulting from excessive rainfall will be managed by conventional drainage measures within the quarry, such as periodic pumping out to the surrounding drainage controls. Water will be retained on site for quarry operations and for environmental mitigation;
- Only emergency repair of vehicles will be completed onsite and any major vehicle repairs/maintenance will occur offsite or in suitably bunded areas;
- Plant/vehicle refuelling will be completed in designated non-permeable (compacted clay or concrete) bunded areas;
- Runoff water from the site will be collected and monitored to prevent chemicals and hydrocarbon pollutants seeping into the groundwater system;
- Handling and storage of fuel and oil within the site will be in accordance with Australian Standards, AS 1940-2004 (Storage and Handling of Flammable and Combustible Liquids) and NSW Work Cover 2005 Code of Practice for Storage and Handling of Dangerous Goods to reduce the risk of any spills or environmental release. Above ground storage in a bunded facility will be implemented as required;
- Safety Data Sheets (SDS) will be kept in the site safety system for all chemicals used on site. The SDS's will contain information on the environmental impacts of the use of certain chemicals and include detail on emergency response, clean up and disposal. Handling and storage of all chemicals within the project site will be in accordance with Dangerous Goods Act 1975 (NSW), and Australian standards, including AS 1940-2004 (Storage and Handling of Flammable and Combustible Liquids);
- Groundwater level and quality monitoring to continue as detailed in the established site Water Management Plan to identify any potential contamination resulting from quarry operations;
- Quarry rehabilitation to occur consistent with the Landscape & Rehabilitation Management Plan and the Land Resources Assessment & Rehabilitation Advice (EMM 2022) prepared for MOD 10; and
- An updated Water Management Plan reflecting the proposed modification and the recommendations of this assessment will be prepared.

# 6.4 AIR QUALITY AND GREENHOUSE GASES

EMM was commissioned by the applicant to prepare an Air Quality and Greenhouse Gas Assessment (AQGGA) for the proposed MOD 10 development. The AQGGA is provided in **Appendix K**.

The assessment presents a quantitative assessment of potential air quality impacts for the operation of the proposed modification and is prepared in accordance with the Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales ('Approved Methods for Modelling') (NSW EPA 2017). Greenhouse gas (GHG) emissions are presented and benchmarked in general accordance with the National Greenhouse and Energy Reporting (Measurement) Technical Guidelines (DoE 2014) and GHG Protocol Corporate Accounting and Reporting Standard (Bhatia et al 2010).



# 6.4.1 Air Quality Assessment

#### **6.4.1.1** Assessment Locations

To assess potential air quality impacts across the surrounding area, residences within approximately 5km of the proposal site were selected as assessment locations. Assessment locations are shown in the below **Figure 34** and **Table 8**.



Figure 34: Air Quality Assessment Locations.

Table 8 – Air Quality Assessment Locations

ID	Property Details	Description
Α	Lot 100 DP 1028885	Private residence
В	Lot 3 DP 785172	Private residence
С	Lot 1 DP 785172	Private residence
D	Lot 250 DP 1092111	Private residence
Е	Lot 22 DP 1024341	Private residence
F	Lot 50 DP 1036893	Private residence
G	Lot 1 DP 1032636	Private residence
Н	Lot 10 DP 1032636	Private residence
Ī	Lot 11 DP 1032636	Private residence
J	Lot 13 DP 1032636	Private residence

In addition to predictions at these points, ground level concentrations are also predicted over an 8 km by 8 km sampling grid with a 200m spacing. These gridded predictions are used to generate contour plots showing the extent of predicted ground level concentrations across the local area.



# 6.4.1.2 Other Quarrying Operations & Approach to Cumulative Assessment

An existing quarry, known as Karuah Quarry, operates adjacent to and west of the KEQ and is operated by Hunter Quarries Pty Ltd. Karuah Quarry is located on Lot 21 DP 1024341 and Lot 11 DP 1024564. Karuah Quarry's approved hours of operation are 7.00 am to 6.00 pm Monday to Friday and 7.00 am to 1.00 pm Saturdays. Karuah Quarry has an annual production limit of 500,000 tonnes. Operations at the Karuah Quarry are in the process of scaling down with the quarry typically only used on a campaign basis (i.e. specific product for a specific project). The Karuah Quarry consent currently remains active until June 2027 in line with DA 265/10/2004.

There are two (2) proposed quarrying operations in the vicinity of KEQ, being:

- Karuah South Quarry (KSQ) Proposed quarry (State Significant Development (SSD) 8795) at Lot 11 DP 1024564, located to the west of the KEQ adjacent to the M1 Pacific Motorway. KSQ seeks to extract the remaining resource generally south of the existing Karuah Quarry limit of extraction. KSQ is proposed as a conventional drill and blast operation with rock collected and processed onsite. Processed product is proposed to be stockpiled onsite. Hours of operation of the proposed KSQ are from 5:00 am to 6:00 pm Monday to Friday and 5.00 am to 1.00 pm Saturday with only product loading and transport activity to occur between 5.00 am and 7.00 am. The proposed annual production limit is 600,000 tonnes; and
- Karuah Red Quarry (KRQ) Proposed quarry (a Designated Development) to be located west of the existing KQ on Lot 201 DP 1024537. This quarry is a much smaller operation than KQ, KEQ and KSQ, with an extraction limit of up to 100,000 tonnes per annum proposed for up to 20 years.

The KSQ is not approved and the KRQ application has not been lodged. It is considered reasonable however to include these proposed developments in a cumulative assessment. Operations at the existing KQ are winding down and will likely cease completely prior to the commencement of KSQ and therefore not considered for cumulative assessment. The concurrent operation of KEQ, KSQ and KRQ is the more conservative (and long-term) scenario. If compliance is demonstrated for this scenario, compliance can also be assumed for the short-term concurrent operation of KEQ with the winding down of Karuah Quarry.

# 6.4.1.3 Key Air Pollutants

The assessment focuses on fugitive dust emissions, the key pollutant from quarrying activities. Fugitive dust emissions for quarrying activities are assessed for three particulate matter (PM) size fractions, as follows:

- total suspended particulate matter (TSP);
- particulate matter less than 10 micrometres ( $\mu m$ ) in aerodynamic diameter ( $PM_{10}$ ); and
- particulate matter less than 2.5 µm in aerodynamic diameter (PM2.5).

# 6.4.1.4 Existing Ambient Air Quality

KEQPL operate an air quality monitoring program for the KEQ, consisting of High Volume Air Samplers measuring TSP and  $PM_{10}$  at a single location (a residence approximately 850m southwest of the KEQ) and dust deposition gauges measuring dust fallout at five (5) locations.



A review of historical monitoring data indicates that the existing operations of the KEQ are not adversely impacting on local air quality. Annual average TSP and  $PM_{10}$  concentrations are 27% and 52% of the respective impact assessment criteria, based on averages over the past six (6) years, while exceedances of the impact assessment criterion for 24-hour  $PM_{10}$  are infrequent. The measured annual average dust deposition ranges from 0.6 to 1.9 g/m²/month, well below the impact assessment criterion of 4 g/m²/month.

### **6.4.1.5 Emissions Inventory**

The assessment focusses on fugitive dust emissions, the key pollutant from quarrying activities. Fugitive dust emissions were inventoried for the concurrent operation of the following quarrying operations:

- Proposed operations at the KEQ (i.e. approved operations plus the MOD 10 expanded disturbance areas);
- Proposed Karuah South Quarry (KSQ), at maximum proposed production; and
- Proposed Karuah Red Quarry (KRQ), at maximum proposed production.

A detailed emissions inventory was derived for the proposed KEQ operations, based on the approved throughput of 1.5 million tonnes per annum and including the following activities:

- Removal and handling of overburden material;
- Drilling, blasting and extraction of rock;
- Handling and transfer (wheel generated dust) of rock from pit to processing;
- Processing of rock (crushing and screening);
- Material handling and storage at the processing area, including front-end loaders managing stockpiles;
- Internal material movement (wheel generated dust) of product material from processing to product storage;
- Wheel generated dust from product trucks entering and exiting the site; and
- Wind erosion from exposed ground and stockpiles.

A simplified emissions inventory was derived for the proposed KSQ and KRQ operations, for a maximum proposed throughput 600,000 tonnes per annum and 100,000 tonnes per annum respectively.

Dust mitigation measures were incorporated into the emission inventory.

### 6.4.1.6 Dispersion Modelling

Dispersion modelling for the assessment was undertaken using the CALPUFF modelling system, with fugitive dust emission sources represented in the model by a series of volume and area sources.

Below is a summary of the modelling results for  $PM_{10}$ ,  $PM_{2.5}$  and Total Suspended Particulate Matter (TSP) & Dust Deposition.

# Results - PM<sub>10</sub>

The predicted incremental and cumulative ground level  $PM_{10}$  concentrations are presented in **Table 9** below.



Table 9 – Predicted ground level  $PM_{10}$  concentrations ( $\mu g/m^3$ )

ID	Karuah East Quarry		Karuah South + Karuah Red Quarry		Cumulative (with Background)	
	24-hour	Annual	24-hour	Annual	24-hour	Annual
	average	average	average	average	average	average
IAC	50	25	50	25	50	25
Α	13.6	1.2	6.0	0.9	50.1	20.7
В	9.6	1.2	13.9	1.4	49.5	21.1
С	6.1	0.8	5.3	0.7	48.8	20.0
D	3.6	0.5	4.5	0.4	48.7	19.5
Е	5.8	0.5	2.6	0.3	48.7	19.3
F	6.2	0.6	7.1	0.9	48.9	20.1
G	14.7	1.6	6.7	0.4	49.3	20.5
Н	25.6	1.8	6.7	0.7	49.2	21.0
I	15.1	1.0	3.2	0.3	48.7	19.9
J	6.5	0.3	1.7	0.1	48.7	19.0

Note: IAC = impact assessment criterion

The highest incremental 24-hour average  $PM_{10}$  concentration from KEQ occurs at assessment location H (25.6 µg/m³) (no exceedance of criterion). The highest incremental 24-hour average  $PM_{10}$  concentration from other quarries (13.9 µg/m³) occurs at a different assessment location (B) (no exceedance of criterion). When background concentrations are added, there is one additional day above the 24-hour average impact assessment criterion at assessment location A (50.1 µg/m³). This occurs on a day when the background is elevated (48.7 µg/m³) and the contribution from the KEQ is small (~1 µg/m³). It is noted that a conservatively high regional background is used for cumulative assessment, and therefore this predicted additional day above the 24-hour average impact assessment criterion is not expected to occur.

The highest incremental annual average  $PM_{10}$  concentration is 1.8  $\mu g/m^3$  (from KEQ) and 1.4  $\mu g/m^3$  (from other quarries). When background concentrations are added, there are no exceedances of the annual average impact assessment criterion at any assessment location.

#### Results - PM<sub>2.5</sub>

The predicted incremental and cumulative ground level  $PM_{2.5}$  concentrations are presented in **Table 10** below:



Table 10 – Predicted ground level  $PM_{2.5}$  concentrations ( $\mu g/m^3$ )

ID	Karuah East Quarry		Karuah East Quarry Karuah South + Karuah Red Quarry		Cumulative (with background)	
	24-hour average	Annual average	24-hour average	Annual average	24-hour average	Annual average
IAC	25	8	25	8	25	8
Α	1.8	0.2	0.9	0.1	18.8	7.7
В	1.1	0.2	2.0	0.2	18.7	7.8
С	0.7	0.1	0.8	0.1	18.1	7.6
D	0.5	0.1	0.7	0.1	17.8	7.5
Е	0.7	0.1	0.4	<0.1	17.8	7.5
F	0.8	0.1	1.0	0.1	17.8	7.6
G	1.9	0.2	1.0	0.1	17.7	7.7
Н	3.1	0.2	1.0	0.1	17.7	7.7
I	1.9	0.1	0.5	<0.1	17.6	7.6
J	0.8	<0.1	0.2	<0.1	17.6	7.5

Note: IAC = impact assessment criterion

The highest incremental 24-hour average  $PM_{2.5}$  concentration from KEQ occurs at assessment location H (3.1 µg/m³). The highest incremental 24-hour average  $PM_{2.5}$  concentration from other quarries (2.0 µg/m³) occurs at a different assessment location (B). When background concentrations are added, there are no additional days above the 24-hour average impact assessment criterion at any assessment location.

The highest incremental annual average  $PM_{2.5}$  concentration is 0.2  $\mu$ g/m³ (from KEQ) and 0.2  $\mu$ g/m³ (from other quarries). When background concentrations are added, there are no exceedances of the annual average impact assessment criterion at any assessment location.

### Results – Total Suspended Particulate Matter (TSP) and Dust Deposition

The predicted incremental and cumulative ground level TSP concentrations and dust deposition are presented in **Table 11** below:



Table 11 – Predicted ground level TSP concentrations ( $\mu g/m^3$ ) and Dust Deposition ( $g/m^2/month$ )

ID	Karuah East Quarry			th + Karuah Quarry		ive (with round)
	TSP	Dust	TSP	Dust	TSP	Dust
		Depos		Depos		Depos
IAC	90	2	90	2	90	4
Α	2.9	0.1	1.7	<0.1	41.7	1.2
В	2.8	0.1	2.4	0.1	42.3	1.2
С	1.7	<0.1	1.2	<0.1	40.0	1.2
D	1.1	<0.1	0.7	<0.1	38.9	1.2
Е	1.1	<0.1	0.4	<0.1	38.6	1.1
F	1.2	<0.1	1.6	<0.1	39.9	1.2
G	3.2	0.1	0.7	<0.1	41.0	1.2
Н	3.6	0.1	1.1	<0.1	41.8	1.2
I	1.9	<0.1	0.5	<0.1	39.5	1.1
J	0.6	<0.1	0.2	<0.1	37.9	1.1

Note: IAC = impact assessment criterion

The highest incremental annual average TSP concentration is  $3.6 \,\mu\text{g/m}^3$  (from KEQ) and  $2.4 \,\mu\text{g/m}^3$  (from other quarries). When background concentrations are added, there are no exceedances of the annual average impact assessment criterion at any assessment location.

The highest incremental annual average dust deposition level is  $0.1 \,\mu\text{g/m}^3$  (from KEQ) and  $0.1 \,\mu\text{g/m}^3$  (from other quarries). When background concentrations are added, there are no exceedances of the annual average impact assessment criterion at any assessment location.

# 6.4.2 Greenhouse Gas Assessment

The primary source of energy for the site is from diesel combustion and therefore the largest source of GHG emissions for the proposal. Other minor sources of GHG emissions include explosives use during blasting, consumption of grid electricity in the site office and vegetation clearing for the MOD 10 additional disturbance area.

Annual average GHG emissions (Scope 1 and 2) generated by the proposal are minor, representing approximately 0.002% of total GHG emissions for NSW and 0.001% of total GHG emissions for Australia.

# 6.4.3 Conclusion and Mitigation and Management Measures

The AQGGA concludes that the MOD 10 proposal is acceptable in terms of local air quality and greenhouse gas impacts.

Following the determination of the MOD 10 application, it will be necessary to update the Air Quality and Greenhouse Gas Management Plan to include the proposed changes as well as the below mitigation measures.



**Table 12 - Mitigation Measures** 

Rank	Activity	Current or proposed control	Benefit
1	Hauling	Water cart operating on haulage routes - level 2 watering Vehicle speed restrictions	84-86% control of fugitive emissions from hauling.
2	Processing	Enclosure within crusher building Water application at crusher/screens	85% control of fugitive emissions from crushing and screening.
3	FEL movements	Water cart used to dampen FEL routes within processing/product storage areas	90% control of fugitive emissions from FEL movements.
4	Loading and dumping	Enclosure for dumping ROM material Minimise drop heights for truck loading	45% control of fugitive emissions from loading and dumping.
5	Wind erosion	Water sprays on stockpiles Natural wind breaks from surrounding vegetation	48% control of fugitive emissions from wind erosion.
6	Conveyors and transfers	Wind shielding of conveyors Carry over moisture content from crusher building	64% control of fugitive emissions from conveyors/transfers.
7	Fuel combustion	Regular maintenance of plant and equipment Avoid excessive idling	Benefits not quantified
8	Grading roads	Water cart operating on haulage routes Grader speed limits	75% control of fugitive emissions from grading.
9	Drilling & blasting	Blast planning to avoid unfavourable conditions	Benefits not quantified.

# Monitoring

The existing air quality monitoring network is described in the Air Quality and Greenhouse Gas Management Plan. The network consists of five dust deposition gauges and High Volume Air Samplers measuring TSP and  $PM_{10}$  at one location.

No changes to the existing air quality monitoring network are recommended for proposed MOD 10.

#### 6.5 ABORIGINAL ARCHAEOLOGY

# 6.5.1 Impact Assessment

RPS was engaged by the applicant to prepare an Aboriginal Heritage Due Diligence Assessment of the proposed MOD 10 additional area of disturbance (refer to **Appendix L**).

The due diligence assessment was conducted in accordance with the Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales (DECCW 2010). The due diligence assessment included:

- A review of the Heritage NSW Aboriginal Heritage Information Management System (AHIMS) database;
- A review of existing documentation including the Heritage Management Plan that applies to the KEQ (RPS), the Cultural Heritage Assessment (January 2018) prepared by the Karuah Local Aboriginal Land Council that formed part of the MOD 1 approval, the Due Diligence Assessment prepared by RPS (2018) for MOD 2; the



- Cultural Heritage Assessment (RPS, June 2012) that formed part of the original KEQ Project Approval and a Due Diligence Assessment undertaken for a separate project (Karuah River Crossing upgrade, RPS 2013); and
- A visual inspection of the proposed MOD 10 additional disturbance area was undertaken to identify whether Aboriginal objects are present on the ground surface or are likely to be present below the ground surface.

The AHIMS search did not identify any Aboriginal objects or sites within the subject site. One (1) item was identified within the search area, being AHIMS site 38-4-0505, which is located approximately 2km southwest of the subject site on the southern side of the Pacific Highway. The proposal will not result in any impacts on this item.

No Aboriginal objects or sites were identified during the visual inspection. Ground surfaces were inspected for stone artefacts with none identified. Ground surface visibility was moderate throughout. There was limited material identified, and significant quantities of imported material were also observed. These materials are not suitable for artefact manufacture. Some mature trees were identified within the MOD 10 Project Area, none of which contained evidence of cultural scarring. The sub-surface archaeological potential of the additional surface is considered by RPS to be low.

The results of the AHIMS search and visual inspection indicate that there are no identified Aboriginal objects in the proposed additional disturbance area. RPS conclude that there is a low possibility that the proposed works will result in harm to Aboriginal objects.

### 6.5.2 Conclusion and Mitigation and Management Measures

The Due Diligence Assessment concludes that the results of the AHIMS search (no identified Aboriginal objects) and results of the visual inspection (no Aboriginal objects identified) combined with the lack of natural resources in the area, there is a low possibility of sub surface sites or objects within the MOD 10 area.

The following recommendations are recommended:

- The Karuah East Quarry Heritage Management Plan must be updated to include the MOD 10 increase in disturbance footprint. In accordance with Condition 36(c) of Project Approval 09\_0175 for the KEQ and the approved Heritage Management Plan, Registered Aboriginal Parties (RAPs) must be provided the opportunity to monitor initial disturbance associated with the proposal for the identification of unrecorded Aboriginal objects. RAPs must be notified 14 days in advance of work;
- The due diligence assessment must be kept by KEQPL so that it can be presented, if needed, as a defence from prosecution under Section 86(2) of the National Parks and Wildlife Act 1974;
- All site workers and personnel involved in site impact works associated with proposed MOD 10 should be inducted and briefed on the possible identification of Aboriginal objects during construction and their responsibilities according to the provisions of National Parks and Wildlife Act 1974 and the Heritage Act 1977;
- If unrecorded Aboriginal object/s are identified during works, all works in the immediate area must cease and the area cordoned off. The area is to be managed in accordance with the procedures outlined in the Karuah East Quarry Heritage Management Plan; and
- All human remains in, on or under the land must not be harmed. If suspected human remains are located during any stage, the following procedure should be followed:



- 1. Immediately cease all activity at the site;
- 2. Ensure no further harm occurs, secure the area to avoid further harm to the remains; and
- 3. Notify the NSW Police 000.

#### 6.6 NOISE

EMM was commissioned by the applicant to prepare a Noise impact Assessment (NIA) for the proposed MOD 10 development. The NIA assesses the noise and vibration impacts of the proposed modification on existing sensitive receptors in the surrounding area. The NIA is enclosed as **Appendix J**.

The NIA was completed in accordance with the following guidelines and policies:

- Noise Policy for Industry (NPfI) (NSW EPA 2017);
- Interim Construction Noise Guideline (ICNG) (NSW EPA 2009);
- Road Noise Policy (RNP) (NSW DECCW 2011); and
- Voluntary Land Acquisition and Mitigation Policy (VLAMP) (NSW Government 2018).

### 6.6.1 Vibration Assessment

Vibration from operational activity will not change as a result of the proposed modification compared to that currently approved. The main potential source of vibration from the site is blasting, movement of the dozer in the pit and/or front end loaders in the stockpile areas. Given the separation distance of at least 650m between the KEQ working areas and the nearest private residences, vibration levels are expected to be below that which could cause disturbance to residents. Accordingly, a detailed assessment of vibration impacts is not necessary.

# 6.6.2 Noise Assessment

Operational noise criteria for current approved operations are provided in Schedule 3 Condition 3 of the Project Approval 09\_0175. These criteria were established by the recent MOD 9 approval on 2 December 2021. Importantly, the derivation of these limits was based on the current NSW EPA policy (i.e. NPfI) and background noise monitoring undertaken in June 2021.

Table 13 - Existing Operational Noise Limits (dB)

Noise Assessment Location)	Morning Shoulder L <sub>Aeq, 15 min</sub>	Morning Shoulder L <sub>A,max</sub>	Day L <sub>Aeq,15 min</sub>	Evening L <sub>Aeq,15 min</sub>
Α	35	52	42	40
В	35	52	40	40
G	35	52	43	39
Н	35	52	44	46
	35	52	40	37
All other residences	35	52	40	35



#### **Noise Sensitive Receivers**

The closest noise sensitive receivers are shown in **Figure 35** below and described in **Table 14** below. These are generally consistent with the Project Approval, previous noise impact assessments and current compliance noise monitoring requirements.



Figure 35: Noise Receptors and Assessment Locations.

**Table 14 - Noise Assessment Locations** 

RECEPTOR ID	PROPERTY DETAILS
A	Lot 100 DP 785175
В	Lot 3 DP 785172
С	Lot 2 DP 785172
D	Lot 22 DP 1024341
E	Lot 250 DP1092111
F	Lot 50 DP 1036893
G	Lot 1 DP 1032636
Н	Lot 10 DP 1032636
	Lot 11 DP 1032636
J	Lot 14 DP 1032636

# **Existing Quarry Noise Emissions**

Quarterly daytime noise monitoring is currently undertaken at Receptors A, B, F & G in accordance with the approved Noise Management Plan (SLR). On 26 April 2022 an updated Noise MP was approved by the NSW DPE to accommodate MOD 9, which will extend monitoring into the morning shoulder and evening periods and add on additional monitoring location (receiver H).



Based on the results of quarterly noise compliance monitoring, noise from the KEQ is generally not audible at any of the locations over noise from the traffic on the M1 Pacific Motorway and noise emissions from the KEQ satisfy the relevant operational noise limits as provided in the Project Approval. Noise levels at Location G have previously been quantified to be in the range  $L_{Aeq,15\,min}$  37-38dB.

Additional operator-attended noise monitoring was undertaken during logger deployment by EMM in June 2021. Quarry noise emissions were quantified under noise-enhancing weather conditions at Locations G and H.

#### **Ambient Noise Environment**

A background noise monitoring program was undertaken in June 2021 to establish reliable contemporary noise monitoring data and to appropriately characterise the noise environment at relevant receivers. The monitoring program included:

- Unattended noise monitoring at four locations surrounding the quarry to establish ambient and background noise levels; and
- Operator-attended noise monitoring was also completed by EMM at the unattended noise logger locations during the 2021 monitoring program.

The monitoring program provided opportunity to validate the computer noise model under noise-enhancing weather conditions.

# **Operational Noise Assessment**

Contemporary noise goals (PNTL's (Project Noise Trigger Levels)) were established based on the results of the ambient noise monitoring undertaken. PNTL's are the lower (i.e. More conservative) of with the project intrusiveness or amenity levels. These are summarised in **Table 15** below.

Table 15 - Project Noise Trigger Levels

Assessment location	, , , , , , , , , , , , , , , , , , , ,		Amenity noise level, L <sub>Aeq,15-min</sub> , dB		PNTL, L <sub>Aeq,15min</sub> , dB				
	Morning Shoulder	Day <sup>1</sup>	Evening 1	Morning Shoulder <sup>1</sup>	Day <sup>1</sup>	Evening 1	Morning Shoulder <sup>1</sup>	Day <sup>1</sup>	Evening 1
Α	46	51	51	38	53	43	38	51	43
В	46	51	51	38	53	43	38	51	43
С	46	51	51	38	53	43	38	51	43
D	46	51	51	38	53	43	38	51	43
E	46	51	51	38	53	43	38	51	43
F	46	51	51	38	48	43	38	48	43
G	42	46	46	38	48	43	38	46	43
Н	38	40	45	38	48	43	38	40	43
I	38	40	45	38	48	43	38	40	43
J	35	40	35	38	48	43	35	40	35

Note: 1. Morning shoulder: 5am to 7am Monday to Saturday; 5 am to 8 am Sundays and public holidays; Day: 7 am to 6 pm Monday to Saturday; 8 am to 6 pm Sundays and public holidays; Evening: 6 pm to 10 pm.

It is noted that during the assessment process for MOD 9 (approved 2 December 2021), clarification was sought by the NSW EPA regarding why the evening PNTLs were higher than the day PNTLs for residences H and I. This was addressed by the following points:



- Changes in diurnal patters are most likely due to weather effects and variances in traffic flow on the Pacific Highway;
- There is a direct correlation between the ambient background noise levels measured at locations G and H. This indicated that the primary influence on ambient and background levels is part of the broader environment and not something that is localised to a particular residence; and
- Of ten long-term unattended noise monitoring periods undertaken at location G since February 2019 only one of those monitoring periods recorded an evening RBL less than the daytime. On all other occasions the measured evening RBL was equal to or greater than the daytime RBL (ranging from equal to up to 6 dB higher). This clearly demonstrates that this is a long-term feature of the locality.

Noise modelling was based on three (3) dimensional digitised ground contours of the surrounding land and surface infrastructure. Noise predictions were carried out using the iNoise software. iNoise calculates total noise levels at assessment locations from concurrent operation of multiple noise sources. The model considers factors such as the lateral and vertical location of plant, source-to-receptor distances, ground effects, atmospheric absorption, topography of the surface facilities area and surrounds and applicable meteorological conditions.

A conservative approach was selected for the consideration of potentially noise enhancing weather conditions. Noise emissions from the quarry have been predicted for noise enhancing conditions.

The noise model considered a representative snapshot of surface operations with equipment placed at locations representing a realistic operational scenario. Equipment sound power levels have been based on measurements undertaken at the site. **Table 16** below provides a summary of the acoustically significant fixed and mobile equipment considered in the noise model.

Table 16 - Acoustically Significant Plant and Equipment

	SOUND POWER LEVEL	OPERATING DURING THIS PERIOD			
ITEM	PER ITEM (DBA)	MORNING SHOULDER	DAY	EVENING	
Jaw crusher	114	×	✓	✓	
Primary screen	108	×	✓	✓	
Haul trucks (4 of)	107	×	✓	<b>✓</b>	
Excavator (extraction, 2 of)	102	×	<b>√</b>	✓	
Diesel generator set (3 of)	98	×	✓	<b>✓</b>	
Front end loader (operations, 2 of)	104	×	✓	<b>✓</b>	
Front end loader (sales)	104	✓	✓	✓	
Screens 2, 3 and 4	103	×	✓	✓	
Cone crushers (2 of)	103	×	✓	<b>✓</b>	
Vertical shaft impactor (Barmac)	106	×	✓	<b>✓</b>	
Drill rig	114	×	√	×	
Road truck	103	✓	✓	<b>√</b>	

Notes: 1. 2 haul trucks continuously operating between pit and jaw crusher, 2 haul trucks continuously operating between processing area and sales stockpile.

#### **Results of Operational Noise Assessment**

Operational noise emissions for each proposed period of operations are summarised in **Table 17** below.



**Table 17 - Operational Noise Predictions** 

Location	ational Noise Predic	Predicted noise level MOD 10 operations (LAeq,15 min) (dB)	PNTL (L <sub>Aeq,15 min</sub> ) (dB)	Existing noise limit (LAeq, 15 min) (dB)
A	Morning shoulder	<35	38	35
	Day	40	51	42
	Evening	40	43	40
В	Morning shoulder	<35	38	35
	Day	40	51	40
	Evening	40	43	40
С	Morning shoulder	<35	38	35
	Day	35	51	40
	Evening	35	43	35
D	Morning shoulder	<35	38	35
	Day	<35	51	40
	Evening	<35	43	35
E	Morning shoulder	<35	38	35
	Day	<35	51	40
	Evening	<35	43	35
F	Morning shoulder	<35	38	35
	Day	<35	48	40
	Evening	<35	43	35
G	Morning shoulder	<35	38	35
	Day	39	46	43
	Evening	39	43	39
Н	Morning shoulder	<35	38	35
	Day	44	40	44
	Evening	461	43	46
l	Morning shoulder	<35	38	35
	Day	37	40	40
	Evening	37	40	37
J	Morning shoulder	<35	35	35
	Day	<35	40	40
	Evening	<35	35	35

Notes: 1. This predicted noise level included a moderation factor of +2 dB to account for the low frequency noise from the processing plant.

Predicted noise emissions from MOD 10 operations are the same as those provided in the MOD 9 Noise Impact Assessment (EMM, August, 2021). This indicates that the expansion of the stockpile area is predicted to have a negligible impact on the existing noise emissions from the KEQ.

Quarry noise emissions are predicted to be below (i.e. comply with) the relevant existing morning shoulder, daytime and evening noise limits as per Schedule 3 Condition 3 of the Project Approval at all assessment locations.



Quarry noise emissions are predicted to be below (i.e. comply with) the relevant PNTL during all periods of operations at most assessment locations. The one exception is Location H during the day and evening period. Morning shoulder operations are predicted to meet the PNTL at this location.

As outlined in **Section 6.6.3** below (and as part of the recent MOD 9 approval process), an extensive investigation has previously been undertaken to identify and implement, where relevant, all feasible and reasonable noise mitigation measures. Measures that have been implemented include, but are not limited to, enclosures of the jaw crusher, cone crushers and generators as well as a review of the operating sound power level of mobile equipment. Based on this investigation and the outcome of the noise impact assessment undertaken for the MOD 9 application, the approved noise limit for daytime operation of the quarry at Location H is currently L<sub>Aeq,15 minute</sub> 44 dB. This current daytime limit is predicted to be achieved for the daytime operations which are not proposed to change as part of MOD 10. Furthermore, the approved noise limit for evening operation of the quarry at Location H is currently L<sub>Aeq,15 minute</sub> 46 dB. This current evening limit is predicted to be achieved for the evening operations which are not proposed to change as part of MOD 10.

Based on the results of the recent ambient noise monitoring at location H, the rating background noise level is lowest during the day and higher in the evening, primarily due to highway traffic. The justification for this deviation from the NPfl methodology was provided in the MOD 9 NIA (EMM, August 2021) and summarised above. The measured evening RBL was 40 dB which results in a project intrusive noise level of 45 dB. The predicted operational noise emission at Location H was compared to the measured RBL+5dB (intrusive criteria) and considered a negligible (+1dB) exceedance and not warranting consideration of additional mitigation measures.

It is important to note the following relevant to the dwelling at Location H:

- The dwelling at Location H was approved and built after the KEQ commenced operations. The approval for this dwelling, issued by Mid Coast Council (DA 69/2018/A) also included the establishment and operation of a truck depot;
- The Mid Coast Council approval for the dwelling at Location H includes a condition
  of consent for acoustic treatment of the building to limit the noise impacts from the
  quarry in accordance with the requirements of AS/NZS 2107(5). In its assessment of the
  application for the dwelling, Council considered the operation of the quarry and
  included Condition 11 of consent DA/69/2018 which states:
  - '11. Prior to the issue of a construction certificate, plans and specifications detailing the measures to reduce noise impacts on the building occupants from the quarry must be submitted to and approved by the certifying authority. The buildings must be acoustically designed and constructed to meet the requirements of Australian Standard AS/NZS 2107: Acoustics Recommended design sound levels and reverberation times for building interiors. Evidence from an appropriately qualified person that their design will achieve the requirements of the Australian standard must be submitted with the plans and specifications.'
- Noting that there is an operational truck depot on the site, the dwelling is acoustically treated (specifically noting that it was established after the quarry) and the noise exceedance is negligible when compared to the project intrusive noise level, it is considered that any potential impact on Location H is minimal; and



• In accordance with PA 09\_0175 (Condition 5 of Schedule 4), Location H is subject to additional mitigation upon request. KEQPL, if requested by the owner of the dwelling at Location H will consider reasonable and feasible receiver mitigation measures consistent with the Voluntary Land Acquisition and Mitigation Policy (VLAMP) (DPIE 2018). Where additional noise mitigation is required, additional noise mitigation measures consistent with the measures outlined in the VLAMP will be implemented. The measures must be reasonable and feasible, proportionate to the level of impact and directed towards reducing the noise impacts of the development. MOD 10 does not seek to amend this condition.

#### **Sleep Disturbance**

Consideration was given to likely maximum noise level events at the nearest residential assessment locations during the morning shoulder period to determine the potential for sleep disturbance.

Typical maximum noise events are likely to include reversing alarms and impacts associated with loading and/or unloading material. A typical conservative sound power level of L<sub>Amax</sub> 125 dB has been used to predict potential sleep disturbance impacts at receiver locations.

Results of noise modelling found that maximum noise level events are predicted to satisfy the relevant maximum noise level event screening criteria at all assessment locations under noise-enhancing meteorological conditions. It is unlikely that the project will cause sleep disturbance at any receivers.

#### **Road Traffic Noise Assessment**

Based on the annual production limit, which is not proposed to change as a result of proposed MOD 10, the following summarises the traffic generation of Karuah East Quarry:

- A total of 432 vehicle movements per day which equates to 216 despatched loads per day; and
- A maximum hourly traffic flow of 44 vehicle movements which equates to 22 despatched loads during that hour.

MOD 10 will not affect the number of vehicle movements or their arrival/departure patterns. Road traffic noise impacts are not predicted as a result of MOD 10.

#### **Construction Noise Assessment**

Construction activity associated with proposed MOD 10 is expected to consist of two short-term periods of vegetation clearing, earthworks and construction of an administration building. All construction will occur during the daytime standard construction hours only (consistent with the construction hours specified in Condition 7 of Schedule 2 of the Project Approval) as follows:

'Construction activities: 7.00am to 6.00pm, Monday to Friday; and 8.00am to 1.00pm, Saturdays, unless noise from these activities does not exceed  $40dB(A)L_{Aeq(15min)}$  at any privately owned residence.'



Given the nature of the required construction works and noting that they are to be completed over a short-term period and will be similar in nature to operational noise from the Quarry, construction noise impacts are not expected as a result of proposed MOD 10. Construction noise mitigation measures will be incorporated into the Noise Management Plan, which will be updated for MOD 10.

# 6.6.3 Conclusion and Mitigation Measures

The NIA concludes that noise emissions from MOD 10 are not predicted to change compared to those predicted from MOD 9 operations (approved on 2 December 2021). MOD 10 will have a negligible impact and can be supported.

## **Mitigation Measures**

#### **Construction Noise Mitigation**

The Noise Management Plan will be updated to include best practice construction noise management, including:

- Adherence to the approved construction hours in Project Approval 09\_0175 (Condition 7 of Schedule 2);
- Quarterly noise monitoring will continue consistent with the requirements of the Noise Management Plan;
- Plant and equipment will be kept well maintained;
- Regular inspection and maintenance of equipment will be undertaken to ensure it is
  in good working order and operating at the lowest feasible noise level;
- Damaged equipment is not to be operated until it is maintained or repaired;
- Regular training of staff and contractors (i.e. toolbox talks) to use equipment in ways to minimise noise;
- Operate mobile plant in a quiet, efficient manner;
- Switching off vehicles and plant when not in use;
- A speed limit of 20 km per hour will be applied and enforced for all construction related vehicles on site;
- Clear signage will be available at the site including relevant contact numbers for community enquiries; and
- Prompt response will be made to any community issues of concern.

## **Operational Noise Mitigation**

Due to negligible noise impact at all receivers and substantial mitigation measures already implemented, apart from updating the Noise Management Plan to accommodate MOD 10, no further noise mitigation or management is necessary. Provided below is a summary of the measures already implemented as a result of the MOD 8 and MOD 9 approvals:

- Enclosure of the jaw crusher with 100 mm thick concrete on the north, east and south elevations. The jaw crusher is also enclosed with a roof manufactured from Hushclad Ultimate:
- Enclosure of the Jaw Crusher with 100 mm thick concrete panels on the North, East and South sides. Roofing materials to have an acoustic rating of STC28;
- Enclosure of the Cone Crushers on the Northern and eastern elevations with materials having an acoustic rating of STC28. Southern and western elevations and roof to be enclosed with Colorbond;



- Purchase and use of generator sets which are acoustically treated including complete enclosure of the engine and generator, acoustically treated exhaust systems and cooling systems;
- The Applicant will not fire blasts at the Karuah quarry and the Karuah East quarry at the same time;
- The Applicant will implement a blasting program where nearby receivers are notified in advance of a blast;
- The following control measures for vibration will be undertaken:
  - Reducing the maximum instantaneous charge (MIC) by using delays, reduced hole diameter and/or deck loading;
  - Changing the burden and spacing by altering the drill pattern and/or delay layout or altering the hole inclination;
  - Use the minimum practicable sub drilling which gives satisfactory toe conditions;
     and
  - o Investigate alternative rock breaking techniques.
- The following control measures for air blasting will be undertaken:
  - Reducing the maximum instantaneous charge (MIC) by using delays, reduced hole diameter and/or deck loading;
  - o Ensure stemming depth and type is adequate;
  - o Eliminate exposed detonating cord and secondary blasting;
  - o Restrict blasting events to favourable weather conditions;
  - Orient quarry faces away from potentially sensitive receivers;
  - Use a hole spacing and burden which will ensure that the explosive force is just sufficient to break the ore to the required size; and
  - The Applicant will take particular care where the face is already broken and consider deck loading where appropriate to avoid broken ground or cavities in the face.
- Splitting or hammering of Class 1 (700 mm 1200 mm) and Class 2 (400 mm 700 mm) rock will not be undertaken after 6:00 pm;
- The Applicant will implement training to ensure staff are aware of the sensitivity of noise emissions;
- Product will be loaded into trucks from as low a height as possible;
- Loading of Class 1 (700 mm 1200 mm) and Class 2 (400 mm 700 mm) rock for dispatch during the following hours will be undertaken via excavator 'grabs' using the hydraulic excavator rock grab attachment rather than a bucket attachment:
  - o 5:00 am to 7:00 am, Monday to Friday;
  - o 6:00 pm to 9:00 pm, Monday to Friday;
  - o 9:00 pm to 10:00 pm, Monday to Friday on up to 50 calendar days per year; and
  - o 6:00 am to 7:00 am, Saturdays.
- The following measures have been implemented:
  - o Inclusion of the dump hopper into the jaw crusher building;
  - o Incorporation of windrows along the internal quarry haul roads; and
  - Training of operators to use higher gears and lower engine acceleration where practical.

#### **Operation Noise Monitoring**

The Noise Management Plan will be updated to accommodate the MOD 10 proposal.

No changes to monitoring frequency or locations is required.

#### <u>Variation to Environment Protection License</u>

Application will be made to vary EPL 20611 applying to KEQ.



## 6.7 LAND RESOURCES & REHABILITATION

EMM was commissioned by the applicant to prepare a Land Resources Assessment and Rehabilitation Strategy Advice for the proposed modification.

The Land Resource Assessment and Rehabilitation Strategy Advice assesses the impact of proposed MOD 10 on land and soil capability and current and future land uses and considers the existing rehabilitation and closure strategy as it relates to the proposed MOD 10 additional disturbance areas.

The Land Resource Assessment and Rehabilitation Strategy Advice is provided in **Appendix M**.

A Soil survey and Land resource assessment for the KEQ was originally undertaken by GSS Environmental (2011) and forms part of the Project Approval documentation for the Karuah East Quarry. This 2011 assessment however did not cover the entirety of the proposed MOD 10 disturbance areas. Accordingly, the land resource assessment (LRA) report has been prepared to supplement to the original 2011 study to assess the type and capability of soils found within the proposed MOD 10 disturbance areas.

The supplementary LRA is based on the current LSC Scheme (NSW Land and Soil Capability Assessment Scheme) and includes:

- Descriptions of the soil landscapes and soil types present within the proposed MOD 10 disturbance areas and their consistency with the existing soil mapping for the greater site (GSSE 2011);
- Assessment of the land and soil capability (LSC) classes of these soils;
- Assessment of proposed MOD 10 impacts on these soils and soil related hazards to the construction, operations and rehabilitation and closure phases of the quarry with emphasis on soil erosion and sediment transport risk; and
- Recommended mitigation and management options to prevent, control, abate or minimise identified soil and land resource impacts associated with the Project.

In addition, the LRA considers the existing KEQ Landscape and Rehabilitation Management Plan (LRMP, SLR 2020) for MOD 10 as it relates to rehabilitation and closure objectives for the site.

#### 6.7.1 Soil Assessment

The soil assessment for the proposed MOD 10 disturbance areas comprised:

- Desktop review of available information, primarily the GSS Environmental Soil Survey and Land Resource Assessment (2011);
- Field soil survey; and
- Determination of soil mapping units (SMUs) present and their key physical and chemical characterisations.

The soils assessment of the proposed MOD 10 additional disturbance areas identified two SMUs as identified in **Table 18** and **Figure 36** below:

Table 18 - Soil Mapping Units

Soil Mapping Unit	<b>Australian Soil Classification</b>	Site ID (refer below figure)
DE	Dermosol	KE2
CH	Chromosol	KE1, KE3



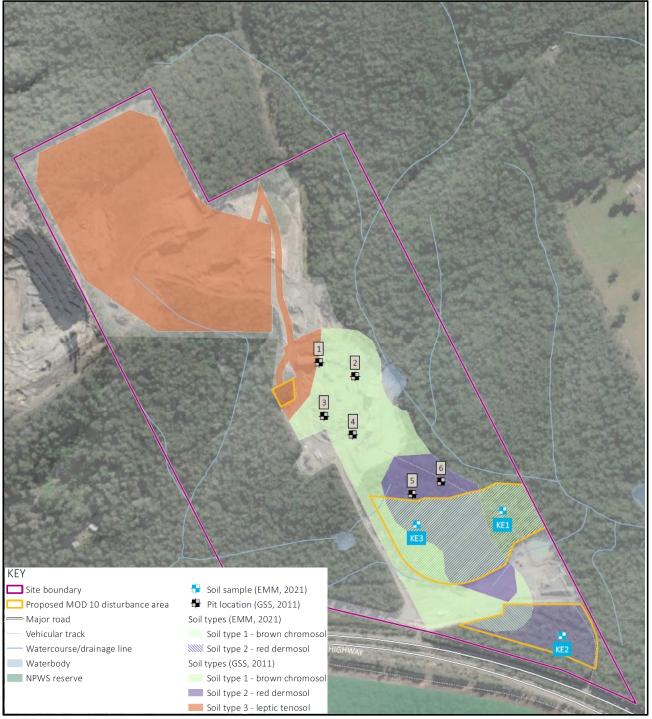


Figure 36: Project Area Soil Mapping Units.

These units are consistent with the soil types encountered previously by GSS Environmental (2011).

These SMUs generally have low to moderate fertility, with very low salinity and no sodicity in the topsoils. All soils are strongly acidic throughout. The Chromosols and Dermosols have relatively benign subsoil, being non-sodic with low salinity, though the deeper subsoils of the Chromosols are occasionally sodic. Aluminium levels are high due to the acidic nature of the soils and mixing of subsoils with topsoils should be avoided to ensure these constraints are not introduced into the topsoils.



# 6.7.2 Land & Soil Capability Assessment

The land soil capability (LSC) of the MOD 10 project area is identified as Class 3 and Class 5, which represents a range of capability from highly to moderately low capability land. Class 3 lands are associated with the Dermosol soil type and Class 5 lands are associated with the Chromosol soil type. Refer to **Figure 37** below.

Class 3 land is generally considered to have moderate limitations with land use restricted capable of sustaining high-impact land uses, such as cropping with cultivation, using more intensive, readily available and widely accepted management practices. However, careful management of limitations is required for cropping and intensive grazing to avoid land and environmental degradation.

Class 5 land has high limitations for high-impact land uses which largely restricts land use to grazing, some horticulture (orchards), forestry and nature conservation. The limitations need to be carefully managed to prevent long-term degradation.

The soil survey and mapping identified that the primary constraints to LSC are soil acidification in the Chromosols, with no single limiting factor for the Dermosols.

The LSC assessment for the proposed MOD disturbance areas indicates a land capability generally consistent with that assessed by GSSE (2011) for the broader KEQ site.



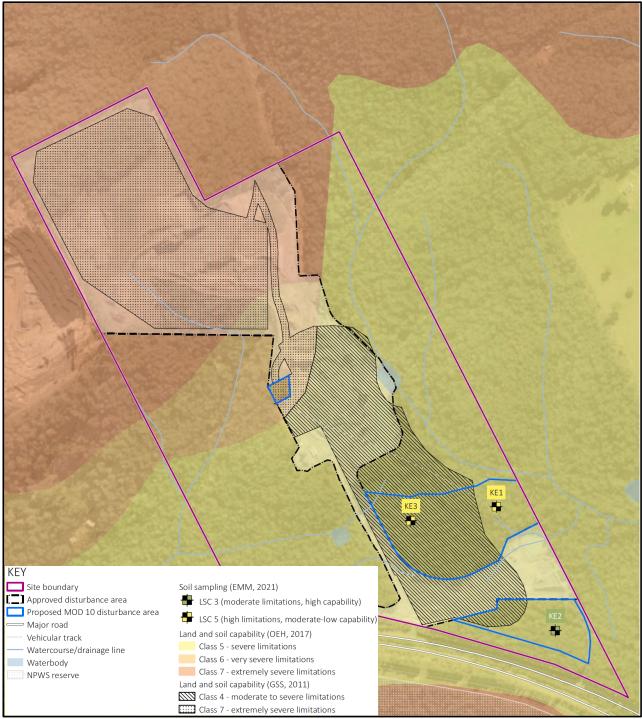


Figure 37: Land Soil Capability Classification.

## 6.7.3 Erosion Hazard

An erosion risk and hazard analysis was conducted to identify the impact of proposed MOD 10 on soil loss.

The physical erosion risk was calculated based on two methodologies:

• Firstly, erosion risk of the soil due to its physical and chemical properties was determined utilising texture derived soil erodibility factors (K-Factors). The erosion risk was found to be high due to the electrochemical instability of the site soils.



• Secondly, the erosion hazard for MOD 10 was calculated in relation to rainfall and slope, for which the rainfall erosivity for the project area is calculated to be 2,627 MJ.mm ha<sup>-1</sup> h<sup>-1</sup>. This means that rainfall and slope in the MOD 10 project area has a low to high hazard of causing erosion.

Due to this high erosion hazard further assessment of erosion hazard was undertaken to determine soil loss classes (SLCs). The SLCs range from 1 (very low) to 7 (extremely high). SLCs greater than or equal to 4 trigger increased erosion and sediment control management requirements (which are contained in the Surface Water Management Assessment prepared by ADW Johnson and enclosed as **Appendix H** (refer to **Section 6.2** of this report)).

#### 6.7.4 Rehabilitation

The rehabilitation methods contained within the approved Landscape and Rehabilitation Management Plan (SLR, March 2020) are appropriate for the MOD 10 area. Only minor update of the Landscape and Rehabilitation Management Plan is needed to include the MOD 10 area and also address the electrochemical instability risk posed by some of the identified subsoils to manage and mitigate the identified erosion hazard and revegetation risks.

This can be readily addressed and is appropriate to be undertaken in a revised Landscape and Rehabilitation Management Plan.

### 6.7.5 Mitigation and Management Measures

The following mitigation measures will be implemented for MOD 10:

## Land & Soil Capability

- The in situ subsoil in the proposed MOD 10 areas will be sheeted with gravel material to form suitable hardstand areas. The batters will be topsoiled with suitably ameliorated topsoil, hydro-mulched and grassed;
- Post quarrying the fill batter will be re-shaped to a flatter batter grade of 1(v):4(h). Any remaining stockpiled material will be pushed against the cut batters to form gradients of 1(v):4(h) or flatter; and
- The hardstand gravels will be removed, the subsoil tested and ameliorated (if required) and topsoil respread over the hardstand and batters to a thickness of approximately 100mm. The batters and hardstand areas will be seeded with native species. The batters will be hydro-mulched for additional erosion protection.

## Soil Resources

The following mitigation and management measures will be implemented for soils that are stockpiled on the site for rehabilitation:

- Topsoil and subsoil management:
  - Ameliorants to reduce dispersion and acidity will be broadcast over the subsoil prior to stripping so that they are well mixed during the stripping and stockpiling process;
  - Stockpiles will be located on an elevated area away from water drainage lines zones where they are not disturbed by other activities;
  - o Topsoil will be stockpiled separately from subsoil stockpiles;



- Topsoil will be stockpiled using methods and machinery that limit the amount of compaction to avoid soil structural decline;
- Long-term topsoil stockpiles and will be hydro-mulched and seeded with appropriate species and monitored for weed management; and
- o Stockpiles will be clearly signposted.
- Measures to minimise the loss of soil during respreading on landscaped and/or rehabilitated areas and promote successful vegetation establishment:
  - Soil will be respread in even layers at a thickness appropriate for the intended use:
  - Topsoil will be compacted firmly but not excessively and left slightly rough (light cultivation after reinstatement may be required) to provide a suitable seed bed for revegetation;
  - As soon as practical after respreading, a sterile cover crop will be established to limit erosion and soil loss;
  - Non-water soluble, mineral based, biologically activated fertilisers will be used to minimise nutrient leaching and to facilitate the rapid establishment of soil microbiology; and
  - A straw-based hydro-mulch will be used to provide erosion protection to newly seeded batters.

#### **Erosion and Sediment Control**

- Erosion and sediment control for the proposed MOD 10 area will be undertaken in accordance with the Surface Water Management Assessment for MOD 10 (ADW Johnson) and the Water Management Plan; and
- Disturbance to lands that contain greater than 10% slope will be avoided (where
  practical) during the high erosivity risk period from November through to April. Where
  it is not possible to avoid disturbance in such areas, the areas should be stabilized to
  achieve the following target C-factors within the nominated timeframes:

Lands	Target C- Factor	Timing
Waterways and other areas subjected to concentrated flows, post construction	0.05	A target C-Factor of 0.05 (approximately 70% soil surface cover) will aim to be achieved 10 days from completion of construction and prior to exposure to concentrated flows.
All lands, including waterways and stockpiles during construction	0.15	A target C-Factor of 0.15 (approximately 50% soil surface cover) will aim to be achieved 20 working days of inactivity or from completion of construction.
Stockpiles, post construction	0.10	A target C-Factor of 0.10 (approximately 60% soil surface cover) will aim to be achieved 10 working days from completion of construction.

 The Water Management Plan will be updated post determination of MOD 10 to address the additional requirements for the highly sensitive lands identified through the erosion hazard assessment.



#### Rehabilitation

- The Landscape and Rehabilitation Management Plan will be updated to include the MOD 10 additional disturbance areas;
- The amended Landscape and Rehabilitation Management Plan will include additional information on amelioration of the electrochemical instability of the identified dispersive subsoils to reduce erosion and revegetation risks; and
- Rehabilitation will be undertaken in accordance with the Landscape and Rehabilitation Management Plan.

#### 6.8 VISUAL

EMM was commissioned by the applicant to prepare a Visual Impact Assessment (VIA) for the proposed MOD 10 development. The purpose of the VIA is to understand the likely interactions between the project and visual receptors in the vicinity.

The VIA is enclosed as **Appendix N**.

# 6.8.1 Assessment Methodology

A visual impact assessment informed the original Project Approved (GSSE, November 2012), the findings and recommended mitigation measures of which remain current. Noting that MOD 10 proposed new areas of disturbance, the VIA supplements the 2012 VIA.

The VIA was prepared in accordance with the Guidelines for Landscape and Visual Impact Assessment, prepared by the Landscape Institute and the Institute of Environmental Management and Assessment (2013).

The assessment included:

- Consideration of the existing environment surrounding the project area and establishment of a visual catchment;
- Identification and evaluation of the visual effect of the project;
- Identification and evaluation of the visual sensitivity within the existing environment;
- Integrate the consideration of visual effect and visual sensitivity findings; and
- Consideration of feasible mitigation measures.

A visit to the locality and key publicly-accessible receptor points was undertaken on 27 December 2020. This provided an opportunity to determine local factors such as vegetation, infrastructure and existing development. The site visit included the town of Karuah and all local public roads.

The VIA identifies an area of theoretical visibility, which represents the area within which the majority of potential views of the project may be located. Within the area of theoretical visibility, not all areas will have a line of sight to the proposed development due to the presence of intervening rises in topography and the area of theoretical visibility does not take into account any vegetation which may also prevent or limit a line of sight (i.e. the theoretical line of sight is often not the 'actual' line of sight due to the intervention of vegetation or structures).

The area of theoretical visibility has been set at a 4 km radius. The area of theoretical visibility, shown in **Figure 38** below, includes residential receivers to the north-east of the and southwest of the quarry. The precincts within which one or more receptors are located are shown as R1 to R6 in yellow squares in the below figure.



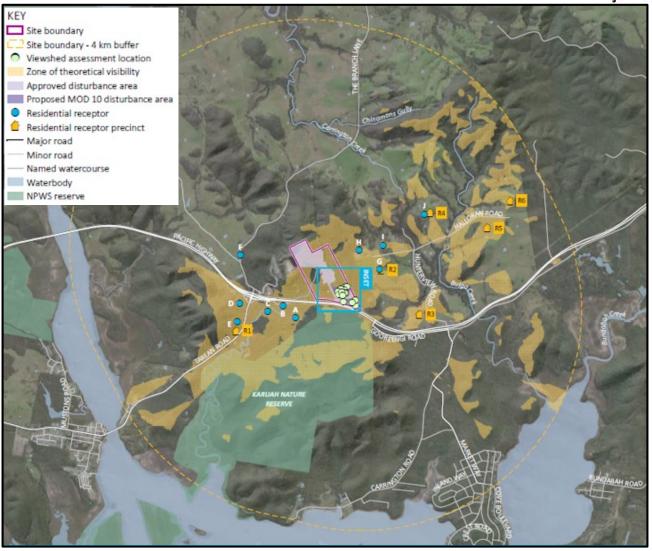


Figure 38: Zone of Theoretical Visibility.

#### 6.8.2 Visual Impact

# **Urban Residential Dwellings**

Urban development in Karuah includes dwellings on the eastern and western side of the Karuah River. None of the dwellings in this location will achieve a clear view line to the development due to intervening vegetation and structures.

There are also houses in Memorial Drive and Bundabah Street, Karuah, which have a potential view line to the proposed development. The line of sight is generally not obstructed across the Karuah River, and the distance of 4.5 km means that the precinct is outside the range applied for the area of theoretical visibility.

Houses along Riverside Drive, Mustons Road, Ridgeway Close, Manton Close, Buudhang Close and Boronia Road (to the north of the Karuah town centre) generally have any viewline towards the proposed development filtered by mature foreshore vegetation. Those few premises which have an unobstructed view across the river, being generally the houses in Manton Close, Ridgeway Close and Buudhang Close, at a little over 4 km from the Site, will be unlikely to perceive any visual effect, noting that there is a significant ridge north of Tarean Road which will prevent any viewline at this location.



The visual impact of the proposed MOD 10 development on urban residential dwellings in the area is considered nil or low.



Photo: Alice Street, Karuah – Looking East



Photo: View from Manton Close / Mustons Road, Karuah

# **Rural Residential Dwellings**

The rural residential precincts are identified in **Figure 38** above. It should be noted that these receptor precincts predominantly identify locations where a number of local rural residences are located (i.e. not individual residences).

There are several rural residential dwellings within the area of theoretical visibility, generally in the Hunterview Road and Halloran Road vicinity, to the east of the KEQ and proposed MOD 10 development. Rural residences are also located along the Tarean Road, Mill Hill Close and The Branch Lane.

The rural residences in the Hunterview and Halloran Road area where a line of sight is a theoretical possibility are typically surrounded by remnant vegetation or landscape planting or are oriented away from the viewshed towards the proposed MOD 10 development. It is also noted that Lot 5 DP 838128 and Lot 14 DP 1024564 are biodiversity offset areas that are heavily vegetated and will not be affected by the MOD 10 proposal.

The presence of mature landscaping trees or remnant bushland will effectively obscure views towards the proposed MOD 10 development from rural residences. For the rural residences to the east of the site, the visual impact was assessed as being within the range of nil to low.



Photo: Residence, Halloran Road, Western Section



Photo: Residence, Halloran Road, Western Section





Photo: Residence, Halloran Road, Eastern Section

There is one rural residence proximate to the proposed development to the west of the existing quarry on The Branch Lane which has any potential view line to the development obscured by the mature vegetation on the north eastern (quarry) side of The Branch Lane and the hills west of the existing quarry.



Photo: Residence, The Branch Lane

The rural dwellings along Tarean Road and Mill Hill Close or Myers Trail are nestled in generally wooded settings and any potential view line to the proposed development is obscured by trees.



Photo: Residence, Tarean Road



Rural residences south of the Pacific Highway also have a visual impact which is low or nil. Intervening vegetation effectively mitigates any visual impact. The intervening vegetation also includes a buffer area (comprised of existing mature vegetation) of approximately 30m wide along the southern end of Lot 13 DP 1024564 which is proposed to be retained by MOD 10.

## **Community Facilities and Commercial Accommodation**

The nearest community facilities and most commercial accommodation are in Karuah and North Arm Cove. The Great Aussie Bush Camp is 7 km away and well outside the area of theoretical visibility. None of these facilities are within the area of theoretical visibility and therefore no visual impact is registered.

#### Designated Lookout, Picnic Site or Recreational Destination

Karuah Nature Reserve & National Park

Several high points within Karuah Nature Reserve and (potentially) Karuah National Park have a theoretical line of sight to the proposed development areas but there are no destination points, such as lookouts or camping sites, at these high points. The peaks are also heavily vegetated, meaning that the line of sight, if any, at those locations is significantly filtered.

Karuah Nature Reserve therefore has, based on distance, capacity to receive some visual effect from the proposed development however the low number of visitors to the park and the limited opportunities to achieve a line of sight to the proposed disturbance areas means that the impact is low.

The Karuah Nature Reserve is proximate to the proposed development but visual impact remains low due to the presence of mature forest. The Karuah National Park is approximately 6 km north-west of the proposed development and the visual impact, if any, at that distance was assessed as nil.

#### Karuah Boat Ramp

Karuah Boat Ramp is 4.8 km south-east of the proposed MOD 10 development and the visual effect, if any, of the proposed development at this distance is nil or low. Intervening rise in elevation and bushland along the Tarean Road alignment will obscure the view to the proposed disturbance areas.

Memorial Park, Karuah

Memorial Park, Karuah, has a more obscured line of sight towards the site. There is topography and vegetation generally obscuring the view line and the distance is approximately 4.8 km.

## **Designated Tourist Road or Scenic Route**

There are no designated tourist roads or scenic routes within the area of theoretical visibility and therefore no visual impact is registered.



#### Main Roads or Rail Line

### Pacific Highway Motorway

The Pacific Highway (A1) carries approximately 45,000 vehicles per day however the road in this location is a dual carriageway with a 110 km/hr speed limit and landscaped verges with mature plantings. There is also landscaping in many sections of the median strip. The duration of any possible line of sight is therefore extremely brief.

The highway is close to the proposed disturbance area (approximately 50 m) but there is a vegetated highway verge and also a proposed buffer of retained vegetation (approximately 30m wide) along the southern extent of the site which will filter or obscure the line of sight for passing traffic.

There is only limited and filtered opportunity to form a view line to the proposed development areas, the potential opportunity for establishing a view line is when approaching from the north.

Minor Roads

### Blue Rock Close and Andersite Road

Blue Rock Close and Andersite Road are predominantly service roads for the Karuah and Karuah East Quarries. There is very limited traffic using these roads other than vehicle movements associated with quarry operations.

## Tarean Road

Tarean Road connects with the Pacific Highway near The Branch Lane and Andersite Road, and is the main approach to Karuah town from the north when diverting from the Pacific Highway.

There is negligible opportunity to form a view line to the proposed development from Tarean Road due to the mature vegetation on both sides of the road. The visual impact is assessed as nil.



Photo: Tarean Road, Looking North East



### The Branch Lane

The Branch Lane runs generally north-south along the western side of the quarry area, and joins the Pacific Highway at the Tarean Road junction.

The area to the east (quarry side) of The Branch Lane is heavily vegetated and no view to the proposed development is available. The visual impact is nil.

## Gooreengi Road

Gooreengi Road, which previously formed part of the old Pacific Highway, runs parallel with the Pacific Highway, at its closest point, approximately 450 km south-east of the quarry and provides access to North Arm Cove and Tahlee. There is no view available from this road due to the mature vegetation along the sides of the road. The visual impact is nil.

## Myers Trail

Myers Trail forms part of the old Pacific Highway and runs parallel to the current Pacific Highway. At its closest point, it is approximately 110 m south of the proposed development. It carries negligible traffic and connects to other management trails within the Karuah Nature Reserve.

Views from the road are obscured by the mature vegetation along the northern side of the road. The visual impact is low.

#### Mill Hill Close

Mill Hill Close is part of the old Pacific Highway and is separated from the current Pacific Highway by an elevated earth embankment (not factored into the area of theoretical visibility) and mature vegetation. It is directly opposite the proposed development – separated by the Pacific Highway. Mill Hill Close carries negligible traffic. An extremely limited view line will be available from this road. The visual impact is assessed as low.

#### <u>Hunterview Road</u>

Hunterview Road connects to the Pacific Highway at the North Arm Cove intersection, approximately 1.2 km (at the closest point) to the east of the KEQ. Hunterview Road services local rural residences and farms in the Bulga Creek area. It connects to Halloran Road.

The road is at a generally lower elevation relative to surrounding land, and has sections of heavily vegetated land on either side. There is no view available to the proposed development from the road.

The visual impact on selected sections of the formed roadway of Hunterview Road is low. For most of the road, the visual impact is nil.









Photo: Hunterview Road looking south west

#### Halloran Road

Halloran Road runs generally east-west from a junction with Hunterview Road. It services several rural residences and farms. At its closest point (western end) the road is approximately 650 m from the proposed development. Halloran Road continues further east to a point approximately 3.5 km from the proposed development.

The road transects a series of ridges and from the higher points there is a view line available to the existing quarry. No line of sight is available at lower sections of the road or where heavily vegetated land obstructs view lines. The visual impact is assessed as low at Halloran Road.



Photo: Halloran Road (western section), looking west



Photo: Halloran Road (eastern section), looking west

### 6.8.3 Conclusion

The VIA concludes that from a visual perspective, the KEQ has significant benefit in terms of the surrounding topography and vegetation.

The site subject to MOD 10 is nestled within a heavily vegetated area and most receptor points are shielded by landscape plantings or mature forests.

Some of the rural residences to the east of the proposed development may register a low visual impact and in some cases nil, depending on the degree to which views from the premises are obscured or filtered by vegetation.

Urban residences in Karuah are a generally 4 km or more from the proposed development, and typically shielded by topography or vegetation such that the impacts are negligible or nil.



Glimpses of the proposed development may be afforded from southbound vehicles on the Pacific Highway, but these views are filtered by road verge vegetation and median strip vegetation, and will be fleeting. Furthermore, the proposed development will maintain a 30m wide buffer of mature vegetation adjacent to the Highway.

Minor roads, notably Hunterview Road and Halloran Road, undulate across some ridges and there will be occasional lines of sight to the development from high points. These are very low volume roads however and this impact is considered low.

There are no public access receptor points, such as lookouts or tourist destinations, which will be impacted visually.

## 6.8.4 Mitigation and Management Measures

Mitigation measures for MOD 10 include:

- A 30m wide vegetation buffer will be retained along the southern extent of Lot 13 DP 1024564; and
- Any plant or structures to be installed in the proposed disturbance area will include finishes of low reflectivity (where practical).

## 6.9 OTHER CONSIDERATIONS

The proposal seeks development consent primarily for an increase to the approved disturbance area of the KEQ to facilitate additional stockpiling areas. The key considerations for this modification application have been confirmed in consultation with the NSW DPE and have been addressed in the preceding sections above.

It is considered that the proposal will have no impact nor will it be impacted upon by any of the following considerations:

- Access, road network and traffic;
- Geotechnical;
- European Heritage;
- Bushfire; and
- Waste Management.

Assessment of the overall Karuah East Quarry in relation to the above items was undertaken as part of the Project Approval process (including MOD 1, MOD 2, MOD 8 and MOD 9 approvals). It is considered that the proposed modification will not affect or be affected by any of these considerations.

In terms of social and economic impact considerations, the proposal will have a positive impact noting that:

 MOD 10 will support the efficient long-term operation of the KEQ. KEQ contains a known resource of high-quality hard rock, and MOD 10 will substantially improve KEQPL's ability to supply this product to market.

This is particularly relevant as the State of NSW recovers from the Covid-19 pandemic, where the NSW Government is placing significant emphasis on supporting infrastructure and construction projects, including the announcement of new key infrastructure projects such as the M1 Pacific Motorway extension to Raymond Terrace. MOD 10 will support the development of such construction and infrastructure projects;



- The proposed modification will substantially improve the capability of the KEQ to tender for important construction and infrastructure projects within the Hunter and Mid Coast regions and in particular comply with tender requirements of agencies such as TfNSW and local Council's. MOD 10 will allow KEQ to be commercially competitive when tendering for large construction / infrastructure projects which will benefit the regional economy;
- Improving operational efficiencies will lead to positive flow on effects to the local economy and will generate ongoing employment opportunities; and
- MOD 10 can be undertaken satisfactorily with regard to key environmental considerations.



# 7.0 Justification of Modified Project

#### 7.1 PROPOSED ADDITIONAL DISTURBANCE AREA

KEQPL management have identified that the proposed additional disturbance area for stockpiling is essential for the ongoing efficient operation of the Karuah East Quarry.

Since the time of approval of the KEQ, the customer and project base of the quarry has evolved, with the quarry now servicing a number of large public infrastructure projects. The evolving client base includes Transport for NSW, Port Authority and a number of local Councils. When tendering for large infrastructure projects, KEQPL are required to demonstrate proof of stockpiling capacity that has been subject to a quality testing process to provide Quality Assurance. This often requires up to three (3) stockpiles of 4,000m³ of particular products to demonstrate compliance with various Australian Standards and Transport for NSW specifications. Given that the Karuah East Quarry stocks up to 15 different types of product, KEQPL are facing a significant problem in that the available stockpiling areas are insufficient in size. This is highly problematic because:

- KEQ will be unsuccessful with tenders because it cannot comply with tender requirements relating to demonstrated stockpiling capacities and Quality Assurance requirements; and
- The lack of stockpiling area will have flow on impacts that will affect the efficiency of the overall quarry operation.

The current situation of very limited stockpiling area already is resulting in instances where quarry operations must periodically cease because the stockpiling areas are at capacity (and cannot resume until the stockpiled material is hauled from the site to market). This situation significantly disrupts the efficient operation of the KEQ and the ability to grow local employment. Unless additional stockpiling area can be established, this situation is likely to be exacerbated as KEQ seeks to tender for large infrastructure projects and provides product to growing markets as the region responds to the covid-19 pandemic and housing affordability crisis.

To address this issue, additional land is required for the stockpiling of material.

In addition to the above, the following is noted:

- Further to its established customer base in the Lower Hunter and Mid Coast regions, KEQ has rapidly emerging customer bases in the Greater Sydney, the Upper Hunter and the New England Regions. Additional stockpiling area is important to service the expanding customer base;
- The proposed modification will have the important effect that the KEQ is commercially competitive in terms of product availability when tendering for construction/infrastructure projects. The approved stockpile area currently available at the Karuah East Quarry is approximately 27,000m². By comparison, this is significantly less than other quarries in the area, which, with a similar extraction rate have available stockpiling areas in excess of 100,000m². This puts KEQ at a distinct disadvantage when competing with other quarries on substantial tenders. MOD 10 will generate a positive public outcome that will result in a more competitive tendering process for local and regional projects;



- KEQPL management observe that as Australia, and in particular the State of NSW, recovers from the Covid-19 pandemic, as an economic stimulus measure, the Federal and NSW Governments are placing significant emphasis on supporting infrastructure and construction projects, including the announcement of new key infrastructure projects such as the M1 Pacific Motorway extension to Raymond Terrace. Proposed MOD 10 is consistent with the intent of the Government's initiative and will support the continued development of construction and infrastructure projects;
- The proposal does not seek to intensify quarry operations in terms of extraction limits, processing throughput, hours of operation or traffic generation. Annual throughput will remain capped at 1.5 million tonnes of product per annum in accordance with the Development Consent. Rather, the proposal will promote more orderly and efficient supply of product to market; and
- The findings of the environmental assessments (refer to **Section 6.0**) undertaken confirm that the site is suitable to accommodate proposed modification. Environmental safeguards incorporated into Management Plans that are in place for the KEQ operation can be readily expanded (where appropriate) to accommodate MOD 10.

## 7.2 SITE SELECTION

KEQPL has given particular attention to site selection of the additional disturbance areas. The proposed additional disturbance areas for stockpiling (i.e. the central and southern disturbance areas) were selected based on the following considerations:

- The locations proposed are logically positioned adjacent to the existing stockpiling area;
- The extraction and processing of materials within the KEQ site occurs in a lineal manner, progressing south from the extraction area, through the processing area to the stockpile area for storage prior to dispatch via the weighbridge. The extension of the existing stockpile area will allow the established lineal movement of materials through the site to be maintained; and
- It is acknowledged that the proposal cuts into the edge of the established biodiversity offset area on Lot 13 DP 1024564; however, no fragmentation of the offset area will occur. To compensate for the impact on the biodiversity offset area, KEQPL will provide a local 'like for like' replacement offset as well as an offset for the MOD 10 proposal. This approach has been confirmed with both the NSW DPE Biodiversity Conservation Division and Federal Department of Agriculture, Water & the Environment prior to lodgement of MOD 10.

In addition to the above, the following is noted:

An administration building forms part of the existing approval, however to date is has
not been constructed due to limitations in the size of the approved disturbance area
(and lack of stockpiling area). At present, KEQPL utilise the weighbridge office for
administrative functions. The proposed additional disturbance area will establish
sufficient space for the construction of an administration office commensurate with
the scale of the KEQ operation that is also well positioned to separate light and heavy
vehicles;



- There is an irregular shaped 'indent' into the Lot 13 site adjacent to the western side
  of the crushing plant. This generates a heavy vehicle manoeuvrability and safety
  issue. The proposed additional disturbance area seeks to regularise the western edge
  of the disturbance area by removing the 'indent' and in doing so will provide
  additional space that will provide an improved vehicle safety for a range of quarry
  vehicles; and
- The proposed additional disturbance areas are well separated from sensitive receivers and the proposed central and southern additional disturbance areas (which will contain additional stockpile areas) are located close to the quarry entry point and have excellent access to the M1 Pacific Motorway.

### 7.3 ALTERNATIVES TO THE PROPOSED MODIFICATION

### 7.3.1 Off-site Stockpiling

The alternative option to the MOD 10 proposal is to source, secure and disturb land elsewhere which will lead to negative outcomes including:

- Inefficient double handling of material; and
- Increased traffic and fuel usage, which also will lead to increased noise and air quality impacts.

The most logical outcome is to keep the proposed stockpile areas adjacent to the existing stockpile area and in one, well managed operation.

#### 7.3.2 Alternate Disturbance Footprint

Throughout the design phase of the MOD 10 footprint, a number of alternative layouts were considered. These are outlined in **Section 6.1.2** of this report and were undertaken to avoid biodiversity impacts and maintain ecosystem functionality. In particular, the design iterations resulted in substantially reduced impacts on threatened flora species *Tetratheca juncea* and *Grevillea parviflora*; maintained vegetation connectivity; and avoided riparian vegetation associated with a second order stream located north-east of the central disturbance area.

#### 7.3.3 Do Nothing Option

The key impact of not proceeding with the proposed development is that the KEQ will remain highly restricted by available stockpiling area. This will have adverse impact on KEQPL's ability to:

- Comply with authority tendering requirements on important infrastructure projects;
- Be competitive with local competitors when tendering for infrastructure projects;
- Efficiently supply quality hard rock product to the established and emerging markets;
   and
- Support and grow local employment and contribute to the local and regional economy.



# 8.0 Conclusion

This modification application is made under Section 4.55(2) of the Environmental Planning and Assessment Act 1979 and seeks to modify State Significant Development Consent 09\_0175 for the Karuah East Quarry.

The proposed modification seeks to increase the disturbance area of the Karuah East Quarry from 33.01ha to 40.18ha (a 7.17ha increase) primarily to establish additional stockpiling areas. MOD 10 will also facilitate improved surface water management, a new administrative building and improved areas for vehicle manoeuvring and parking.

The approved extraction area, extraction rates, quarrying activity, hours of operation and vehicle movements will not be affected by the proposed modification.

The proposed modification is necessary to support the long term operational efficiency of the Karuah East Quarry. Current stockpiling areas available within the quarry are not sufficient to meet existing and future needs and MOD 10 is required to resolve this issue.

The proposed modification will substantially improve the capability of the KEQ to tender for important construction and infrastructure projects and in particular comply with tender requirements of agencies such as TfNSW and local Council's. MOD 10 will allow KEQ to be commercially competitive when tendering for large construction / infrastructure projects which will benefit the regional economy and support local positions of employment.

Consultation has been undertaken with the NSW Department of Planning & Environment, the NSW DPE Biodiversity Conservation Division, the NSW Biodiversity Conservation Trust and the Federal Department of Agriculture, Water & Environment. The application is considered to be consistent with the outcome of consultation completed. Consultation has also been undertaken (and will continue) with the Karuah East Quarry Community Consultative Committee.

This Modification Report has demonstrated that MOD 10 can be undertaken satisfactorily with regard to all key environmental considerations.

Overall, it is considered that the proposed amendment to State Significant Development Consent 09\_0175 is a suitable development that can be supported.



# **UPDATED PROJECT DESCRIPTION**



# STATUTORY COMPLIANCE TABLE



# **UPDATED SUMMARY OF MITIGATION MEASURES**



# APPROVED DEVELOPMENT PLAN



# PROPOSED DEVELOPMENT PLANS



# **CONCEPT CIVIL ENGINEERING PLANS**



# **BIODIVERSITY DEVELOPMENT ASSESSMENT REPORT**



# SURFACE WATER ASSESSMENT



# **GROUNDWATER ASSESSMENT**



# NOISE IMPACT ASSESSMENT



# AIR QUALITY & GREENHOUSE GAS ASSESSMENT



# ABORIGINAL HERITAGE DUE DILIGENCE ASSESSMENT



# LAND RESOURCES ASSESSMENT & REHABILITATION STRATEGY ADVICE



# **VISUAL IMPACT ASSESSMENT**



# NSW DPE CORRESPONDENCE FOR MOD 10



SUPPLEMENTARY ENVIRONMENTAL ASSESSMENT REQUIREMENTS – MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE

