Title of Proposal - West Mt Cotton Quarry Expansion

Section 1 - Summary of your proposed action

Provide a summary of your proposed action, including any consultations undertaken.

1.1 Project Industry Type

Mining

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

Karreman Quarries Pty Ltd are seeking approval to extend the existing quarry area of the West Mount Cotton Quarry (the Project) located on West Mount Cotton Road in Redland City, Queensland. The existing quarry and the proposed extension are wholly located within the West Mount Cotton Key Resource Area – KRA 72. The purpose of the Project is to facilitate an extension to the existing pit in order to maintain continuity of supply of aggregates and roadbase materials to meet future demand for construction materials across the Greater Brisbane region.

The latest approvals relating to the existing West Mount Cotton Quarry were granted by Redland City Council in 2004 and have been subject to two change applications. The quarry is operating under a Queensland Environmental Authority under Environmental Protection Act 1994 (EP Act).

The proposed quarry extension is located within the resource/processing area boundary of KRA 72 within Lots 1 to 5 on RP 186598. The quarry extension comprises approximately 60 ha and is expected to be developed over a period of approximately 30 – 50 years (market dependent).

The West Mount Cotton quarry is an established operation having commenced in 1955 before being purchased by Karreman 1976. The resource is strategically located to provide essential supply of construction materials to developing urban areas in South East Queensland including Brisbane, Redlands and Port of Brisbane.

Project activities proposed for the quarry extension within KRA 72 consist of the following:
• extension of the existing open cut pit within Lots 1 to 5 on RP185598 in a southerly and westerly direction progressively over time;
• the relocation of an existing electrical transmission line to allow for the extension of the pit;
• construction of haul roads and ancillary access tracks;
• clearing of vegetation, topsoil and overburden and stockpiling viable materials for incorporation into rehabilitation works; and
• drilling, blasting and loading of broken rock into dump trucks for transport to the existing crushing and screening plant located within Lot 100 to the north of the quarry extension area.

No changes to approved extraction limits or operating hours for the quarry are propsoed. Lot 100, north of Tingalpa Creek, will continue to support all existing site infrastructure including administration and staff offices, employee amenities, testing laboratory, weighbridges, workshops, stores and fuel storage facilities, water supply and sedimentation ponds,

multi?stage crushing and screening plant, CTB roadbase plant, product stockpiles, truck fleet parking and on-site car parking areas. There is no change proposed to this infrastructure, nor is there an intention to replicate the infrastructure in the area of pit extension.

Extraction will be staged over the life of the quarry operation and any clearing will be carried out progressively in line with pit development.

The existing Energex easement and powerlines currently traversing the Project area will require realignment and will occupy an area of approximately 3.5 ha.

1.3 What is the extent and location of your proposed action? Use the polygon tool on the map below to mark the location of your proposed action.

Area	Point	Latitude	Longitude
Extension Area	1	-27.609570121865	153.18984580173
Extension Area	2	-27.609574875417	153.18981897964
Extension Area	3	-27.61041149721	153.18989408149
Extension Area	4	-27.612027680307	153.18907868995
Extension Area	5	-27.612560064811	153.18837058677
Extension Area	6	-27.616220138235	153.19128883018
Extension Area	7	-27.613178007867	153.19369208945
Extension Area	8	-27.612084721627	153.19489371909
Extension Area	9	-27.610069243612	153.19550526275
Extension Area	10	-27.610107271842	153.19603634013
Extension Area	11	-27.618283034813	153.19343996181
Extension Area	12	-27.616723982921	153.18389129771
Extension Area	13	-27.614442403562	153.18346214427
Extension Area	14	-27.608861840436	153.18442773952
Extension Area	15	-27.609570121865	153.18984580173

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 proposed action, being the extension of the existing quarry pit and supporting infrastructure, will take place on Lot 1-5 on RP186598 in the Redland City Council local government area.

The site is located approximately 20km east of the Redlands City centre and approximately the same distance from the Pacific Highway to the west. Surrounding land uses principally comprise rural residential development to the north east and north west of the site. The Venman Bushland National Park is located to the south of the site while the Don and Christine Burnett Conservation Area is located to the west.

Lots 3-5 already comprise the approved quarry excavation area while the balance of the site is vacant and undulating (ranging between about 60m AHD and 90m AHD) and is vegetated (except for a house and dam on Lot 2). Lot 100 is included in the application because it contains infrastructure including administration and staff offices, employee amenities, testing laboratory, weighbridges, workshops, stores and fuel storage facilities, water supply and sedimentation ponds, multi?stage crushing and screening plant, CTB roadbase plant, product stockpiles, truck fleet parking and on-site car parking areas. There is no change proposed to this infrastructure, nor is there an intention to replicate the infrastructure in the area of pit extension.

For the purposes of Question 1.6 (below), the following areas are defined:

Total Quarry Area:

The total area of the 6 lots making up the quarry (Lot 100 on SP234173 and Lots 1-5 on RP186498) = approximately 222ha (222.024ha)

Existing Quarry Footprint:

Those areas currently authorised to be used for quarrying under existing approvals = approximately 88ha (87.79ha)

Extension Footprint:

The total extension area on Lots 1-5 on RP186498 (excluding those parts of the lots either already used/approved for extractive industry and those parts which are not intended to be quarried – such as the buffer areas and powerline relocation area) = approximately 60ha (59.77ha)

Disturbance Footprint:

Extension Footprint plus the area of disturbance associated with the powerline relocation =

approximately 63ha (63.08ha)

Avoidance Footprint:

Total Quarry Area less the Disturbance Footprint and Existing Quarry Footprint = 71ha (71.154ha)

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

Approximately 60ha (Extension Footprint)

1.7 Is the proposed action a street address or lot?

Lot

1.7.2 Describe the lot number and title. Existing Operation - Lot 100 on SP234173, Existing and proposed: Lots 1-5 on RP186598

1.8 Primary Jurisdiction.

Queensland

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

No

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

Yes

1.10.1 Is there a local government area and council contact for the proposal?

No

1.11 Provide an estimated start and estimated end date for the proposed action.

Start date 01/2020

End date 01/2068

1.12 Provide details of the context, planning framework and State and/or Local government requirements.

An development application for the extension of the quarry pit will require a Development Permit for Material Change of Use Extractive Industry under the *Planning Act 2016* . The application will also seek a Development Permit for Material Change of Use for Environmentally Relevant Activities, namely Extractive and Screening Activities under EP Act.

The assessment manager is the Redland City Council and also referred to the State Government for assessment as part of this process.

The site is identified in the Rural Zone under the Redland City Council Planning Scheme (Redland City Plan 2018). It is also identified on the following overlays:

Bushfire HazardEnvironmental SignificanceExtractive ResourcesFlood & Storm Tide HazardLandslide HazardRegional Infrastructure CorridorsWater Resource CatchmentsWaterways Corridors and Wetlands

The following referrals have been identified:

EPBC – EPBC Act (Referral to Commonwealth Department of the Environment & Energy – DoEE)Clearing Native Vegetation – Planning Regulation - Schedule 10, Part 3 (Referral to the Department of State Development Manufacturing Infrastructure and Planning (DSDMIP))ERA – Planning Regulation - Schedule 10, Part 5 (Referral to DSDMIP)Koala Habitat Area - Planning Regulation - Schedule 10, Part 10 (Referral to Council)State Transport - Planning Regulation - Schedule 10, Part 9 (Referral to DSDMIP)Waterway Barrier Works - Planning Regulation - Schedule 10, Part 6 (Referral to DSDMIP)Taking or interfering with water/ Removing Quarry Material - Planning Regulation - Schedule 10, Part 19 (Referral to DSDMIP)Electricity Infrastructure - Planning Regulation - Schedule 10, Part 9 (Referral to Energy Queensland)

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

Karreman Quarries Pty Ltd has been established in the area for over 30 years and will continue to liaise with neighbours and interested stakeholders about the proposal throughout the application process.

Engagement with the Aboriginal Cultural Heritage Party occurred as part of historical applications on site and contact has again been made to seek guidance on ensuring that Aboriginal Cultural Heritage is appropriately considered as part of the extension application. This process is expected to run concurrently with the application process.

The following is also a summary of consultation that has occurred with regulators:

-Pre-referral meeting (teleconference) with the Department of Environment and Energy in October 2017.

-Pre-referral meeting held with Department of Natural Resources and Mines in August 2018.

-Pre-lodgement meeting with Redlands City Council In November 2018

-Pre-lodgement meeting has been requested with the Department of State Development ---Manufacturing Infrastructure & Planning (DSDMIP) via the State Assessment & Referral Agency.

-Public consultation of the EPBC referral will be undertaken in accordance with the statutory requirements.

-The development application made to Council will be public notified in accordance with the requirements of the *Planning Act 2016*

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.

Ecological Assessments:

1) Comprehensive fauna and habitat surveys were carried out in 2003/2004 as part of a previous development application;

Comprehensive flora and fauna surveys were completed by James Warren and Associates (JWA) in 2003. These seasonal (Autumn and Spring) surveys included a biodiversity assessment and comparison between lands north and south of Tingalpa Creek and comprised targeted surveys for reptiles and amphibians, birds, koala, threatened flora and vegetation community analysis. The primary author of the *Terrestrial Ecology Assessment* attached to this referral (Dr Watson) participated in the seasonal JWA 2003 surveys. The land to the south of Tingalpa Creek generally includes the area that comprised part of this (2017) study, and as such, where relevant, the results are incorporated into this analysis.

2) Koala surveys (by F.Carrick and D. De Villiers1) in 2017;

Comprehensive koala surveys were conducted from September to December, 2017 across the Project site

Surveys were conducted to assess the local koala population and its habitat at the Karreman Quarry and surrounding areas. The surveys provided current data to compare with previous surveys that occurred in 2012. The survey also aimed to evaluate the success of an existing koala habitat restoration program at another site which Karreman Quarries has control colloquially termed the “Pineapple Farm”.

Surveys at the quarry used a systematic strip transect methodology, as outlined in Dique et al. (2004). These surveys involved comprehensive assessments, where approximately 30% of the vegetated area of was surveyed for koalas, also noting signs of their presence. In summary, transects were positioned across the site, starting at a random point between 1-60m from a site boundary. Subsequent transects were delineated across the site, spaced parallel at even intervals (usually units of 60m) to uniformly sample the site. Transects were orientated to sample a cross section, arranged perpendicular to the grain of the landscape in order to sample the vegetation and habitat between and including ridge lines, gullies and drainage lines/creeks to account for habitat variation and provide an unbiased assessment of the site by sampling a broad spectrum of habitat.

Four searchers were spaced 15 - 20m apart, resulting in transects that were 45-60m in width. The length of transects varied based on site conditions and the size of the site. Searchers were equipped with a compass to ensure a fixed bearing was navigated in each transect, and with binoculars to ensure that all trees and canopies could be searched thoroughly for koalas. A handheld GPS unit was used to mark the location of the start and finish points of each transect and locations of koalas and their signs of use of habitat with high accuracy (usually <5m). Where possible, koala sex (male, female), age (dependent juvenile, sub-adult, or adult), health status (no obvious disease, overt signs of chlamydial disease or other ailments) and reproductive status for females (signs of dependent young in the pouch or on the mother’s front or back) were recorded.

The same transects at the northern part of the quarry were resurveyed based on previous surveys. Transects in the southern part of the quarry were delineated based on the methods described above.

Surveys were conducted by a team of highly experienced ecologists with over 50 years’ collective

experience conducting koala surveys. Each observer had a minimum of eight years’ and a maximum of 20 years’ experience conducting koala field surveys. Surveys were designed and overseen by a koala ecologist with over 20 years’ experience in the methodology, design and implementation of koala surveys.

3) Fauna Surveys

A summary of fauna surveys that have been completed across the Project site is below:

• Habitat and targeted fauna surveys in December 2015 and July 2016 (3 Person Days);

• Habitat, target flora, bird and reptile surveys in October 2017, November 2017 and August 2018 (7 Person Days);

• Systematic fauna surveys over five days in October 2017 (10 Person Days);

• Supplementary (targeted) fauna and habitat surveys (local conservation areas and site) over

two days in November 2017 (6 Person Days);

• Supplementary fauna and habitat surveys (local conservation areas and site) over six days in

August 2018 (8 Person Days).

Since 2015 a range of fauna surveys and habitat assessments have been undertaken by two experienced ecologists/zoologists. On some occasions, up to four ecologists were on site participating in survey work. Weather for the survey period was

generally fine with warm to hot conditions and periods of precipitation prior to and during the survey.

Site assessment methodology consisted of an initial site inspection and assessment of habitats,

followed by a systematic survey, designed for each target species. Five systematic survey sites were established to cover a range of habitats and distribution throughout the subject area. At systematic sites the

following equipment was deployed: medium-sized cage traps, small cage traps, large and small Elliott

traps, drift fence and buckets and/or funnel (folding) traps, hair traps, bat detector and a camera

station. Supplementary sites were established in habitat considered suitable for target survey. Active

searches (diurnal and nocturnal), call-playback and spotlighting were completed over the five to

seven-day period. Bat call analysis was completed by Greg Ford (Australian bat expert, Balance

Environmental) and hair analysis by Barbara Triggs (hair and scat expert, Victoria).

A description of survey effort, locations and weather conditions is provided in **Attachment F** of the attached *Terrestrial Ecology Assessment* and is summarised below:

Trap/Survey Tool

Effort

Elliotts

240 trap nights

Cages

36 trap nights

Hair Funnels

224 trap nights

Pitfalls

76 trap nights

Funnel/Folding

132 trap nights

Anabat

8 trap nights

Active Searches (Diurnal)

16 days (over approx. 32 person days)

Active Searches (Nocturnal)

10 nights (approx. 22 person hours)

Call Playback

8 nights (various locations)

Camera Station

6 cameras for 28 days/nights

Koala Searches

7 days (approx. 16 person hours) note detailed surveys done by others

4) Flora Surveys

The following databases and reports were reviewed prior to undertaking field investigations, to determine vegetation communities and component plant species likely to be encountered on the site:

• Commonwealth's EPBC Online Protected Matters Search Tool (Commonwealth Department of the Environment and Energy, 2017). The search covered a 2 km radius surrounding the site;

• Queensland's Wildlife Online database (Queensland Government Wildlife Online 2017). The search covered a 10 km radius surrounding the site;

• Regional Ecosystems Report (Queensland Department of Environment and Heritage Protection, 2017);

• Regulated Vegetation (Queensland Department of Natural Resources and Mines, 2017);

• Biodiversity and Conservation Values (Queensland Department of Environment and Heritage Protection, 2017);

• Flora Survey Trigger Map (Queensland Department of Environment and Heritage Protection, 2017);

• "Vineforest Plant Atlas for South-East Queensland" P. I. Forster, P.D. Bostock, L.H. Bird and A.R. Bean. Queensland Herbarium, Queensland Government, 1991.

• "Material Change of Use – West Mt Cotton Quarry" (James Warren and Associates 2004); and

• Protected Plant Survey ENERGEX easement realignment, Karreman Quarry (Gondwana Ecology 2016)

Flora surveys were carried out on 4th October 2017 and 1st November 2017. Seven locations were selected for surveying to cover the range of vegetation communities and habitats expected to occur across the site. Most of the

site is mapped as ‘High Risk’ in the Flora Survey Trigger Mapping under the Nature Conservation Act 1992 (NC Act). To satisfy the requirements of the

“Flora Survey Guidelines – Protected Plants, Version 2.0” (Queensland Department of Environment

and Heritage Protection, December 2016) a timed meander flora survey was conducted within each

habitat to determine the presence of any of the target threatened plant species. In addition to

recording flora species, the structure and condition of the vegetation within each habitat was also

noted.

Desktop mapping and spatial information was reviewed to inform an assessment of regional ecosystems (REs) (both remnant and high value regrowth) and habitat types that may be present over the site.

In addition database searches were undertaken to determine the potential presence of threatened ecological communities (TECs) and listed flora species such as through EPBC Act Protected Matter Search Tool (PMST) and Wildlife Online.

Spatial mapping layers covering the site including RE mapping, were down loaded from the Queensland Government Spatial Catalogue on 23 March 2018.

A NearMap geo-referenced satellite image covering the Site (resolution 0.29m/pixel) was extracted

and loaded into GIS in combination with RE Mapping Layer and field survey sites were selected to assess the regional ecosystem mapping.

The desktop assessment was supported by a field survey conducted initially over two days, 26th and

27th of March, with follow up survey on 2nd April 2018. The survey consisted of the following

components:

• Vegetation structure / quaternary transect assessments at selected locations to cover each RE type;

• General traverse of the vegetation communities encountered;

• Field survey / GPS tracking of vegetation boundaries, where they were found to be significantly different to RE Mapping;

• Photographic records were taken for all survey locations and additional observations, and

• Opportunistic sightings of listed flora species and fauna species (for species that may not have been identified on previous flora / fauna surveys).

Further information is available in the attached *Terrestrial Ecology Assessment* prepared by Gondwana Ecology Group and the *Environmental Offset Strategy* prepared by EMM.

Other Assessments:

In addition to the ecological assessments summarised above, the following assessments/reporting are being carried out:

Geological InvestigationsBlasting AssessmentNoise, Dust & Vibration AssessmentSurface Water & Water Quality AssessmentTraffic AssessmentVisual/Scenic Amenity AssessmentEconomic Need Analysis

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

No

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

Yes

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

This project is an expansion of an existing quarry that has been in operation since 1955.

Section 2 - Matters of National Environmental Significance

Describe the affected area and the likely impacts of the proposal, emphasising the relevant matters protected by the EPBC Act. Refer to relevant maps as appropriate. The interactive map tool can help determine whether matters of national environmental significance or other matters protected by the EPBC Act are likely to occur in your area of interest. Consideration of likely impacts should include both direct and indirect impacts.

Your assessment of likely impacts should consider whether a bioregional plan is relevant to your proposal. The following resources can assist you in your assessment of likely impacts:

• Profiles of relevant species/communities (where available), that will assist in the identification of whether there is likely to be a significant impact on them if the proposal proceeds;

• Significant Impact Guidelines 1.1 – Matters of National Environmental Significance;

• Significant Impact Guideline 1.2 – Actions on, or impacting upon, Commonwealth land and Actions by Commonwealth Agencies.

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

No

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

No

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

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

2.4.1 Impact table

Species	Impact
Koala (Phascolarctos cinereus)	55.40ha Is an important population likely to be present? Yes the Study Area was confirmed as supporting an important population. The Study

Species	Impact
	Area forms part of a large core area of significant Koala bushland and provides habitat for resident animals and connectivity and movement opportunities in the broader landscape for the species (Koala Research and Management 2018). Direct evidence of Koala usage was found and an incidental observation of a Koala adjacent to the site was made during targeted Koala surveys. Koalas were also observed at adjacent sites and the broader Redlands area has a high number of Koala records. However population densities were noted as low. The quarry north survey area and Scout sites had a density of 0.06 to 0.1 koalas per hectare, while the quarry south area had 0 koalas per hectare. This declining trend of Koala density is typical of many Koala populations in South east Queensland (Koala Research and Management 2018). Disease was also apparent in some individuals which is typical of Koalas in this region and the peri-urban environment around the Project which put stress on Koalas from threats such as dogs, vehicles and habitat fragmentation. Koala Habitat Assessment Tool The Koala habitat assessment tool was applied and a score of 9/10 was awarded. The full justification is provided in the ‘Reassessment of the koala population at Karreman Quarry and surrounding properties’ prepared by Koala Research and Management in June 2018. Impact Assessment 1) Lead to a long term decrease in size of a population Koalas are known to be utilising habitat within the Study Area and the local region supports an important Koala population. The loss of 55.46 ha of Koala habitat has the potential to impact on some individual Koalas which are utilising this area of habitat as part of their home range. There will be some areas of remnant bushland retained on the broader site and there are large areas of Koala habitat surrounding the Project area, including large areas within protected areas. Therefore, these habitats being retained will provide Koala habitat and movement opportunities for those individuals. Clearing of habitat will be staged over 50 years. Vegetation will be gradually cleared in line with quarry development

Species	Impact
	(average clearing rates could be as gradual as 1.3 ha annually). Therefore, a large portion of Koala habitat will be retained on site for a number of years. This will also ensure the resident Koalas still have this habitat available and have time to move to adjacent habitats. The proponent has also established 25 ha of advance offset area consisting of Koala habitat tree plantings which have been confirmed as supporting Koalas now (Koala Research and Management 2018). The offset package proposed for the Project will also ensure that new areas of Koala habitat are established prior to impacts occurring to reduce the stress on the local Koala population and provide alternative habitat for them to use. Other mitigation measures that will be taken include the use of a fauna spotter during vegetation clearing. They will check areas for Koalas prior to any clearing and during clearing to ensure they are not harmed during clearing process. Clearing will be done in a sequential manner to ensure Koalas can safely move out of the area to adjacent habitat. If Koalas are found to be present, that tree, and adjacent trees, will not be cleared until the Koala has moved from the area on its own accord. Indirect impacts may occur to Koalas from the quarry operation as a result of noise associated with drilling activities and as a result of an increase in weeds and pest animals (itself a result of clearing further areas). Noise levels of quarry operations will be regulated by the permit conditions to what are deemed acceptable limits and extraction will only be during the day, therefore noise is not expected to have a significant impact on Koalas. Bushland that is retained in the Study Area will be actively managed for weeds and pest animals to ensure the bushland remains in good ecological condition, weeds are not spread through the site and threats from pests such as wild dogs are reduced. Biosecurity procedures in the quarry areas will be enforced. As a result of mitigation measures to be put in place, including establishment of advance habitats in the local region prior to loss of habitat, the Project is not expected to result in a long term decrease in the size of the

Species	Impact
	population. 2) Reduce the area of occupancy of an important population Koalas are known to be utilising habitat within the Study Area and the local region supports an important Koala population. The loss of 55.46 ha of Koala habitat has the potential to impact on some individual Koalas which are utilising this area of habitat as part of their home range and reduce the area of occupancy. There will be some areas of remnant bushland retained on the broader site however it won't be able to support the same densities as at present. There are large areas of Koala habitat surrounding the Project area, including large areas within protected areas. Therefore these habitats being retained will provide Koala habitat and movement opportunities for those individuals. Clearing of habitat will be staged over 50 years. Vegetation will be gradually cleared in line with quarry development (average clearing rates could be as gradual as 1.3 ha annually). Therefore, a large portion of Koala habitat will be retained on site for a number of years. This will also ensure that resident Koalas still have this habitat available and have time to move to adjacent habitats. The proponent has also established 25 ha of advance offset area consisting of Koala habitat tree plantings which have been confirmed as supporting Koalas now (Koala Research and Management 2018). The offset package proposed for the Project will also ensure that new areas of Koala habitat are established prior to impacts occurring to reduce the stress on the local Koala population and to provide alternative habitat for them to use. Further detail on proposed offset areas is provided in Appendix C. Overall the Project is likely to reduce the area of occupancy on the Project site, but will increase Koala habitat and occupancy rates on other properties in the local area through revegetation and habitat restoration programs. 3) Fragment an existing important population into two or more populations The loss of 55.4ha of Koala habitat in the Study Area will not result in the fragmentation of an important population into two or more populations. The broader core area of Koala habitat which the impact area is part of

Species	Impact
	will still remain largely intact and remain as a large, connected Koala habitat area. It includes Venman Bushland National Park, Daisy Hill Conservation Park and Don and Christine Burnett conservation area. Koalas will still be able to move through these habitats and more broadly within the Koala Coast. While the Project is recognised as reducing Koala movement across the Study Area it is not expected to impact on the broader Koala Coast population due to the large areas of intact habitat still being in place. 4) Adversely affect habitat critical to the survival of a species Habitat critical to the survival of the Koala consists of forests and woodlands dominated by eucalypt species (DoEE, 2018). Based on the habitat assessment completed post targeted Koala surveys, a habitat score of 9/10 was identified. The Project is likely to adversely affect habitat critical for survival of the species. The habitat is in good condition and is known to be utilised by Koalas but at low densities. The loss of 55.4 ha is considered significant. The loss of Koala habitat will be offset and offsets will be in place prior to impacts occurring through staging of impacts and advance offset delivery. This will ensure impacts to the local Koala population are minimised and that additional areas of important habitat are created. 5) Disrupt the breeding cycle of an important population Female Koalas can potentially produce one offspring each year, with births occurring between October and May (DoEE, 2018). While no Koalas were observed in the Study Area their presence was detected. It is likely the Study Area supports breeding habitat for the species. However, the quarry activities are not expected to disrupt the breeding cycle of an important population. Habitat areas will be retained in the Study Area which can be utilised for breeding by the species. Spotter catchers will be present during clearing to identify Koalas and ensure they are not harmed during clearing process or as works progress (eg movement of machinery). If a Koala is confirmed the tree in which it is located and adjacent trees will not be cleared to ensure the animal is not harmed and permitted to move

Species	Impact
	from the area of its own accord. Works will also only occur during the day which avoids periods when Koalas are most active. No disruption to Koalas breeding cycle is expected. 6) Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline The Project will result in the loss of 55.46 ha of Koala habitat. There will be some areas of remnant bushland retained on the broader site and there are large areas of Koala habitat surrounding the Project area, including large areas within protected areas. Therefore these habitats being retained will provide Koala habitat and movement opportunities for those individuals. Clearing of habitat will be staged over 50 years. Vegetation will be gradually cleared in line with quarry development (average clearing rates could be as gradual as 1.3 ha annually). Therefore, a large portion of Koala habitat will be retained on site for a number of years. This will also ensure the resident Koalas still have this habitat available and have time to move to adjacent habitats. The proponent has also established 25 ha of advance offset area consisting of Koala habitat tree plantings which have been confirmed as supporting Koalas now (Koala Research and Management 2018). The offset package proposed for the Project will also ensure that new areas of Koala habitat are established prior to impacts occurring to reduce the stress on the local Koala population and provide alternative habitat for them to use. Other mitigation measures that will be taken include the use of a fauna spotter during vegetation clearing. They will check areas for Koalas prior to any clearing and during clearing to ensure they are not harmed during clearing process. Clearing will be done in a sequential manner to ensure Koalas can safely move out of the area to adjacent habitat. If Koalas are found to be present that tree, and adjacent trees, will not be cleared until the Koala has moved from the area on its own accord. Indirect impacts may occur to Koalas from the quarry operation as a result of noise associated with drilling activities and as a result of an increase in weeds and pest animals (itself a result of

Species	Impact
	clearing further areas). Noise levels of quarry operations will be regulated by the permit conditions to what are deemed acceptable limits and will only be during the day, therefore is not expected to have a significant impact on Koalas. Bushland that is retained in the Study Area will be actively managed including weed management to ensure bushland remains in good ecological condition and weeds are not spread from the site. As a result of mitigation measures to be put in place, including establishment of advance habitats in the local region prior to loss of habitat, the Project is not expected to result in the species population decline. 7) Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat The Project through clearing of additional areas of bushland has the potential to increase light penetration and open up areas which may then increase weed invasion and numbers of pest animals to adjacent bushland. Weeds have the potential to reduce movement of Koalas between trees and feral animals such as wild dogs prey on Koalas. Areas of retained bushland will be actively managed including weed and pest animal control to maintain the bushland areas in good condition and reduce threats. Hygiene protocols in the quarry operational areas will also be implemented to reduce any weeds or disease being introduced to the site, or spread from the site. Based on implementing the proposed mitigation measures it is not expected the Project will result in an increase of invasive species in the species habitat. 8) Introduce disease that may cause the species to decline The most well-known disease present in the Koala population is associated with particular strains of Chlamydia. Koala Retrovirus was recently identified and is thought to be responsible for a range of conditions, including leukaemia and an immunodeficiency syndrome (DoEE, 2018). The Project is not likely to directly result in an increase in Chlamydia in Koalas. This is a broader issue for the population. But through a cumulative loss of Koala habitat and increase in stress on animals from dog attacks and

Species	Impact
	fragmentation of habitat etc the number of Koalas contracting Chlamydia are increasing. 9) Interfere substantially with the recovery of the species DoEE (2018) identifies a number of recovery and conservation objectives through Commonwealth Conservation Advice. These are listed below: • Develop and implement a development planning protocol to be used in areas of Koala subpopulations or subpopulation fragments to prevent loss of Koala subpopulations, habitat critical to the survival of the species and vital habitat connectivity. • Development plans should explicitly address ways to mitigate risk of vehicle strike when development occurs adjacent to, or within, Koala habitat. • Develop and implement a management plan to control the adverse impacts of predation on Koalas by dogs in urban, peri-urban and rural environments. • Monitor the progress of recovery, including the effectiveness of management actions and the need to adapt them, if necessary. • Identify populations of high conservation priority. • Develop and implement options of vegetation recovery and re-connection in regions containing fragmented Koala populations, including inland regions in which Koala populations were diminished by drought and coastal regions where development pressures have isolated Koala populations. • Investigate formal conservation arrangements, management agreements and covenants on private land, and, for both Crown and private land, investigate and/or secure inclusion of habitat critical to the survival of the Koala in reserve tenure, if possible. • Engage with private landholders and land managers responsible for the land on which populations occur and encourage these key stakeholders to contribute to the implementation of conservation management actions. • Manage any other known, potential or emerging threats such a Bell Miner (Manorina melanophrys) associated Dieback or Eucalyptus rust. The Project will not interfere substantially with any of these objectives. In fact through implementation of the Project’s offset package there will be a net gain in Koala habitat. Conclusion Based on

Species	Impact
	an evaluation of all criteria, the Project was found to have a significant impact on Koalas. The Project will result in the loss of 55.46 ha of habitat critical to the survival of Koalas and a reduction in occupation and movement through the site. However through the identified mitigation measures such as staged clearing and an offset program which will establish a net-gain in Koala habitat areas in advance of impacts occurring, the Project will ensure impacts on the local Koala population are minimised.
Greater Glider (Petauroides volans)	46.77ha Impact Assessment 1) Lead to a long term decrease in size of a population The species was identified as likely to occur in the Study Area due to a number of records of the species in adjacent areas and the site supporting eucalypt woodlands containing preferred foraging resources. The Study Area also supports mature eucalypt trees containing hollows that have potential to support breeding. Clearing of habitat for Greater Glider will occur as a result of the quarry extension resulting in loss of up to 46.77 ha. Within the Study Area large areas of eucalypt woodland containing preferred foraging resources will be retained. There are also large tracts of eucalypt woodland in adjacent areas that will provide habitat and refuge for the species, many of which are in protected areas. Records of the species have been recorded from Venman Bushland National Park and Daisy Hill Conservation Park. The Study Area will retain areas of bushland that provide connectivity to these habitats. To avoid and minimise impacts on Greater Glider fauna spotter catchers will be present prior to clearing to check for the presence of any hollow bearing trees. Procedures will then be put in place to ensure impacts are minimised through retaining the hollow bearing trees for another 24 hrs while adjacent trees are cleared to allow species to vacate the hollows overnight. When hollow bearing trees are cleared procedures will be put in place to minimise impacts to species. The relocation of hollows into adjacent areas of bushland will also be implemented. These measures will be outlined in a SMP. Given the

Species	Impact
	extent of habitat remaining in the locality, coupled with the implementation of mitigation measures, the Project is not likely to harm any individuals or lead to a long term decrease in the size of an important population. 2) Reduce the area of occupancy of an important population The Project will result in a loss of 46.77 ha of preferred habitat for the species including potential breeding habitat. Clearing of habitat will be staged over 50 years. Vegetation will be gradually cleared in line with quarry development (average clearing rates could be as gradual as 1.3 ha annually). Therefore, large areas of potential habitat will be retained over the course of the Project and be available for the species. Any loss of hollow bearing trees that can't be avoided, the hollow will be relocated to adjacent bushland on site, with the aim that there is a no net loss of breeding resources for the species on site. Large areas of foraging and breeding habitat will also still occur in adjacent bushland including Venman Bushland National Park and Daisy Hill Conservation Park. The Project is not expected to reduce the area of occupancy for an important population. 3) Fragment an existing important population into two or more populations The local area is likely to support an important population and habitat for the species due to a high number of records in adjacent bushland. While the Project will result in staged clearing over 50 years it won't significantly fragment Greater Glider's habitat in the local area, or result in a population being split into two populations. There are tracts of habitat that will remain on site post clearing which are connected to larger habitats in adjacent areas. These adjacent habitats will support the species and provide connectivity. 4) Adversely affect habitat critical to the survival of a species The Project will result in a loss of 46.77 ha of preferred habitat for the species. The loss of this small area of foraging habitat in the Study Area is not likely to significantly affect habitat critical to the survival of the species. There are also areas of suitable habitat being retained on site, and large tracts of habitat are present in adjacent areas. Where loss of hollow

Species	Impact
	bearing trees is unavoidable, hollows will be translocated to adjacent bushland on the site to maintain breeding habitat. Clearing of habitat will be staged over 50 years. Vegetation will be gradually cleared in line with quarry development (average clearing rates could be as gradual as 1.3 ha annually). Therefore large areas of potential habitat will be retained over the course of the Project and be available for the species. 5) Disrupt the breeding cycle of an important population Females give birth to a single young from March to June (TSSC 2016). Their relatively low reproductive rate may render isolated populations in small remnants prone to extinction (TSSC 2016). Where possible clearing will avoid being done in the core breeding season. To avoid and minimise impacts on Greater Glider breeding habitat and young, fauna spotter catchers will be present prior to clearing to check for the presence of the species and hollow bearing trees. Procedures will then be put in place to ensure impacts are minimised through retaining the hollow bearing trees for another 24 hrs while adjacent trees are cleared to allow species to vacate the hollows overnight. When hollow bearing trees are cleared procedures will be put in place to minimise impacts to species. The relocation of hollows into adjacent areas of bushland will also be implemented. These measures will be outlined in a SMP. The Project is not expected to disrupt the breeding cycle of an important population. 6) Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline The Project has potential to result in a direct loss of 46.77 ha of habitat. There is also potential for indirect impacts to occur to adjacent habitats through modification of habitat and decrease in condition over time. This may occur through increased fragmentation and weed invasion. Mitigation measures will be put in place to ensure retained habitats on site maintain their ecological condition such as through pest animal management, weed management and fire management. Hygiene protocols will also be implemented to ensure weeds are not introduced or spread from trucks,

Species	Impact
	vehicles and machinery. The direct and indirect impacts from the Project are not expected to result in a decline of the species. 7) Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat The Project has the potential to result in the spread of weed species. Weeds have the potential to compete with native flora species recruitment, reduce the ability for fauna species to utilise the area and can increase fuel loads and potential for hot wildfires to occur. Weeds are likely only to have a minor impact on Greater Glider as they forage and breed in mature eucalypts which are not as susceptible to weeds. Hygiene protocols, such as wash-down facilities, will be present on site to ensure weeds are not brought in with vehicles or machinery. Based on implementing the proposed mitigation measures it is not expected the Project will result in an increase of invasive species that would significantly impact on the Greater Glider's habitat. 8) Introduce disease that may cause the species to decline Eucalypt dieback is a known threat to the species and can occur as a result of a variety of pests, pathogens and parasites including soil pathogens. They can take advantages of trees stressed by environmental changes. Hygiene protocols, such as wash-down facilities, will be present on site to ensure pathogens are not brought in with vehicles or machinery. Monitoring of bushland on site will also occur to check for any signs of eucalypt dieback. No specific disease is applicable to Greater Glider. 9) Interfere substantially with the recovery of the species The Project is not expected to interfere substantially with the recovery of the species. Clearing of habitat will be undertaken sequentially in small areas, and areas of habitat will be retained on site and in adjacent areas. This availability and connectivity of foraging and breeding habitat will ensure any Greater Glider will have available foraging and breeding resources. Fire will also be managed on site to ensure hot wildfires are minimised and hollow bearing trees protected. Conclusion The Project will not have a significant impact on the Greater Glider as: • vegetation clearing will result in a

Species	Impact
	total loss of 46.77 ha of habitat over 50 years; • Clearing of habitat will be staged over 50 years. Vegetation will be gradually cleared in line with quarry development (average clearing rates could be as gradual as 1.3 ha annually). Therefore, maintaining habitat areas on site; • hollow bearing trees will be retained where possible, and if their loss is unavoidable the hollow will be translocated into adjacent suitable habitat on site to ensure a no net loss of breeding resources; • large areas of habitat are available in adjacent areas which are connected to the Study Area, including protected areas which will support breeding and maintain the populations; • fauna spotter catchers will be present prior to, and during clearing, to check for presence of the species and ensure impacts are minimised.
Grey Headed Flying Fox (Pteropus poliocephalus)	46.69ha Impact Assessment 1) Lead to a long term decrease in size of a population The species was identified as having potential to occur in the Study Area due to localised records and the site supporting eucalypt woodlands containing preferred foraging resources. Clearing of potential habitat for Grey-headed Flying-fox will occur as a result of the quarry extension resulting in loss of up to 46.69 ha of remnant vegetation that supports mature tree specimens. Within the Study Area large areas of eucalypt woodland and closed canopy rainforest containing preferred foraging resources will be retained. There are also large tracts of eucalypt woodland in adjacent areas that will provide habitat and refuge for the species, many of which are in protected areas. Given the extent of habitat remaining in the locality, coupled with the implementation of mitigation measures, the Project is not likely to harm any individuals or lead to a long term decrease in the size of an important population. 2) Reduce the area of occupancy of an important population The Project will result in a loss of 46.9 ha of preferred habitat for the species, remnant vegetation with mature tree specimens that flower and fruit. The species is migratory and its movements and occupancy of an area follow flowering and fruiting tree species. Therefore the loss of this small area of

Species	Impact
	foraging habitat in the Study Area is not likely to significantly impact the occupancy of the local region as there are large areas of suitable habitat present in adjacent areas. Key winter feeding habitat of Melaleuca quinquenervia forests are limited within the impact area and whilst RE12.3.6 occurs within the impact area mature specimens of Melaleuca quinquenervia are limited in number. The clearing of the proposed extension area will be staged over 50 years (average clearing rates could be as gradual as 1.3 ha annually). Therefore, large areas of potential habitat will be retained over the course of the Project and be available for the species. 3) Fragment an existing important population into two or more populations The Project will not result in any major fragmentation of habitat, nor will it result in a population being split into two populations. There are tracts of habitat that will remain post clearing which are connected to larger habitats in adjacent areas. These adjacent habitats will support the species and provide connectivity. As the species is migratory it will be able to move between these patches, including forage across cleared lands in search of flowering and fruiting tree specimens 4) Adversely affect habitat critical to the survival of a species The Project will result in a loss of 46.69 ha of preferred habitat for the species. The species has not been observed to occupy the site, the loss of the foraging habitat in the Study Area is not likely to significantly affect habitat critical to the survival of the species. There are also areas of suitable habitat being retained on site, and large tracts of habitat are present in adjacent areas. Clearing of habitat will be staged over 50 years. Vegetation will be gradually cleared in line with quarry development (average clearing rates could be as gradual as 1.3 ha annually). Therefore, large areas of potential habitat will be retained over the course of the Project and be available for the species. 5) Disrupt the breeding cycle of an important population Breeding generally occurs in early autumn in association with larger flying-fox camps with females giving birth in October. Flying-fox camps have not been observed

Species	Impact
	within the impact area, clearing of the proposed extension area will be staged over 50 years (average clearing rates could be as gradual as 1.3 ha annually). Therefore, large areas of potential habitat will be retained over the course of the Project and be available for the species. To avoid and minimise impacts on Grey-headed Flying-fox fauna spotter catchers will be present prior to clearing to check for the presence of the species. Procedures will then be put in place to avoid and minimise impacts The Project is not expected to disrupt the breeding cycle of an important population. 6) Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline The Project has potential to result in a direct loss of 46.69 ha of habitat. There is also potential for indirect impacts to occur to adjacent habitats through modification of habitat and decrease in condition over time. This may occur through increased fragmentation and weed invasion. Mitigation measures will be put in place to ensure retained habitats on site maintain their ecological condition such as through pest animal management, weed management and fire management. Hygiene protocols will also be implemented to ensure weeds are not introduced or spread from trucks, vehicles and machinery. The direct and indirect impacts from the Project are not expected to result in a decline of the species. 7) Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat The Project has the potential to result in the spread of weed species. Weeds have the potential to compete with native flora species recruitment, reduce the ability for fauna species to utilise the area and can increase fuel loads and potential for hot wildfires to occur. Weeds are likely only to have a minor impact on Flying-foxes as the forage and breed in mature tree specimens which are not as susceptible to weeds. Hygiene protocols, such as wash-down facilities, will be present on site to ensure weeds are not brought in with vehicles or machinery. Based on implementing the proposed mitigation measures it is not expected

Species	Impact
	the Project will result in an increase of invasive species that would significantly impact on the Grey-headed Flying-fox's habitat. 8) Introduce disease that may cause the species to decline Eucalypt dieback is a known threat to the species and can occur as a result of a variety of pests, pathogens and parasites including soil pathogens. They can take advantages of trees stressed by environmental changes. Hygiene protocols, such as wash-down facilities, will be present on site to ensure pathogens are not brought in with vehicles or machinery. Monitoring of bushland on site will also occur to check for any signs of eucalypt dieback. 9) Interfere substantially with the recovery of the species The Project is not expected to interfere substantially with the recovery of the species. Clearing of habitat will be undertaken sequentially in small areas, and areas of habitat will be retained on site and in adjacent areas. This availability and connectivity of habitat will ensure any Grey-headed Flying-fox will have available foraging and breeding resources. Conclusion The Project will not have a significant impact on Grey?headed Flying?fox as: • vegetation clearing will result in a total loss of 46.69 ha of habitat over 50 years; • B180312RP1 clearing will be staged in line with quarry development, occurring gradually, therefore maintaining habitat areas on site; • the local area has limited records and the species important populations occur in NSW and Victoria, therefore the Project site is likely to only provide marginal foraging habitat; • large areas of habitat will be retained in the local area which are connected to the Project site. As the species is nomadic following flowering eucalypts there will be adequate foraging resources available; • fauna spotter catchers will be present prior to, and during clearing, to check for presence of the species and their nests.

2.4.2 Do you consider this impact to be significant?

Yes

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?

No

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

No

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

No

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

No

2.9 Is the proposed action likely to have ANY direct or indirect impact on a water resource related to coal/gas/mining?

No

2.10 Is the proposed action a nuclear action?

No

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

No

2.12 Is the proposed action to be undertaken in a Commonwealth Heritage Place Overseas?

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?

No

Section 3 - Description of the project area

Provide a description of the project area and the affected area, including information about the following features (where relevant to the project area and/or affected area, and to the extent not otherwise addressed in Section 2).

3.1 Describe the flora and fauna relevant to the project area.

Flora

Detailed flora surveys of vegetation communities in the Study Area have confirmed the 222 ha Study Area supports 125.98 ha of remnant vegetation and 8.66 ha of high value regrowth (HVR) with varying age and height. Seven regional ecosystems (REs) were confirmed to occur on the Project site through ground-truthing. The remaining areas are cleared or disturbed from previous land use. All areas were found to have weed incursion consisting of exotic pasture grasses and common environmental weeds. The Project was found to impact on a total of 55.45 ha of remnant and regrowth vegetation.

A breakdown of impacts to each RE is below:

• RE12.3.1 (Gallery rainforest (notophyll vine forest) on alluvial plains);

• RE12.3.6 - *Melaleuca quinquenervia* +/- *Eucalyptus tereticornis*, *Lophostemon suaveolens*, *Corymbia intermedia* open forest on coastal alluvial plains;

• *Corymbia intermedia*, *E. acmenoides* open forest on metamorphics +/- interbedded volcanics

• RE12.11.24 - *Eucalyptus carnea*, *E. tindaliae*, *Corymbia intermedia* +/- *E. siderophloia* or *E. crebra* woodland on metamorphics +/- interbedded volcanics;

• RE12.11.25 - *Corymbia henryi* and/or *Eucalyptus fibrosa subsp. fibrosa* +/- *E. crebra*, *E. carnea*, *E. tindaliae* woodland on metamorphics +/- interbedded volcanics;

• RE12.11.26 - *Eucalyptus baileyana* and/or *E. planchoniana* woodland to open forest on metamorphics +/- interbedded volcanics, and

• RE12.11.27 - *Eucalyptus racemosa subsp. racemosa* and/or *E. seeana* and *Corymbia intermedia* woodland on metamorphics +/- interbedded volcanics

Please refer to the attached *Terrestrial Ecology Assessment* prepared by Gondwana Ecology Group (Section 2) and the *Environmental Offset Strategy* prepared by EMM (Section 5.1) for more detailed assessment of vegetation communities and flora on the site.

Fauna

More than 134 fauna species have been recorded within the Study Area and comprises 11 amphibians, 73

birds, 33 mammals15 and 17 reptiles. This includes several pest/non-native species.

It is acknowledged that additional species are likely to occur within the subject area and the numbers

reported are those from physical surveys within the area.

The following species of conservation significance have been recorded within or immediately adjacent

to the subject land (i.e. from the JWA 2003-2004 and recent 2017/2018 surveys):

• Tusked Frog (vulnerable - Queensland)

• Koala (vulnerable – Queensland and Commonwealth)

• Grey-headed Flying-fox (vulnerable – Commonwealth)

• Powerful Owl (vulnerable - Queensland)

Not unexpectedly, give the current and historical land use, seven pest species were also recorded,

comprising one amphibian, one bird, four mammals and one reptile.

No suitable habitat for migratory shorebird/wetland species (e.g. sandpiper, greenshank) occurs

within or immediately adjacent to the subject land. Potential habitat (e.g. forested habitat along

Tingalpa Creek) occurs for migratory terrestrial species (e.g. fantails, monarch, flycather). Potential

habitat occurs for common, mobile marine species, including aerial insectivores, raptors (e.g. seaeagle,

osprey, bee-eater, swift, goose, egret, needle-tail).

Additional description of the assessment of potential listed fauna species under EPBC Act that may occur in the Project site is included in the *Terrestrial Ecology Assessment* prepared by Gondwana Ecology Group (Section 6)

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

The quarry is located within the catchment of Tingalpa Creek, which flows through the site (limited to Lot 100) and drains to Leslie Harrison Dam. There are a number of gullies running through the site. The quarry is run in accordance with an approved environmental management plan and conditions of Environmental Authority which ensures that neither seepage nor surface runoff from disturbed areas is discharged to Tingalpa Creek without treatment. Water collected at the pit sump is actively reused (dust suppression and moisture content in roadbase materials) in accordance with a stormwater management plan.

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

The soils of the Karreman West Mount Cotton Quarry are dominated by yellow, grey-brown and red kurosols across lower slopes and shallower tenosols on the steeper slopes. These soils are characterised by shallow, weakly structured A-horizons underlain by clay-rich B-horizons grading into weathered bedrock at depths of generally around one metre or so.

The vegetation characteristics are described in section 3.1 above and in the attached Terrestrial Ecology Assessment prepared by Gondwana Ecology Group (Section 2) and the Environmental Offset Strategy prepared by EMM (Section 5.1).

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

There are no other identified outstanding natural features and/or any other important or unique values relevant to the project area.

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

The vegetation characteristics are described in section 3.1 above and in the attached *Terrestrial Ecology Assessment* prepared by Gondwana Ecology Group (Section 2) and the *Environmental Offset Strategy* prepared by EMM (Section 5.1).

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

The greywacke quarry or ‘pit shell’ will be constructed as a series of benches. The pre-quarrying surface level varies between RL 90m AHD to RL 50m AHD, with an average surface of approximately RL 70m AHD. The vertical interval between benches is between 12m to 15m. The width of terminal benches is approximately 10m. The overall gradient of the terminal batter slopes is between 45 to 50 degrees from the horizontal.

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

The extension area is within (and adjacent to) an active quarry with associated roads, infrastructure and quarry activities. The land has also had clearing for several dwelling and improvements (e.g. fences, roads and dams) for semi-rural/small scale farming activities. While a large proportion of the area contains regrowth vegetation, there are areas of relatively intact habitats.

Detailed flora surveys of vegetation communities in the Study Area have confirmed the 223.5 ha Study Area
supports 125.98 ha of remnant vegetation and 8.66 ha of high value regrowth (HVR) with varying age and
height. Seven regional ecosystems (REs) were confirmed to occur on the Site through ground?truthing. The
remaining areas are cleared or disturbed from previous land use. All areas were found to have weed
incursion consisting of exotic pasture grasses and common environmental weeds.

Please refer to the previously attached Terrestrial Ecology Assessment prepared by Gondwana Ecology Group and the Environmental Offset Strategy prepared by EMM

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

There are no known or mapped heritage places or values in the disturbance footprint.

3.9 Describe any Indigenous heritage values relevant to the project area.

A cultural heritage assessment by the Jagera Corporation in 2004 of Lots 2-5 and 100, did not identify any indigenous cultural heritage sites. Contact has again been made with the relevant Indigenous Party to seek guidance on ensuring that Aboriginal Cultural Heritage is appropriately considered as part of the extension application.

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

Freehold

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

The proposed action, being the extension of an existing quarry pit, will take place on Lot 1-5 on RP186598 in the Redland City Council Shire area. Lots 3-5 already contain an approved quarry excavation area while the balance of the site is vacant but vegetated (except for a house and dam on Lot 2). Lot 100 is included in the application because it contains infrastructure including administration and staff offices, employee amenities, testing laboratory, weighbridges, workshops, stores and fuel storage facilities, water supply and sedimentation ponds, multi?stage crushing and screening plant, CTB roadbase plant, product stockpiles, truck fleet parking and on-site car parking areas. There is no change proposed to this infrastructure, nor is there an intention to replicate the infrastructure in the area of pit extension.

Section 4 - Measures to avoid or reduce impacts

Provide a description of measures that will be implemented to avoid, reduce, manage or offset any relevant impacts of the action. Include, if appropriate, any relevant reports or technical advice relating to the feasibility and effectiveness of the proposed measures.

Examples of relevant measures to avoid or reduce impacts may include the timing of works, avoidance of important habitat, specific design measures, or adoption of specific work practices.

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

The existing West Mount Cotton Quarry has been operating since the 1950's and is situated within a designated extractive industry zone. The proposed extension area will constitute an extension to the existing quarry pit within the mapped KRA by the Queensland Government. KRAs are areas earmarked for future quarry extraction and aim to ensure future planning processes allow for these land uses to occur given their importance to the local economy.

The proposed extension area reflects the extent of the quarry resource within the current KRA boundary. Ecological, economic, social and statutory compliance studies of the quarry resource were conducted during 2004. These studies were conducted in support of a previous extension application when the extent of KRA 72 West Mount Cotton was significantly greater.

As a result of these studies, significant areas in proximity to the quarry were identified as having high ecological values in respect to the condition of the vegetation, and their value as high quality koala (*Phascolarctos cinereus)* habitat. In total, 63.87 ha of remnant vegetation was agreed to be excluded from future extension areas. This vegetation includes, 16.58 ha of Endangered regional ecosystem, 43.69 ha of Of Concern regional ecosystem, 12.51 ha of watercourse vegetation, 5.63ha of coastal rainforest and 58.24 ha of koala habitat located principally to the north of the existing quarry. These areas are not part of the current proposal and will be retained for their conservation values going forward.

The remaining area that occurs within the KRA was planned for future quarrying and the KRA was reduced to the current extent. At this time, advanced offsets were established by the proponent to meet the anticipated koala offset requirements of planned future extension areas and the balance land within Lot 100 on SP234173 was set aside for conservation. Additional information in relation to the history of the quarry is provided in the *Environmental Offset Strategy* prepared by EMM (Appendix E).

A range of mitigation measures will be implemented that will reduce environmental impacts and these include:

· staging of vegetation clearing over the 50 year life of the Project. Vegetation will be gradually cleared in line with quarry development (average clearing rates could be as gradual as 1.3 ha annually). Therefore, large areas of remnant vegetation and habitats will be retained on the Site for a longer period of time;

· use of fauna spotter catchers during clearing to ensure no impacts occur to Koalas or other fauna during vegetation clearing;

· weed hygiene protocols and biosecurity procedures will be implemented to ensure weeds and bacteria are not introduced or spread from the site during clearing operations;

· dust and noise reduction measures will be in place to ensure impacts on local wildlife and bushland is minimised;

· The proposed extension is for extraction only, with processing/loading continuing to occur on Lot 100. This ensures familiarity among operators in the pit with the environmental management procedures.

· an advanced offset of Koala planting has been established nearby to the impact site which is presently supporting Koalas and will be legally secured and managed into the future to become a high-quality Koala habitat area and support the local Koala population;

· staged delivery of koala habitat offsets will occur in advance of clearing to minimise the immediate impact from the loss of native vegetation and habitats in the local region as well as deliver a net-gain for those MNES identified as having been significantly impacted; and

· as part of the offset package legally securing and actively managing bushland areas within Lot 100 SP234173 already set aside for retention, to improve habitat quality and overall ecological condition and reduce threats such as from bushfire and pest animals.

The existing EMP contains the following vegetation management practices:

- requiring that vegetation not be interfered with, damaged or destroyed without the permission of the Quarry Manager - requiring vegetation to be cleared in stages and each stage of clearing to be guided by a Vegetation Clearing Plan - requiring all vehicles and equipment (other than vehicles and equipment carrying out works authorised by the Quarry Manager) to remain on defined roads, hardstands and workings - requiring all plant and equipment, including trucks, bulldozers, backhoes etc to be cleaned and be free of soil and weed seeds prior to entering the site - avoiding pushing cleared vegetation into gullies, drainage lines and standing vegetation - destroying declared plant as soon as possible after their presence has been identified and reported - banning the lighting of fires unless expressly permitted by the Quarry Manager and DEHP consulting adjacent land holders on fire management strategies - designating and

demarcating land for nature refuge, retaining bushland buffers and protecting riparian vegetation - minimising the use of weedicides and fertilisers - planting remaining bushland edges to reduce edge effects of clearing - banning the collection of fire wood and timber from areas to be protected - excluding fire from vine forest vegetation community - undertaking vegetation and fauna studies to identify ecological values of the site - limiting land disturbances to that absolutely essential for extraction - protecting vegetation communities in buffer land and flag areas to be cleared - using indigenous plant species in the rehabilitation of the workings - planting species which support local fauna - revegetating or allowing natural regeneration of areas of the site which has been cleared in the past and will not be disturbed by extractive operations - salvaging topsoil for use in rehabilitation activities - maintaining vegetation cover on topsoil stockpiles to enhance the survival of soil flora/microbes - training staff on environmental awareness, endangered species, control of weeds, pests and pathogens - flagging of buffer areas to prevent the intrusion of mobile equipment - implementing Water Quality Management Plan to prevent erosion and sedimentation of gullies and other undisturbed areas - enhancing and/or planting of buffer land with local provenance plant species (native tree which occur in the locality) to improve habitat potential of buffer land - implementing progressive rehabilitation

In relation to fauna, the existing EMP requires the following:

1. Prior to starting work each day, inspect the work area for fauna and make sure that fauna are

clear of the work area

2. undertaking surveys (diurnal and nocturnal where appropriate) for Koalas which are to be

completed immediately prior to clearing to ensure that no Koalas are in the area proposed for

clearing

3. identifying habitat trees prior to cleating and once this has been completed, clearing is to be

conducted using a staged approach where the smaller non habitat trees are removed in the first

stage with the larger remaining habitat trees removed three to five days after the initial clearing.

This staged method creates a disturbance stimulus and provides fauna with time to leave the site

thus maximizing the chances of fauna survival while reducing the need for human intervention

for translocation or rescue.

4. ensuring clearing operators are trained on the appropriate clearing procedures, particularly for

the identification of Koalas, prior to commencement of clearing

5. identifying habitat trees immediately prior to felling and ensuring an appropriately qualified person is present to inspect the trees and relocate remaining fauna where possible. An example of an appropriately qualified person would be someone with the requisite training and skills to supervise the capture and release of fauna.

6. undertaking a second inspection following felling of the relevant trees to identify and relocate any other fauna disturbed by the clearing process or remaining with the felled timber

7. ensuring that the actual felling of the habitat trees be conducted in manner that will maximize the chances of survival for any fauna remaining within the tree hollows. This will involve pushing rather than cutting and cushioning the tree fall with other felled timber and foliage.

8. record keeping and supply of capture and release records to Queensland Parks and Wildlife Service in accordance with their licensing conditions following completion of the project.

Since the 1990's, Karreman Quarries have developed a strong appreciation of the ecological and strategic importance of the need to offset the impacts of vegetation clearing, where such clearing is unavoidable for the conduct of extractive industry. Over several decades, Karreman has actively engaged in acquiring additional lands around its quarry site to act as a buffer and build an inventory of bush land that supports remnant vegetation and koala habitat.

In 2010, after all opportunities were exhausted to purchase lands surrounding the quarry to provide further vegetation offsets for future extensions anticipated for the quarry, Karreman studied and surveyed land within the regional area of the quarry and after field studies and evaluation, purchased the "Pineapple farm" land nearby to the north-west along Avalon Road. The previous owner of the farm still lives on the land in a sub-leased area.

Tree planting and establishment of juvenile trees at the Pineapple farm over approximately 21 ha has occurred and surveys have confirmed koala visitation and usage as koala habitat. Karreman has demonstrated that revegetation by a quarry in the Redland City of previously cleared agricultural land, can be achieved to establish koala habitat and koala usage. Through the experience gained and working with ecological experts, Karreman has further improved their knowledge and understanding of re-establishing and sustaining koala habitat by rehabilitation and revegetation of previously disturbed lands.

Karreman Quarries have demonstrated a commitment to the continued rehabilitation of

vegetation offset lands to balance and mitigate vegetation clearing impacts from the extension of quarrying operations (when clearing is unavoidable in order to replace depleted hard rock reserves).

It is noted that Karreman Quarries has actively secured (through purchase or legal agreement) a number of properties surrounding the quarry that are able to be rehabilitated/revegetated to create a net positive ecological outcome. The security of these properties provides certainty of the outcome.

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.

The Quarry has, over a number of decades, avoided and mitigated impacts in order to retain areas containing the most significant environmental qualities. Additional measures to avoid and mitigate are described in section 4.1. An assessment of impacts on matters protected by the EPBC Act are described elsehwhere in this referral and in the attached technical reports. To the extent that the proposed actions are found to have a significant residual impact on matters protected by the EPBC, potential offsets have been identified (including advanced offset plantings already established nearby) which will result in no net environmental loss as a result of the proposed actions.

Section 5 – Conclusion on the likelihood of significant impacts

A checkbox tick identifies each of the matters of National Environmental Significance you identified in section 2 of this application as likely to be a significant impact.

Review the matters you have identified below. If a matter ticked below has been incorrectly identified you will need to return to Section 2 to edit.

5.1.1 World Heritage Properties

No

5.1.2 National Heritage Places

No

5.1.3 Wetlands of International Importance (declared Ramsar Wetlands)

No

5.1.4 Listed threatened species or any threatened ecological community

Listed threatened species and communities - Yes

5.1.5 Listed migratory species

No

5.1.6 Commonwealth marine environment

No

5.1.7 Protection of the environment from actions involving Commonwealth land

No

5.1.8 Great Barrier Reef Marine Park

No

5.1.9 A water resource, in relation to coal/gas/mining

No

5.1.10 Protection of the environment from nuclear actions

No

5.1.11 Protection of the environment from Commonwealth actions

No

5.1.12 Commonwealth Heritage places overseas

No

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.

Not Applicable

Section 6 – Environmental record of the person proposing to take the action

Provide details of any proceedings under Commonwealth, State or Territory law against the person proposing to take the action that pertain to the protection of the environment or the conservation and sustainable use of natural resources.

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

Karreman Quarries currently operates multiple quarries in accordance with its environmental approvals and licences (including an existing ERA over this site (Ref: SPCE01241210)) with strict requirements relating to various environmental matters such as vegetation, rehabilitation, noise, dust & water quality.

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.

In 2004 proceedings were commenced against Karreman Quarries Pty Ltd in the Magistrates Court at Cleveland for:

1. a breach of the Environment Protection Act 1993 (QLD) for an action that might cause environmental harm; and

2. for a development offence under the Integrated Planning Act (QLD) 1997,

arising from quarrying activities outside of an approved quarry footprint.

Subsequently a development approval was obtained to authorise retrospectively those activities.

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

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

Karreman Quarries currently operates multiple quarries in accordance with its environmental approvals and licences (including an existing ERA over this site (Ref: SPCE01241210)) with strict requirements relating to various environmental matters such as vegetation, rehabilitation, noise, dust & water quality.

An Environmental Management Plan was approved as part of the previous approval in 2012 and remains the current environmental policy for the site.

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?

No

Section 7 – Information sources

You are required to provide the references used in preparing the referral including the reliability of the source.

7.1 List references used in preparing the referral (please provide the reference source reliability and any uncertainties of source).

Reference Source	Reliability	Uncertainties
JWA (2004) Ecological Report - MCU Application for extension of quarry activities – West Mount Cotton Quarry. Report prepared for Connor O'Meara Solicitors.	Good	No known uncertainties
DNRM (2017) Regulated vegetation mapping and supporting regional ecosystem mapping.	Good	No known uncertainties
Commonwealth (2017) protected matters report – co-ordinates -27.6133 153.1895.	Good	No known uncertainties
DSDMI (2018) SPP mapping for MSES.	Good	No known uncertainties
DEHP (2018) Protected Flora Survey Trigger Map. Accessed 23 February 2018.	Good	No known uncertainties
DISITIA (2018) Wildlife Online Extract. Species list for specific point - co-ordinates -27.6133; 153.1895.	Good	No known uncertainties
DEHP (2016) Map 4: Logan City Council and Map 6: Redland City Council	Good	No known uncertainties
http://www.environment.gov.au/ biodiversity/ threatened/communities/pubs/101-listing-advice.pdf	Good	No known uncertainties
DEHP (2017) Biodiversity and Conservation Values Report. Accessed August 2017.	Good	No known uncertainties
Department of the Environment and Energy (DoEE), 2012. EPBC Act Environmental Offsets Policy and How to use the Offsets assessment guide	Good	No known uncertainties

Reference Source	Reliability	Uncertainties
DoEE, 2013. Significant Impact Guidelines 1.1: Matters of National Environmental Significance	Good	No known uncertainties
Department of Environment and Heritage Protection (DEHP), 2014a. Significant Residual Impact Guidelines – Environmental Protection Act 1994, Nature Conservation Act 1992	Good	No known uncertainties
DEHP, 2014b. Significant Residual Impact Guideline for matters of state environmental significance and prescribed activities assessable under the Sustainable Planning Act 2009 Environment Conservation & Offset Services (ECOS) 2018. West Mount Cotton Road Quarry – Pit Extension Project, Vegetation Survey Report. Prepared for Karreman Quarries Pty Ltd	Good	No known uncertainties
Koala Research and Management 2018. Reassessment of the koala population at Karreman Quarry and surrounding properties. Prepared for Karreman Quarries Pty Ltd	Good	No known uncertainties
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.	Good	No known uncertainties
DERM 2009. Decline of the koala coast population: population status in 2008. (Department of Environment and Resource Management, Queensland Government: Brisbane.)	Good	No known uncertainties
de Villiers, D. L. 2015. The role of urban koalas in maintaining	Good	No known uncertainties

Reference Source	Reliability	Uncertainties
regional population dyanmics of koalas in the Koala Coast. PhD Thesis. The University of Queensland, Brisbane, Australia.		
Dique, D.S., de Villiers, D.L. and Preece, H.J. 2003. Evaluation of line-transect sampling for estimating koala abundance in the Pine Rivers Shire, south-east Queensland. Wildlife Research 30: 127-133	Good	No known uncertainties
Dique, D.S., Preece, H.J., Thompson, J., and de Villiers, D.L. 2004. Determining the distribution and abundance of a regional koala population in south-east Queensland for conservation management. Wildlife Research 31: 109-117.	Good	No known uncertainties
Dique, D.S., Penfold, G., Thompson, J.A., Leslie, R. and Preece, H.J. 2001. Koala distribution and density in southeast Queensland: the accuracy and precision of koala surveys. In, 'Research and Management of Nonurban Koala Populations'. (Eds. K. Lyons, A. Melzer, F. Carrick and D. Lamb.) pp.102-121. (Koala Research Centre of Queensland:Rockhampton.)	Good	No known uncertainties
EPA 2007. Report on Koala Coast surveys 2005-2006. (Environmental Protection Agency, Queensland Government, Brisbane.)	Good	No known uncertainties
Gordon, G. 1991. Gordon, G. 1991. Estimation of the age of the koala, Phascolarctos cinereus (Marsupialia: Phascolarctidae) from tooth wear and growth. Australian Mammalogy 14: 5-12	Good	No known uncertainties
Hanger, J., de Villiers, D., Forbes, N., Nottidge, B., Beyer, H., Loader, J. and Timms, P.	Good	No known uncertainties

Reference Source	Reliability	Uncertainties
(2017) Moreton Bay Rail Koala Management Program: Final technical report for Queensland Department of Transport and Main Roads.		
Rhodes, J. R., Beyer, H. L., Preece, H.J. and McAlpine, C.A. 2015. South East Queensland Koala Population Modelling Study. UniQuest, Brisbane, Australia.	Good	No known uncertainties
Rhodes, J. R., C. F. Ng, D. L. de Villiers, H. J. Preece, C. A. McAlpine, and H. P. Possingham. 2011. Using integrated population modelling to quantify the implications of multiple threatening processes for a rapidly declining population. Biological Conservation 144:1081-1088.	Good	No known uncertainties
Queensland Government. 2016. Queensland Environmental Offsets Policy (Version 1.2). (Department of Environment and Heritage Protection, Brisbane.)	Good	No known uncertainties

Section 8 – Proposed alternatives

You are required to complete this section if you have any feasible alternatives to taking the proposed action (including not taking the action) that were considered but not proposed.

8.0 Provide a description of the feasible alternative?

Not taking the action.

It is not possible to delay the proposal, move the proposal or undertake other activities on the land.

Geological resources are fixed in location and are finite. The resource, where accessible under the current approvals, is nearing exhaustion. The proposed extension constitutes a logical extension of the existing footprint within the boundary of the State identified Key Resource Area. The operation has an existing and established market, having commenced in the 1950's, that would require servicing from an alternative location if not pursued. Extensions to existing operations ensure that potential impacts are consolidated and managed accordingly and can avoid the need for additional greenfield operations that have the potential to introduce new and additional impacts. No changes to existing ancillary infrastructure (including processing plant) and site access are required to facilitate the Project.

8.1 Select the relevant alternatives related to your proposed action.

8.27 Do you have another alternative?

No

Section 9 – Contacts, signatures and declarations

Where applicable, you must provide the contact details of each of the following entities: Person Proposing the Action; Proposed Designated Proponent and; Person Preparing the Referral. You will also be required to provide signed declarations from each of the identified entities.

9.0 Is the person proposing to take the action an Organisation or an Individual?

Organisation

9.2 Organisation

9.2.1 Job Title

Managing Director

9.2.2 First Name

Dick

9.2.3 Last Name

Karreman

9.2.4 E-mail

dick@karreman.com.au

9.2.5 Postal Address

PO Box 716
Cleveland QLD 4163
Australia

9.2.6 ABN/ACN

ACN

010168742 - KARREMAN QUARRIES PTY LTD

9.2.7 Organisation Telephone

(07)32066311

9.2.8 Organisation E-mail

dick@karreman.com.au

9.2.9 I qualify for exemption from fees under section 520(4C)(e)(v) of the EPBC Act because I am:

Not applicable

Small Business Declaration

I have read the Department of the Environment and Energy's guidance in the online form concerning the definition of a small a business entity and confirm that I qualify for a small business exemption.

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

9.2.9.2 I would like to apply for a waiver of full or partial fees under Schedule 1, 5.21A of the EPBC Regulations

No

9.2.9.3 Under sub regulation 5.21A(5), you must include information about the applicant (if not you) the grounds on which the waiver is sought and the reasons why it should be made

Person proposing the action - Declaration

I, DICK KARREMAN, 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 of or for the benefit of any other person or entity.

Signature: Karreman Date: 4 Dec 2018

I, DICK KARREMAN., the person proposing the action, consent to the designation of DICK KARREMAN as the proponent of the purposes of the action describe in this EPBC Act Referral.

Signature: Karreman Date: 4 Dec 2018.

9.3 Is the Proposed Designated Proponent an Organisation or Individual?

Organisation

9.5 Organisation

9.5.1 Job Title

Managing Director

9.5.2 First Name

Dick

9.5.3 Last Name

Karreman

9.5.4 E-mail

dick@karreman.com.au

9.5.5 Postal Address

PO Box 716
Cleveland QLD 4163
Australia

9.5.6 ABN/ACN

ACN

010168742 - KARREMAN QUARRIES PTY LTD

9.5.7 Organisation Telephone

(07) 3206 6311

9.5.8 Organisation E-mail

dick@karreman.com.au

Proposed designated proponent - Declaration

I, DICK KARREMAN, 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:.....Karreman..... Date: ..4 Dec 2018.....

9.6 Is the Referring Party an Organisation or Individual?

Organisation

9.8 Organisation

9.8.1 Job Title

Principal Planner

9.8.2 First Name

Kieran

9.8.3 Last Name

Ryan

9.8.4 E-mail

kieran@reelplanning.com

9.8.5 Postal Address

PO Box 2088
Milton QLD 4064
Australia

9.8.6 ABN/ACN

ABN

49116492123 - REEL PLANNING PTY LTD

9.8.7 Organisation Telephone

(07) 32175771

9.8.8 Organisation E-mail

mail@reelplanning.com

Referring Party - Declaration

I, Kieran Ryan, I 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: 04-12-18

Appendix A - Attachments

The following attachments have been supplied with this EPBC Act Referral:

1. 2012 Approval Part 1.pdf
2. 2012 Approval Part 2.pdf
3. 2012 EMP.pdf
4. 2014 Change Approval.pdf
5. Karreman_Owned_Properties_20180921.pdf
6. Site_Plan_Extension_Plan_20180828.pdf
7. Technical Ecology Report.pdf
8. Technical Ecology Report Attachments Part 1.pdf
9. Technical Ecology Report Attachments Part 2.pdf
10. West Mount Cotton Rd Offset Strategy Part 1.pdf
11. West Mount Cotton Rd Offset Strategy Part 2.pdf
12. West Mount Cotton Rd Offset Strategy Part 3.pdf