EPBC Act referral

Australian Government
Department of Agriculture, Water and the Environment

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Title of proposal	**2022/9164 - Karuah East Quarry - Modification 10**

Section 1

Summary of your proposed action

1.1 Project industry type Mining

1.2 Provide a detailed description of the proposed action, including all proposed activities

Proposed Action

Karuah East Quarry (KEQ) is an operational hard rock quarry located at Karuah, NSW. Project Approval (09_0175) was originally granted for the KEQ on 17 June 2014 under Section 75J of the Environmental Planning & Assessment Act 1979 (EP&A Act). The project also received approval under the Environment Protection & Biodiversity Conservation Act (EP&A) 1999 from the Federal Department of Agriculture, Water & the Environment (DAWE) on 20 March 2015 (EPBC 2014/7282). KEQ is also subject to an Environmental Protection License (EPL 20611).

The KEQ is located off the Pacific Highway (Blue Rock Close), approximately 4 km north of Karuah on the following lands:

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

The total approved impact footprint for KEQ is 33.01 ha (of which 28.34ha is comprised of native vegetation), inclusive of all approved modifications.

The proponent seeks to increase the approved disturbance area of the existing quarry, primarily to establish additional stockpiling area. The proposed modification, hereafter referred to as MOD 10 and/or the Development Site, is located at Lot 12 DP1024564 and 13 DP 1024564, Blue Rock Close, Karuah and is approximately 7.17 ha (of which 6.98ha is comprised of native vegetation) (Att A_Figures 1 and 2). The new total disturbance area for the KEQ will increase from 33.01 ha to approximately 40.18 ha (of which 35.32ha is comprised of native vegetation) and is inclusive of:

- Northern disturbance area – approximately 0.17 ha and lies adjacent to the existing crushing plant. This nominal area will facilitate improved vehicle manoeuvrability and operational safety. It will also regularize the western boundary of the KEQ in the proximity of the crushing plant.
- Central disturbance area – approximately 4.91 ha and lies north of the existing southern stockpile area and is within the existing biodiversity offset area for the KEQ. This area is proposed to be used for stockpiling and improved surface water management, particularly relevant to existing Dam 2.
- Southern disturbance area – approximately 2.093 ha and lies south of the existing southern stockpile area and is within the existing biodiversity offset for the KEQ. This area is proposed to be used for stockpiling. This area will also include a new two (2) storey administration building, staff and customer parking and a heavy vehicle parking area.

All vegetation within the KEQ MOD10 Development Site will cleared to facilitate the development. Minor indirect disturbance to adjacent areas have been considered as part of this assessment.

Figure 1 and 2 presents the proposed Karuah East Quarry MOD 10 disturbance area and the existing approval area.

Environmental safeguards incorporated into Management Plans that are in place for the KEQ operation will be expanded to accommodate the proposal. The project approval as it relates to extraction rates, quarrying activity and vehicle frequency will not be affected by the proposal. A detailed description of the approved activities is provided in Att B_2014 EPBC Referral_EcoLogical prepared by EcoLogical Australia (2014).

As a result of consideration of potential environmental impacts, the proponent has made improvements to the proposed MOD 10 throughout the iterative design phases to minimise potential environmental impacts and to reduce potential impact, particularly on threatened species.

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.
- Offset the impact of MOD 10.
- Environmental Management/Monitoring Reports will be required to ensure the mitigation measures continue to be effective.

This approach remains consistent with project discussions with DAWE and the NSW Biodiversity Conservation Division (BCD) (as detailed in Section 1.13 of this referral).

Project Justification

Proposed MOD 10 is essential for the KEQ. The following is noted:

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 customer base includes Transport for NSW, Port Authority and several local Councils. When tendering for large infrastructure projects, KEQ Pty Ltd 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 4,000 tonnes of product to demonstrate compliance with various Australian Standards and TfNSW specifications. Given that the KEQ stocks up to 15 different types of product, KEQ Pty Ltd 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.
- The lack of stockpiling area will have flow on impacts that will affect the overall quarry operation.

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

The proposed additional disturbance areas for stockpiling (i.e. the central and southern disturbance areas) were selected based on the following considerations:
- The proposed locations are logically located, adjacent to the existing stockpiling area.
- The extraction and processing of materials within the 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 existing stockpile area will allow the established linear movement of materials through the site to be maintained.
- The approved stockpile area currently available at the KEQ is approximately 27,000m2. By comparison, this is significantly less than other quarries in the area, which have a similar extraction rate yet have available stockpiling areas in excess of 100,000m2, disadvantaging KEQ when competing with other quarries on substantial tenders.
- It is acknowledged that the proposal encompasses part of an existing 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, KEQ Pty Ltd will provide a like-for-like replacement offset as well as an offset for this proposed action. This methodology has been discussed with both the BCD and DAWE. Both agencies have indicated support for this methodology.

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

1.3 What is the extent and location of your proposed action?

See Appendix B

1.5 Provide a brief physical description of the property on which the proposed action will take place and the location of the proposed action (e.g. proximity to major towns, or for off-shore actions, shortest distance to mainland)

The Development Site is shown in Att A – Figure 2.

The Study Area is located 4km north-east of Karuah NSW, a small township that lies on the edge of the Karuah River, approximately 40 km north of the Newcastle CBD within the MidCoast Council Local Government Area.

The Development Site lies adjacent to the operational KEQ. The separate Karuah Hard Rock Quarry approved by DA 265-10-2004 in June 2005 (which is operated independently but by an affiliated company with KEQ) and the proposed Karuah South Quarry (SSD-8795) (not affiliated with KEQ) are located to the west/south-west of KEQ. An aerial fauna crossing extends between the vegetation on Lot 13, across the KEQ internal north-south haul road to the vegetation on Lot 12 (which is the established offset for the Karuah Quarry). The Development Site is connected to Karuah Nature Reserve to the south (via underground fauna crossing), remnant vegetation to the west and the KEQ biodiversity offset area to the east.

1.6 What is the size of the proposed action area development footprint (or work area) including disturbance footprint and avoidance footprint (if relevant)?

The Development Site (footprint) is 7.17 ha and is comprised of three separate disturbance areas on the periphery of existing areas of the quarry (Att A – Figure 1-3).
- The northern disturbance area is 0.17 ha in area and consists of a small, irregular shaped cut in adjacent to areas of the crushing plant. To the west of the northern disturbance area lies the Conservation Area for the Karuah Quarry (which will not be directly impacted by the proposal).
- The central disturbance area is 4.91 ha in area and is located to the north of the existing stockpile area and is bordered by the internal north south haul road to the west and remnant vegetation to the north and east.
- The southern disturbance area is 2.09 ha in area and is located to the south of the existing stockpile area, within a vegetated area between the quarry and the Pacific Highway.
- Within these threes disturbance areas, there is 0.19 ha of cleared land (existing tracks) as a result of past disturbances.

1.7 Proposed action location

Lot - 13 DP 1024564 and Lot 12 DP 1024564

1.8 Primary jurisdiction New South Wales

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1.9 Has the person proposing to take the action received any Australian Government grant funding to undertake this project?

☐ Yes ☑ No

1.10 Is the proposed action subject to local government planning approval?

☐ Yes ☑ No

1.11 Provide an estimated start and estimated end date for the proposed action	Start Date	25/11/2022
	End Date	31/12/2034

1.12 Provide details of the context, planning framework and state and/or local Government requirements

Approval Pathway & Permissibility

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

In accordance with Schedule 2, Clause 6 of the Transitional Regulation, the KEQ Project 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 (notice reference n2019-124).

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

EP&A Act 1979

MOD 10 to the KEQ Project Approval is proposed under S4.55(2) of the EP&A Act. This approach has been confirmed in Scoping Meetings with the NSW DPIE (Department of Planning, Industry & Environment) and also in correspondence issued by the NSW DPIE (dated 24 February 2021 – refer to Att I_DPIE Correspondence MOD 10) following the completion of the Scoping Meetings.

Other EPIs applicable to proposed MOD 10 are discussed below:

State Environmental Planning Policy – State & Regional Development (State & Regional Development SEPP)

KEQ is a State Significant Development and the provisions of the SEPP apply.

State Environmental Planning Policy Koala Habitat Protection 2020 (Koala SEPP)

The development will consider the provisions of Koala SEPP.

SEPP (Infrastructure) 2007 (ISEPP)

ISEPP 2007 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.

MOD 10 will consider the provisions of the SEPP.

SEPP (Mining, Petroleum Production & Extractive Industries) 2007

SEPP MPPEI provides permissibility for the KEQ and provides certain matters be considered by the consent authority. These matters were satisfactorily addressed as part of the KEQ approval.

MOD 10 will consider the relevant provisions of the SEPP.

SEPP (Coastal Management) 2018

No coastal wetlands or proximity areas are located on the subject site. It is also noted that the land is not mapped as containing ‘coastal environment area’ or ‘coastal use area’.

Great Lakes Local Environmental Plan 2014

The site is zoned RU2 Rural Landscape under the GLLEP 2014.

Extractive industries are permissible in this land zone.

Other Legislative Matters

Biodiversity Conservation Act 2016 (BC Act)

The BC Act is a key piece of legislation that identifies and protects threatened species, populations and ecological communities in NSW. Under Part 7.7 of the BC Act, Part 4 Development Applications must be accompanied by a Biodiversity Development Assessment Report (BDAR) if entry into the Biodiversity Offset Scheme (BOS) is triggered.

The NSW biodiversity values map was reviewed on 7 February 2022, and there are no areas of biodiversity value mapped within the Development Site. However, the proposal will require clearing of 6.98 ha which exceeds the area clearing threshold of 0.5 ha for land with a minimum lot size of between 1 and 40 ha. As such, the requirement to prepare a BDAR is triggered. The BOS is also triggered as the project is an SSD.

The BDAR is the key informing study for this EPBC Act referral, providing an assessment of impacts to biodiversity values

following avoidance measures including impacts requiring offset in accordance with the Biodiversity Assessment Method (BAM) (DPIE 2020) (Att O_KEQ_MOD10_BDAR).

Biosecurity Act 2015

This legislation is to be addressed in the Biodiversity Development Assessment Report.

Protection of the Environment Operations Act 1997

An Environmental Protection License (EPL) (No. 20611) applies to the KEQ. Following determination of MOD 10, a variation to the EPL will be necessary.

Water Management Act 2000 (WM Act)

MOD 10 will give consideration to the WM Act. MOD 10 does not generate the need for any approval under the WM Act.

National Parks & Wildlife Act 1974 (NPW Act)

No Aboriginal cultural heritage sites were identified during the original Project Approval, consultation and subsequent survey. A Due Diligence assessment has been completed for the MOD 10 area and it has been confirmed that there is a low possibility of sub surface sites or objects.

There is an existing Heritage Management Plan in place at the quarry that will be updated to include the MOD 10 area.

Local Land Services Act 2013 (LLS Act)

Under section 60O(ai) LLS Act the clearing of native vegetation in a regulated rural area is permitted following approval by a determining authority for a development consent under Part 4 of the EP&A Act. The proposed SSD will be assessed utilising the BAM and subject to approval under the BC Act and Part 4 of the EP&A Act.

1.13 Describe any public consultation that has been, is being or will be undertaken, including with Indigenous stakeholders

Consultation and stakeholder engagement completed to date is summarised below.

Consultation with the NSW DPIE, including scoping meetings, has been undertaken (refer to Att I_DPIE Correspondence MOD 10 and Att J_NSW DPIE Consultation).

Following completion of the Scoping Meetings, the NSW DPIE issued correspondence dated 24/02/21 confirming that it is satisfied with the proposed Modification application approach and instructed the proponent to prepare and lodge the 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 Att I_DPIE Correspondence MOD 10.

Ongoing discussions have occurred with the NSW DPIE since February 2021 regarding the status of MOD 10. A site inspection was undertaken with DPIE in December 2021. Biodiversity Conservation Division (BCD)

8 August 2019 and 25 February 2020 – The proponent, ADW Johnson and Kleinfelder met with Mr. Steven Cox and Mr. Robert Gibson from the BCD. Key items resolved:

- 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). Plus, 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 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); 3) Payment into the Biodiversity Conservation Fund.
- Directed the applicant to lodge the MOD 10 application and it will be referred to and assessed by the BCD. In principle, BCD is happy with the methodology proposed by Kleinfelder.

Commonwealth Department of Agriculture, Water & Environment (DAWE)

18 July 2019 and 8 April 2020 – The proponent, ADW Johnson and Kleinfelder had a teleconference with the DAWE staff (Robin Neilson and Peter Blackwell on 18 July 2019 and Dane Roberts & Martin Paull on 8 April 2020). Key items resolved:

- Impacting on an offset site can be done and has been done before.
- 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 is a new action.
- 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 KEQ is a SSD, the Bilateral Agreement process may apply, however this decision lies with the DPIE.
- If MOD 10 is assessed under the Bilateral Agreement, the NSW DPIE undertakes their assessment following the decision on the EPBC referral, it was recommended that the referral be submitted to DAWE 4 weeks prior to lodgement with the NSW DPIE.
- The EPBC Act becomes involved again at the end of the NSW process.

Karuah East Quarry Community Consultative Committee (KEQ CCC)

Proposed MOD 10 was introduced to the KEQ CCC on 4 March 2019 and updates have occurred at subsequent meetings on 2 September 2019, 9 March 2020, 14 September 2020 March 2021 and 6 December 2021. Information confirmed with the

CCC includes:
- Details of the application.
- Justification for the proposal.
- Specialist inputs to be included in the MOD 10 application (as detailed in the Scoping Meetings with the NSW DPIE) (Att J_NSW DPIE Consultation).

To date there has been no objection from the CCC and the CCC have recognised the need for MOD 10. The questions that have arisen to date are:

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

A:
1. The use of part of Lot 201 (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; OR
3. Purchase credits on the BAM/BBAM credit register or payment into the Biodiversity Conservation Fund.

Q: Will the fauna crossing across the north / south haul road be maintained?
A: Response – yes, to be maintained.

Karuah Local Aboriginal Land Council
Consultation with Indigenous stakeholders, Karuah Local Aboriginal Land Council, was conducted in January 2010 and March 2010 for the KEQ. No Aboriginal cultural heritage sites were identified during the consultation and subsequent survey. A Heritage Management Plan is in place for the overall KEQ operation.

1.14 Describe any environmental impact assessments that have been or will be carried out under Commonwealth, State or Territory legislation including relevant impacts of the project

A Biodiversity Development Assessment Report (BDAR) has been prepared for the proposed MOD10 (Att O_KEQ_MOD10_BDAR). In addition, investigations within Lot 21/201 have commenced, which are proposed to support a Biodiversity Stewardship Application and the replacement of the portion of the KEQ BOA that will be impacted by MOD 10 (Att S Proposed_MOD10_Offset&StewardshipSite).

Previously, an ecology assessment (Att K_ KEQ Ecological Assessment) was prepared to support the original application for the KEQ in conjunction with an EPBC referral (EPBC 2014/7282) (Att B_2014 EPBC Referral_EcoLogical). Both assessments covered much of the proposed MOD 10 area.

A Biodiversity Offset Area Management Plan (BOAMP) (Att N_KEQ_BOAMP) was prepared to satisfy Schedule 3, Condition 33 of the Project Approval and Conditions 7 – 9 of the EPBC Approval.

1.15 Is this action part of a staged development (or a component of a larger project)?

☑ Yes ☐ No

1.15.1 Provide information about the larger action and details of any interdependency between the stages/components and the larger action

The proposed action (MOD 10) is an extension of the existing KEQ primarily to establish additional stockpiling area.

KEQ's project approval (09_0175) was granted on 17 June 2014 (Att G_KEQ Project Approval). Further detail on the action is provided in Section 1.2.

Key features of the Karuah East Quarry project approval include:
- Karuah East Quarry is a stand-alone operation, separate to the existing Karuah Quarry operation.
- The extraction (excluding overburden), processing and transport of up to 1.5 million tonnes of quarry product in any calendar year.
- Quarrying operations are permitted on the site until 31st December 2034.
- Establishment and use of quarry plant and associated infrastructure.
- A total permitted disturbance area of 33.01 ha.
- Establishment of a biodiversity offset area on lands adjacent to the quarry (Lot 14 & Part Lot 13 DP 1024564 and Lot 5 DP 838128)
- Haulage of product from the site to market by via the Pacific Highway;
- Up to 216 laden truckloads per day (at maximum production);
- Roadworks to secure access to the site including upgrade and extension of Blue Rock Close, realignment of Andesite Road and Blue Rock Close intersection and adjust road markings at Branch Lane and Andesite Road intersection;
- Employment of approximately 30 on-site staff;
- Staged clearing;
- Drilling and blasting activities;
- Loading and hauling of extracted material;

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- Crushing and screening of extracted material;
- Stockpiling of material on-site; and
- Progressive rehabilitation.

Conditions apply to manage / mitigate potential impacts associated with a range of environmental considerations including noise; blasting; air quality; soil and water; transport; biodiversity; heritage; emergency; hazardous management and waste.

A number of modifications have been approved to the KEQ project approval, including:

Modification 1 (MOD 1) to the Project Approval was approved on 27th April 2018 under the provisions of 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 and operational safety in proximity of the crushing plant and quarry infrastructure. The additional disturbance area for MOD1 included 0.25 ha of native vegetation. Following approval of MOD 1 by the NSW DPIE, a variation to the boundary of the project area approved by EPBC approval 2014/7282 was approved by the DAWE on 4th October 2018. This included approval of a revised Biodiversity Offset Area Management Plan prepared in accordance with Condition 14 of EPBC approval 2014/7282.

Modification 2 (MOD 2) to the Project Approval was approved 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, in particular surface water, and improved operational safety for quarry vehicles using the internal north south haulage road. The additional area for MOD 2 did not include any native vegetation (MOD 2 was restricted to heavily disturbed areas) and did not require amendment to the Biodiversity Offset Area Management Plan.

Modifications 3 – 7 were withdrawn.

Modification (MOD 8) to the Project Approval was granted consent on 22nd December 2020 under the provisions of s4.55 (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. MOD 8 did not involve any additional disturbance area or impact on native vegetation and accordingly an amendment to the Biodiversity Offset Area Management Plan was not necessary.

Modification 9 (MOD 9) approved an extension of hours to the operation of the Karuah East Quarry. It was approved by the NSW DPIE on 2 December 2021. MOD 9 does not involve any additional disturbance area or impact on native vegetation. MOD 9 provides appropriate flexibility for KEQ Pty Ltd to maintain a constant supply of product to its current and emerging customer bases in Newcastle, the Hunter Valley, the Upper Hunter, New England and Greater Sydney Region.

1.16 Is the proposed action related to other actions or proposals in the region?

☑ Yes ☐ No

1.16.1 Identify the nature/scope and location of the related action (Including under the relevant legislation)

The proposed action is an extension of the active KEQ (EPBC 2014/7282), primarily to facilitate additional stockpiling area, and is located adjacent to the proposed MOD10 action. The KEQ project approval 09_0175 was granted on 17/06/2014 and has been operational since late 2017. The DAWE advised that the MOD 10 should be progressed as a new action as opposed to a variation to the existing approval.

The existing approval relates to KEQ – an operational hard rock quarry within a total approved impact footprint of 33.01 ha (which is comprised of 28.34ha of native vegetation), inclusive of all approved modifications. As part of the approval, a Biodiversity Offset Area has been established within land adjacent to the operational areas of the quarry. Road access to the KEQ is via Blue Rock Close. A detailed description of the approved activities is provided in the Project Approval conditions (Att G_KEQ Project Approval).

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Section 2

Matters of national environmental significance

2.1 Is the proposed action likely to have any direct or indirect impact on the values of any World Heritage properties?

☐ Yes ☑ No

2.2 Is the proposed action likely to have any direct or indirect impact on the values of any National Heritage places?

☐ Yes ☑ No

2.3 Is the proposed action likely to have any direct or indirect impact on the ecological character of a Ramsar wetland?

☐ Yes ☑ No

2.4 Is the proposed action likely to have any direct or indirect impact on the members of any listed species or any threatened ecological community, or their habitat?

☑ Yes ☐ No

Species or threatened ecological community

Tetratheca juncea (Black-eyed Susan) – abbreviated to Tj throughout.
Listed Vulnerable species under the EPBC Act.

See Att H_KEQMOD10_EPBCAssessmentofSignificance_page1

Impact

A total of 2,906 Tj clumps were identified within the Study Area, of which 2,102 occur within the Development Site (48 in the northern disturbance area, 1,670 in the central disturbance area and 384 in the southern disturbance area). A total of 804 clumps are located in the buffer areas (Att A_Figure6). The minimum subpopulation size of Tj (within Lots 5, 13 and 14) is approximately 6,907. Within the immediate locality, there are 13,439 known clumps of Tj located within Lot 21 DP1042537 and Lot 201 DP1024564 (see Att F_Letter_KEQ_MOD10_Offsets_DAWE_page9); and approximately 12,215 clumps of Tj were previously recorded on the southern side of Pacific Highway (ERM 1999, page 13.25). Tj plants clumps are also known to be present with Lot 12 DP1024564, Lot 4 DP838128 and likely Lot 11 DP 1024564 (however direct counts of plant clumps have not been undertaken). All patches of Tj within land surrounding KEQ are considered to comprise a single subpopulation. As such, the subpopulation is calculated to comprise approx 32,561 plant clumps.

The proposed MOD10 will result in the direct removal of 2,102 clumps, equating to 6.4% of the subpopulation. It is difficult to accurately estimate the size of the Tj population as there are a number of subpopulations which occur within 5kms of the Development Site, however, direct count data is not available. As such the minimum estimate is based on existing data (previous counts). A total of 6,907 clumps of Tj are currently located within the KEQ biodiversity offset area (Att E_ KEQ BOA Monitoring Report 2020_page8), the removal of 2,102 clumps will reduce the number of Tj to approximately 4,678 clumps within the current KEQ biodiversity offset area.

The Tj identified in the buffer areas (804 clumps) are potentially susceptible to edge effects and other impacts such as stigma (flower) clogging from quarry operations. The clearing of habitat may also lead to changes in pollinator activity which may influence the species reproduction. However, monitoring of known Tj plant clumps adjacent to the operation areas of KEQ (within the KEQ Biodiversity Offset area) has indicated that abundance has remained relatively stable since 2015. As such, limited evidence of indirect disturbance on the species has been recorded indicating that edge effects are minimal provided mitigation measures are implemented.

All the Tj clumps identified occur within the PCT 1619, except for one clump which was identified in PCT 695. The Development Site will require the removal of 6.68 ha of the PCT 1619, which is known habitat for Tj and 0.30 ha of PCT 695.

The EPBC Act Referral Guidelines for Tj (Commonwealth of Australia 2011) state that a high risk of a significant impact to Tj may occur if a proposed action directly or indirectly affects an 'important population' of the species, resulting in loss of greater than 25% or 1,000 plant clumps (whichever is the lesser). The population within the immediate vicinity of KEQ is estimated to be in excess of 32,561 plant clumps and thus meets the definition of an 'important population'. The proposal will directly affect greater than 1,000 plant clumps, but will not impact more than 25% of the population (6.4% will be directly impacted) (see Att H_KEQMOD10_EPBCAssessmentofSignificance_page1). Noting this, referral of the action is considered necessary.

Tj is well known within the locality, with numerous records from populations in the vicinity of Swan Bay, Wallaroo Nature Reserve, Karuah Nature Reserve, Tahlee and Girvan. Additionally, a large portion of a subpopulation of the species remains in the KEQ biodiversity offset area (Lot 13, Lot 14 and Lot 5).

Existing management plans will be extended and updated to include MOD 10:

- Air Quality Management Plan – will assist in monitoring and minimising the potential for Tj stigma clogging of all plant populations in retained bushland habitats.
- 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 Tj and its habitat, beyond the disturbance footprint.

The proposed action will not fragment any existing populations of Tj as the area to be cleared is adjacent to other areas containing the appropriate vegetation types and Tj records. Approx 6.68 ha of PCT1619 and 0.30 ha of PCT 695 will be cleared inclusive of 2,102 Tj clumps (representing 6.4% of the subpopulation).

Indirect impacts to 804 clumps within a 30m buffer will be managed through the incorporation of the avoidance and mitigation measures discussed in Section 4. To date, this has been successfully managed for the KEQ operation and is supported by monitoring undertaken since the quarry's establishment. Offsets have been identified to replace the area of the BOA to be impacted and to offset impacts to Tj as a result of MOD10.

See Att H_KEQMOD10_
EPBCAssessmentofSignificance_page1 for further detail.

Species or threatened ecological community

Grevillea parviflora subsp. parviflora (Small-flower Grevillea)
Listed Vulnerable species under the EPBC Act
See Att H_KEQMOD10_EPBCAssessmentofSignificance_page6

Impact

A total of 242 Grevillea parviflora subsp. parviflora individuals were identified within the Study Area, however, only one individual is located in the Development Site in the central disturbance area, while 167 individuals are located in the central buffer area and 74 individuals are in the southern buffer area (Att A_Figure7). The Development Site will therefore directly impact on 1 % of the individuals identified within the Study Area during survey.

All the G. parviflora identified (242 individuals) occur within the PCT 1619 Smooth-barked Apple - Red Bloodwood - Brown Stringybark - Hairpin Banksia heathy open forest community. The Development Site will require the removal of 6.68 ha of the PCT 1619, which is known habitat for the G. parviflora.

The G. parviflora identified in the buffer areas (241) may be susceptible to edge effects and other impacts such as stigma (flower) clogging from quarry operations. The clearing of habitat may also lead to changes in pollinator activity which may influence the species reproduction. However, monitoring of known G. parviflora within the KEQ Biodiversity Offset area have indicated that abundance has remained relatively stable since 2015. As such, limited evidence of indirect disturbance on the species has been recorded indicating that edge effects are minimal provided mitigation measures are implemented.

An additional 100 individuals are known to occur within the KEQ biodiversity offset area (Lot 13 and 14) adjacent to the Development Site. With the inclusion of the KEQ offset individuals the minimum size of the subpopulation is 342 G. parviflora.

According to the Environmental Impact Assessment Guidelines for Grevillea parviflora subsp. parviflora (NSW NPWS 2002), sites containing greater than 50 plants are significant.

At least eight populations of G. parviflora have been recorded in 10 km of the Study Area with approximately 500 populations identified across the species distribution in NSW (EcoLogical 2014).

G. parviflora is found on crests, upper slopes or flat plains in low-lying in sandy or light clay soils over thin shales, often with lateritic ironstone gravels. G. parviflora often occurs in open, slightly disturbed sites, including tracks and easements (NSW NPWS 2002).

Preliminary offset investigations have identified the PCT 1619 community and a population G. parviflora in the proposed Lot 21/201 offset site, which will replace the area of the KEQ biodiversity offset area to be impacted and will partially fulfill the credit obligation of MOD 10 with like-for-like offsets under the NSW BOS. Offset options include a minimum of 71 individuals of G. parviflora.

Approximately 30 ha of PCT 1619 habitat and at least 100 individuals are located within the KEQ biodiversity offset area (Lot 13 and 14) adjacent to the Development Site. All biodiversity offsets will be managed in perpetuity.

Management plans will be extended and updated to include MOD 10:

- Air Quality Management Plan – will assist in monitoring and minimising the potential for stigma clogging of all plant populations in retained bushland habitats with emphasis regarding threatened flora. This will be updated to include MOD 10.
- 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 G. parviflora and its habitat, beyond the disturbance footprint.
- A Biodiversity Stewardship Site Assessment report and management plan will be prepared for the proposed Lot 21/210 offset site, and any other offset sites purchased to fulfill the credit obligation.

The proposed development will not fragment any existing populations of G. parviflora as the area to be cleared is adjacent to other naturally vegetated areas containing the appropriate vegetation types. Approximately 6.68 ha of PCT 1619 will be cleared and one G. parviflora directly impacted and 241 individuals indirectly impacted by MOD 10.

Like-for-like biodiversity offsets will compensate for the loss of the species. There is however regard for some indirect impacts to the species through issues such as dust, accidental disturbance, and weed invasion. The incorporation of the avoidance and mitigation measures discussed in Section 4 will alleviate a significant adverse impact on this species as a result of MOD 10.

The proposal is therefore unlikely to significantly impact the species.

See Att H_KEQMOD10_EPBCAssessmentofSignificance_page6 for further detail.

Species or threatened ecological community

Asperula asthenes (Trailing Woodruff)
Listed Vulnerable species under the EPBC Act
See Att H_KEQMOD10_EPBCAssessmentofSignificance_page8

Impact

No Asperula asthenes were identified within the Study Area, despite undertaking targeted surveys during the suitable survey periods for the species (25/10/2018, 26/10/2018 and 11/10/2019). Previous records obtained from the NSW BioNet Atlas show records of the species within the buffer zone of northern disturbance area and the buffer zone of the central disturbance area. The records occur in PCT 695: Blackbutt - Turpentine - Tallowwood shrubby open forest community. The Development Site will require the removal of 0.30 ha of potential habitat for the species.

Asperula asthenes is restricted in distribution to the lower north coast of NSW, primarily between the Karuah / Bulahdelah area in the south and north to Kempsey, with an outlier to the north near Coffs Harbour. The species has a range of approximately 100 - 150 km north to south, but is

generally restricted to the near coastal fringe (DPIE 2022).

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.

Asperula asthenes occurs sporadically within areas of potential habitat within its known range. The species is known from a few locations in the surrounding area (15 –20 km), namely Girvan, and Bulahdelah. At least 399 individuals are located within the KEQ biodiversity offset area (Lot 13 and 14 1024564) adjacent to the Development Site (Kleinfelder 2020).

Preliminary offset obligations have identified the PCT 695 community in the proposed Lot 21/201 offset site, which will replace the area of the KEQ biodiversity offset area to be impacted and will partially fulfill the credit obligation of MOD 10 with like-for-like offsets under the NSW BOS. The remaining credit obligation will be fulfilled by credits generated within the Karuah Manning, Hunter, Upper Hunter, Wyong (in-part) and Yengo (in-part) IBRA Sub-regions and / or by payment into the BCT. Approximately 399 individuals are located within the KEQ biodiversity offset area (Lot 13, 14 and Lot 5) adjacent to the Development Site.

Management plans will be extended and updated to include MOD 10:

- Air Quality Management Plan – will assist in monitoring and minimising the potential for stigma clogging of all plant populations in retained bushland habitats with emphasis regarding threatened flora. This will be updated to include MOD 10.
- Prior to construction all retained areas will be regarded as no-go areas and will be fenced and have signage erected to reduce the potential for any adverse impact to potential habitat for the species beyond the disturbance footprint.

The proposed action will not impact on any Asperula asthenes individuals. No Asperula asthenes were identified during survey in the Development Site and / or the Study Area. Approximately 0.30 ha of potential habitat will be cleared. Potential indirect impacts to the KEQ biodiversity offset area population such as dust, accidental disturbance, and weed invasion will be managed through the incorporation of the avoidance and mitigation measures discussed in Section 4.

The proposal is therefore unlikely to significantly impact the species.

See Att H_KEQMOD10_EPBCAssessmentofSignificance_page8 for further detail.

Species or threatened ecological community

Koala (Phascolarctos cinereus)
Listed Endangered species under the EPBC Act
See Att H_KEQMOD10_EPBCAssessmentofSignificance_page11

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Impact

No Koalas, or evidence thereof, were detected during target searches (2019, 2020 and 2021), nor in previous assessments or monitoring studies conducted within the Study Area. Koala presence has previously been recorded within Lot 11 (Wedgerock 2018), approximately 900m to the west of the MOD 10 footprint, along/adjacent to the Pacific Hwy (2010, 2020) near Tarean Rd and within Karuah Nature Reserve on the southern side of the Hwy. Overall, there are 12 dated records of Koalas within 2 kms of the Study Area, with one being recorded along the Pacific Hwy and the other located along Halloran Rd (near Bulga Creek). More broadly, there are 49 records of Koalas within 5 kms of the Study Area (NSW BioNet 2022), however, most are located on the southern side of the Pacific Highway (which is connected via underground fauna crossing).

A total of 12.39 ha of potential Koala habitat has been mapped within the Study Area, of which 6.68 ha is to be removed (Att A_Figure9). While all areas constitute habitat critical to the survival of the koala (score of 8 in accordance with the EPBC referral guidelines for the Koala) (DotE 2014), there are limited impacts to 0.30 ha of PCT695 which contains the greater number of Koala use trees, while PCT1619 contains fewer Koala use trees (OEH 2018). As such, higher quality habitat associated with PCT 695 is largely avoided, while the majority of impacts are limited to PCT 1619 which has less koala use tree species.

Within the North Coast Koala Management Area Koala use trees are classified in order of importance as 'Regional High Use' trees 'Local High Use' trees, 'Significant Use' trees, 'Irregular Use' trees and 'Low Use' trees. Koala use trees listed as 'Regional high use', 'Local high use' or 'Significant use' that occur within the MOD10 site include Eucalyptus microcorys; Angophora costata, E. pilularis, E. globoidea, E. saligna, A. torulosa, Syncarpia glomulifera and E. acmenoides.

The impact to the Koala and Koala habitat will be assessed in accordance the NSW BAM (DPIE 2020) under the BC Act to support a Modification Application for MOD 10. An EPBC Act significant impact will be determined as part of the EIS process.

Given that targeted surveys in accordance with the BAM, did not detect Koalas, or evidence thereof, the proposed action will not create a Species Credit obligation for the Koala, however the species is a dual credit type requiring the offset of ecosystem credits for the species.

As such, impacts to PCT 695 and PCT 1619 will be offset through the retirement of Ecosystem Credits using the proposed Lot 21/201 offset site, which will replace the area of the KEQ biodiversity offset area to be impacted and will partially fulfill the credit obligation of MOD 10 with like-for-like offsets under the NSW BOS.

Onsite mitigation and management measures are currently in place and have been undertaken since development of the KEQ biodiversity offset area management plan (Kleinfelder 2021) and will be updated to reflect the addition of MOD 10 (as have previous modifications). Relevant management measures to the Koala include:

- Fencing, gates, signage.
- Erosion, sediment, and soil management.
- Revegetation and regeneration.
- Weed control.
- Vertebrate pest management.
- Fire management.

Applicable management strategies and performance/competition criteria will be updated in accordance with the addition of MOD 10. These will include, but are not limited to:

- Air Quality Management Plan
- 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 potential habitat for the species beyond the disturbance footprint.

The proposed action requires the removal of a small amount (0.30 ha) of high-quality habitat and 6.68 ha of low-moderate quality habitat. No Koalas, or evidence thereof, have been detected during recent or previous targeted surveys within the Study Area. Very few records exist within the broader patch of native vegetation on the northern side of the Pacific Hwy.

Overall the action is expected to result in minimal impacts to the Koala due to the small removal of potential habitat, no fragmentation of habitat, lack of evidence of Koala habitation within the Development Site (or KEQ land more broadly), low abundance of Koalas with the bushland patch to the north of the Pacific Hwy, the availability of habitat within the broader locality (including the KEQ Biodiversity Offset Area) and the low likelihood that the action could interfere with the recovery of the Koala.

See Att H_KEQMOD10_EPBCAssessmentofSignificance_page11 for further detail.

Species or threatened ecological community

Grey-headed Flying-fox (Pteropus poliocephalus)
Listed Vulnerable species under the EPBC Act
See Att H_KEQMOD10_EPBCAssessmentofSignificance_page16

Impact

Several Grey-headed Flying-fox individuals were detected foraging within the Survey Area (all PCTs); however, no roost sites were detected during surveys. Canopy trees within the Study Area have the potential to provide foraging habitat for Grey-headed Flying-fox when in flower. The Development Site will directly remove 6.98 ha of potential foraging habitat for the species. Potential indirect impacts may include disturbance from increased light, noise and activity due to the proposal, on

retained or adjoining areas that support potential foraging habitat.

Grey-headed Flying Fox are a highly mobile species and utilise a variety of forested habitats within near coastal areas of south-eastern Australia and may potentially forage through-out all native vegetation within the Study Area and surrounds. Grey-headed Flying-foxes are generally found within 200 km of the eastern coast of Australia, from Rockhampton in Queensland to Adelaide in South Australia (DPIE 2022). In times of natural resource shortages, they may be found in unusual locations.

Due to the high mobility of the species, there are no separate or distinct populations as individuals move between camps and throughout their geographic distribution. The species may occur in subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps and feeds on the nectar and pollen of native trees, Eucalyptus, Corymbia, Angophora, Melaleuca and Banksia (DPIE 2022). Additionally, they also eat both native rainforest fruits and often utilise cultivated fruit crops (e.g. orchards). Roosting camps are generally located within 20 km of a regular food source although the species can travel up to 50 km to forage. Camps are commonly found in gullies, close to water, or in vegetation with a dense canopy.

Preliminary offset obligations have identified the PCT 1619 and PCT 695 community in the proposed Lot 21/201 offset site, which will replace the area of the KEQ biodiversity offset area to be impacted and will partially fulfill the credit obligation of MOD 10 with like-for-like offsets under the NSW BOS. The remaining credit obligation will be fulfilled by credits generated within the Karuah Manning, Hunter, Upper Hunter, Wyong (in-part) and Yengo (in-part) IBRA Sub-regions and / or by payment into the BCT. Due to the location of the Study Area next the active KEQ indirect impacts such as noise and lighting are likely to be already occurring. Additionally, management plans will be extended and updated to include MOD 10.

The removal of potential foraging habitat is not anticipated to significantly impact the species - extensive areas of similar vegetation representative of the region occur to the east and south of the Development Site and will continue to provide habitat in the wider area. The incorporation of the avoidance and mitigation measures discussed in Section 4 will alleviate a significant adverse impact on this species as a result of MOD 10.

The proposal is therefore unlikely to significantly impact the species.

See Att H_KEQMOD10_EPBCAssessmentofSignificance_page16 for further detail.

2.4.2 Do you consider this impact to be significant?

☑ Yes ☐ No

2.5 Is the proposed action likely to have any direct or indirect impact on the members of any listed migratory species or their habitat?

☑ Yes ☐ No

Migratory species

Fork-tailed Swift (Apus pacificus)
Listed Migratory species under the EPBC Act
See Att H_KEQMOD10_EPBCAssessmentofSignificance_page18

Impact

No migratory species were identified during the field surveys. The proposal has the potential to influence foraging (aerially) through the removal of 6.98 ha of native vegetation. Indirect impacts (such as dust and noise) may have a minor indirect influence of the foraging habits of the species over the site.

The species are widely distributed and have broad habitat preferences.

There is potential for the species to utilise the areas above the site, on occasion, for foraging. Potential foraging extents for these species is more likely to occur to the east and south of the Study Area.

The implementation of Management Plans will assist in mitigating indirect impacts on foraging habit of the species.

Native vegetation within the Study Area is not considered to be important habitat for the species. Considering the large amount of similar habitat both within the biodiversity offset area and the broader locality, the proposal is unlikely to significantly impact on migrant populations of the species.

The high mobility and aerial foraging habit of the species suggests that the species will be unaffected by the prosed action.

As such, the proposal is unlikely to significantly impact the species.

See Att H_KEQMOD10_EPBCAssessmentofSignificance_page18 for further detail.

Migratory species

White-throated Needletail (Hirundapus caudacutus)
Listed Migratory species under the EPBC Act
See Att H_KEQMOD10_EPBCAssessmentofSignificance_page18

Impact

No migratory species were identified during the field surveys. The proposal has the potential to influence foraging (aerially)

through the removal of 6.98 ha of native vegetation. Indirect impacts (such as dust and noise) may have a minor indirect influence of the foraging habits of the species over the site.

The species are widely distributed and have broad habitat preferences.

There is potential for the species to utilise the areas above the site, on occasion, for foraging. Potential foraging extents for these species is more likely to occur to the east and south of the Study Area.

The implementation of Management Plans will assist in mitigating indirect impacts on foraging habit of the species.

Native vegetation within the Study Area is not considered to be important habitat for the species. Considering the large amount of similar habitat both within the biodiversity offset area and the broader locality, the proposal is unlikely to significantly impact on migrant populations of the species.

The high mobility and aerial foraging habit of the species suggests that the species will be unaffected by the prosed action.

As such, the proposal is unlikely to significantly impact the species.

See Att H_KEQMOD10_EPBCAssessmentofSignificance_page18 for further detail.

Migratory species

Black-faced Monarch (Monarcha melanopsis)
Listed Migratory species under the EPBC Act
See Att H_KEQMOD10_EPBCAssessmentofSignificance_page18

Impact

No migratory species were identified during the field surveys. The proposal also has the potential to reduce the area of available foraging habitat for the species by 0.30 ha (PCT 695 Blackbutt - Turpentine - Tallowwood shrubby open forest of the coastal foothills of the central NSW North Coast Bioregion). The species may, on occasion, utilise these wetter, denser environments associated with the drainage line. The species typically breeds in rainforest habitat. While the species has not been detected with the locality of the site, the species may forage within habitats consistent with PCT 695 during their migrations.

The species mainly occurs in rainforest ecosystems, including semi-deciduous vine-thickets, complex notophyll vine-forest, tropical (mesophyll) rainforest, subtropical (notophyll) rainforest, mesophyll (broadleaf) thicket/shrubland, warm temperate rainforest, dry (monsoon) rainforest and (occasionally) cool temperate rainforest. It is also sometimes found in nearby open eucalypt forests (mainly wet sclerophyll forests), especially in gullies with a dense, shrubby understorey as well as in dry sclerophyll forests and woodlands, often with a patchy understorey. The species is found along the coast of eastern Australia, becoming less common further south. They exhibit migratory behaviour, spending spring, summer and autumn in eastern Australia, and wintering in southern and eastern Papua New Guinea from March to August.

The implementation of Management Plans will assist in mitigating indirect impacts on foraging habit of the species.

Potential habitat within the Study Area (0.30 ha) is not considered to be important habitat for the species. Considering the large amount of similar habitat both within the biodiversity offset area and the broader locality, the proposal is unlikely to significantly impact on migrant populations of the species.

While the species may utilise habitats within the Study Area as a foraging resource, the species is less likely to breeding within the site. Due to the small scale of impacts, the proposal is unlikely to significantly impact the species.

See Att H_KEQMOD10_EPBCAssessmentofSignificance_page18 for further detail.

Migratory species

Rufous Fantail (Rhipidura rufifrons)
Listed Migratory species under the EPBC Act
See Att H_KEQMOD10_EPBCAssessmentofSignificance_page18

Impact

No migratory species were identified during the field surveys. The proposal also has the potential to reduce the area of available foraging habitat for the species by 0.30 ha (PCT 695 Blackbutt - Turpentine - Tallowwood shrubby open forest of the coastal foothills of the central NSW North Coast Bioregion). The species may, on occasion, utilise these wetter, denser environments associated with the drainage line. The species typically breeds in rainforest habitat. While the species has not been detected with the locality of the site, the species may forage within habitats consistent with PCT 695 during their migrations.

Southern populations of Rufous Fantail are known to migrate following breeding to spend winter in northern Australia, while in northern localities the species is present year-round. The species is found mainly in wet sclerophyll forests, rainforests, swamp forest and occasionally mangroves, and can tolerate some level of human disturbance in urban areas. The Rufous Fantail generally forages in the upper and mid canopy of forested areas for prey. Prey usually consists of flying insects.

The implementation of Management Plans will assist in mitigating indirect impacts on foraging habit of the species.

Potential habitat within the Study Area (0.30 ha) is not considered to be important habitat for the species. Considering the large amount of similar habitat both within the biodiversity offset area and the broader locality, the proposal is unlikely to

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significantly impact on migrant populations of the species.
Whie the species may utilise habitats within the Study Area as a foraging resource, the species is less likely to breeding within the site. Due to the small scale of impacts, the proposal is unlikely to significantly impact the species.
See Att H_KEQMOD10_EPBCAssessmentofSignificance_page18 for further detail.

2.5.2 Do you consider this impact to be significant?

☐ Yes ☑ No

2.6 Is the proposed action to be undertaken in a marine environment (outside Commonwealth marine areas)?

☐ Yes ☑ No

2.7 Is the proposed action likely to be taken on or near Commonwealth land?

☐ Yes ☑ No

2.8 Is the proposed action taking place in the Great Barrier Reef Marine Park?

☐ Yes ☑ No

2.9 Is the proposed action likely to have any direct or indirect impact on a water resource from coal seam gas or large coal mining development?

☐ Yes ☑ No

2.10 Is the proposed action a nuclear action?

☐ Yes ☑ No

2.11 Is the proposed action to be taken by a Commonwealth agency?

☐ Yes ☑ No

2.12 Is the proposed action to be undertaken in a Commonwealth Heritage place overseas?

☐ Yes ☑ No

2.13 Is the proposed action likely to have any direct or indirect impact on any part of the environment in the Commonwealth marine area?

☐ Yes ☑ No

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Section 3

Description of the project area

3.1 Describe the flora and fauna relevant to the project area

Plant Community Type (PCT)

Three PCTs, as defined in the BioNet Vegetation Classification database, were identified within the Study Area being:

- PCT 1619 - Smooth-barked Apple - Red Bloodwood - Brown Stringybark - Hairpin Banksia heathy open forest of coastal lowlands. PCT 1619 was divided into two zones based on condition, this included areas of regrowth (this is discussed further in descriptions below).
- PCT 695 - Blackbutt - Turpentine - Tallowwood shrubby open forest of the coastal foothills of the central NSW North Coast Bioregion.
- PCT 1590 - Spotted Gum - Broad-leaved Mahogany - Red Ironbark shrubby open forest. Note, PCT 1590 does not occur within the Development Site.

Additionally, the site contains areas of cleared land (existing tracks). Cleared land, including areas of existing infrastructure, were mapped as Excluded, as these areas do not require further assessment under the BAM.

Details on the vegetation zones (including vegetation formation and class, condition class and area) defined within the Development Site are outlined below. Att A_Figure3 shows the distribution of PCTs and vegetation zones within the Development Site.

Zone 1: PCT 1619 - Smooth-barked Apple - Red Bloodwood - Brown Stringybark - Hairpin Banksia heathy open forest of coastal lowlands (Mod-Good Condition). Vegetation Formation: Dry Sclerophyll Forests (Shrubby sub-formation). Vegetation Class: Sydney Coastal Dry Sclerophyll Forests. Area in Development Footprint: 6.50 ha.

Zone 2: PCT 1619 - Smooth-barked Apple - Red Bloodwood - Brown Stringybark - Hairpin Banksia heathy open forest of coastal lowlands (Regrowth). Vegetation Formation: Dry Sclerophyll Forests (Shrubby sub-formation). Vegetation Class: Sydney Coastal Dry Sclerophyll Forests. Area in Development footprint: 0.18 ha.

Zone 3: PCT 695 - Blackbutt - Turpentine - Tallowwood shrubby open forest of the coastal foothills of the central NSW North Coast Bioregion (Mod-Good Condition). Vegetation Formation: Wet Sclerophyll Forests (Shrubby sub-formation). Vegetation Class: North Coast Wet Sclerophyll Forests. Area in Development footprint: 0.30 ha.

Database Searches

A BioNet and Protected Matters Search Tool (PMST) search identified a total of 19 threatened flora, five threatened ecological communities, 20 threatened fauna and 38 migratory species (and/or their habitats) listed under the EPBC Act that were recorded or modelled to occur within a 5 km radius of the Study Area. The PMST search also indicated that the MOD10 Development Site is within 7kms of the Myall Lakes Ramsar site. The PMST result is provided in Att L_Protected Matters Search, while a Likelihood of Occurrence assessment is provided in Att C_LikelihoodofOccurrenceTable.

Field Survey

Flora and fauna surveys, including habitat assessments, were conducted during May 2019 to August 2021 throughout the Study Area (BDAR to be attached as addendum under separate cover once finalised). Field surveys are detailed in Att A_Figure3, 4, 5 and 8.

Flora Results

A total of 122 species of native flora were detected within the Study Area during field surveys. Two species listed as Vulnerable under the EPBC Act were identified within the Development Site: Tetratheca juncea and Grevillea parviflora subsp. parviflora. A list of flora species identified within the Site will be provided within the BDAR (to be attached as an addendum under separate cover). Additionally, one vulnerable EPBC listed species (Trailing Woodruff Asperula asthenes) was not detected during field surveys, however, the species has previously been detected within the disturbance buffer surrounding the Development Site.

No ecological communities listed under the EPBC Act were found within the Study Area during field surveys. Vegetation and threatened flora surveys are detailed within Att A_Figure3, 4, 5.

Fauna Results

A total of 56 species of native fauna were detected within the Study Area during field surveys. This includes 33 bird, 21 mammal and two amphibians. A list of fauna species identified within the Site will be provided within the BDAR (to be attached as an addendum under separate cover).

One threatened species listed under the EPBC Act was identified during field surveys within the Study Area – Grey-headed Flying-fox. While not detected during targeted surveys the Koala was assessed as having potential habitat within the Development Site.

A total of 28 hollow-bearing trees (HBTs) and dead stags containing large hollows were identified during the surveys within the Study Area. However, a further 33 HBTs were also noted within proximity to the Study Area. In total, 10 HBTs occur within the Development Site, including two HBTs and 8 Dead Stags, together containing 23 hollows of various sizes.

Threatened fauna surveys are detailed within Att A_Figure8.

Previous investigations for the original KEQ project which covered the MOD10 Development Site are detailed within Att K_ KEQ Ecological Assessment.

3.2 Describe the hydrology relevant to the project area (including water flows)

The Study Area is situated in the upper catchments of both Yalimbah and Bulga Creeks. The catchment-divides along a ridge top which runs north-south. There is an unnamed first order stream in the north-west of the central disturbance area and an unnamed first order steam in the south-east of the central disturbance area, both of which are ephemeral and poorly defined. The latter flows into a second order stream which flows south-east along the western boundary of the offset area into Bulga Creek further to the east.

In relation to waterfront land, the proposed disturbance area does not encroach into the 2nd order stream's Vegetated Riparian Zone (VRZ), being a 20m buffer either side of the stream. Filling/realignment is proposed in the upper reaches of both described 1st order watercourses, which is consistent with NRAR's Guidelines for Controlled Activities on Waterfront Land.

There are no important wetlands (as defined by the BAM) within or adjacent to the Study Area. An area of Coastal Wetland, mapped under the Coastal Management SEPP, occurs to the south-west of the Study Area, on the southern side of the Pacific Highway approximately 1km downstream of the site. This Coastal Wetland is associated with Yalimbah Creek and Karuah River. There is an additional area of coastal wetland associated with the Bulga Creek catchment approximately 3.5 km downstream of the site. Additionally, there are no local wetlands, being any wetland, which is not identified as an important wetland under the BAM, mapped to occur within the Study Area.

There are three constructed dams within the KEQ (north, south and west of the central disturbance area). The dams are devoid of native vegetation and are highly turbid, being used principally for sediment control. An additional constructed dam lies 300 m to the east of the Development Site, within the KEQ Biodiversity Offset Area.

A Surface Water Assessment will be provided to the Assessment Area upon request. A Water Management Plan is currently in place for the KEQ (see Att M_KEQ Water Management Plan).

3.3 Describe the soil and vegetation characteristics relevant to the project area

The Study Area occurs on three Soil Landscapes mapped by the Soil Landscapes of the Port Stephens 1:100 000 Sheet (SEED 2022):

- Gan variant a (9332gga): Covers teep hills of the Nerong Volcanics on the Karuah Mountains. This soil landscape occurs in the north of the map, on the eastern side of the Karuah River on steep cone-shaped hills. Nerong Volcanics, which are carboniferous siliceous volcanic flows of rhyolitic and dacitic ignimbrites with occasional interbeds of tuffaceous sandstone and conglomerate. The main soils are stony brownish black weakly pedal sandy loam; bleached stony hardsetting light sandy clay loam; and whole coloured well-structured light clay. This soil landscape occurs throughout the northern development area.

- Nungra (9332ng): Covers gently inclined footslopes and drainage plains on Quaternary alluvium. Quaternary alluvium and deep silty footslope deposits eroded from surrounding hills and overlying Carboniferous rock strata. The main soils are greyish yellow brown weakly pedal silty loam; bleached hardsetting silty clay loam; and greyish yellow brown mottled silty clay. This soil landscape occurs throughout parts of the central and southern development area

- North Arm Cove (9332nc) – Covers undulating hills on ignimbrites of the Nerong Volcanics. Nerong Volcanics include ignimbrite (dominant), toscanite, dacite, andesite, agglomerate, conglomerate, sandstone and siltstone. The main soils are dark weakly structured light sandy clay loam; bleached hardsetting sandy clay loam; mottled blocky clay; loose sporadically bleached loamy sand; and mottled earthy dark brown fine sandy clay loam. This soil landscape occurs throughout parts of the central and southern development area.

No significant soil hazard features occur within the Development Site and/or the Study Area (no steep slopes, no significant drainage features and there are no mapped acid sulphate soils).

Vegetation has been described under Question 3.1. Vegetation present within the MOD10 development site is broadly classified as Dry Sclerophyll Forest and Wet Sclerophyll Forest (Att A_Figure6).

Three vegetation types, as defined in the BioNet Vegetation Classification database (Plant Community Types), were identified within the Study Area being:

- PCT 1619 - Smooth-barked Apple - Red Bloodwood - Brown Stringybark - Hairpin Banksia heathy open forest of coastal lowlands. PCT 1619 was divided into two zones based on condition, this included areas of regrowth (this is discussed further in vegetation zone descriptions below).

- PCT 695 - Blackbutt - Turpentine - Tallowwood shrubby open forest of the coastal foothills of the central NSW North Coast Bioregion.

- PCT 1590 - Spotted Gum - Broad-leaved Mahogany - Red Ironbark shrubby open forest. Note, PCT 1590 only occurs within proximity to the Development Site and will not be directly impacted.

No areas of non-native vegetation are present within the Development Site.

Details on the vegetation zones (including vegetation formation and class, condition class and area) defined within the Development Site are outlined below. Att A_Figure3 shows the distribution of PCTs and vegetation zones within the Development Site.

Zone 1: PCT 1619 - Smooth-barked Apple - Red Bloodwood - Brown Stringybark - Hairpin Banksia heathy open forest of coastal lowlands (Mod-Good Condition). Vegetation Formation: Dry Sclerophyll Forests (Shrubby sub-formation). Vegetation Class: Sydney Coastal Dry Sclerophyll Forests. Area in Development Footprint: 6.50 ha.

Zone 2: PCT 1619 - Smooth-barked Apple - Red Bloodwood - Brown Stringybark - Hairpin Banksia heathy open forest of coastal lowlands (Regrowth). Vegetation Formation: Dry Sclerophyll Forests (Shrubby sub-formation). Vegetation Class:

Sydney Coastal Dry Sclerophyll Forests. Area in Development footprint: 0.18 ha.

Zone 3: PCT 695 - Blackbutt - Turpentine - Tallowwood shrubby open forest of the coastal foothills of the central NSW North Coast Bioregion (Mod-Good Condition). Vegetation Formation: Wet Sclerophyll Forests (Shrubby sub-formation). Vegetation Class: North Coast Wet Sclerophyll Forests. Area in Development footprint: 0.30 ha.

Greater details on each of the vegetation zones is provided in Att O_KEQ_MOD10_BDAR_page25-32.

3.4 Describe any outstanding natural features and/or any other important or unique values relevant to the project area

There are no areas of outstanding natural features or any other important or unique values within the Study Area.

3.5 Describe the status of native vegetation relevant to the project area

No threatened vegetation communities listed under the EPBC Act are present within the Study Area. The Study Area is situated on the periphery of a larger patch of native vegetation that is connected to Karuah Nature Reserve to the south. Some habitat linkage between these areas exists via underground fauna crossing and rope bridge crossings.

The Study Area is mapped as occurring within regional corridors – Fauna Corridor for North-east NSW and the Climate Change Corridors of Coastal North-east NSW (Scott 2003). The southern extent of the Study Area lies within the Karuah Mountain regional corridor that potentially provides habitat linkage for Brush-tailed Phascogale and Squirrel Gliders. The Study Area is towards the southern limit of the corridor, which mainly extends to the north-east.

The Study Area is also mapped within the Wallingat – Karuah Coastal Climate Change Corridor. The Wallingat – Karuah Coastal Climate Change Corridor provides broad linkage across the floodplain for fauna occupying coastal habitats, along climatic gradients to protect ecosystems and species which may be particularly vulnerable to the effects of climate change.

The condition of the vegetation within the proposed MOD10 development footprint include moderate/good condition vegetation (majority of the site including Vegetation Zones 1 & 3: 6.50 ha and 0.30 ha, respectively) and regrowth vegetation (relating to Vegetation Zone 2: 0.18 ha).

Vegetation Zones 1 & 3 are reflective of remnant vegetation with limited evidence of past disturbance. Few weeds occur within these zones, restricted to occasional infestations of Lantana camara (Lantana) which occur at low densities.

Vegetation Zone 2 is in a slightly lower state of condition. This vegetation zone typically represents vegetation that is more disturbed than Vegetation Zone 1 & 3, and is lacking structural complexity in some areas of the Zone (midstory and shrub layer largely absent), and the ground layer has a higher proportion of weed species present. This condition of is largely related

Despite the differences in vegetation zones (and condition), vegetation integrity plot data demonstrates that all Vegetation Zones have comparable Vegetation Integrity scores (based on composition, structure and function).

See Att O_KEQ_MOD10_BDAR_page21-32 for further details regarding the vegetation assessment and the calculation of vegetation integrity scores.

3.6 Describe the gradient (or depth range if action is to be taken in a marine area) relevant to the project area

The Study Area occurs on the Newcastle Coastal Ramp landscape. This landscape is comprised of undulating lowlands and low to steep hills on complex patterns of faulted and gently folded Carboniferous conglomerate, lithic sandstone, felspathic sandstone, and mudstone. The Newcastle Coastal Ramp landscape has a general elevation of 50 to 275 m and a local relief of 40 to 150 m with stony red texture-contrast soils on steep slopes, yellow and brown texture-contrast soils on lower slopes and deep dark clay loams along streams (SEED 2022).

The highest point on the site is approximately 150 m Australian Height Datum (AHD) associated with a ridgeline falling to the south of the Study Area (EcoLogical 2014).

3.7 Describe the current condition of the environment relevant to the project area

The MOD10 Development Site is almost entirely naturally vegetated (6.98 ha of 7.17 ha), containing three native PCTs of generally good quality with expected representative species and diversity. A total of 0.19 ha is mapped as cleared land (existing tracks).

As detailed in Section 3.6, Vegetation Zones 1 & 3 are of moderate/good conditions with occasional infestations of Lantana camara (Lantana) which occur at low densities. Ecologically, these vegetation zones contain habitat features (hollow-bearing trees, fallen logs, and leaf litter cover) that would be suitable for fauna (e.g. Squirrel Glider). These vegetation zones also support habitat for threatened flora. Overall, these Vegetation Zones are reflected by moderate vegetation integrity scores (see Att O_KEQ_MOD10_BDAR_page32 and Att R_BAM Vegetation Integrity Plot Data

Functional attributes (hollow-bearing trees, variation in stem size, fallen logs, litter cover and high threat weed cover) particularly within Vegetation Zone 2 have reduced the vegetation integrity of the Vegetation Zone (well below benchmark values). Despite this, Vegetation Zone 2 has reasonability high compositional (diversity of species within each growth form) and structural (coverage of species within each growth form) scores which has a positive influence on the overall vegetation integrity score for the Vegetation Zone. Vegetation Zone 2 is in an advanced state of regrowth following past disturbances (dwelling was located within the zone in the past).

The occurrence of weeds within the MOD10 area is mostly concentrated around the KEQ/MOD10 boundary and along existing tracks. No pest animals were identified during surveys. In addition, there are no obvious areas of erosion, soil

disposition or rubbish dumping evident within the MOD10 footprint.

Of note, the entire boundary of KEQ is fenced with fauna exclusion fencing. Given that the proposed MOD10 footprint lies directly adjacent to KEQ, the fauna exclusion fencing borders vegetation associated with MOD10 development site preventing fauna from entering the operational areas of KEQ. MOD10 is unlikely to be important to facilitate connectivity within the area given its position (directly adjacent to fenced areas of KEQ). Vegetation to the north of the central disturbance area of MOD10 provides some connectivity between land to the west of the haul road via an aerial fauna crossing which provides linkage from the KEQ BOA to the KQ conservation area. MOD10 has been specifically designed to retain this area of vegetation in proximity to the crossing and is 57m in width.

3.8 Describe any Commonwealth Heritage places or other places recognised as having heritage values relevant to the project

There are no Commonwealth Heritage Places or other places recognised as having heritage values relevant to the Study Area.

3.9 Describe any Indigenous heritage values relevant to the project area

Cultural Heritage Assessment was prepared by RPS for the proposed KEQ in 2012 (Att T_KEQ Cultural Heritage Assessment). The initial consultation and survey were conducted in January 2010 and March 2010 in accordance with the guidelines of the then Department of Conservation and Climate Change and Water (DECCW) Interim Community Consultation Requirements (2005) with the Karuah Local Aboriginal Land Council.

An AHIMS database search was undertaken on the 21 May 2012 (EcoLogical 2014). The search revealed no listed sites inside the immediate Study Area and the pedestrian survey revealed no Aboriginal cultural heritage items. No evidence of Aboriginal cultural heritage was found during the survey (EcoLogical 2014). The potential for undisturbed and in situ Aboriginal cultural material was considered unlikely. The report concluded that no Aboriginal cultural heritage sites were identified during survey.

There is a Heritage Management Plan in place for the existing KEQ operation (Att P_KEQ Heritage Management Plan), which will be extended to cover the MOD 10 area. If Aboriginal site/s are identified during any works, then all activity in the area will cease, the area cordoned off and contact made with the DPIE Environment line and a suitably qualified archaeologist and the relevant Aboriginal stakeholders, so that it can be adequately assessed and managed.

Specifically relevant to the MOD 10 proposal, an Aboriginal Heritage Due Diligence Assessment has been completed (Att Q_Aboriginal Archaeology Due Dil). This report confirms that based on the results of a site inspection (where no Aboriginal objects were identified) and a lack of natural resources in the region, there is a low possibility of sub surface sites or objects within the MOD 10 area.

An updated AHIMS search specific to MOD10 is attached (Att D_ AHIMS and Extensive Search Report).

3.10 Describe the tenure of the action area (e.g. freehold, leasehold) relevant to the project area

Freehold. All land within the Study Area is owned by affiliates of KEQ Pty Ltd.

3.11 Describe any existing or any proposed uses relevant to the project area

The KEQ contains a valuable resource, and involves the extraction of up to 1.5 million tonnes of andesite per annum (excluding overburden material) from a total resource of approximately 29 million tonnes over a 20-year extraction period. As detailed in earlier sections of this referral, proposed MOD 10 is required due to insufficient stockpiling area for the KEQ as its customer base grows and evolves.

Additional land for the stockpiling of material and for operation procedures including greater vehicle movability in and around the crushing plant is required. The proposed additional disturbance areas for stockpiling (i.e. the central and southern disturbance areas) were selected based on the following considerations:

- The proposed locations are logically located adjacent to the existing stockpiling area.
- The extension of the existing stockpile area will allow the established linear movement of materials through the site to be maintained.
- The approved stockpile area currently available at the KEQ is approximately 27,000m2. By comparison, this is significantly less than other quarries, disadvantaging KEQ when competing with other quarries.
- MOD 10 will also allow for improved water management to occur.

Note: PDF may contain fields not relevant to your application. These fields will appear blank or unticked. Please disregard these fields.

Section 4

Measures to avoid or reduce impacts

4.1 Describe the measures you will undertake to avoid or reduce impact from your proposed action

Environmental Safeguards

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

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

Environmental safeguards specially for MOD 10 will be developed as specialist reporting for MOD 10 continues and will confirmed within the MOD 10 application to be lodged with the NSW DPIE. Examples of measures include:

- A Biodiversity Stewardship Site Assessment Report and management plan will be prepared and implemented for the Lot 21/201 offset site. Monitoring will continue for the KEQ biodiversity offset area.
- The Air Quality Management Plan will be extended and updated to include MOD 10 and will assist in minimising the potential for stigma clogging of all plant populations in retained bushland habitats with particular emphasis in regard to threatened flora. Best practice control measures include, but are not limited to: 1) Vehicle speed restrictions; 2) Watering dust prone surfaces; 3) Dust barrier - geotextile covering of cyclone fences (during construction) to restrict airborne dust to offset area populations; 4) Use of larger vehicles rather than smaller vehicles to minimise the number of vehicle movements; 5) The incorporation of wind breaks and the enclosure of the crushing plant; 6) Watering of any unsealed roads and surfaces will be undertaken regularly to limit dust emissions.
- Air quality monitoring will be undertaken in by a suitably qualified consultant.
- Stockpiles are subject to water spraying.
- The Erosion and Sediment Control Plan will be extended to include MOD 10 will be implemented to minimise potential impacts. All erosion and sediment control measures will be maintained in a functioning condition until individual areas have been deemed to be successfully rehabilitated.

Structural soil conservation works will be inspected after high intensity rainfall so that de-silting and prompt repairs and/or replacement of damaged works can be initiated as required.

The proponent will update the Surface Water Management Plan to include MOD 10, to monitor both the surface water quality upstream and downstream of the site, and the effectiveness of the water management.

Relative to the MOD 10 proposed additional disturbance area, DPIE indicated that the KEQPL should consider widening the fauna linkage at the northern edge of the proposed MOD 10 area. This this matter has been reviewed in the context of landform design and has been increased in width from approximately 32m in width to approximately 57m in width (and also a reduction in the disturbance footprint by approximately 2,007m2. This has the benefit of reducing impact on Tetratheca juncea, Grevillea parviflora and arboreal fauna.

Biodiversity Offsets

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

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

A preliminary assessment of the offset obligation of the proposed MOD 10 development has been undertaken (Att F_Letter_KEQ_MOD10_Offsets_DAWE). Please note that in the attached correspondence (Att F_Letter_KEQ_MOD10_Offsets_DAWE) MOD10 was previously referred to as MOD9.

A portion of the Lot 21/201 (owned by Hunter Quarries Pty Ltd) is proposed to be utilised as the replacement offset required for impacts on the existing KEQ offset area. The utilisation of the Lot 21/201 offset site will partially fulfil the credit obligation of MOD 10.

The remaining ecosystem credit requirements for the MOD 10 site can be fulfilled by credits generated within the Karuah Manning, Hunter, Upper Hunter, Wyong (in-part) and Yengo (in-part) IBRA Sub-regions, or through payment into the Biodiversity Conservation Trust (BCT) Fund.

4.2 For matters protected by the EPBC Act that may be affected by the proposed action, describe the proposed environmental outcomes to be achieved

Proposed environmental outcomes to be achieved include:

The proposed Offset Replacement and Stewardship site for MOD10 (part Lot 21/ part Lot 201) will be maintained and managed in perpetuity to ensure no net loss of biodiversity values. The proposed Offset/Stewardship Site contain vegetation

types comparable to those identified within the MOD10 site (e.g. PCT 1619 Smooth-barked Apple Forest). The presence of all EPBC listed threatened species detected within the MOD10 Study Area, has been confirmed within the proposed offset/stewardship site including Tetratheca juncea, Grevillea parviflora sub parviflora, Squirrel Glider and Southern Myotis. The vegetation and threatened species habitat will be managed in accordance with the Management Plan which will be prepared for the Stewardship Site and Offset Replacement. An Offset/Stewardship Site Feasibility Assessment has been undertaken to ensure that impacts to the existing KEQ BOA offset are adequately replaced and that impacts as a result of MOD10 are offset in accordance with the BAM (see Att F_Letter_KEQ_MOD10_Offsets_DAWE).

The KEQ biodiversity offset area threatened species populations are continually managed and monitored to ensure quarry operations are not impacting on them. Annual threatened species monitoring is undertaken within the KEQ BOA for Tetratheca juncea, Grevillea parviflora sub parviflora. A Conservation Agreement is to be placed over the biodiversity offset area following decision of MOD 10.

Any remaining ecosystem credit requirements for the MOD 10 site will be retired within the Karuah Manning, Hunter, Upper Hunter, Wyong (in-part) and Yengo (in-part) IBRA Sub-regions are maintained and managed in perpetuity (in accordance with the like-for-like and variation rules of the BAM).

Management measures will be implemented and endorsed through updated Management Plans, ensuring Biosecurity risks are minimised and weed species are treated, improving the integrity and potential foraging resources of retained vegetation. The KEQ Biodiversity Management Plan will be updated in accordance with MOD10.

Rehabilitation and Closure plan will be updated to include the MOD 10 area. Until such time that extraction has ceased rehabilitation will occur around the perimeter of the pit only along the resource exhausted benches and will not involve the pit floor.

- The revegetation program will re-establish native tree/shrub/ground cover and will stabilise reshaped and benched areas. Benches will be deep ripped to actively promote infiltration of water which will enhance soil moisture requirements for direct tree seeding and minimise surface runoff to underlying benches and the pit floor dirty water control system.

- On completion of quarry operations, the pit floor will be re-shaped and revegetated with wetland plant species to form a free draining wetland environment. A mixture of native trees and shrubs locally indigenous to the area will be sown onto the majority of the reshaped and benched pit areas following topdressing and site preparation.

- The seed will be sourced from reputable seed supply agents and ideally collected from the local area (~10 km radius). Native seed for revegetation of the quarry will be appropriately pre-treated in order to break dormancy restrictions. The aim of the rehabilitation will be to provide similar vegetation types and re-establish habitats suitable for threatened species known from the locality (including MNES impacted by MOD10).

- The native tree and shrub seed mix will be sown at a total combined rate of approximately 6.3kg/ha. Seeding will be conducted in late spring, summer and early autumn.

- Fencing (or a similar barrier) will be erected and maintained to exclude and prohibit the movement of persons and vehicles into areas that have been rehabilitated.

Rehabilitation of the Karuah East Quarry will be managed in accordance with the biodiversity offset areas associated with the project and the KEQ Landscape and Rehabilitation Plan (Att U_ KEQLandscape and Rehab Plan). Flora species known from the offset areas (and from the previous KEQ area prior to disturbance) will be used in the revegetation seed mix. The goal of final rehabilitation will be to create a fauna corridor between rehabilitation and offset areas. Once rehabilitation is established, the rehabilitation and offset areas will be managed concurrently for land management (including pest and weed management).

Note: PDF may contain fields not relevant to your application. These fields will appear blank or unticked. Please disregard these fields.

Section 5

Conclusion on the likelihood of significant impacts

5.1 You indicated the below ticked items to be of significant impact and therefore you consider the action to be a controlled action

- ☐ World Heritage properties
- ☐ National Heritage places
- ☐ Wetlands of international importance (declared Ramsar wetlands)
- ☑ Listed threatened species or any threatened ecological community
- ☐ Listed migratory species
- ☐ Marine environment outside Commonwealth marine areas
- ☐ Protection of the environment from actions involving Commonwealth land
- ☐ Great Barrier Reef Marine Park
- ☐ A water resource, in relation to coal seam gas development and large coal mining development
- ☐ Protection of the environment from nuclear actions
- ☐ Protection of the environment from Commonwealth actions
- ☐ Commonwealth Heritage places overseas
- ☐ Commonwealth marine areas

5.2 If no significant matters are identified, provide the key reasons why you think the proposed action is not likely to have a significant impact on a matter protected under the EPBC Act and therefore not a controlled action

An assessment of impacts of the proposal on Matters of National Environmental Significance using the significant impact criteria (Commonwealth of Australia 2013) has been prepared by Kleinfelder (Att H_KEQMOD10_EPBCAssessmentofSignificance). Impacts to flora, fauna and migratory species listed under the EPBC Act that have been found within the Study Area, or that are considered to have suitable habitat within the Study Area, are not considered to be significant due to the following:

- One Grevillea parviflora subsp. parviflora and approximately 6.68 ha of habitat will be cleared and a total of 241 individuals will be potentially indirectly impacted by MOD 10. Like-for-like biodiversity offsets will compensate for the loss of the species and habitat under the NSW BOS. The incorporation of the avoidance and mitigation measures indicated in Section 4 will further reduce impacts of MOD 10. There is not considered to be a significant adverse impact on this species as a result of the project. The extension and update of Management Plans to include MOD 10 will assist in mitigating edge effects on remaining foraging habitat.

- No Asperula asthenes will be impacted upon as a result of the works and as such no significant direct adverse impacts will be presented as part of this project. However, regard for some potential indirect impacts to the species in the KEQ offset area through issues such as dust, and weed invasion will be monitored and managed. Monitoring of Asperula asthenes within the Biodiversity Offset Area indicates that indirect impacts are minimal as the number of monitored individuals has remained relative constant since the 2015. With the incorporation of the avoidance and mitigation measures indicated in this document (detailed in Section 4), there is not considered to be a significant adverse impact on this species as a result of the project. The extension and update of Management Plans to include MOD 10 will assist in mitigating edge effects on remaining foraging habitat.

- The Koala has been recorded within land to the west, however, targeted searches have not detected Koalas, or evidence thereof, within the Study Area. Very few records exist within the broader patch of native vegetation that is well connected to the Study Area (north of the Pacific Hwy). Given the low number of Koala recorded within the locality, and no evidence of Koalas detected during survey (thus, no evidence of breeding individuals), the Study Area is unlikely to contain a key source population for breeding. The proposal seeks to clear 0.30 ha of PCT 695 (habitat critical to the survival of the Koala) and 6.68 ha of PCT 1619 (low-moderate quality koala habitat). Overall, the action is expected to result in minimal impacts to the species due to the small removal of high-quality habitat, limited number of records within the locality, absence of Koalas from the Study Area and the availability of habitat within the broader landscape.

- While Grey-headed Flying Fox potentially use Eucalypt and other species within the Development Site as part of its foraging range, no roost sites for the species were detected during surveys. Vegetation to be retained to the east and to the south of the Study Area, is considered to provide high quality potential foraging habitat suitable for this species and given the mobility of the species, the proposed action is considered unlikely to significantly impact the species. The extension and update of Management Plans to include MOD 10 will assist in mitigating edge effects on remaining foraging habitat.

- Potential habitat for migratory species within the Development Site is not considered to be important habitat for the species. Considering the large amount of similar habitat both within the Study Area and in the locality, the proposal is unlikely to significantly impact on migrant populations of these species occurring in the locality. The extension and update of Management Plans to include MOD 10 will assist in mitigating edge effects on remaining foraging habitat.

Note: PDF may contain fields not relevant to your application. These fields will appear blank or unticked. Please disregard these fields.

Section 6

Environmental record of the person proposing to take the action

6.1 Does the person taking the action have a satisfactory record of responsible environmental management? Explain in further detail

Yes. The proponent is committed to maintaining a continuous environmental management program, particularly through the implementation of the Management Plans that apply to the KEQ site. KEQ provides monthly environmental reports on its website. KEQPL have generally satisfied and implemented the Conditions of Consent associated with the KEQ approval.

In response to two penalty notices (further detailed in Section 6.2), KEQPL undertook a detailed review of each of these issues and have implemented substantial improvements at the site to rectify / resolve the issues in consultation with relevant government agencies. Since this time, there have been no further infringement notices issued.

KEQPL has a range of Management Plans currently in place at the quarry to ensure satisfactory environmental performance.

Management Plans are subject to regular review (internally and by external parties) and KEQPL has demonstrated responsible environmental management.

6.2 Provide details of any past or present proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources against either (a) the person proposing to take the action or, (b) if a permit has been applied for in relation to the action – the person making the application

On 2/10/18, the DPIE issued a Penalty Notice to KEQPL for failing to construct noise mitigation measures as required by the KEQ approval. As a result of this matter, in consultation with the NSW EPA, KEQ commissioned an acoustic consultant to undertake a review of operations in the context of the NSW NPfI. This resulted in implementation of industry best practice acoustic mitigation at the KEQ (formalised by the MOD 8 approval). The KEQ was issued a penalty notice in August 2019 for discharging sediment laden water from the site. In response KEQ undertook a review & implemented improved surface water management infrastructure. The site Water MP includes monitoring of dams to ensure they are functioning efficiently.

Since this time no further infringement notices have been issued. KEQPL operates in accordance with a range of MP's, and performance in relation to the MP's is subject to regular audit (internal & external). KEQPL has demonstrated responsible environmental management.

6.3 If it is a corporation undertaking the action will the action be taken in accordance with the corporation's environmental policy and framework?

☑ Yes ☐ No

6.3.1 If the person taking the action is a corporation, provide details of the corporation's environmental policy and planning framework

Hunter Quarries environmental policy and framework – Hunter Quarries website http://hunterquarries.com.au/sustainability/environment/ (September 2020)

"We recognise the impact of our activities on those in which we operate. Our dedication to this is demonstrated through our firm commitment to sustainability.

Our end to end approach to sustainability is driven by a range of initiatives, focused on achieving specific targets in sustainable environmental management, and our commitment to our community. Through this approach we persistently strive to review and develop our practices, in order to continuously improve our sustainability.

Through bi-monthly and annual evaluations of environmental performance with a critical focus on noise, dust and pollution control, as well as consideration for evolving scientific knowledge and community consultation, Hunter Quarries has established a comprehensive approach to our environment sustainability and industry leading best practice.

Hunter Quarries have undertaken a number of measures including successful seeding on completed quarry benches, the installation of additional spray and PLC controls for dust suppression, and rubber and poly screens systems for the reduction of noise."

The KEQ Environment and Community Policy has now been attached as 'Att V_KEQ Environment and Community Policy'

6.4 Has the person taking the action previously referred an action under the EPBC Act, or been responsible for undertaking an action referred under the EPBC Act?

☑ Yes ☐ No

6.4.1 EPBC Act No and/or Name of Proposal

KEQ Project Approval EPBC reference 2014/7282 (KARUAH EAST QUARRY PTY LTD/Mining/Lower Hunter/New South Wales/Karuah East Quarry, 3 km NE Karuah, NSW) was granted on 17 June 2014.

Karuah Quarry Project Approval reference 2004/1358 was granted on 19 March 2004.

Note: PDF may contain fields not relevant to your application. These fields will appear blank or unticked. Please disregard these fields.

Section 7

Information sources

Reference source

Commonwealth of Australia. 2011. EPBC Act Referral guidelines for the vulnerable black-eyed susan, Tetratheca juncea.

Reliability

High – information is reliable

Uncertainties

None

Reference source

Commonwealth of Australia. 2013. Significant Impact Guidelines 1.1 – Matters of National Environmental Significance significant impact criteria

Reliability

High – information is reliable

Uncertainties

None

Reference source

Commonwealth of Australia. 2014. EPBC Act Referral Guidelines for the vulnerable koala (combined populations of Queensland, New South Wales and the Australian Capital Territory). (Commonwealth of Australia 2014).

Reliability

High – information is reliable. Subject to revision following species listing as Endangered.

Uncertainties

None

Reference source

Department of Agriculture, Water and the Environment (DAWE). 2022. Protected Matters Search Tool. (DAWE 2022)

Reliability

High – information is reliable and current

Uncertainties

None

Reference source

ERM Mitchell McCotter. 1999. Karuah to Buladelah Pacific Highway Upgrading – Environmental Impact Statement (Volume 2) – Assessment of Environmental Impacts (section E). (ERM 1999).

Reliability

High – information is reliable

Uncertainties

None

Reference source

NSW National Parks & Wildlife Service. 2002. Environmental Impact Assessment Guidelines - Grevillea parviflora subsp. parviflora. (NSW NPWS 2002).

Reliability

Note: PDF may contain fields not relevant to your application. These fields will appear blank or unticked. Please disregard these fields.

High – information is reliable

Uncertainties

Not applicable

Reference source

Office of Environment and Heritage. 2018. A review of koala tree use across New South Wales. (OEH 2018).

Reliability

High – information is reliable

Uncertainties

None

Reference source

Office of Environment and Heritage. 2012. Myall Lakes Ramsar site: Ecological character description. (OEH 2012).

Reliability

High – information is reliable

Uncertainties

None

Reference source

The NSW Department of Planning, Industry and Environment. 2022. BioNet Vegetation Classification (DPIE 2022)

Reliability

High – information is reliable and current

Uncertainties

None

Reference source

The NSW Department of Planning, Industry and Environment. 2022. Threatened Biodiversity Data Collection (DPIE 2022)

Reliability

High – information is reliable and current

Uncertainties

None

Reference source

The NSW Department of Planning, Industry and Environment. 2022. BioNet Atlas of NSW (DPIE 2022)

Reliability

High – information is reliable and current

Uncertainties

None

Note: PDF may contain fields not relevant to your application. These fields will appear blank or unticked. Please disregard these fields.

Reference source

The NSW Department of Planning, Industry and Environment (DPIE). 2022. Threatened Biodiversity Profile Search https://www.environment.nsw.gov.au/threatenedspeciesapp/
- Tetratheca juncea (DPIE 2022)
- Grevillea parviflora subsp. parviflora (DPIE 2022)
- Asperula asthenes (DPIE 2022)
- Koala (DPIE 2022)
- Grey-headed Flying Fox (DPIE 2022)

Reliability

High – information is reliable and current

Uncertainties

None

Reference source

The NSW Department of Planning, Industry and Environment. 2022. Saving our Species profiles http://www.environment.nsw.gov.au/savingourspecies

Reliability

High – information is reliable and current

Uncertainties

None

Reference source

SEED 2022. The Central Resource for Sharing and Enabling Environmental Data in NSW. Available at https://www.seed.nsw.gov.au/.

Reliability

High – information is reliable and current

Uncertainties

None

Reference source

Scott, D. 2003. Key Habitats and Corridors for Forest Fauna: A Landscape Framework for Conservation in North-east New South Wales. NSW NPWS Occasional Paper 32, NSW National Parks and Wildlife Services, Sydney

Reliability

High – information is reliable

Uncertainties

None

Reference source

Department of Agriculture, Water and the Environment (DAWE). 2022. Species Profile and Threats Database for
- Tetratheca juncea
- Grevillea parviflora subsp. parviflora
- Asperula asthenes
- Koala
- Grey-headed Flying Fox
- White Throated Needletail
- Fork-tailed Swift
- Black-faced Monarch
- Rufous Fantail

Note: PDF may contain fields not relevant to your application. These fields will appear blank or unticked. Please disregard these fields.

Reliability

High – information is reliable and current

Uncertainties

None

Note: PDF may contain fields not relevant to your application. These fields will appear blank or unticked. Please disregard these fields.

Section 8

Proposed alternatives

Do you have any feasible alternatives to taking the proposed action?

Yes ☑ No

Note: PDF may contain fields not relevant to your application. These fields will appear blank or unticked. Please disregard these fields.

Section 9

Person proposing the action

9.1.1 Is the person proposing the action an organisation or business?

☑ Yes ☐ No

Organisation

Organisation name (as registered for ABN/ACN)	KARUAH EAST QUARRY PTY LIMITED
Business name	
ABN	80141505035
ACN	
Business address	Blue Rock Close, Karuah, 2324, NSW, Australia
Postal address	
Main Phone number	0240500304
Fax	
Primary email address	info@hunterquarrieseast.com.au
Secondary email address	

9.1.2 I qualify for exemption from fees under Regulation 5.23(1)(ii) of the EPBC Regulations because I am:

☐ Small business
☑ Not applicable

9.1.2.2 I would like to apply for a waiver of full or partial fees under Regulation 5.21A of the EPBC Regulation

☐ Yes ☑ No

9.1.3 Contact (for an organisation - the contact details of the person authorised to sign on behalf of the organisation)

First name	Joel
Last name	Fleming
Job title	Environment & Development Manager
Phone	02 4997 5829
Mobile	0447 044 646
Fax	
Email	jf@hunterquarries.com.au
Primary address	Blue Rock Close, Karuah, 2324, NSW, Australia
Address	

Declaration: Person proposing the action (To be signed by the person at 9.1.3)

I, Joel Fleming **, declare that to the best of my knowledge the information I have given on, or attached to the EPBC Act Referral is complete, current and correct. I understand that giving false or misleading information is a serious offence. I declare that I am not taking the action on behalf or for the benefit of any other person or entity.**

Signature: ..... Date: 22/02/2022

I, _____, the person proposing the action, consent to the designation of _____ as the proponent for the purposes of the action described in this EPBC Act Referral.

Signature:.....Date: .....

Australian Government
Department of Agriculture, Water and the Environment

Note: PDF may contain fields not relevant to your application. These fields will appear blank or unticked. Please disregard these fields.

Proposed designated proponent

9.2.1 Is the proposed designated proponent an organisation or business?

☑ Yes ☐ No

Organisation

Organisation name (as registered for ABN/ACN)	KARUAH EAST QUARRY PTY LIMITED
Business name	
ABN	80141505035
ACN	
Business address	Blue Rock Close, Karuah, 2324, NSW, Australia
Postal address	
Main Phone number	02 40500304
Fax	
Primary email address	info@hunterquarrieseast.com.au
Secondary email address	

9.2.2 Contact (for an organisation - the contact details of the person authorised to sign on behalf of the organisation)

First name	Joel
Last name	Fleming
Job title	Environment & Development Manager
Phone	02 4997 5829
Mobile	0447 044 646
Fax	
Email	jf@hunterquarries.com.au
Primary address	Blue Rock Close, Karuah, 2324, NSW, Australia
Address	

Declaration: Proposed Designated Proponent

I, Joel Fleming **,the proposed designated proponent, consent to the designation of myself as the proponent for the purposes of the action described in this EPBC Act Referral.**

Signature: ..... **Date:** 22/02/2022

Australian Government
Department of Agriculture, Water and the Environment

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Referring party (person preparing the information)

9.3.1 Is the referring party an organisation or a business?

☑ Yes ☐ No

Organisation

Organisation name (as registered for ABN/ACN)	Kleinfelder Australia Pty LTD
Business name	
ABN	23146082500
ACN	
Business address	Suite 3, 240-244 Pacific Highway, Charlestown, 2290, NSW, Australia
Postal address	
Main Phone number	0249495200
Fax	
Primary email address	dobrien@kleinfelder.com
Secondary email address	

9.3.2 Contact (for an organisation - the contact details of the person authorised to sign on behalf of the organisation)

First name	Daniel
Last name	O'Brien
Job title	Senior Ecologist
Phone	0249495200
Mobile	0423490608
Fax	
Email	dobrien@kleinfelder.com
Primary address	Suite 3, 240-244 Pacific Highway, Charlestown, 2290, NSW, Australia
Address	

Declaration: Referring party (person preparing the information)

I, Daniel O'Brien **, declare that to the best of my knowledge the information I have given on, or attached to this EPBC Act Referral is complete, current and correct. I understand that giving false or misleading information is a serious offence.**

Signature: ..... **Date:** 17/02/2022 .....

Australian Government
Department of Agriculture, Water and the Environment

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Appendix A

Attachment

Document Type	File Name
action_area_images	Att A_Figures1to9.pdf
govt_approval_conditions	*Att G_KEQ Project Approval_Consolidated Consent.pdf
public_consultation_reports	Att D_ AHIMS and Extensive Search Report.pdf
public_consultation_reports	Att I_DPIE Correspondence MOD 10.pdf
public_consultation_reports	Att J_NSW DPIE Consultation.pdf
supporting_tech_reports	Att B_2014 EPBC Referral_EcoLogical.pdf
supporting_tech_reports	Att C_LikelihoodofOccurrenceTableV5.pdf
supporting_tech_reports	Att H_KEQMOD10_EPBCAssessmentofSignificance V4.pdf
supporting_tech_reports	Att K_ KEQ Ecological Assessment.pdf
supporting_tech_reports	Att L_Protected Matters Search.pdf
supporting_tech_reports	Att E_ KEQ BOA Monitoring Report 2020.pdf
supporting_tech_reports	Att O_KEQ_MOD10_BDAR.pdf
supporting_tech_reports	Att F_Letter_KEQ_MOD10_Offsets_DAWE.pdf
supporting_tech_reports	Att G_KEQ Project Approval.pdf
impact_reduction_docs	*Att F_Letter_KEQ_MOD10_Offsets_BCD_DAWE.pdf
impact_reduction_docs	Att M_KEQ Water Management Plan.pdf
impact_reduction_docs	Att N_KEQ_BOAMP.pdf
impact_reduction_docs	**Att P_KEQ Heritage Management Plan.pdf
impact_reduction_docs	**Att Q_Aboriginal Archaeology Due Dil.pdf
impact_reduction_docs	Att R_BAM Vegetation Integrity Plot Data.pdf
impact_reduction_docs	Att S Proposed_MOD10_OffsetandStewardshipSite.pdf
impact_reduction_docs	**Att T_KEQ Cultural Heritage Assessment.pdf
impact_reduction_docs	Att U_ KEQLandscape and Rehab Plan.pdf
impact_reduction_docs	Att V_KEQ Environment and Community Policy.pdf

Appendix B

Coordinates

Area 1
-32.628566663007,152.0098797026
-32.628563486739,152.00988721339
-32.6285443642,152.00993243164
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Area 2
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* DO NOT PUBLISH - SUPERSEDED
** DO NOT PUBLISH- SENSITIVITIES

Note: PDF may contain fields not relevant to your application. These fields will appear blank or unticked. Please disregard these fields.

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Area 3
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