PUBLIC NOTIFICATION

Rockhampton Regional Council

Approval Sought: Material Change of Use

Proposed Development: "Other Change" to a Development Permit for Extractive Industry, Medium Impact Industry and a Warehouse

Where: 59793 Bruce Highway, Midgee

Lot Description: Lot 2 on RP888747

Application Reference: D/79-2017

Make a submission from:

16 May to 6 June 2022

You may make a submission to Rockhampton Regional Council

PO BOX 1860, Rockhampton QLD 4700
Email: enquiries@rrc.qld.gov.au
Phone: 07 4932 9000 or 1300 22 55 77

Click here to view the 'Guide to public notification of development and change applications'

For more information on planning requirements within the Rockhampton Region feel free to visit www.rrc.qld.gov.au



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18 February 2022
Ref: 2607.CA1.310.004

Planning Department
Rockhampton Regional Council
PO Box 1860
Rockhampton QLD 4700

Via email: developmentadvice@rrc.qld.gov.au

Dear Sir/Madam

OTHER CHANGE APPLICATION – ROCKHAMPTON REGIONAL COUNCIL REFERENCE D/79-2017

PROPOSED EXTENSION TO THE MIDGEE QUARRY ON LAND SITUATED OFF THE BRUCE HIGHWAY, MIDGEE QLD 4702, PROPERLY DESCRIBED AS LOT AS LOT 2 ON RP888747, LOT 1 ON SP247721, LOT 931 ON LIV40265, LOT 725 ON RP888747 AND LOT 2 ON SP247721

Groundwork Plus has been engaged by Hopkins Brothers Pty Ltd to prepare an application to make changes to the approved development known as the Midgee Quarry, located at 59793 Bruce Highway, Midgee.

The change application is lodged pursuant to section 82 of the *Planning Act 2016* (**Planning Act**) for an 'other' change to a development approval. An 'other' change requires the responsible entity to administer the change application, and assess and decide the application, in the context of the existing development approval. The proposed change seeks to extend the approved Extractive Industry footprint onto four (4) adjacent parcels of land at 1 and 931 Bruce Highway, Midgee, Lot 725 Bruce Highway, Bouldercombe, and 33 Gavial-Gracemere Road Bouldercombe. It is also proposed to increase the extraction volume to allow the operation to produce up to 2 million tonnes per annum and to extend the hours of operation to 24/7.

The attached change application has been prepared in accordance with Section 79 of the Planning Act, bring the mandatory information required for a 'properly made application'.

The required information is as follows:

79(1)(a) - The change application has been made using the approved forms to the Assessment Manager, being Rockhampton Regional Council.

79(1)(b) - The application fee nominated by the Rockhampton Regional Council of $15,000.00 will be paid on receipt of an invoice.

79(1A) - Written consent from Manyfold Pty Ltd, Darryl Carroll and John Carroll has been obtained.

Enclosed is a detailed Planning Assessment Report and associated attachments in support of the development application.

If you have any queries regarding this matter, please do not hesitate to contact me by telephone: (07) 3871 0411 or by email: mbenham@groundwork.com.au. We look forward to receiving Rockhampton Regional Council's confirmation notice for the application.

Yours faithfully
Groundwork Plus Pty Ltd



Megan Benham
Senior Town Planning Consultant

Enc/s:

- *DA Forms and Landowner's Consent*
- *Planning Assessment Report and supporting attachments*

MIDGEE QUARRY

Other Change Application

Prepared for: Hopkins Brothers

Date: 17 February 2022

File Reference: 2607.CA1.310.017

DOCUMENT CONTROL

PROJECT / DETAILS REPORT

Document Title:	Midgee Quarry – Other Change Application
Principal Author:	Megan Benham
Client:	Hopkins Brothers Pty Ltd
Reference Number:	2607.CA1.310.017

DOCUMENT STATUS

Issue	Description	Date	Author	Reviewer
0	Lodgement	17 February 2022	Megan Benham	John Taylor

DISTRIBUTION RECORD

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1. Introduction

1.1. Application Scope

Groundwork Plus have been engaged by Hopkins Brothers Group Pty Ltd (**Hopkins Brothers**) to prepare and submit a development application to the Rockhampton Regional Council (**Council**) in relation to the expansion of the existing Extractive Industry operations, known as the Hopkins Brothers Midgee Quarry. The existing operation is located at 59793 Bruce Highway, Midgee QLD 4702, properly described as Lot 2 on RP888747.

The purpose of this application is to extend the quarry footprint onto four (4) adjacent parcels of land at 1 and 931 Bruce Highway, Midgee, Lot 725 Bruce Highway, Bouldercombe, and 33 Gavial-Gracemere Road Bouldercombe, properly described as Lot 1 on SP247721, Lot 931 on LIV40265, Lot 725 on RP888747 and Lot 2 on SP247721 (herein referred to as the **site**). It is also proposed to increase the extraction volumes to a maximum production limit of 2 million tonnes per annum and also to extend the hours of operation to 24/7 operations.

The development application is lodged pursuant to section 82 of the *Planning Act 2016* (**Planning Act**) for an 'other' change to a development approval. An 'other' change requires the responsible entity to administer the change application, and assess and decide the application, in the context of the existing development approval held over Lot 2 on RP888747.

An Environmental Authority (**EA**) is already held for the existing operation. A separate application will need to be made to the Department of Environment and Science (**DES**) to allow for the proposed increase in production threshold for extraction and screening, of more than 1,000,000 tonnes per annum, which triggers Environmentally Relevant Activity (**ERA**)16(2)(c) and ERA 16(3)(c).

This Planning Assessment Report (**report**) examines the relevant provisions of the Rockhampton Region Planning Scheme and the State Development Assessment Provisions.

This report has been prepared to accompany the development application, to describe the proposed development, identify potential impacts, nominate environmental management measures to be implemented to manage any potential impacts and to assess the proposed Extractive Industry operation changes against the applicable legislative requirements.

This report is intended to ensure that sufficient information is provided to Council, the State Assessment and Referral Agency (**SARA**) and other interested parties, so as to reach an informed decision regarding the proposed development application.

1.2. The Applicant

The Hopkins Brothers have a long-standing transport business history in the Rockhampton region dating back to the 1880's, with the current headquarters established at Parkhurst. Hopkins Brothers are a leading local supplier of hard rock quarry products, sand, soil and gravels, earthmoving, transport, rail maintenance and construction services in Central Queensland.

1.3. Midgee Quarry Background

Extractive Industry operations have occurred on Lot 2 on RP888747 since the 1960s. Hopeman Pty Ltd trading as Hopkins Brothers have operated the Midgee Quarry since the early 2000s.

The Extractive Industry operation has evolved over the years to respond to market demand, resulting in various planning permits having been obtained from Council.

A Material Change of Use – Development Permit for Extractive Industry, Medium Impact Industry and a Warehouse was approved by Council on 6 November 2018 (**2018 Approval**) (Council reference: D/79-2017). The 2018 Approval extended the operational area, concrete crushing operations and facilitated an outdoor storage area to store extracted material and equipment associated with the Extractive Industry and industrial operations.

An EA is currently held for ERA 16(2)(b) and 16(3)(b) for extracting and screening between 100,000 to 1,000,000 tonnes of material per year. The EA was last updated on 19 January 2010 (DES reference: IPCE01813610) (**2010 EA**).

Copies of the abovementioned approvals are provided as **Attachment 1 – 2018 Approval** and **Attachment 2 – 2010 Current Environmental Authority**.

A further Material Change of Use – Development Permit for High Impact Industry (Asphalt Plant) and devolved ERA was approved by Council on 9 April 2020 (Council reference: D/83-2019). The asphalt plant has not yet been established on the site.

2. Site Details

It is proposed to extend the Extractive Industry activities over the properties identified in **Table 1: Site Details**. Copies of the title searches and easement documents for each lot are provided as **Attachment 3 – Site Searches**.

Table 1: Site Details

	Existing Operation	**Proposed Extension**			
Property Description	**Lot 2 on RP888747**	**Lot 1 on SP247721**	**Lot 931 on LIV40265**	**Lot 725 on RP888747**	**Lot 2 on SP247721**
Street Address	59793 Bruce Highway, Midgee	1 Bruce Highway, Midgee	931 Bruce Highway, Midgee	Lot 725 Bruce Highway, Bouldercombe	33 Gavial-Gracemere Road, Bouldercombe
Tenure	Freehold	Freehold	Freehold	Freehold	Freehold
Registered Owner	Hopkins Brothers Group Pty Ltd	Manyfold Pty Ltd	Manyfold Pty Ltd	Darryl Carroll	John Carroll
Property Size	85.15ha	117.8ha	48.967ha	195.7158ha	55.34ha
Easements	-	-	-	EMT V – Pipeline Purposes (Gas)	-
Existing Land Use	Extractive Industry, Medium Impact Industry and Warehouse	Rural	Rural	Rural	Rural
Proposed Land Use	Extractive Industry and associated activities				
Access	Continued use of existing access to/from the Bruce Highway				
Assessment Manager:	Rockhampton Regional Council				
Planning Scheme:	Rockhampton Region Planning Scheme 2015 (version 2.2)				
Zone:	Rural Zone				
Defined Land Use:	Extractive Industry, Medium Impact Industry and Warehouse				
Level of Assessment:	Impact Assessable				
Referral Matters	Clearing native vegetation Environmentally Relevant Activities State Transport Infrastructure (thresholds) State transport corridors and future State transport corridors				

3. Description of Proposal

Midgee Quarry is located at 59793 Bruce Highway, Midgee QLD 4702, properly described as Lot 2 on RP888747. Hopkins Brothers currently operate the Extractive Industry operations under the 2018 Approval and 2010 EA, which allow up to 1,000,000 tonnes of material to be extracted, screened and transported from the operations per annum.

This application seeks to extend the approved extraction footprint onto four (4) adjacent parcels of land at 1 and 931 Bruce Highway, Midgee, Lot 725 Bruce Highway, Bouldercombe, and 33 Gavial-Gracemere Road Bouldercombe, properly described as Lot 1 on SP247721, Lot 931 on LIV40265, Lot 725 on RP888747 and Lot 2 on SP247721. The application also seeks to increase the extraction volumes to a maximum production limit of 2 million tonnes per annum, although it should be noted that this maximum annual production volume is not likely to represent the average production rate, and also to extend the hours of operation to 24/7 operations.

3.1. Site Operation

The approved operation consists of 32.35 hectares of land which provides extraction, processing, stockpiling, ancillary operations areas and stormwater controls (refer **Attachment 1 – 2018 Approval**).

It is proposed to extend the operation to utilise the known hard rock resources across the adjacent areas (refer **Attachment 3 – Site Layout Plan**). The proposed extraction footprint, as it evolves over the life of the Extractive Industry operations, will ultimately consist of almost 200 hectares of land which will provide for extraction, processing, stockpiling, ancillary operations areas, and stormwater controls. Two (2) separate pits will be created, due to a difference in the extractive resource material properties and also because of the natural divide of the road reserve between Lot 2 and Lot 1 on SP247721.

Extraction will occur progressively in line with operational needs, initially focused on the existing disturbance areas in the south-west and south-east and then moving north into Lot 1 on SP247721. Given the long-term nature of the activity, and the different materials available, defined staging has not been identified.

Extraction within proposed Pit 1 is not reliant on proposed Pit 2. An existing internal access road exists between the existing operation and Pit 1. This route will be maintained to transport material from proposed Pit 1 to proposed Pit 2, before being transported via the Bruce Highway access.

A fixed processing plant is currently located near the existing office, at the east of the approved extraction area. Stockpiling areas are provided to the south and north, and within the existing quarry pit workings, as required.

The location of the proposed fixed processing plant and associated stockpiles are indicative and conceptual only, being subject to change depending on operational needs over the life of the quarry. Revised stormwater management controls will also be required as the quarry extends onto adjacent land.

It is proposed to extend the hours of operation to allow for 24 hours a day, 7 days a week operations. The purpose of this is to enable the operation the flexibility to respond to market demand, particularly for large infrastructure projects. Night-time operations are likely to be project based and therefore run for defined periods and intermittently. The primary operating hours will continue to be daytime operations, as currently occurs.

Table 2: Development Attributes (Approved and Proposed) provides a summary of the existing and proposed site activities.

Table 2: Development Attributes (Approved and Proposed)

	Approved	Proposed
Permit Reference:	D/79-2017	Changes are suggested to Council and SARA conditions to reflect the nature and extent of the proposed change (refer section 3.2 below).
Planning Scheme Details:	Rockhampton Region Planning Scheme Impact Assessment	No Change.
Environmental Authority:	IPCE01813610	TBC.
Environmentally Relevant Activity:	ERA 16(2)(b) and 16(3)(b) for extracting and screening between 100,000 to 1,000,000 tonnes of material per year.	ERA 16(2)(c) and 16(3)(c) for extracting and screening more than 1,000,000 tonnes of material per year.
Area of disturbance:	32.35 hectares of area for extractive activities.	Two (2) pits providing 181.28 hectares of area for extractive activities. Developed progressively in line with operational needs (refer **Attachment 3 – Site Layout Plan**).
Access:	Bruce Highway – Upgrade requirements where transport of more than 700,000 tonnes of material per year.	Bruce Highway – Upgrade requirements for left turn in where transport of more than 700,000, plus upgrade requirements for right turn in where transport of more than 1,000,000 tonnes per year (refer **Attachment 4 – Traffic and Pavement Impact Assessment**).
Internal Access Roads:	1 kilometre access road from Bruce Highway to pit entrance.	Unchanged access from Bruce Highway. Additional internal access routes will be established between proposed Pit 1 and proposed Pit 2.
Hours of Operation	6am to 6pm Monday to Saturday, with no operations on Sunday or Public Holidays.	24 hours a day, 7 days per week. Blasting will will be limited to 9am to 3pm, Monday to Friday. No blasting will occur on Sundays or public holidays.
Staff:	15	Unchanged.

Site Infrastructure:	Site office, amenities, weighbridge, car parking and access areas and stormwater controls.	No change to site office, amenities, weighbridge, car parking and access areas. An amended Stormwater Management Plan has been prepared to support the 'other' change application (refer **Attachment 5 – Stormwater Management Plan**).
Processing Plant:	Fixed processing plant location near the access road, generally along the eastern edge of the approved quarry footprint.	No change. It is noted that the fixed processing plant may be moved over the life of the quarry, to respond to the operational needs of the site. Mobile plant and equipment will also continue to be used throughout the extraction areas. Noise, vibration and air quality assessments have been prepared to confirm that the operation can continue to comply with the relevant amenity criteria and objectives at the surrounding sensitive land uses (refer **Attachment 6 – Noise Assessment** and **Attachment 7 – Air Quality Assessment**.
Vegetation Clearing:	Clearing of remnant vegetation is permitted to occur.	It is proposed to clear remnant vegetation to expand the extractive activities (refer **Attachment 8 – Assessable Vegetation Clearing**). Clearing of regulated regrowth is also proposed. This clearing will occur either in accordance with exemptions under the *Planning Regulation 2017*, or in accordance with the relevant Accepted Development Vegetation Clearing Code.
Post Extraction Land Use	Return to agricultural pursuits, or similar, consistent with local and state planning requirements.	No change.

3.2. Conditions of Approval

This 'other' change application seeks to change the existing approval by extending the Extractive Industry footprint, increasing the maximum extraction volume to 2 million tonnes per annum and changing the hours of operation. **Table 3: Suggested Conditions** provides a summary of the suggested amendments to the conditions, when reviewed against the proposed changes. It is noted that the EA will be amended concurrently by DES, with the 2010 EA conditions updated to ensure that the operation continues to meet the necessary environmental values and objectives.

Table 3: Suggested Conditions

Condition	Comment
Council Conditions	
2.1. Approved plans	Update to reference amended plans and documents (refer **Attachment 1 – 2018 Approval**).
6.1. Hours of operation	It is proposed to operate the site 24 hours a day, 7 days a week. This is supported by noise, air quality and vibration assessments. It is suggested that Condition 6.1 be amended as follows: *Other than for the limitations outlined, the hours of operation are permitted to occur 24 hours a day, 7 days per week. Blasting is limited to 9am to 3pm, Monday to Friday. No blasting will occur on Sundays or public holidays.*
State Assessment and Referral Agency Conditions	
1. Road access	Update to require an AUL(S) intersection design be provided once the total material hauled from the site exceeds 700,000 tonnes in a 12 month period (cumulative production of the existing quarry and the approved asphalt plant) and a CHR intersection design to be provided when the quarry exceeds 1,000,000 tonnes in a 12 month period (refer **Attachment 4 – Traffic and Pavement Impact Assessment**).
3. Monetary contributions	Pavement contributions have been determined using the Department of Transport and Main Road's Guide to Traffic Impact Assessment (refer **Attachment 4 – Traffic and Pavement Impact Assessment**).
4. Vegetation Clearing	Update to reflect the extent of assessable vegetation proposed to be cleared.

3.3. Description of Quarry Activities

The Midgee Quarry operations will continue to use standard quarrying methodologies that involve clearing, topsoil and overburden stripping, drilling and blasting, extraction, processing and stockpiling with the final products sold for use in the construction industry, refer **Figure 1: Conceptual on-site extraction operations**.

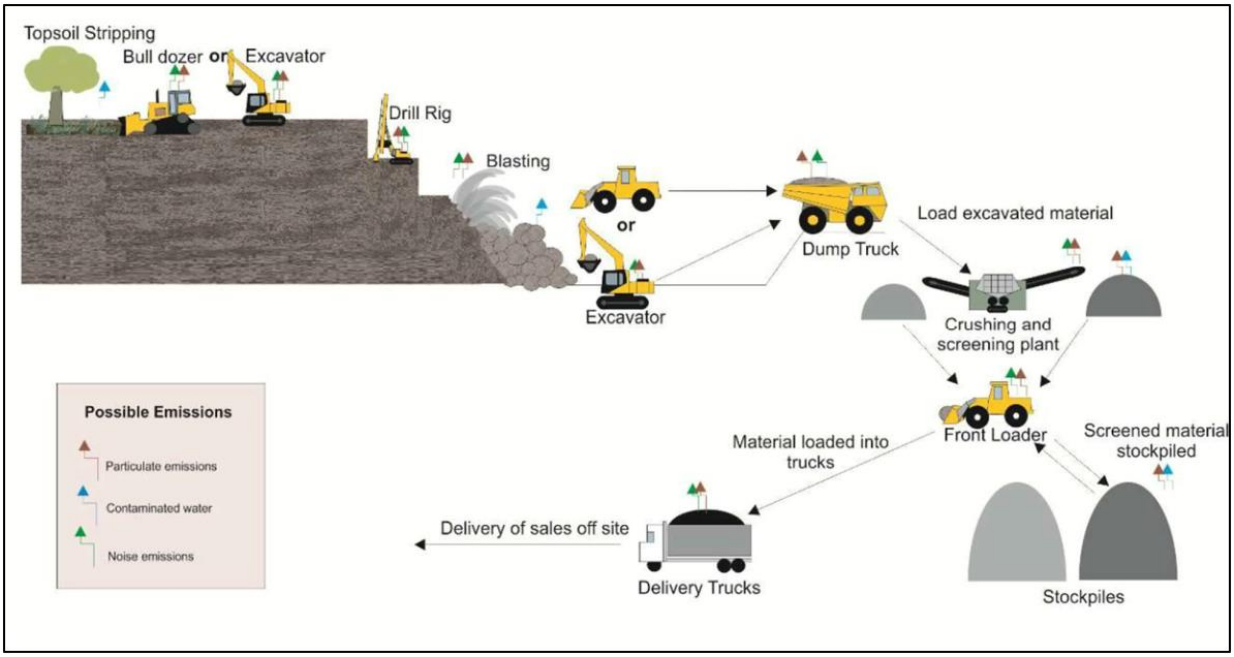


Figure 1: Conceptual on-site extraction operations

Operations will comprise the following basic elements:

- Clearing of vegetation and stripping of topsoil and overburden via mechanical means (i.e. bulldozer or excavator);
- Stockpiling topsoil and overburden for future use as saleable general fill, incorporate into onsite rehabilitation works where required, or use in construction of stormwater controls;
- Drilling and blasting the exposed underlying rock to manageable size from the developed quarry benches to the quarry pit or bench below;
- Transferring raw material to the crushing and screening plant/stockpile area using off-road haul truck(s) loaded by an excavator or front-end loader;
- Crushing and screening raw material using mobile crushing and screening plan;
- Stockpiling the final products using a front-end loader and/or off-road haul truck before the material is sold and loaded into trucks for transportation off-site for use; and
- Rehabilitating disturbed areas progressively, once the terminal quarry benches have been established.

Operations will continue to be supported by a range of ancillary buildings and structures including, but not limited to:

- Site office and amenities block, car and truck parking areas;
- Weighbridge, workshop and truck wash down facility;
- Boundary fencing and/or security fencing; and
- Internal access roads.

The type of plant and equipment deployed on-site varies from time-to-time to service individual contracts. Types of major plant and equipment deployed on-site may include; bulldozer, grader, excavator, drill rig, off-road trucks, front-end loader, fixed processing (including crushing and screening plant/s), mobile processing (including crushing and screening plant/s), pre-coat plant, pugmill and on-road haul trucks. Machinery repairs and maintenance is carried out on-site where practical within the workshop area. Stationary equipment is generally be serviced in the field unless it is practical for the parts to be dismantled and transported to the workshop. Consumables (e.g., tyres, oils and greases) will continue to be supplied by contractors and removed (including associated packaging) for disposal off-site in accordance with the requirements of the prevailing legislation and the local authority requirements.

Operations within proposed Pit 1 will occur via mobile processing, with extractive material won by ripping, rather than blasting.

3.4. Site Management Measures

This section provides a summary of the potential impacts associated with the proposed 'other' change to nearby sensitive receivers. This summary is based on the findings of the Environmental Assessment Report (**EAR**), stormwater assessment, noise assessment, air quality assessment and ecological assessments commissioned to support the application (refer **Attachment 5 – Stormwater Management Plan**, **Attachment 6 – Noise Assessment**, **Attachment 7 – Air Quality Assessment** and **Attachment 9 – Ecological Assessment, Attachment 10 – Environmental Assessment Report**).

A new Site Based Management Plan (**SBMP**) has been prepared to detail the operational controls and measures that will be employed to ensure that potential environmental impacts are managed to required standards (refer **Attachment 11 – Site Based Management Plan**).

The SBMP will continue to be the principal management tool for guiding environmental management on the site, by providing a framework at the operational level to prevent, or suitably manage environmental impacts. A SBMP is a dynamic management document, intended to be reviewed and updated on an ongoing basis to ensure relevant to the operational needs of the site. Best practice and contemporary conditions require reviews of environmental performance to be undertaken periodically. This is reflected by the evaluation of control measures nominated in the SBMP.

The SBMP provides mitigation measures for air quality, water quality, hydrocarbons and chemicals, noise, blasting, waste management, rehabilitation, bushfire management, flora and fauna and acid sulfate soils. The existing operation operates in a way which protects the environmental values of these items. A review of the existing measures has been undertaken to ensure the proposed changes continue to protect environment values.

3.4.1. Noise and Air Quality

The Midgee Quarry operations will continue use machinery and employ practices which have the potential to generate noise, dust and vibration. The nearest sensitive receptor is the caravan park, located to the south of the site access to the Bruce Highway.

An assessment of the potential noise, vibration and air quality impacts of the proposed changes identified that general mitigation measures, as detailed in the SBMP (refer to sections 4.1, 4.5 and 4.6 of **Attachment 11 – Site Based Management Plan**), are suitable to mitigate potential impacts to nearby sensitive receptors.

The findings of the noise and vibration assessment confirms the recommended general site management measures would continue to assist in ensuring the proposed changes did not impact on nearby receptors.

The air quality assessment identifies that sealing the main haul road, between the Bruce Highway and pit, is required when:

- The quarry transports more than 1.2 million tonnes of material in a year; OR
- The quarry transports more than 500,000 tonnes of material in a year AND the asphalt plant operates at maximum capacity; OR
- The quarry transports more than 800,000 tonnes of material in a year AND the asphalt plant operates at a capacity of 50%.

Whilst it is recommended that the entire main internal access road is paved eventually, the assessment acknowledges that paving the entire main internal access road would be costly. Therefore, should the operator of the quarry seek to stage paving the main internal access road, future monitoring will be undertaken (including visual inspections) to ensure compliance is achieved with the relevant environmental criteria.

As the matters of noise, dust and blasting are regulated by DES under the EA conditions, it is suggested that Council continue to defer these matters to DES.

A copy of the noise and air quality assessment are provided as **Attachment 6 – Noise Assessment** and **Attachment 7 – Air Quality Assessment**.

3.4.2. Water Management

The Midgee Quarry will continue to be operated in a way that protects the environmental values of water. A water quality management plan has been prepared and is included in section 4.2 of the SBMP (refer **Attachment 11 – Site Based Management Plan**).

As water quality is regulated by DES under the EA conditions, it is suggested that Council continue to defer these matters to DES.

3.4.3. Land Management

The Midgee Quarry will continue to operate in a manner which is responsive to the surrounding environmental values and protects staff and site infrastructure from potential risks associated with environmental hazards.

A rehabilitation management plan has been prepared and is included in section 4.9 of the SBMP (refer **Attachment 11 – Site Based Management Plan**). The land will be returned to a safe, stable and free draining landform, which is capable of being used for rural purposes or similar, consistent with the local and state planning outcomes. It is noted that model operating conditions imposed by DES, will likely be applied to the EA to regulate rehabilitation objectives, including the requirement for progressive rehabilitation.

As land management objectives are regulated by DES under the EA conditions, it is suggested that Council continue to defer these matters to DES. Operating in accordance with the SBMP will also

ensure the potential risks to staff and site infrastructure as a result of environmental hazards are mitigated.

3.5. Visual Environment

The Midgee Quarry will continue to use standard quarrying methodologies that involve clearing, topsoil and overburden stripping, drilling and blasting, extraction, processing and stockpiling of material.

The site is not subject to any specific scenic amenity mapping or overlays. As such, the following provides a discussion of the existing site and surroundings and the existing and potential vistas of the proposed operations from selected viewpoints.

The discussion focuses on the ultimate quarry footprint as shown in the **Attachment 3 – Site Layout Plan**. However, it is noted that the extractive activities, including progressive clearing, overburden stripping and rehabilitation will occur progressively and over a long period of time, in line with operational needs.

3.5.1. Current Landscape

The site, and surrounding land, is included in the Rural Zone under the Planning Scheme. The landform surrounding the site is comprised of a mixture of low-lying agricultural land to the west of the unnamed road and hilly vegetated land to the east. The contours of the site range from 20m AHD towards Gavial Creek, up to 60m AHD at the peak of the ridgeline towards the Bruce Highway. Hilly terrain generally occurs to the east of the unnamed road reserve, which rises to 90m AHD at the peak.

The site abuts the Bruce Highway to the east, with the extraction area located approximately 1km from the site access.

The current visual environment is dominated by rural pursuits, being primarily grazing activities along the Bruce Highway and Gavial Creek. Small rural lots have been created to the north-west of the site and on the western side of the Burnett Highway. There are no known national, state or regionally significant views within the landscape.

The existing quarry benefits from vegetated ridgelines, which screen the operation from view from all aspects, including the Bruce Highway, Gavial Gracemere Road and the Burnett Highway. Vegetated buffers will be retained to the north, south and east. Vegetation to the west of the unnamed road, while mature, is relatively sparse.

The expected views within the area would continue to be predominantly bushland and rural activities. Midgee Quarry has been operational on the site since the 1960s and the current site access (including signage) is apparent to those travelling on the Bruce Highway.

3.5.2. Viewpoints

The visibility of the operation is determined by a combination of factors including; distance and elevation of areas from which the site can be viewed, the angle of view, existing screening (e.g. vegetation) and topography. The visibility of a quarry rock face is also dependent on the extent to which they contrast in colour and form within the overall scene.

Due to the rural setting and distance between the activity and potential receptors, a discussion has been provided in relation to the visual appearance of the activity from the north, east and west. For discussion purposes six (6) viewpoints are discussed (refer **Figure 2: Viewpoint Locations**). These viewpoints were selected to provide a general representation of the likely change in amenity from the north, east and west. For the purposes of viewpoint selection, priority was given to the location of the physical residence, not the larger parcel of land. It is acknowledged however that, due to the nature of agricultural activities, viewpoints may occur from other locations on adjoining land.

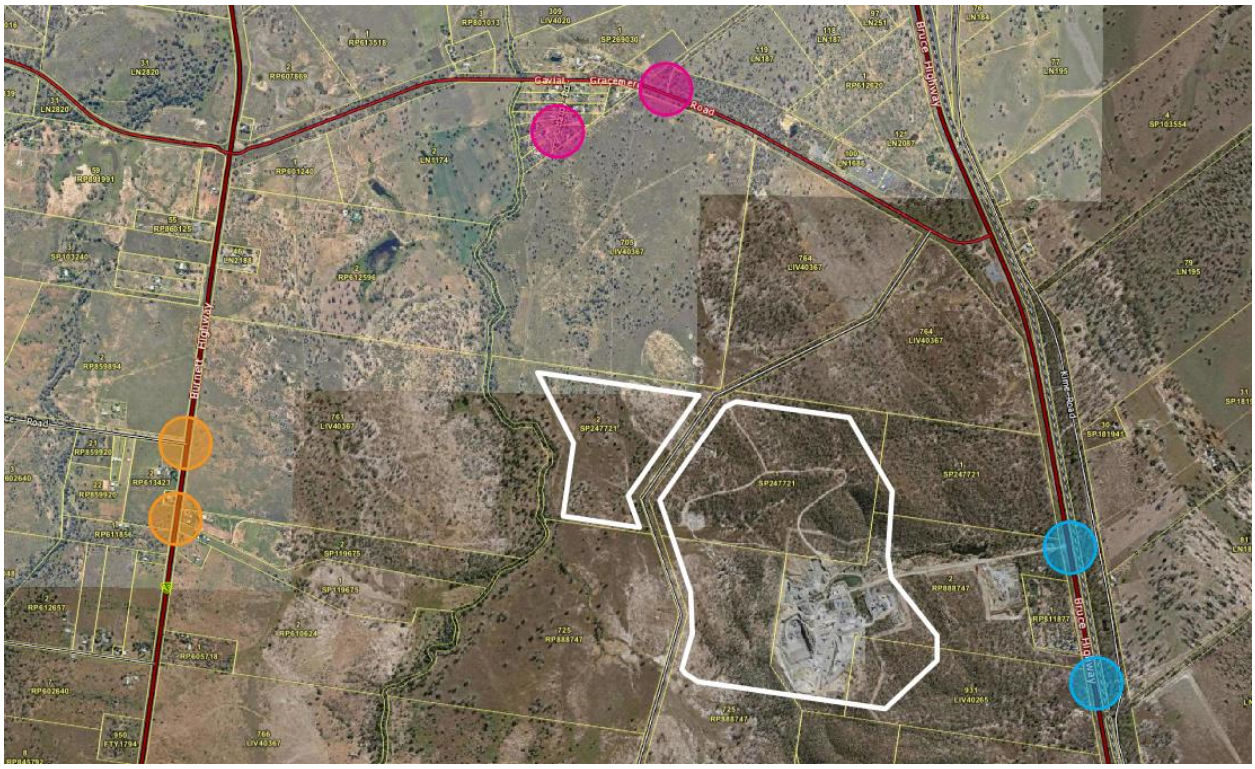


Figure 2: Viewpoint Locations

Cross sections have been prepared to illustrate the location and scale of the quarry operation from the nearest residences (refer **Attachment 12 – Visual Assessment**).

When considering the existing visual setting and the distance between the activity and the nearest residences, it is confirmed that the changes to the visual environmental will be negligible.

East – Bruce Highway

The topography of the area, as well as vegetation on the site and adjoining land, limits the visual catchment of the activity from land to the east, south-east and north-east. Kangaroo Country Caravan Park (**Caravan Park**) is the nearest receptor, being directly adjacent to the approved storage area and within 600m of proposed Pit 2. There are no other receptors located on land to the north-east.

Existing bund walls, around the perimeter for the storage area, will continue to assist in screening the activities on the storage pad form the Caravan Park (refer **Figure 3: Amenity bunds around storage area**).



Figure 3: Amenity bunds around storage area (Source: QLD Globe)

It is proposed to extend the quarry footprint in an easterly and northerly direction, into Lot 931 on LIV40265 and Lot 1 on SP247721. Both lots are undulating topography, forming natural drainage corridors directed towards the Bruce Highway. The quarry footprint will work into the hill, maintaining the existing ridgeline, which has levels between 40-50m AHD.

The Bruce Highway and Caravan Park are located 600-700m east of the quarry footprint at an elevation of approximately 10m AHD. The operation will not be visible from the east, being screened from view by retained vegetation on the elevated topography (refer **Figure 4: View from Bruce Highway towards extraction area**). There may be short periods of time when site establishment works (i.e. stripping and overburden removal of the top bench) may be visible, albeit in the distance, from the east. However, once complete, the operation will return to being unnoticed in the landscape. Awareness of any minor change in the landscape (i.e. removal of distant vegetation) is considered negligible due to the wide view corridor and variation in landscape detail (i.e. colours, textures etc).

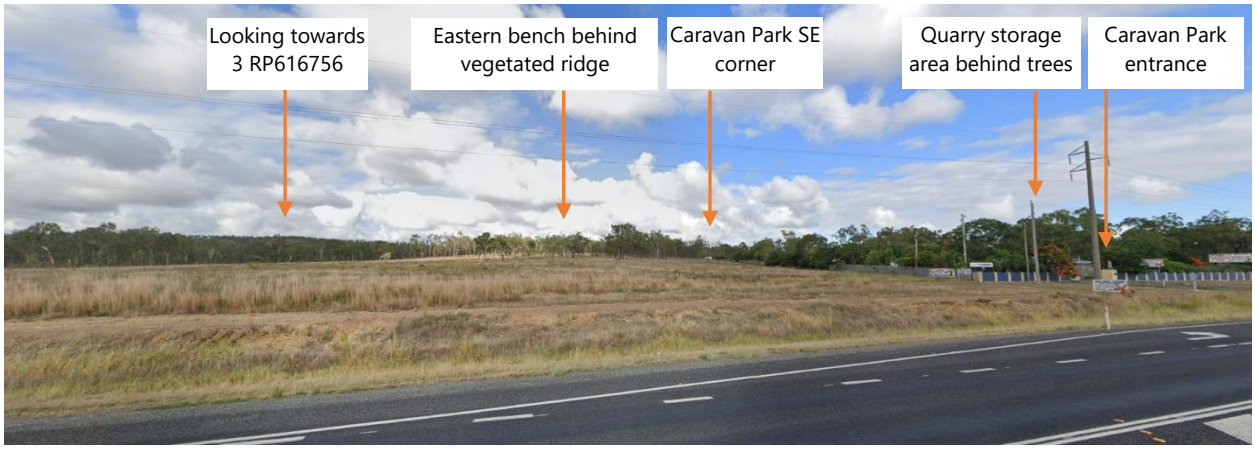


Figure 4: View from Bruce Highway towards extraction area (Source: Google Maps)

When travelling from the north, there are no visual markers other than the constructed access location which becomes visible, albeit in the far distance, from approximately 250m north of the site entrance. A visual marker (an advertising sign) is visible when travelling from the south. The sign becomes visible, albeit in the far distance, from approximately 500m south of the site entrance. The entrance to the site is visible when passing the site.

If stationary directly adjacent to the site access a crest in the topography screens the extraction area from view (refer **Figure 5: Existing Site Access**). The storage area is also screened from view by existing vegetation. No change is proposed to the storage area as a result of this application. At the posted speed of 100km/hour the travellers' awareness of the site is considered negligible.

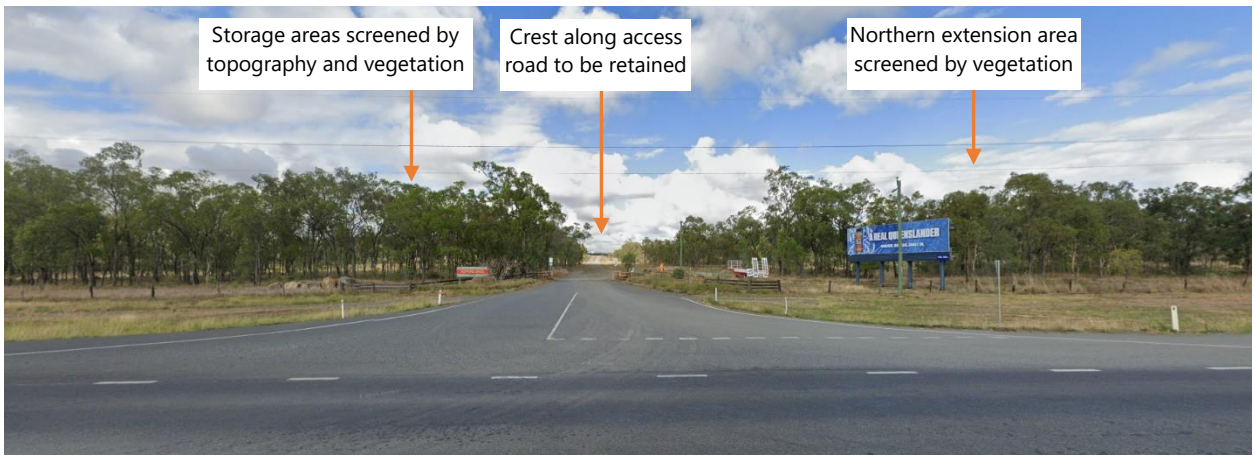


Figure 5: Existing site access (Source: Google Maps)

North – Gavil Gracemener Road and Hardy Road

The topography of the area, as well as scattered vegetation, limits the visual catchment for land to the north. There are no receptors on land directly to the north of the site. A rural subdivision exists to the north-west, consisting of 13 residences.

It is proposed to extend the quarry footprint to the north onto Lot 1 on SP247721 and also create a new pit on land to the west onto Lot 2 on SP247721. Lot 1 on SP247721 is undulating topography, forming natural drainage corridors directed towards the Bruce Highway and Gavial Creek. Lot 2 on SP247721 is low-lying with scattered vegetation cover.

Quarry activities in Pit 2 will work into the hill, maintaining a ridgeline in the north-eastern boundary of the Pit. Operations within Pit 1 will occur via mobile processing, with extractive material won by ripping rather than blasting.

The rural land Hardy Road is 1-1.5km north-east of the quarry footprint at an elevation of approximately 10m AHD. Residences will generally have a primary viewpoint (e.g. from a main verandah or towards a distinctive feature) and secondary views in other directions. An aerial assessment of the residences on Hardy Road suggest that primary and secondary views are not orientated towards the extraction areas (refer **Figure 6: Primary and Secondary views Hardy Road residences**).

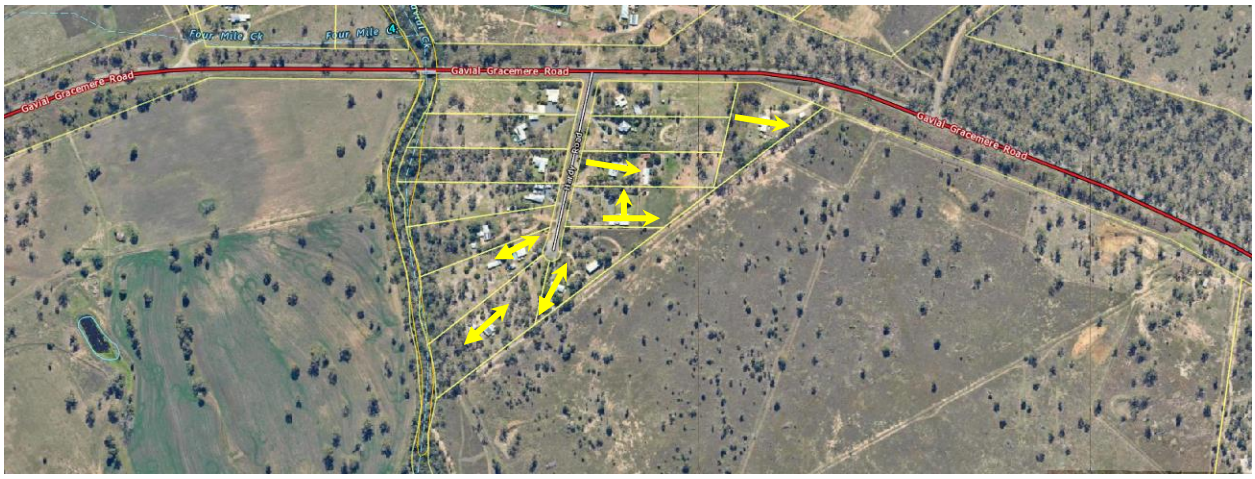


Figure 6: Primary and Secondary views Hardy Road residences (Source: Google Maps)

There may be a minor change in the landscape due to removal of distant scattered vegetation. However, at a distance of 1km to 1.5km and with remaining scattered vegetation in between, the activity will most likely be indiscernible, due to the wide view corridor and variation in landscape detail (i.e. colours, textures etc) (refer **Figure 7: Looking south-east through Lot 8 on RP617436 Hardy Road**).



Figure 7: Looking south-east through Lot 8 on RP617436 Hardy Road (Source: Groundwork Plus)

Gavial Gracemere Road is over 1km to the north of the site. This road does not provide a scenic route. When travelling from the east, topography will obstruct all view of the activity. When travelling from the west, travellers take in a broad context within which the site is not the primary focus. At the posted speed of 100km/hour, an awareness of any minor change in the landscape (i.e. removal of distant scattered vegetation) is considered to be negligible, due to the wide view corridor and variation in landscape detail (i.e. colours, textures etc) (refer **Figure 8: Looking south-east from Tipson Lane**).



Figure 8: Looking south-east from Tipson Lane (Source: Google Maps)

West – Burnett Highway

Land to the west of the unnamed road is low-lying and scattered with vegetation. There are no receptors on land directly to the south of the site. Rural land exists to the west of Gavial Creek and adjacent to the Burnett Highway.

It is proposed to extend the quarry footprint to the west onto Lot 725 on RP888747 and also create a new pit on land to the west, on Lot 2 on SP247721. Both lots are low-lying with scattered vegetation cover, with some steeper land on Lot 725 on RP888747 adjacent to the existing quarry operation.

Quarry activities in proposed Pit 2 will work into the hill, maintaining a topographical buffer until natural ground level is reached. Operations within proposed Pit 1 will occur via mobile processing, with extractive material won by ripping rather than blasting.

The rural land on the Burnett Highway is 1.6km to the west of the quarry footprint at an elevation of approximately 30m AHD. As discussed above, residences generally have primary and secondary views. An aerial assessment of the residences on the Burnett Highway suggest that primary and secondary views are largely oriented away from the extraction areas (refer **Figure 9: Primary and Secondary views Burnett Highway residences**). At a distance of over 1.5km, and with remaining vegetation along Gavial Creek, the activity will be relatively indiscernible due to the wide view corridor and variation in landscape detail (i.e. colours, textures etc).

Burnett Highway is over 1.6km west of the site. The road does not provide a scenic route. When travelling from the north or south, travellers take in a broad context within which the site is not the primary focus. At the posted speed of 100km/hour, an awareness of any changes in the landscape (i.e. removal of scattered vegetation, extraction of topographical buffers) is considered negligible (refer **Figure 10: Looking east from Burnett Highway**).

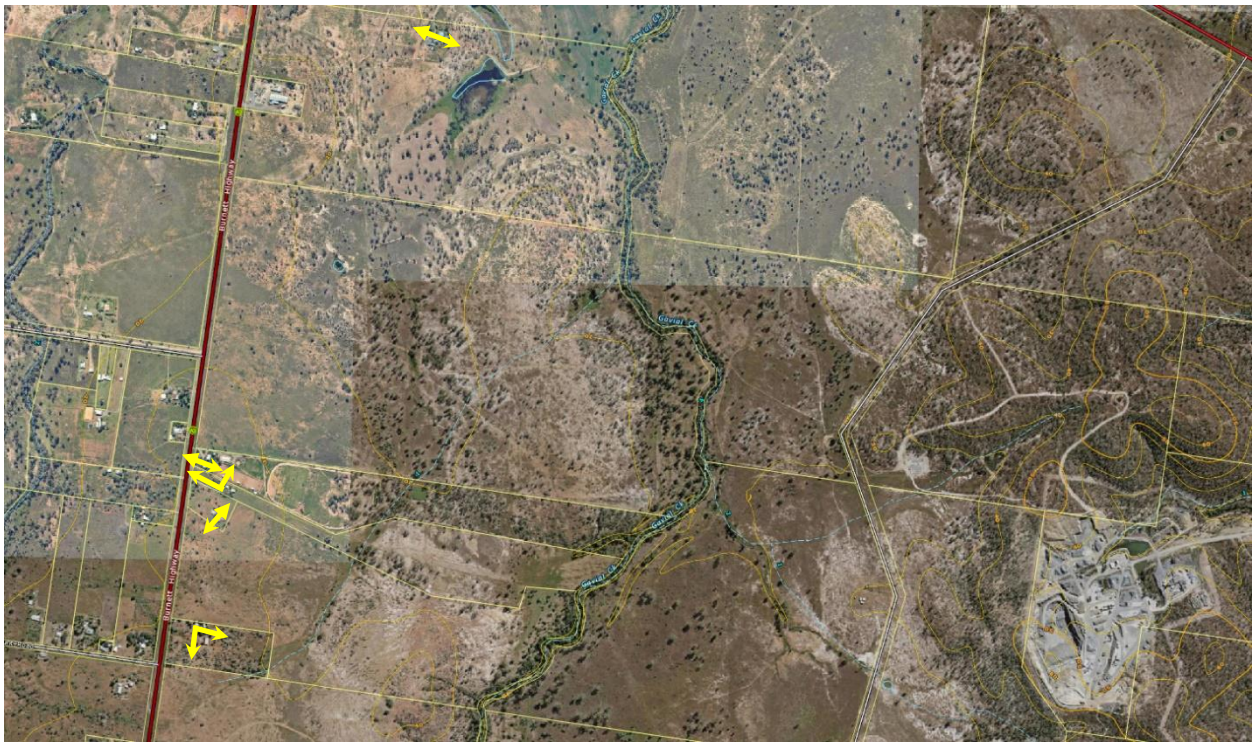


Figure 9: Primary and Secondary views Burnett Highway residences (Source: Google Maps)



Figure 10: Looking east from Burnett Highway (Source: Google Maps)

3.5.3. Summary of Visual Environment

The topography varies across the site providing vegetated ridgelines in the east and low-lying land adjoining the Gavial Creek. The proposed changes seek to extend the quarry footprint primarily to the north and west. No change is proposed to the site access or approved storage area adjoining the Bruce Highway.

Three (3) indicative viewpoints were identified to the east, north-west and west of the extended quarry footprint. Having considered the current views of the site, the distance between residences and the operation and the progressive nature of the operation, it is considered that the expanded activities will result in a negligible change to the visual environment. The vegetation along Gavial Creek will be managed to ensure the vegetation buffer adjoining the creek continues to provide a visual buffer, to alleviate the visual appearance of the quarry operation where workers are undertaking agricultural pursuits on land to the west of Gavial Creek.

The operation will not be visible from the east, being screened from view by retained vegetation on the higher topography. There may be short periods of time when site establishment works (i.e. stripping and overburden removal of the top bench) may be visible from the east. Once site establishment works are complete, the operation will return to being unnoticed in the landscape.

While the extended operation will remove the existing topography buffers, which shield the operation from residences to the west, the visual environment will have a negligible change due to distance, wide field of view and speed environment.

4. Assessment Framework

4.1. Planning Act 2016

The Midgee Quarry operates pursuant to the 2018 Approval, which includes a concurrence agency response from the SARA.

The original application was approved in 2018, having followed the assessment process under the superseded *Sustainable Planning Act 2009*. At the time, a Material Change of Use for Extractive Industry, Medium Impact Industry and Warehouse was impact assessable under the Rockhampton Region Planning Scheme 2015.

Pursuant to section 78(1) of the Planning Act a person may make an application (a ***change application***) to change a development approval.

A change application is either a 'minor' change pursuant to section 81 of the Planning Act or an 'other' change pursuant to section 82 of the Planning Act. In this instance, the proposed changes to the quarry footprint and hours of operation do not meet the definition of a 'minor' change under Schedule 2 of the Planning Act. Therefore, an 'other' change application is sought pursuant to section 82 of the Planning Act.

Section 82(2) of the Planning Act states (***emphasis added***):

> *(2) For administering the change application, and assessing and deciding the change application in the context of the development approval, the relevant provisions apply—*
> *(a) as if—*
> *i) the responsible entity were the assessment manager; and*
> ***ii) the change application were the original development application, with the changes included, but was made when the change application was made; and***
> *(b) with necessary changes.*

Section 82(4) of the Planning Act prescribes the matters which are to apply to the assessment of the 'other' change application which includes (***emphasis added***):

> *a) The assessment benchmarks;*
> *b) Any matters a referral agency must, may, or may only assess the application against or have regard to under section 55(2);*
> *c) if the development to which the change application relates requires code assessment—any matters the assessment must be carried out having regard to under section 45(3)(b);*
> *d) if the development to which the change application relates requires impact assessment - any matters the assessment must or may be carried out against or having regard to under section 45(5)(a)(ii) or (b).*

The assessment undertaken under section 82(2)(a)(ii) is explained further in the explanatory notes of the Planning Act as (***emphasis added***):

The intent of the reference to assessing and deciding the change application "in the context of the development approval" is that the proposed change should not be considered in isolation. Neither however is the entirety of the development including the change re-assessed. Instead, ***it is intended the change be assessed with reference to the context of the development approval already existing for the development.***

For example, if there is a development approval for a 10 storey building, and an applicant seeks to change the approval to add a further 2 storey's, the additional 2 storeys is intended to be assessed in the context of a 10 storey building, against the assessment benchmarks relevant to a 12 storey building in that locality.

To this end, the clause clarifies that ***only the matters for assessment*** *(assessment benchmarks, matters to which regard must be had and the like)* ***that are relevant to assessing the change in the context of the original approval are relevant for the assessment of the change application****.*

For example, if a development approves development for several different purposes (such as a shopping centre, cinema and service station), and the change application seeks only to change the development for the purpose of the cinema, it is unlikely that the assessment benchmarks relevant to the other purposes would be relevant in assessing the change application.'

Under the Planning Act, the *Development Assessment Rules* (**DA Rules**) set out the development assessment process for application. The process is illustrated in
Figure 11: Development Assessment Process below.

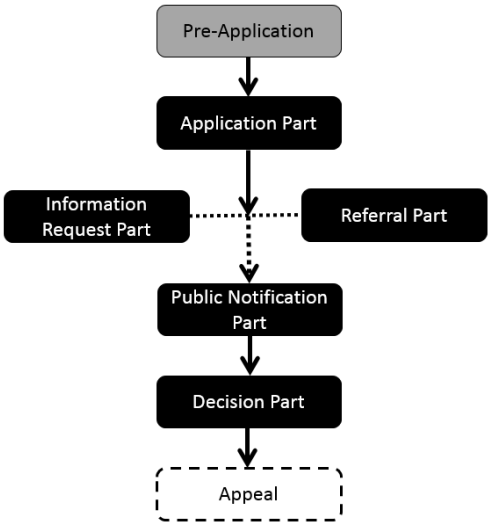


Figure 11: Development Assessment Process

4.1.1. Referral Part

Schedule 10 of the *Planning Regulation 2016* (**Planning Regulation**) details the referral triggers and the relevant assessment benchmarks.

Pursuant to section 82(4) of the Planning Act the matters a referral agency must, may, or may only assess the application against, or have regard to under section 55(2) of the Planning Act, apply to the extent the maters are relevant to assessing and deciding the change application in the context of the development approval.

The matters of State interest relevant to the change application and the corresponding State Assessment Provisions (**SDAP**) are shown in **Table 4: Referral Items**.

Table 4: Referral Items

Referral Matters	Development Type	Schedule 10	Relevant to 2018 Approval	Relevant to change application	Relevant SDAP v2.6
Clearing native vegetation	Material Change of Use	Part 3, Div 4, Table 1	Yes	Yes	State Code 16: Native Vegetation Clearing
Non-devolved Environmentally Relevant Activities	Material Change of Use	Part 5, Div 4, Table 2	No No change to existing EA for less than 1mtpa	Yes New concurrence ERA for extracting more than 1mtpa	State Code 22: Environmentally Relevant Activities
Waterway Barrier Works	Operational Works	Part 6, Div 4, Sub 3, Table 1	No Waterway barrier works were not proposed.	No Waterway barrier works are not proposed.	-
Land subject to a pipeline	Material Change of Use	Part 9, Div 3, Table 2	No Application did not include Lot 725.	No No activities will occur on Emt V on Lot 725 (Pipeline for gas purposes).	-
State Transport Infrastructure (thresholds)	Various Aspects of Development	Part 9, Div 4, Sub 1, Table 1	Yes	Yes	State Code 6: Protection of State Transport Networks
State transport corridors and future State transport corridors	Material Change of Use	Part 9, Div 4, Sub 2, Table 4	Yes	Yes	State Code 1: Development in a state-controlled road environment

Referral Matters	Development Type	Schedule 10	Relevant to 2018 Approval	Relevant to change application	Relevant SDAP v2.6
Taking or interfering with water	Operational Works	Part 19, Div 1, Sub 3, Table 2	No EA exemption applies	No EA exemption applies	-

An assessment against the SDAP Codes is provided as **Attachment 13 – SDAP Code Assessment** and Appendix 5 of **Attachment 9 – Ecological Assessment**. For ease of reference, a brief summary of the relevant aspects of State interest is provided below.

4.1.2. Clearing native vegetation

Clearing of native vegetation was considered in the original development application. Clearing of Category B vegetation for extractive industry is a relevant purpose pursuant to section 22A of the *Vegetation Management Act 1994* (**VMA**) (refer **Attachment 14 – Relevant Purpose Determination**). It is proposed to extend the quarry footprint, clearing additional remnant vegetation (Category B) if least concern (refer **Attachment 15 – Remnant Vegetation**).

Performance Outcome PO1 of SDAP Code 16 seeks for clearing to be reasonably avoided or reasonably minimised. Extractive resources are site specific, limited in occurrence by geological conditions and are finite. In this instance, it is not possible to avoid or minimise clearing required while accessing the resource. The vegetation clearing will occur in line with the operational needs and will be confined to that area necessary to facilitate a working quarry pit.

An ecological assessment, included the assessment against SDAP Code 16, is included within this application to assess the potential of the operation to impact on ecological features (refer **Attachment 9**). The report confirms that a vegetation offset is not required for clearing remnant vegetation (Category B) of least concern.

The quarry footprint is also mapped as containing regrowth vegetation (Category C and Category R) of least concern and of concern status. Clearing of regrowth vegetation is not a relevant purpose under the VMA. The detailed quarry development plan will ensure any clearing of regrowth vegetation occurs pursuant to a relevant exemption or Accepted Development Vegetation Clearing Code (**ADVCC**).

4.1.3. Non-devolved Environmentally Relevant Activities

Concurrence ERAs trigger referral to SARA for assessment. The original development application did not include a referral to SARA as the existing EA included concurrence ERA 16(2)(b). ERA 16(2)(b) permits extraction, other than dredging, of between 100,000 to 1 million tonnes of material per annum.

The proposed changes to the activity include extraction of up to 2 million tonnes of material per annum. Thereby requiring a new concurrence ERA, being ERA 16(2)(c) for extraction, other than dredging, of more than 1 million tonnes of material per annum.

Relevant technical assessments have been undertaken to confirm that the activity will continue to meet the relevant environmental values.

4.1.4. State Transport Infrastructure

Impacts to the state controlled road network were considered in the original development application. The existing conditions of approval require the construction of an AUL(S) turn lane treatment and the payment of pavement contribution.

As the extraction volume is proposed to be increased, the potential traffic and pavement impacts of the operation to the state transport network have been considered (refer **Attachment 4 – Traffic and Pavement Impact Assessment**). The assessment concluded that the existing Bruce Highway site access and Bruce Highway / Gavial Gracemere intersection would operate within satisfactory operating parameters with the increased extraction volume. The assessment recommends that upgrades to the site access occur at the following timings:

(a) The AUL(S) turn lane treatment be provided once the total material hauled from the site exceeds 700,000 tonnes in a 12 month period. There is an existing approval in place which allows this to be applied cumulatively with the production of the asphalt plant.

(b) The CHR turn land treatment be provided when the quarry expands (i.e. when the production of the quarry exceeds 1 million tonnes in a 12 month period).

A pavement contribution (cents per tonne rate) has been calculated for extraction volumes which exceed 1 million tonnes per annum, using the required methodology.

4.2. Other State Legislation

4.2.1. Environmental Protection Act 1994

The *Environmental Protection Act 1994* (**EP Act**) regulates the assessment process for EA's for any relevant ERA. The site operates pursuant to the 2018 Approval and existing 2010 EA. As this is not a new development application, a separate application will be lodged concurrently to update the EA to allow extraction and screening of more than 1,000,000 tonnes per annum.

DES has developed model operating conditions which regulate noise, dust, blasting, water quality and rehabilitation of quarry activities. As such, these matters will be conditioned as part of the new EA for the quarry operation and subsequently regulated by DES. It is therefore considered unnecessary for Council to further regulate these environmental matters during their assessment.

4.2.2. Waterway Barrier Works

The existing quarry pit intersects with a low risk (green) waterway for waterway barrier works. It is apparent that the mapped feature has been historically disturbed by site activities. The proposed quarry footprint does not extend any further east than the historical disturbance of the mapped feature. Therefore, no new impact to the mapped feature is proposed.

A second low risk (green) waterway traverses Lot 1 on SP247721 and Lot 725 on RP888747, intersecting Pit 2. SARA has confirmed that this feature does not provide for fish passage (refer **Attachment 16 – Waterway Barrier Works Determination**).

A third low risk (green) waterway traverses Lot 725 on RP88874. The quarry footprint has been designed to avoid this feature.

Therefore, as shown in **Figure 12: Waterway Barrier Works Mapping**, the proposal does not require assessment of the potential impacts to waterways for waterway barrier works.

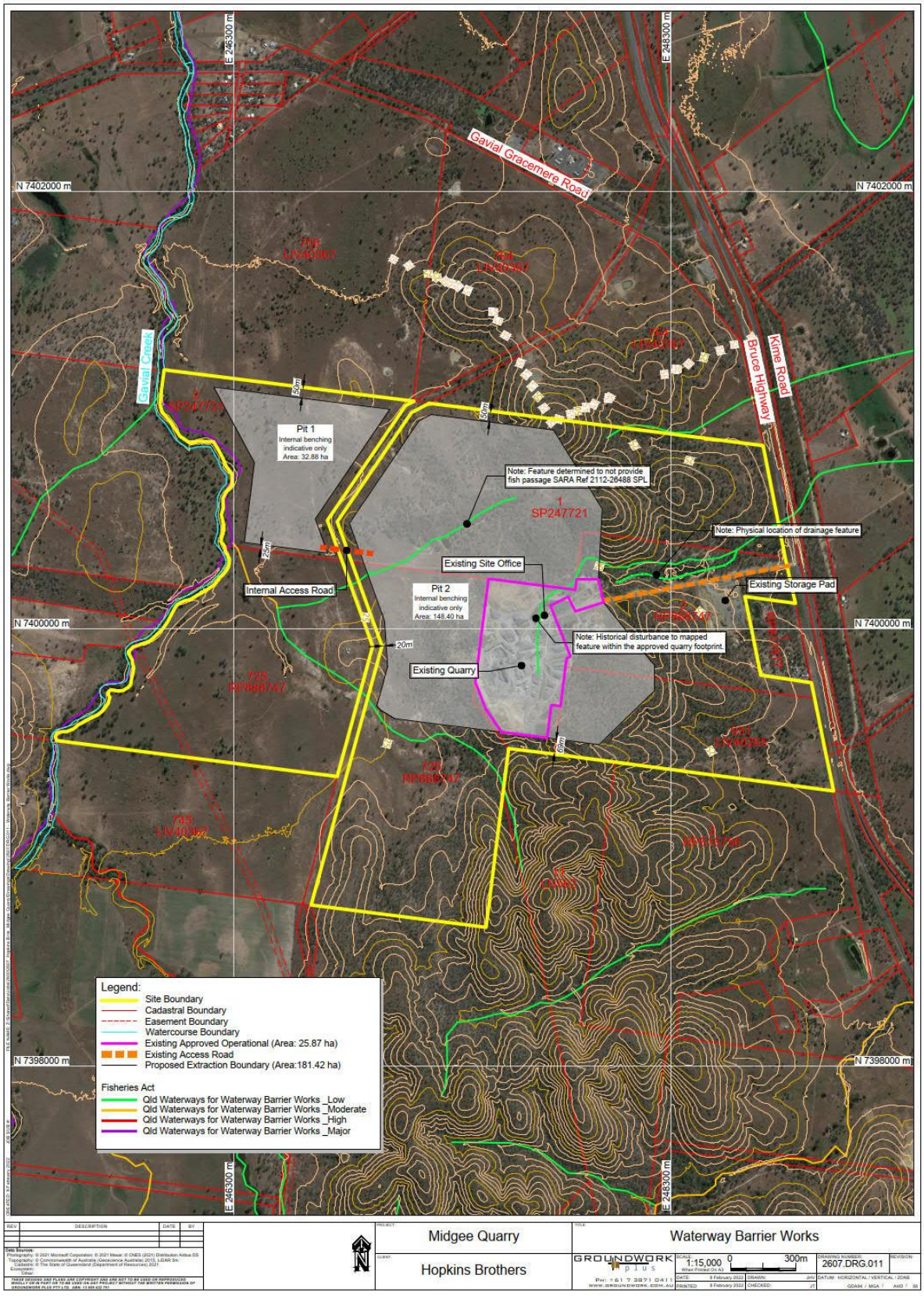


Figure 12: Waterway Barrier Works Mapping

4.2.3. Water Act 2000

The *Water Act 2000* (**Water Act**), in conjunction with other State legislation, regulates the taking and interfering with water in Queensland. Pursuant to Section 26 of the Water Act, "*All right to the use, flow and control of all water in Queensland are vested in the State*". Therefore, any water is a 'State Resource'.

Part 3 of the Water Act outlines how the State authorises the taking or interfering with water. Pursuant to Section 94, the general authorisations to interfere with water allow the following:

94 General authorisations to interfere with water

Any person may do any of the following-

(a) Interfere with overland flow water;

(b) Interfere with water from a watercourse, lake, spring by impoundment for structures used by the State of the Commonwealth to collect monitoring data.

The development application is for ERAs and an EA and therefore, the authorisations in Section 97 of the Water Act are also applicable (**emphasis added**):

97 Environmental Authorities

(1) ***A person may take overland flow water that is not more than the volume necessary to satisfy the requirements of****-*

(a) ***An environmental authority****; or*

(b) A ***development permit carrying out an environmentally relevant activity****, other than a mining or petroleum activity, under the Environmental Protection Act 1994, schedule 4.*

(2) A person ***may interfere with the flow of water by impoundment if the interference is not more than is necessary to satisfy the requirements of an environmental authority****.*

(3) However, subsections (1) and (2) apply only if-

(a) ***The impacts of the take or interference were assessed as part of a grant of an environmental authority or development permit****; and*

(b) The environmental authority or development permit was granted with a condition about the take or interference with water.

Typical of most extractive industry operations, the quarry footprint will be encompassed by a perimeter bund. Overland flow that falls within the quarry footprint will be collected, treated and re-used on site. No activities are proposed within any mapped or unmapped watercourses as per the Water Act's watercourse determination map (refer **Attachment 17 – Water Act Determination**).

4.3. Local Planning Considerations

4.3.1. Regional Plan

Regional plans are part of a suite of policies and legislative instruments that guide land use planning and development in order to influence economic, social and environmental factors in Queensland.

Rockhampton Regional Council falls within the Central Queensland Regional Plan, which commenced in October 2013.

The purpose of the plan is to identify the state's interests in land use planning for the region. Specifically, the plan identifies regional outcomes and policies in relation to the state's intent for the future spatial structure of the region, including Priority Agricultural Areas, Priority Living Areas and priority outcomes for infrastructure.

The Rockhampton Region Planning Scheme (**Planning Scheme**), specifically the strategic framework, appropriately advances the Central Queensland Regional Plan 2013, as it applies in the planning scheme area.

4.3.2. State Planning Policy

The State Planning Policy (**SPP**) is a key component of Queensland's land use planning system. The SPP defines the Queensland Government's policies about matters of state interest in land use planning and development. The Planning Scheme does not reflect the July 2017 SPP. As such, an assessment of the proposed development against the 'assessment benchmarks' as outlined in the SPP is provided in **Table 5: SPP Assessment Benchmarks**.

Table 5: SPP Assessment Benchmarks

State Interest	Applicable	Discussion
Liveable Communities	No	The site is not mapped within an urban area nor does it propose an activity which will be accessed via common private title.
Mining and Extractive Resources	No	The site is not identified within a Key Resource Area.
Water Quality	No	The site is not mapped within a listed area.
Natural Hazards	Yes	Portions of the site are identified as being subject to potential impact buffer, medium and high potential bushfire intensity. The SPP mapping is less onerous than the Bushfire hazard overlay code contained in the Planning Scheme. Quarry activities generally have a broad range of plant and equipment available to assist in preventing and reducing potential impacts associated with a bushfire event (e.g. heavy machinery, water trucks). Management procedures for protection against fire are included in the SBMP (refer section 4.10 of **Attachment 11 – Site Based Management Plan**). It is noted that vegetation within Pit 2 will be progressively removed as a consequence of this application, reducing the extent of bushfire prone land. The proposed changes will not directly, indirectly or cumulatively increase the severity of the bushfire hazard on the site or the adjoining properties. Therefore, the application achieves the assessment benchmarks in the SPP. The site access, and a portion of the access road, are identified as being subject to the Queensland floodplain assessment overlay (level 1). No changes are proposed to the existing site access, or haulage road configuration. The proposed changes will not directly, indirectly or cumulatively increase the severity of the flood hazard on the site, or the adjacent properties or state-controlled road. Therefore, the application is considered to achieve the assessment benchmarks.

State Interest	Applicable	Discussion
		The balance of the subject site is identified as being subject to the Local Government flood mapping area. Where an area is identified in a Local Government flood plan area, the SPP requirement for flood are triggered by the flood mapping contained in the Local Government's Planning Scheme. Rockhampton Regional Council has prepared a Flood hazard overlay map. Therefore, further assessment of the assessment benchmarks in the SPP relating to flood areas is not required.
Strategic Airport and Aviation Facilities	Yes	The site is identified as being within the obstacle limitation surface contours (158.5m) and wildlife hazard buffer zone (13km) of the Rockhampton Airport. The extended quarry footprint, and associated activities, will not create a permanent or temporary physical or transient intrusion into the operational airspace of the Rockhampton Airport. Further, the proposal includes the provision of mitigation measures which aim to retain the current ecological processes, and wildlife habitat, of the site. Therefore, the application is considered to achieve the assessment benchmarks in the SPP.

4.3.3. Rockhampton Region Planning Scheme

The site is located within the Rockhampton Regional Council local government area and is regulated by the *Rockhampton Region Planning Scheme 2015*.

Where there is inconsistency between the provisions within a Planning Scheme, the strategic framework prevails over all other components, to the extent of the inconsistency, but is only applicable to impact assessable development. Overlays prevail over all other components to the extent of any inconsistency.

Definitions

The 2018 Approval approved Extractive Industry, Medium Impact Industry and Warehouse activities to occur on the site. Schedule 1 of the Planning Scheme defines these land uses as:

Extractive industry *means the use of premises for—*

1. *extracting or processing extractive resources; and*
2. *any related activities, including, for example, transporting the resources to market.*

Medium impact industry *means the use of premises for an industrial activity—*

1. *that is the manufacturing, producing, processing, repairing, altering, recycling, storing, distributing, transferring or treating of products; and*
2. *that a local planning instrument applying to the premises states is a medium impact industry; and*
3. *that complies with any thresholds for the activity stated in a local planning instrument applying to the premises, including, for example, thresholds relating to the number of products manufactured or the level of emissions produced by the activity.*

Warehouse *means the use of premises for—*

1. *storing or distributing goods, whether or not carried out in a building; or*
2. *the wholesale of goods, if the use is ancillary to the use in paragraph (a).*

This 'other' change request seeks to extend the Extractive Industry activities to four (4) adjoining properties.

Planning Scheme Mapping

The Planning Scheme divides the region into various areas based the key land uses and strategic outcomes. The Planning Scheme further identifies overlay areas which reflect state and local level interests that may include constraints, presence of valuable resources, particular opportunities for development or particular sensitivity to the effects of development.

The site is identified as follows:

- Rural Zone
- Acid sulfate soils (5m – 20m AHD)
- Agricultural land classification (Class A and B)
- Airport environs (Wildlife buffer and obstacle limitation surface (<15m))
- Bicycle network (Cycling recreational route – Gavial-Gracemere Road)
- Biodiversity (MSES, MLES – general, biodiversity corridors, waterways)
- Bushfire hazard (All categories)
- Flood hazard (Floodplain investigation area)
- Regional infrastructure corridors (Gas pipeline corridor)
- Road hierarchy (Highway, State controlled road)
- Transport noise corridor
- Steep land (All categories)

Temporary Local Planning Instruments

There are no known temporary local planning instruments applicable to the proposed 'other' change.

Assessment Level

The Planning Scheme comprises assessment tables which identify the level of assessment for development in each zone. Assessment tables distinguish between exempt, self-assessable, code assessable and impact assessable development.

Within the Rural zone an Extractive Industry, Medium Impact Industry and Warehouse are **Impact Assessable**.

Assessment Benchmarks

The Planning Scheme has a specific zone code, overlay codes and specific development codes. The following codes are applicable to the proposed development:

- Rural zone code
- Acid sulfate soils overlay code
- Airport environs overlay code
- Biodiversity overlay code
- Bushfire hazard overlay code
- Flood hazard overlay code
- Steep land overlay code

An assessment of the proposed development against the relevant codes is included as **Attachment 18 – Council Code Assessment**.

An assessment of the Overall Outcomes for each code and the strategic framework have also been provided below.

Purpose Statements

Development codes are codes for assessment where identified as an applicable code by the Planning Scheme. Purpose statements provide the overall context for the code and holistically defines what the code seeks to achieve. A discussion of each of each relevant code is provided in **Table 6: Purpose Statement Discussion**.

Table 6: Purpose Statement Discussion

Code	Response
The purpose of the Rural Zone Code is to ensure that land with productive capacity is maintained for a range of existing and emerging rural uses that are significant to the economy.	This application seeks to extend an existing quarry, securing the businesses' ongoing access to a known resource. The purpose of the Rural Zone Code recognises that different types of rural land are suited to specific uses, including extractive industries. The proposal seeks to extend the quarry footprint onto adjacent lots, increase the operational hours to 24 hours a day, 7 days per week and also to increase the extraction volume up to 2 million tonnes per annum, although it should be noted that this maximum annual production volume is not likely to represent the average production rate. The existing approval was determined to have no nuisance to any nearby sensitive land uses. Noise, air quality and vibration assessments confirmed the operation can continue to occur in a manner which will not cause any nuisance to any nearby sensitive land uses. The main internal access road, connecting the site access to the pit, will be sealed, once specific production limits are exceeded. The visual environment will have a negligible change due to distance, wide field of view from sensitive land uses and the speed environment. Extractive resources are site specific, limited in occurrence by geological conditions and are finite. Therefore, it is not possible to avoid or minimise clearing required while accessing the resource. Revegetation will be undertaken to prevent or reduce loss of environmental values identified a state government level. It is expected that these revegetation outcomes would also mitigate loss of environmental values identified a local level. The quarry footprint will be developed progressively, in line with operational needs. Agricultural activities will continue

	to occur across the site in areas which are not subject to quarry activities. Progressive rehabilitation will also occur to ensure areas are returned to a safe, stable and self-draining state to support a return to agricultural activities. Additional upgrade work is proposed to the site access to ensure this protects the safety and efficiency of the state controlled infrastructure network.
The purpose of the Extractive Industry Code is to facilitate the development of extractive resource, while ensuring the protection of the environment, landscape values and sensitive land uses. Extractive industry must be protected from developments that constrain safe and efficient ongoing operation. Once an extractive industry use has ceased, the site is satisfactorily rehabilitated.	Refer to the response to the Rural Zone Code above.
The purpose of the Access, Parking and Transport Code is to ensure that parking, access and transport facilitates for vehicles, pedestrians and cyclists are provided to service development in a safe, equitable and sustainable way.	The site has direct access to the Bruce Highway, being a state controlled road. Additional upgrade work is proposed to the site access to ensure this protects the safety and efficiency of the state controlled infrastructure network. No change to on-site access, transport or parking facilitates is proposed.
The purpose of the Stormwater Management Code is to provide for sustainable stormwater infrastructure which protects water quality, environmental values and maintains or enhances community health, safety and amenity.	Water quality and land management for the operations are currently regulated by DES under the 2010 EA conditions. The site is not connected to reticulated stormwater infrastructure, and no infrastructure will become a Council asset. The stormwater management plan addresses management of stormwater runoff and location and size of sediment basins. Stormwater management will be reviewed and updated on an ongoing basis to ensure relevant to the operational needs of the site. Best practice and contemporary conditions require reviews of environmental performance to be undertaken periodically.
The purpose of the Waste Management Code is to ensure that development is provided with on-site waste management facilitates including waste collection, storage, disposal and cleaning facilitates which maintain public health and streetscape amenity.	No change is proposed, or required, to the approved waste storage area. A waste management plan has been included in the Site Based Management Plan (refer **Attachment 11 – Site Based Management Plan**).
The purpose of the Works Code is to ensure development is provided with	The site is not connected to reticulated stormwater infrastructure, and no infrastructure will become a Council

a level of infrastructure which maintains or enhances community health, safety and amenity and which avoids or minimises impacts on the natural environment.	asset. The site has direct access to the Bruce Highway, being a state controlled road. The main internal haul road will continue to provide access between the site and the Bruce Highway. The quarry will continue to occur in a manner which maintains the health, safety and amenity of nearby sensitive land uses. Revegetation will be undertaken to prevent or reduce loss of environmental values identified a state government level. It is expected that these revegetation outcomes would also mitigate loss of environmental values identified a local level.
The purpose of the Acid Sulfate Soils Overlay Code is to ensure development involving acid sulfate soils is planned and managed to avoid potential adverse impacts on the natural and built environment, including infrastructure and human health.	No acid sulfate soils have been disturbed as part of the current operation and as such, are not anticipated to be disturbed as part of the proposed extended areas. Ongoing monitoring will be undertaken to ensure that acid sulfate soils are not intercepted.
The purpose of the Airport Environs Overlay Code is to ensure that the current and future operations of the Rockhampton Airport and associated aviation facilities are not adversely impacted by development and land uses.	No change is proposed to onsite infrastructure. Outdoor lighting will be installed in accordance with the relevant standards to ensure that lighting does not adversely impact on any aviation facilities.
The purpose of the Biodiversity Overlay Code is to protect, rehabilitate and manage areas of environmental significance and the ecological processes and biodiversity values of terrestrial and aquatic ecosystems.	This application seeks to extend an existing Extractive Industry operations, securing the businesses' ongoing access to a known resource. Extractive resources are site specific, limited in occurrence by geological conditions and are finite. Therefore, it is not possible to avoid or minimise clearing required while accessing the resource. Revegetation will be undertaken to prevent or reduce loss of environmental values identified a state government level. It is expected that these revegetation outcomes would also mitigate loss of environmental values identified a local level. The quarry footprint will be developed progressively, in line with operational needs. Progressive rehabilitation will also occur to ensure areas are returned to a safe, stable and self-draining state to support a return to agricultural activities.
The purpose of the Bushfire Hazard Overlay Code is to manage development outcomes in bushfire hazard areas so that risk to life, property, community, economic activity and the environment as a result of bushfire is avoided or minimised.	Extractive Industry activities generally have a broad range of plant and equipment available to assist in preventing and reducing potential impacts associated with a bushfire event (e.g. heavy machinery, water trucks). Management procedures for protection against bushfire are included in the SBMP (refer section 4.10 of **Attachment 11 – Site Based Management Plan**). The

	proposed changes will not directly, indirectly or cumulatively increase the severity of the bushfire hazard on the site or the adjoining properties.
The purpose of the Flood Hazard Overlay Code is to manage development outcomes in flood prone areas so that risk to life, property, community and the environment as a result of flood is avoided or minimised. Development does not increase likelihood or consequences of flood damage, either on-site or to any other property or infrastructure.	A small portion of Lot 2 on SP247721 is identified as being within the flood plain investigation area. The area intersects with proposed Pit 1 and a portion of the internal access road. No habitable buildings are proposed in the flood investigation area. Furthermore, any hazardous material will be stored in accordance with the relevant Australian Standard. There will be no direct, indirect or cumulative increase in the severity of the flood hazard on the site, or the adjacent properties.
The purpose of the Steep Land Overlay Code is to ensure that development does not materially increase the extent or the severity of landslide hazard and avoids risk to life, property, community and the environment during landslides.	Site stability will continue to be considered through the quarry development plans and the creation of safe and stable benches.

Strategic Framework

The proposed 'other' change is listed as Impact Assessable development meaning it must be assessed against the entirety of the Planning Scheme, including the strategic framework. The strategic framework sets the policy direction for the Planning Scheme and forms the basis for ensuring appropriate development occurs within the area for the life of the Planning Scheme.

The Planning Scheme has six (6) themes which collectively represent the policy intent of the scheme. A discussion of each is provided in **Table 7: Strategic Framework Assessment**.

Table 7: Strategic Framework Assessment

Theme	Response
Theme 1: Settlement Pattern	
This theme seeks to protect the desired pattern of settlement in the Rockhampton Region. This includes maintaining the productive capacity of rural lands, including their rural and landscape values, and responding to the natural hazards of the area. Rural land is identified as providing for uses including primary production, mining and tourism.	The Planning Scheme defines rural areas as the balance of non-urban area which contains rural production and landscapes. This proposal seeks to extend an established hard rock quarry onto adjacent land, providing an opportunity to access a proven resource. The proposal will not alienate or impact on the productive agricultural capacity of the rural area. A majority of the proposed extraction area, particularly proposed Pit 2, consists of terrain which is not suitable for agricultural activities. The quarry footprint will be developed progressively, in line with operational needs. Agricultural activities will continue to occur across the site in areas which are not subject to

	quarry activities. Progressive rehabilitation will also occur to ensure areas are returned to a safe, stable and self-draining state to support a return to agricultural activities. Vegetation retained to the east of the site will continue to provide an appropriate natural corridor to the north and south. Assessments have confirmed that nearby residences will not be impacted by the proposal, subject to the implementation of standard site management measures and sealing of the main access road when extraction exceeds certain criteria. An assessment has confirmed that the capacity and safety of the state controlled road network will not be impacted by the proposal, subject to upgrades to the existing site access where extraction exceeds 1 million tonnes per annum.
Theme 2: Natural environment and hazards	
This theme seeks to ensure development does not create unsustainable impacts on the natural environment and responds to the natural hazards of the area. The strategic outcomes seek to maintain a network of environmental areas and linking natural corridors. There is also a desire to ensure development avoids unacceptable risks due to natural hazards and ensure the natural processes and the protection function of landforms and vegetation is maintained in natural hazard areas. The health, well-being, amenity and safety of local communities and individuals is to be protected from the impacts of air, noise and hazardous materials.	Management plans have been developed to address site constraints including, flooding, bushfire and acid sulfate soils. Site stability will also be considered through the quarry development plans and the creation of safe and stable benches. Hazardous materials will continue to be appropriately located, designed and constructed to minimise health and safety risks to site workers and adverse impacts to the environment. The quarry footprint will be developed progressively, in line with operational needs. Clearing of vegetation areas will only occur immediately prior to extraction. Vegetation retained to the east of the site will continue to provide an appropriate natural corridor to the north and south. No impacts to mapped drainage features is proposed.
Theme 3: Community identity and diversity	
This theme seeks to ensure the quality of life of residents is enhanced through access to infrastructure, services and facilities.	The proposal will not impact the communities access to infrastructure, services and facilities. An air quality assessment and noise assessment confirm the operation will not impact on nearby residences, subject to appropriate mitigation measures. Topography, retained vegetation, wide view corridors and the variation in landscape detail (i.e. colours, textures etc) will ensure any changes to the visual environment are relatively

	indiscernible from nearby residences and travellers on the state road network.
Theme 4: Access and mobility	
This theme seeks to ensure the region is well connected to employment centres, and the safety and efficiency of transport infrastructure (including the Bruce Highway) is not compromised by development.	A traffic assessment confirmed that the proposal will not impact on the safety, function or capacity of the local and state controlled road network. The assessment recommended that additional upgrade works be undertaken at the site access to the Bruce Highway where extraction exceeds 1 million tonnes per annum.
Theme 5: Infrastructure and services	
This theme seeks to ensure infrastructure and services are planned and delivered in a logical and cost efficient manner.	The site is not connected to any Council provided infrastructure, nor it is proposed to connect to Council infrastructure as a result of this development. The sites access to the Bruce Highway will be upgraded when extraction exceed 1 million tonnes per annum.
Theme 6: Natural resources and economic development	
This theme seeks to ensure the economy of the region continues to grow and provides the community with diverse and new employment opportunities. The strategic outcomes state that industries which add value to existing rural production are encouraged where, they can access appropriate infrastructure; their impacts are managed and they do not unreasonably impact on environmental values.	This proposal seeks to extend an established hard rock quarry onto adjacent land, providing an opportunity to access a proven resource. Extension of the quarry future guards the site operators access to a proven resource, and the ongoing employment of local workers. A local hard rock resource also diversifies the market, providing competition and choice to consumers.

5. Conclusion

This Planning Assessment Report has been prepared to support a development application for an 'other' change to an existing Material Change of Use – Development Permit for Extractive Industry, Medium Impact Industry and Warehouse at 59793 Bruce Highway, Midgee, currently confined to Lot 2 on RP888747. It is proposed to extend the quarry footprint onto four (4) adjacent parcels of land at 1 and 931 Bruce Highway, Midgee, Lot 725 Bruce Highway, Bouldercombe, and 33 Gavial-Gracemere Road Bouldercombe, properly described as Lot 1 on SP247721, Lot 931 on LIV40265, Lot 725 on RP888747 and Lot 2 on SP247721. It is also proposed to increase the extraction volume to allow the operation to produce up to 2 million tonnes per annum and to extend the hours of operation to 24/7. The proposal is required to follow the Impact Assessment application process.

DES has oversight of extraction and screening activities through the concurrent approval of the EA for ERA 16. DES have a number of model operating conditions which regulate noise, dust, water quality and land management, which are expected to be conditions as part of the EA for this site. Given DES oversight, it is suggested that it is unnecessary for Council to further regulate these matters.

Having regard to the assessment conducted, it is considered that the proposed changes to the existing Extractive Industry activity remain consistent with the planning and environmental objective of the relevant planning instruments and policies. As such, it is recommended that the proposed expansion of the operation be supported by Council, and the State Assessment and Referral Agency, subject to reasonable and relevant conditions.

ATTACHMENTS

GROUNDWORK plus

Attachment 1

2018 Approval

Attachment 2

2010 Current Environmental Authority

Attachment 3

Site Layout Plan

Attachment 4

Site Searches

Attachment 5

Traffic and Pavement Impact Assessment

Attachment 6

Stormwater Management Plan

Attachment 7

Nosie Assessment

Attachment 8

Air Quality Assessment

Attachment 9

Ecological Assessment

Attachment 10

Environmental Assessment Report

Attachment 11

Site Based Management Plan

Attachment 12

Visual Assessment

Attachment 13

SDAP Code Assessment

Attachment 14

Relevant Purpose Determination

Attachment 15

Remnant Vegetation

Attachment 16

Waterway Barrier Works Determination

Attachment 17

Water Act Determination

Attachment 18

Council Code Assessment

Change application form

Planning Act Form 5 (version 1.2 effective 7 February 2020) made under Section 282 of the Planning Act 2016.

This form is to be used for a change application made under section 78 of the *Planning Act 2016*. It is important when making a change application to be aware of whether the application is for a minor change that will be assessed under section 81 of the *Planning Act 2016* or for an other change that will be assessed under section 82 of the *Planning Act 2016*.

An applicant must complete all parts of this form, and provide any supporting information that the form identifies as being required to accompany the change application, unless stated otherwise. Additional pages may be attached if there is insufficient space on the form to complete any part.

***Note**: All terms used in this form have the meaning given under the Planning Act 2016, the Planning Regulation 2017, or the Development Assessment Rules (DA Rules).*

PART 1 – APPLICANT DETAILS

1) Applicant details	
Applicant name(s) (*individual or company full name*)	Hopkins Brothers Group Pty Ltd
Contact name *(only applicable for companies)*	c/- Groundwork Plus Pty Ltd (Megan Benham)
Postal address *(P.O. Box or street address)*	PO Box 1774
Suburb	Milton
State	QLD
Postcode	4064
Country	Australia
Email address *(non-mandatory)*	mbenham@groundwork.com.au
Mobile number *(non-mandatory)*	0429 735 447
Applicant's reference number(s) *(if applicable)*	2607.CA1

2) Owner's consent - Is written consent of the owner required for this change application?

***Note**: Section 79(1A) of the Planning Act 2016 states the requirements in relation to owner's consent.*

☒ Yes – the written consent of the owner(s) is attached to this change application

☐ No

PART 2 – LOCATION DETAILS

3) Location of the premises *(complete 3.1) or 3.2), and 3.3) as applicable)*

3.1) Street address and lot on plan

☒ Street address **AND** lot on plan (*all lots must be listed*), ***or***

☐ Street address **AND** lot on plan for an adjoining or adjacent property of the premises *(appropriate for development in water but adjoining or adjacent to land e.g. jetty, pontoon. All lots must be listed).*

a)	Unit No.	Street No.	Street Name and Type	Suburb
			REFER TABLE BELOW	
	Postcode	Lot No.	Plan Type and Number *(e.g. RP, SP)*	Local Government Area(s)
b)	Unit No.	Street No.	Street Name and Type	Suburb
	Postcode	Lot No.	Plan Type and Number *(e.g. RP, SP)*	Local Government Area(s)

3.2) Coordinates of premises *(appropriate for development in remote areas, over part of a lot or in water not adjoining or adjacent to land e.g. channel dredging in Moreton Bay)*

***Note**: Place each set of coordinates in a separate row.*

☐ Coordinates of premises by longitude and latitude

Longitude(s)	Latitude(s)	Datum	Local Government Area(s) *(if applicable)*
		☐ WGS84 ☐ GDA94 ☐ Other:	

☐ Coordinates of premises by easting and northing

Easting(s)	Northing(s)	Zone Ref.	Datum	Local Government Area(s) *(if applicable)*
		☐ 54 ☐ 55 ☐ 56	☐ WGS84 ☐ GDA94 ☐ Other:	

3.3) Additional premises

☒ Additional premises are relevant to the original development approval and the details of these premises have been attached in a schedule to this application

☐ Not required

PART 3 – RESPONSIBLE ENTITY DETAILS

4) Identify the responsible entity that will be assessing this change application

***Note**: see section 78(3) of the Planning Act 2016*

Rockhampton Regional Council

PART 4 – CHANGE DETAILS

5) Provide details of the existing development approval subject to this change application

Approval type	Reference number	Date issued	Assessment manager/approval entity
☒ Development permit ☐ Preliminary approval	D/79-2017	13 November 2018	Rockhampton Regional Council
☒ Development permit ☐ Preliminary approval	IPCE01813610	16 February 2010	Department of Environment and Science

6) Type of change proposed

6.1) Provide a brief description of the changes proposed to the development approval *(e.g. changing a development approval for a five unit apartment building to provide for a six unit apartment building)*:

Other Change – Extension to Midgee Quarry footprint and increase in volume to up to 2,000,000 tonnes per year.

6.2) What type of change does this application propose?

☐ Minor change application – proceed to Part 5

☒ Other change application – proceed to Part 6

PART 5 – MINOR CHANGE APPLICATION REQUIREMENTS

7) Are there any affected entities for this change application

☐ No – proceed to Part 7
☐ Yes – list all affected entities below and proceed to Part 7

***Note**: section 80(1) of the Planning Act 2016 states that the person making the change application must give notice of the proposal and the details of the change to each affected entity as identified in section 80(2) of the Planning Act 2016.*

Affected entity	Pre-request response provided? (*where a pre-request response notice for the application has been given, a copy of the notice must accompany this change application)*	Date notice given *(where no pre-request response provided)*
	☐ No ☐ Yes – pre-request response is attached to this change application	
	☐ No ☐ Yes – pre-request response is attached to this change application	
	☐ No ☐ Yes – pre-request response is attached to this change application	

PART 6 – OTHER CHANGE APPLICATION REQUIREMENTS

***Note**: To complete this part it will be necessary for you to complete parts of DA Form 1 – Development application details and in some instances parts of DA Form 2 – Building work details, as mentioned below. These forms are available at https://planning.dsdmip.qld.gov.au.*

8) Location details - Are there any additional premises included in this change application that were not part of the original development approval?

☐ No
☒ Yes

9) Development details

9.1) Is there any change to the type of development, approval type, or level of assessment in this change application?

☒ No
☐ Yes – the completed Sections 1 and 2 of Part 3 (Development details) of *DA Form 1 – Development application details* as these sections relate to the new or changed aspects of development are provided with this application.

9.2) Does the change application involve building work?

☒ No
☐ Yes – the completed Part 5 (Building work details) of *DA Form 2 – Building work details* as it relates to the change application is provided with this application.

10) Referral details – Does the change application require referral for any referral requirements?

***Note**: The application must be referred to each referral agency triggered by the change application as if the change application was the original development application including the proposed change.*

☐ No
☒ Yes – the completed Part 5 (Referral details) of *DA Form 1 – Development application details* as it relates to the change application is provided with this application. Where referral is required for matters relating to building work the Referral checklist for building work is also completed.

11) Information request under Part 3 of the DA Rules

☒ I agree to receive an information request if determined necessary for this change application
☐ I do not agree to accept an information request for this change application

***Note**: By not agreeing to accept an information request I, the applicant, acknowledge:*

- *that this change application will be assessed and decided based on the information provided when making this change application and the assessment manager and any referral agencies relevant to the change application are not obligated under the DA Rules to accept any additional information provided by the applicant for the change application unless agreed to by the relevant parties*
- *Part 3 of the DA Rules will still apply if the application is an application listed under section 11.3 of the DA Rules.*

Further advice about information requests is contained in the DA Forms Guide: Forms 1 and 2.

12) Further details

☒ Part 7 of *DA Form 1 – Development application details* is completed as if the change application was a development application and is provided with this application.

PART 7 – CHECKLIST AND APPLICANT DECLARATION

13) Change application checklist

I have identified the: • responsible entity in 4); and • for a minor change, any affected entities; and • for an other change all relevant referral requirement(s) in 10) ***Note**: See the Planning Regulation 2017 for referral requirements*	☒ Yes
For an other change application, the relevant sections of *DA Form 1 – Development application details* have been completed and is attached to this application	☒ Yes ☐ Not applicable
For an other change application, where building work is associated with the change application, the relevant sections of *DA Form 2 – Building work details* have been completed and is attached to this application	☐ Yes ☒ Not applicable
Supporting information addressing any applicable assessment benchmarks is attached to this application ***Note**: This includes any templates provided under 23.6 and 23.7 of DA Form 1 – Development application details that are relevant as a result of the change application, a planning report and any technical reports required by the relevant categorising instrument(s) (e.g. the local government planning scheme, State Planning Policy, State Development Assessment Provisions). For further information, see DA Forms Guide: Planning report template.*	☒ Yes
Relevant plans of the development are attached to this development application ***Note**: Relevant plans are required to be submitted for all relevant aspects of this change application. For further information, see DA Forms Guide: Relevant plans.*	☒ Yes

14) Applicant declaration

☒ By making this change application, I declare that all information in this change application is true and correct.

☒ Where an email address is provided in Part 1 of this form, I consent to receive future electronic communications from the responsible entity and any relevant affected entity or referral agency for the change application where written information is required or permitted pursuant to sections 11 and 12 of the *Electronic Transactions Act 2001*.

***Note**: It is unlawful to intentionally provide false or misleading information.*

Privacy – Personal information collected in this form will be used by the responsible entity and/or chosen assessment manager, any relevant affected entity or referral agency and/or building certifier (including any professional advisers which may be engaged by those entities) while processing, assessing and deciding the change application.

All information relating to this change application may be available for inspection and purchase, and/or published on the assessment manager's and/or referral agency's website.

Personal information will not be disclosed for a purpose unrelated to the *Planning Act 2016*, Planning Regulation 2017 and the DA Rules except where:

- such disclosure is in accordance with the provisions about public access to documents contained in the *Planning Act 2016* and the Planning Regulation 2017, and the access rules made under the *Planning Act 2016* and Planning Regulation 2017; or
- required by other legislation (including the *Right to Information Act 2009*); or
- otherwise required by law.

This information may be stored in relevant databases. The information collected will be retained as required by the *Public Records Act 2002*.

PART 8 – FOR COMPLETION OF THE ASSESSMENT MANAGER – FOR OFFICE USE ONLY

Date received: | Reference number(s):

QLeave notification and payment *Note: For completion by assessment manager if applicable*			
Description of the work			
QLeave project number			
Amount paid ($)		Date paid (dd/mm/yy)	
Date receipted form sighted by assessment manager			
Name of officer who sighted the form			

3) Location of the premises - Additional premises				
a)	Unit No.	Street No.	Street Name and Type	Suburb
		59793	Bruce Highway	Midgee
	Postcode	Lot No.	Plan Type and Number *(e.g. RP, SP)*	Local Government Area(s)
	4702	2	RP888747	Rockhampton Regional Council
b)	Unit No.	Street No.	Street Name and Type	Suburb
		1	Bruce Highway	Midgee
	Postcode	Lot No.	Plan Type and Number *(e.g. RP, SP)*	Local Government Area(s)
	QLD	1	SP247721	Rockhampton Regional Council
c)	Unit No.	Street No.	Street Name and Type	Suburb
		931	Bruce Highway	Midgee
	Postcode	Lot No.	Plan Type and Number *(e.g. RP, SP)*	Local Government Area(s)
	4702	931	LIV40265	Rockhampton Regional Council
d)	Unit No.	Street No.	Street Name and Type	Suburb
		33	Gavial – Gracemere Road	Bouldercombe
	Postcode	Lot No.	Plan Type and Number *(e.g. RP, SP)*	Local Government Area(s)
	4702	2	SP247721	Rockhampton Regional Council
e)	Unit No.	Street No.	Street Name and Type	Suburb
		Lot 725	Bruce Highway	Bouldercombe
	Postcode	Lot No.	Plan Type and Number *(e.g. RP, SP)*	Local Government Area(s)
	4702	725	RP888747	Rockhampton Regional Council

DA Form 1 – Development application details

Approved form (version 1.3 effective 28 September 2020) made under section 282 of the Planning Act 2016.

This form **must** be used to make a development application **involving code assessment or impact assessment**, except when applying for development involving only building work.

For a development application involving **building work only**, use *DA Form 2 – Building work details*.

For a development application involving **building work associated with any other type of assessable development (i.e. material change of use, operational work or reconfiguring a lot)**, use this form (*DA Form 1*) **and** parts 4 to 6 of *DA Form 2 – Building work details.*

Unless stated otherwise, all parts of this form **must** be completed in full and all required supporting information **must** accompany the development application.

One or more additional pages may be attached as a schedule to this development application if there is insufficient space on the form to include all the necessary information.

This form and any other form relevant to the development application must be used to make a development application relating to strategic port land and Brisbane core port land under the *Transport Infrastructure Act 1994*, and airport land under the *Airport Assets (Restructuring and Disposal) Act 2008.* For the purpose of assessing a development application relating to strategic port land and Brisbane core port land, any reference to a planning scheme is taken to mean a land use plan for the strategic port land, Brisbane port land use plan for Brisbane core port land, or a land use plan for airport land.

Note: *All terms used in this form have the meaning given under the Planning Act 2016, the Planning Regulation 2017, or the Development Assessment Rules (DA Rules).*

PART 1 – APPLICANT DETAILS

1) Applicant details	
Applicant name(s) (*individual or company full name*)	
Contact name *(only applicable for companies)*	
Postal address *(P.O. Box or street address)*	
Suburb	
State	
Postcode	
Country	
Contact number	
Email address *(non-mandatory)*	
Mobile number *(non-mandatory)*	
Fax number *(non-mandatory)*	
Applicant's reference number(s) *(if applicable)*	

2) Owner's consent
2.1) Is written consent of the owner required for this development application?
☐ Yes – the written consent of the owner(s) is attached to this development application ☐ No – proceed to 3)

PART 2 – LOCATION DETAILS

3) Location of the premises *(complete 3.1) or 3.2), and 3.3) as applicable)*

***Note**: Provide details below and attach a site plan for any or all premises part of the development application. For further information, see DA Forms Guide: Relevant plans.*

3.1) Street address and lot on plan

☐ Street address **AND** lot on plan (a*ll lots must be listed*), ***or***

☐ Street address **AND** lot on plan for an adjoining or adjacent property of the premises *(appropriate for development in water but adjoining or adjacent to land e.g. jetty, pontoon. All lots must be listed).*

a)	Unit No.	Street No.	Street Name and Type	Suburb
	Postcode	Lot No.	Plan Type and Number *(e.g. RP, SP)*	Local Government Area(s)
b)	Unit No.	Street No.	Street Name and Type	Suburb
	Postcode	Lot No.	Plan Type and Number *(e.g. RP, SP)*	Local Government Area(s)

3.2) Coordinates of premises *(appropriate for development in remote areas, over part of a lot or in water not adjoining or adjacent to land e.g. channel dredging in Moreton Bay)*

***Note**: Place each set of coordinates in a separate row.*

☐ Coordinates of premises by longitude and latitude

Longitude(s)	Latitude(s)	Datum	Local Government Area(s) *(if applicable)*
		☐ WGS84 ☐ GDA94 ☐ Other:	

☐ Coordinates of premises by easting and northing

Easting(s)	Northing(s)	Zone Ref.	Datum	Local Government Area(s) *(if applicable)*
		☐ 54 ☐ 55 ☐ 56	☐ WGS84 ☐ GDA94 ☐ Other:	

3.3) Additional premises

☐ Additional premises are relevant to this development application and the details of these premises have been attached in a schedule to this development application

☐ Not required

4) Identify any of the following that apply to the premises and provide any relevant details

☐ In or adjacent to a water body or watercourse or in or above an aquifer

Name of water body, watercourse or aquifer:

☐ On strategic port land under the *Transport Infrastructure Act 1994*

Lot on plan description of strategic port land:

Name of port authority for the lot:

☐ In a tidal area

Name of local government for the tidal area *(if applicable)*:

Name of port authority for tidal area *(if applicable)*:

☐ On airport land under the *Airport Assets (Restructuring and Disposal) Act 2008*

Name of airport:

☐ Listed on the Environmental Management Register (EMR) under the *Environmental Protection Act 1994*	
EMR site identification:	
☐ Listed on the Contaminated Land Register (CLR) under the *Environmental Protection Act 1994*	
CLR site identification:	

5) Are there any existing easements over the premises?

Note: Easement uses vary throughout Queensland and are to be identified correctly and accurately. For further information on easements and how they may affect the proposed development, see DA Forms Guide.

☐ Yes – All easement locations, types and dimensions are included in plans submitted with this development application

☐ No

PART 3 – DEVELOPMENT DETAILS

Section 1 – Aspects of development

6.1) Provide details about the first development aspect

a) What is the type of development? *(tick only one box)*

☐ Material change of use ☐ Reconfiguring a lot ☐ Operational work ☐ Building work

b) What is the approval type? *(tick only one box)*

☐ Development permit ☐ Preliminary approval ☐ Preliminary approval that includes a variation approval

c) What is the level of assessment?

☐ Code assessment ☐ Impact assessment *(requires public notification)*

d) Provide a brief description of the proposal *(e.g. 6 unit apartment building defined as multi-unit dwelling, reconfiguration of 1 lot into 3 lots)*:

e) Relevant plans

***Note**: Relevant plans are required to be submitted for all aspects of this development application. For further information, see DA Forms guide: Relevant plans.*

☐ Relevant plans of the proposed development are attached to the development application

6.2) Provide details about the second development aspect

a) What is the type of development? *(tick only one box)*

☐ Material change of use ☐ Reconfiguring a lot ☐ Operational work ☐ Building work

b) What is the approval type? *(tick only one box)*

☐ Development permit ☐ Preliminary approval ☐ Preliminary approval that includes a variation approval

c) What is the level of assessment?

☐ Code assessment ☐ Impact assessment *(requires public notification)*

d) Provide a brief description of the proposal *(e.g. 6 unit apartment building defined as multi-unit dwelling, reconfiguration of 1 lot into 3 lots)*:

e) Relevant plans

***Note**: Relevant plans are required to be submitted for all aspects of this development application. For further information, see DA Forms Guide: Relevant plans.*

☐ Relevant plans of the proposed development are attached to the development application

6.3) Additional aspects of development

☐ Additional aspects of development are relevant to this development application and the details for these aspects that would be required under Part 3 Section 1 of this form have been attached to this development application

☐ Not required

Section 2 – Further development details

7) Does the proposed development application involve any of the following?	
Material change of use	☐ Yes – complete division 1 if assessable against a local planning instrument
Reconfiguring a lot	☐ Yes – complete division 2
Operational work	☐ Yes – complete division 3
Building work	☐ Yes – complete *DA Form 2 – Building work details*

Division 1 – Material change of use

***Note**: This division is only required to be completed if any part of the development application involves a material change of use assessable against a local planning instrument.*

8.1) Describe the proposed material change of use			
Provide a general description of the proposed use	Provide the planning scheme definition *(include each definition in a new row)*	Number of dwelling units *(if applicable)*	Gross floor area (m^2) *(if applicable)*

8.2) Does the proposed use involve the use of existing buildings on the premises?
☐ Yes
☐ No

Division 2 – Reconfiguring a lot

***Note**: This division is only required to be completed if any part of the development application involves reconfiguring a lot.*

9.1) What is the total number of existing lots making up the premises?

9.2) What is the nature of the lot reconfiguration? *(tick all applicable boxes)*	
☐ Subdivision *(complete 10))*	☐ Dividing land into parts by agreement *(complete 11))*
☐ Boundary realignment *(complete 12))*	☐ Creating or changing an easement giving access to a lot from a constructed road *(complete 13))*

10) Subdivision				
10.1) For this development, how many lots are being created and what is the intended use of those lots:				
Intended use of lots created	Residential	Commercial	Industrial	Other, please specify:
Number of lots created				

10.2) Will the subdivision be staged?	
☐ Yes – provide additional details below ☐ No	
How many stages will the works include?	
What stage(s) will this development application apply to?	

11) Dividing land into parts by agreement – how many parts are being created and what is the intended use of the parts?				
Intended use of parts created	Residential	Commercial	Industrial	Other, please specify:
Number of parts created				

12) Boundary realignment			
12.1) What are the current and proposed areas for each lot comprising the premises?			
Current lot		Proposed lot	
Lot on plan description	Area (m^2)	Lot on plan description	Area (m^2)

12.2) What is the reason for the boundary realignment?

13) What are the dimensions and nature of any existing easements being changed and/or any proposed easement? *(attach schedule if there are more than two easements)*				
Existing or proposed?	Width (m)	Length (m)	Purpose of the easement? *(e.g. pedestrian access)*	Identify the land/lot(s) benefitted by the easement

Division 3 – Operational work

***Note**: This division is only required to be completed if any part of the development application involves operational work.*

14.1) What is the nature of the operational work?		
☐ Road work	☐ Stormwater	☐ Water infrastructure
☐ Drainage work	☐ Earthworks	☐ Sewage infrastructure
☐ Landscaping	☐ Signage	☐ Clearing vegetation
☐ Other – please specify:		

14.2) Is the operational work necessary to facilitate the creation of new lots? *(e.g. subdivision)*	
☐ Yes – specify number of new lots:	
☐ No	

14.3) What is the monetary value of the proposed operational work? *(include GST, materials and labour)*
$

PART 4 – ASSESSMENT MANAGER DETAILS

15) Identify the assessment manager(s) who will be assessing this development application

16) Has the local government agreed to apply a superseded planning scheme for this development application?
☐ Yes – a copy of the decision notice is attached to this development application
☐ The local government is taken to have agreed to the superseded planning scheme request – relevant documents attached
☐ No

PART 5 – REFERRAL DETAILS

17) Does this development application include any aspects that have any referral requirements?
***Note**: A development application will require referral if prescribed by the* Planning Regulation 2017.

☐ No, there are no referral requirements relevant to any development aspects identified in this development application – proceed to Part 6

Matters requiring referral to the **Chief Executive of the *Planning Act 2016*:**

☒ Clearing native vegetation
☐ Contaminated land *(unexploded ordnance)*
☒ Environmentally relevant activities (ERA) *(only if the ERA has not been devolved to a local government)*
☐ Fisheries – aquaculture
☐ Fisheries – declared fish habitat area
☐ Fisheries – marine plants
☐ Fisheries – waterway barrier works
☐ Hazardous chemical facilities
☐ Heritage places – Queensland heritage place *(on or near a Queensland heritage place)*
☐ Infrastructure-related referrals – designated premises
☒ Infrastructure-related referrals – state transport infrastructure
☒ Infrastructure-related referrals – State transport corridor and future State transport corridor
☐ Infrastructure-related referrals – State-controlled transport tunnels and future state-controlled transport tunnels
☐ Infrastructure-related referrals – near a state-controlled road intersection
☐ Koala habitat in SEQ region – interfering with koala habitat in koala habitat areas outside koala priority areas
☐ Koala habitat in SEQ region – key resource areas
☐ Ports – Brisbane core port land – near a State transport corridor or future State transport corridor
☐ Ports – Brisbane core port land – environmentally relevant activity (ERA)
☐ Ports – Brisbane core port land – tidal works or work in a coastal management district
☐ Ports – Brisbane core port land – hazardous chemical facility
☐ Ports – Brisbane core port land – taking or interfering with water
☐ Ports – Brisbane core port land – referable dams
☐ Ports – Brisbane core port land – fisheries
☐ Ports – Land within Port of Brisbane's port limits *(below high-water mark)*
☐ SEQ development area
☐ SEQ regional landscape and rural production area or SEQ rural living area – tourist activity or sport and recreation activity
☐ SEQ regional landscape and rural production area or SEQ rural living area – community activity
☐ SEQ regional landscape and rural production area or SEQ rural living area – indoor recreation
☐ SEQ regional landscape and rural production area or SEQ rural living area – urban activity
☐ SEQ regional landscape and rural production area or SEQ rural living area – combined use
☐ Tidal works or works in a coastal management district
☐ Reconfiguring a lot in a coastal management district or for a canal
☐ Erosion prone area in a coastal management district
☐ Urban design
☐ Water-related development – taking or interfering with water
☐ Water-related development – removing quarry material *(from a watercourse or lake)*
☐ Water-related development – referable dams
☐ Water-related development –levees *(category 3 levees only)*
☐ Wetland protection area

Matters requiring referral to the **local government:**

☐ Airport land
☐ Environmentally relevant activities (ERA) (*only if the ERA has been devolved to local government)*

☐ Heritage places – Local heritage places

Matters requiring referral to the **Chief Executive of the distribution entity or transmission entity:**
☐ Infrastructure-related referrals – Electricity infrastructure

Matters requiring referral to:
- The **Chief Executive of the holder of the licence**, if not an individual
- The **holder of the licence**, if the holder of the licence is an individual

☐ Infrastructure-related referrals – Oil and gas infrastructure

Matters requiring referral to the **Brisbane City Council:**
☐ Ports – Brisbane core port land

Matters requiring referral to the **Minister responsible for administering the *Transport Infrastructure Act 1994*:**
☐ Ports – Brisbane core port land *(where inconsistent with the Brisbane port LUP for transport reasons)*
☐ Ports – Strategic port land

Matters requiring referral to the **relevant port operator**, if applicant is not port operator**:**
☐ Ports – Land within Port of Brisbane's port limits *(below high-water mark)*

Matters requiring referral to the **Chief Executive of the relevant port authority:**
☐ Ports – Land within limits of another port *(below high-water mark)*

Matters requiring referral to the **Gold Coast Waterways Authority:**
☐ Tidal works or work in a coastal management district *(in Gold Coast waters)*

Matters requiring referral to the **Queensland Fire and Emergency Service:**
☐ Tidal works or work in a coastal management district *(involving a marina (more than six vessel berths))*

18) Has any referral agency provided a referral response for this development application?

☐ Yes – referral response(s) received and listed below are attached to this development application
☒ No

Referral requirement	Referral agency	Date of referral response

Identify and describe any changes made to the proposed development application that was the subject of the referral response and this development application, or include details in a schedule to this development application *(if applicable).*

PART 6 – INFORMATION REQUEST

19) Information request under Part 3 of the DA Rules

☐ I agree to receive an information request if determined necessary for this development application
☐ I do not agree to accept an information request for this development application

***Note**: By not agreeing to accept an information request I, the applicant, acknowledge:*

- *that this development application will be assessed and decided based on the information provided when making this development application and the assessment manager and any referral agencies relevant to the development application are not obligated under the DA Rules to accept any additional information provided by the applicant for the development application unless agreed to by the relevant parties*
- *Part 3 of the DA Rules will still apply if the application is an application listed under section 11.3 of the DA Rules.*

Further advice about information requests is contained in the DA Forms Guide.

PART 7 – FURTHER DETAILS

20) Are there any associated development applications or current approvals? *(e.g. a preliminary approval)*

☒ Yes – provide details below or include details in a schedule to this development application
☐ No

List of approval/development application references	Reference number	Date	Assessment manager
☒ Approval ☐ Development application	D/79-2017	13 November 2018	Rockhampton Regional Council
☒ Approval ☐ Development application	IPCE01813610	16 February 2010	Department of Environment and Science

21) Has the portable long service leave levy been paid? *(only applicable to development applications involving building work or operational work)*

☐ Yes – a copy of the receipted QLeave form is attached to this development application
☒ No – I, the applicant will provide evidence that the portable long service leave levy has been paid before the assessment manager decides the development application. I acknowledge that the assessment manager may give a development approval only if I provide evidence that the portable long service leave levy has been paid
☒ Not applicable *(e.g. building and construction work is less than $150,000 excluding GST)*

Amount paid	Date paid (dd/mm/yy)	QLeave levy number (A, B or E)
$		

22) Is this development application in response to a show cause notice or required as a result of an enforcement notice?

☐ Yes – show cause or enforcement notice is attached
☒ No

23) Further legislative requirements

Environmentally relevant activities

23.1) Is this development application also taken to be an application for an environmental authority for an **Environmentally Relevant Activity (ERA)** under section 115 of the *Environmental Protection Act 1994*?

☐ Yes – the required attachment (form ESR/2015/1791) for an application for an environmental authority accompanies this development application, and details are provided in the table below
☒ No

***Note**: Application for an environmental authority can be found by searching "ESR/2015/1791" as a search term at www.qld.gov.au. An ERA requires an environmental authority to operate. See www.business.qld.gov.au for further information.*

Proposed ERA number:		Proposed ERA threshold:	
Proposed ERA name:			

☐ Multiple ERAs are applicable to this development application and the details have been attached in a schedule to this development application.

Hazardous chemical facilities

23.2) Is this development application for a **hazardous chemical facility**?

☐ Yes – *Form 69: Notification of a facility exceeding 10% of schedule 15 threshold* is attached to this development application
☒ No

***Note**: See www.business.qld.gov.au for further information about hazardous chemical notifications.*

Clearing native vegetation

23.3) Does this development application involve **clearing native vegetation** that requires written confirmation that the chief executive of the *Vegetation Management Act 1999* is satisfied the clearing is for a relevant purpose under section 22A of the *Vegetation Management Act 1999*?

☒ Yes – this development application includes written confirmation from the chief executive of the *Vegetation Management Act 1999* (s22A determination)

☐ No

***Note**: 1. Where a development application for operational work or material change of use requires a s22A determination and this is not included, the development application is prohibited development.*

2. See https://www.qld.gov.au/environment/land/vegetation/applying for further information on how to obtain a s22A determination.

Environmental offsets

23.4) Is this development application taken to be a prescribed activity that may have a significant residual impact on a **prescribed environmental matter** under the *Environmental Offsets Act 2014*?

☒ Yes – I acknowledge that an environmental offset must be provided for any prescribed activity assessed as having a significant residual impact on a prescribed environmental matter

☐ No

***Note**: The environmental offset section of the Queensland Government's website can be accessed at www.qld.gov.au for further information on environmental offsets.*

Koala habitat in SEQ Region

23.5) Does this development application involve a material change of use, reconfiguring a lot or operational work which is assessable development under Schedule 10, Part 10 of the Planning Regulation 2017?

☐ Yes – the development application involves premises in the koala habitat area in the koala priority area

☐ Yes – the development application involves premises in the koala habitat area outside the koala priority area

☒ No

***Note**: If a koala habitat area determination has been obtained for this premises and is current over the land, it should be provided as part of this development application. See koala habitat area guidance materials at www.des.qld.gov.au for further information.*

Water resources

23.6) Does this development application involve **taking or interfering with underground water through an artesian or subartesian bore, taking or interfering with water in a watercourse, lake or spring, or taking overland flow water under the *Water Act 2000***?

☒ Yes – the relevant template is completed and attached to this development application and I acknowledge that a relevant authorisation or licence under the *Water Act 2000* may be required prior to commencing development

☐ No

***Note**: Contact the Department of Natural Resources, Mines and Energy at www.dnrme.qld.gov.au for further information.*

DA templates are available from https://planning.dsdmip.qld.gov.au/. If the development application involves:

- *Taking or interfering with underground water through an artesian or subartesian bore: complete DA Form 1 Template 1*
- *Taking or interfering with water in a watercourse, lake or spring: complete DA Form1 Template 2*
- *Taking overland flow water: complete DA Form 1 Template 3.*

Waterway barrier works

23.7) Does this application involve **waterway barrier works?**

☐ Yes – the relevant template is completed and attached to this development application

☒ No

DA templates are available from https://planning.dsdmip.qld.gov.au/. For a development application involving waterway barrier works, complete DA Form 1 Template 4.

Marine activities

23.8) Does this development application involve **aquaculture, works within a declared fish habitat area or removal, disturbance or destruction of marine plants?**

☐ Yes – an associated *resource* allocation authority is attached to this development application, if required under the *Fisheries Act 1994*

☒ No

***Note**: See guidance materials at www.daf.qld.gov.au for further information.*

Quarry materials from a watercourse or lake

23.9) Does this development application involve the **removal of quarry materials from a watercourse or lake** under the *Water Act 2000?*

☐ Yes – I acknowledge that a quarry material allocation notice must be obtained prior to commencing development
☒ No

***Note**: Contact the Department of Natural Resources, Mines and Energy at www.dnrme.qld.gov.au and www.business.qld.gov.au for further information.*

Quarry materials from land under tidal waters

23.10) Does this development application involve the **removal of quarry materials from land under tidal water** under the *Coastal Protection and Management Act 1995?*

☐ Yes – I acknowledge that a quarry material allocation notice must be obtained prior to commencing development
☒ No

***Note**: Contact the Department of Environment and Science at www.des.qld.gov.au for further information.*

Referable dams

23.11) Does this development application involve a **referable dam** required to be failure impact assessed under section 343 of the *Water Supply (Safety and Reliability) Act 2008* (the Water Supply Act)?

☐ Yes – the 'Notice Accepting a Failure Impact Assessment' from the chief executive administering the Water Supply Act is attached to this development application
☒ No

***Note**: See guidance materials at www.dnrme.qld.gov.au for further information.*

Tidal work or development within a coastal management district

23.12) Does this development application involve **tidal work or development in a coastal management district**?

☐ Yes – the following is included with this development application:
- ☐ Evidence the proposal meets the code for assessable development that is prescribed tidal work *(only required if application involves prescribed tidal work)*
- ☐ A certificate of title

☒ No

***Note**: See guidance materials at www.des.qld.gov.au for further information.*

Queensland and local heritage places

23.13) Does this development application propose development on or adjoining a place entered in the **Queensland heritage register** or on a place entered in a local government's **Local Heritage Register**?

☐ Yes – details of the heritage place are provided in the table below
☒ No

***Note**: See guidance materials at www.des.qld.gov.au for information requirements regarding development of Queensland heritage places.*

Name of the heritage place:		Place ID:	

Brothels

23.14) Does this development application involve a **material change of use for a brothel**?

☐ Yes – this development application demonstrates how the proposal meets the code for a development application for a brothel under Schedule 3 of the *Prostitution Regulation 2014*
☒ No

Decision under section 62 of the *Transport Infrastructure Act 1994*

23.15) Does this development application involve new or changed access to a state-controlled road?

☒ Yes – this application will be taken to be an application for a decision under section 62 of the *Transport Infrastructure Act 1994* (subject to the conditions in section 75 of the *Transport Infrastructure Act 1994* being satisfied)
☐ No

Walkable neighbourhoods assessment benchmarks under Schedule 12A of the Planning Regulation

23.16) Does this development application involve reconfiguring a lot into 2 or more lots in certain residential zones (except rural residential zones), where at least one road is created or extended?

☐ Yes – Schedule 12A is applicable to the development application and the assessment benchmarks contained in schedule 12A have been considered

☒ No

***Note**: See guidance materials at www.planning.dsdmip.qld.gov.au for further information.*

PART 8 – CHECKLIST AND APPLICANT DECLARATION

24) Development application checklist	
I have identified the assessment manager in question 15 and all relevant referral requirement(s) in question 17 ***Note**: See the Planning Regulation 2017 for referral requirements*	☐ Yes
If building work is associated with the proposed development, Parts 4 to 6 of *DA Form 2 – Building work details* have been completed and attached to this development application	☐ Yes ☐ Not applicable
Supporting information addressing any applicable assessment benchmarks is with the development application ***Note**: This is a mandatory requirement and includes any relevant templates under question 23, a planning report and any technical reports required by the relevant categorising instruments (e.g. local government planning schemes, State Planning Policy, State Development Assessment Provisions). For further information, see DA Forms Guide: Planning Report Template.*	☐ Yes
Relevant plans of the development are attached to this development application ***Note**: Relevant plans are required to be submitted for all aspects of this development application. For further information, see DA Forms Guide: Relevant plans.*	☐ Yes
The portable long service leave levy for QLeave has been paid, or will be paid before a development permit is issued (*see 21*)	☐ Yes ☐ Not applicable

25) Applicant declaration

☐ By making this development application, I declare that all information in this development application is true and correct

☐ Where an email address is provided in Part 1 of this form, I consent to receive future electronic communications from the assessment manager and any referral agency for the development application where written information is required or permitted pursuant to sections 11 and 12 of the *Electronic Transactions Act 2001*

***Note**: It is unlawful to intentionally provide false or misleading information.*

Privacy – Personal information collected in this form will be used by the assessment manager and/or chosen assessment manager, any relevant referral agency and/or building certifier (including any professional advisers which may be engaged by those entities) while processing, assessing and deciding the development application. All information relating to this development application may be available for inspection and purchase, and/or published on the assessment manager's and/or referral agency's website.

Personal information will not be disclosed for a purpose unrelated to the *Planning Act 2016*, Planning Regulation 2017 and the DA Rules except where:

- such disclosure is in accordance with the provisions about public access to documents contained in the *Planning Act 2016* and the Planning Regulation 2017, and the access rules made under the *Planning Act 2016* and Planning Regulation 2017; or
- required by other legislation (including the *Right to Information Act 2009*); or
- otherwise required by law.

This information may be stored in relevant databases. The information collected will be retained as required by the *Public Records Act 2002.*

PART 9 – FOR COMPLETION OF THE ASSESSMENT MANAGER – FOR OFFICE USE ONLY

Date received: | Reference number(s):

Notification of engagement of alternative assessment manager	
Prescribed assessment manager	
Name of chosen assessment manager	
Date chosen assessment manager engaged	
Contact number of chosen assessment manager	
Relevant licence number(s) of chosen assessment manager	

QLeave notification and payment *Note: For completion by assessment manager if applicable*			
Description of the work			
QLeave project number			
Amount paid ($)		Date paid (dd/mm/yy)	
Date receipted form sighted by assessment manager			
Name of officer who sighted the form			

Company owner's consent to the making of a development application under the *Planning Act 2016*

I, ROBERT HOPKINS [*Insert name in full.*]

Director of the company mentioned below.

and I, PETER HOPKINS [*Insert name in full.*]

Director/Secretary of the company mentioned below.

Of Manyfold Pty Ltd (ACN 101 155 382)

the company being the owner of the premises identified as follows:

1 Bruce Highway, Midgee, QLD 4702, properly described as Lot 1 on SP247721

consent to the making of a development application under the *Planning Act 2016* by:

Hopkins Brothers Group Pty Ltd c/- Groundwork Plus Pty Ltd

on the premises described above for:

Other Change to Midgee Quarry (Council ref: D/79-2017) including:

- Material Change of Use – Development Permit for Extractive Industry, Medium Impact Industry and Warehouse;
- Material Change of Use – Concurrence Environmentally Relevant Activity (ERA);
- Environmental Authority for ERAs:
  - ERA 16(2)(c) for extraction, in a year, of more than 1,000,000 tonnes;
  - ERA 16(3)(c) for screening, in a year, of more than 1,000,000 tonnes.

Company Name and ACN: Manyfold Pty ltd (ACN 101 155 382)

..... Signature of Director	..... Signature of Director/Secretary
8/02/2022 Date	08/02/22 Date

The Planning Act 2016 is administered by the Department of Local Government, Infrastructure and Planning, Queensland Government.

Company owner's consent to the making of a development application under the *Planning Act 2016*

I, ROBERT HOPKINS [*Insert name in full.*]
Director of the company mentioned below.

and I, PETER HOPKINS [*Insert name in full.*]
Director/Secretary of the company mentioned below.

Of Manyfold Pty ltd (ACN 101 155 382)

the company being the owner of the premises identified as follows:

931 Bruce Highway, Midgee, QLD 4702, properly described as Lot 931 on LIV40265

consent to the making of a development application under the *Planning Act 2016* by:

Hopkins Brothers Group Pty Ltd c/- Groundwork Plus Pty Ltd

on the premises described above for:

Other Change to Midgee Quarry (Council ref: D/79-2017) including:

- Material Change of Use – Development Permit for Extractive Industry, Medium Impact Industry and Warehouse;
- Material Change of Use – Concurrence Environmentally Relevant Activity (ERA);
- Environmental Authority for ERAs:
  - ERA 16(2)(c) for extraction, in a year, of more than 1,000,000 tonnes;
  - ERA 16(3)(c) for screening, in a year, of more than 1,000,000 tonnes.

Company Name and ACN: Manyfold Pty ltd (ACN 101 155 382)

..... Signature of Director	..... Signature of Director/Secretary
8/02/2022 Date	08/02/22 Date

The Planning Act 2016 is administered by the Department of Local Government, Infrastructure and Planning, Queensland Government.

Individual owner's consent for making a development application under the *Planning Act 2016*

I, John Edmond Carroll

as owner of the premises identified as follows:

33 Gavial-Gracemere road, Bouldercombe, QLD 4702 properly described as Lot 2 on SP247721

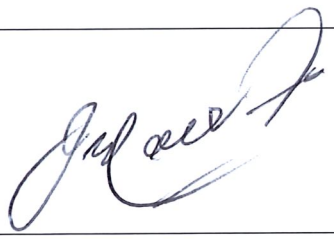
consent to the making of a development application under the *Planning Act 2016* by:

Hopkins Brothers Group Pty Ltd c/- Groundwork Plus Pty Ltd

on the premises described above for:

Other Change to Midgee Quarry (Council ref: D/79-2017) including:

- Material Change of Use – Development Permit for Extractive Industry, Medium Impact Industry and Warehouse;
- Material Change of Use – Concurrence Environmentally Relevant Activity (ERA);
- Environmental Authority for ERAs:
    - ERA 16(2)(c) for extraction, in a year, of more than 1,000,000 tonnes;
    - ERA 16(3)(c) for screening, in a year, of more than 1,000,000 tonnes.



15/2/22

[signature of owner and date signed]

Individual owner's consent for making a development application under the *Planning Act 2016*

I, Darryl Patrick Carroll

as owner of the premises identified as follows:

Lot 725 Bruce Highway, Bouldercombe, QLD 4702 properly described as Lot 725 on RP888747

consent to the making of a development application under the *Planning Act 2016* by:

Hopkins Brothers Group Pty Ltd c/- Groundwork Plus Pty Ltd

on the premises described above for:

Other Change to Midgee Quarry (Council ref: D/79-2017) including:

- Material Change of Use – Development Permit for Extractive Industry, Medium Impact Industry and Warehouse;
- Material Change of Use – Concurrence Environmentally Relevant Activity (ERA);
- Environmental Authority for ERAs:
    - ERA 16(2)(c) for extraction, in a year, of more than 1,000,000 tonnes;
    - ERA 16(3)(c) for screening, in a year, of more than 1,000,000 tonnes.

15/2/22

[*signature of owner and date signed*]

Decision Notice Approval

SUSTAINABLE PLANNING ACT 2009, SECTION 334 AND 335

Application number:	**D/79-2017**	Contact:	Thomas Gardiner
Date of Decision:	**13 November 2018**	Contact Number:	1300 22 55 77

1. APPLICANT DETAILS

Name:	**Hopeman Pty Ltd**
Postal address:	**C/- Gideon Town Planning** **PO BOX 450** **ROCKHAMPTON QLD 4700**
Phone no:	Mobile no: 0402 066 532 Email: gg@gideontownplanning.com.au

2. PROPERTY DESCRIPTION

Street address:	59793 Bruce Highway, Midgee
Real property description:	Lot 2 on RP888747, Parish of Plews

3. OWNER DETAILS

Name:	Hopkins Brothers Group Pty Ltd Tte
Postal address:	380 Alexandra Street, PARKHURST QLD 4702

4. DEVELOPMENT APPROVAL

Development Permit for a Material Change of Use for Extractive Industry, Medium Impact Industry and a Warehouse

5. APPLICATION TYPE

	Development Permit	Preliminary Approval
• **Material change of use** made assessable by the planning scheme	**YES**	NO

6. THE RELEVANT PERIOD

The standard relevant periods stated in section 341 of *Sustainable Planning Act 2009* apply to each aspect of development in this approval, if not stated in the conditions of approval attached.

7. GROUNDS OF JUSTIFICATION OF APPROVAL DESPITE CONFLICT WITH THE PLANNING SCHEME:

The grounds for approving the application, despite the conflict with the Planning Scheme, are:

1)	The proposal does not detract from the scenic features of the surrounding rural land.
2)	The proposal is responsive to the environmental characteristics and constraints of the land, and minimises impacts on natural features such as waterways, wetlands and remnant vegetation.
3)	The proposal ensures that rural land is maintained in large land holdings to protect the agricultural production capacity.

4)	The proposed use does not compromise the strategic framework in the Rockhampton Region Planning Scheme 2015;
5)	Assessment of the development against the relevant zone purpose, planning scheme codes and planning scheme policies demonstrates that the proposed development will not cause significant adverse impacts on the surrounding natural environment, built environment and infrastructure, community facilities, or local character and amenity; and
6)	The proposed development does not compromise the relevant State Planning Policy.

8. THE APPROVED PLANS

The approved development must be completed and maintained generally in accordance with the approved drawings and documents:

Plan/Document Name	Plan/Document Reference	Dated
Current Google Image	GG-003 SP-001 Rev 2	29 June 2017
Site Plan	GG-003 SP-002 Rev 2	29 June 2017
Technical Memorandum	Project No: 123-16-17	16 June 2017
Hopeman Pty Ltd – Midgee Quarry Material Change of Use Environmental Report	Steer Environmental Consulting	27 May 2017
Ecological Assessment Report Proposed Material Change of Use	Document Set ID: 8404932 Version 1	3 July 2017
Detailed Stormwater & Contaminated Water Management Plan	File No: K3626-0006	3 July 2017
Technical Memorandum Re: Midgee Quarry Expansion – 59793 Bruce Highway, Midgee – Storage Pad	File No: K3626-0008	7 September 2017
Permanent – Sediment and Erosion Control Plan	K3626-SE003 Issue A	29 September 2017
Permanent – Sediment and Erosion Control Details	K3626-SE004 Issue A	29 September 2017

9. FURTHER DEVELOPMENT PERMITS REQUIRED

Type of development permit required	Subject of the required development permit
Operational Works	*Site Works*

10. SUPERSEDED PLANNING SCHEME NO

11. REFERRAL AGENCIES

The following Referral Agencies were activated by this application.

Referrals - Development made assessable under a planning scheme, temporary local planning instrument, preliminary approval to which section 242 of the *Sustainable Planning Act* applies or State planning regulatory provisions

	For an application involving	Name of agency	Status	Address
LAND RELATING TO A STATE-CONTROLLED ROAD				
1	Making a material change of use of premises, other than an excluded material change of use, if any part of the land—	Department of Infrastructure, Local Government and Planning	Concurrence Agency	Online: *www.dilgp.qld.gov.au/MyDAS* Postal:

	For an application involving	Name of agency	Status	Address
	(a) is within 25m of a State-controlled road; or (b) is future State-controlled road; or (c) abuts a road that intersects with a State-controlled road within 100m of the land			PO Box 113 Rockhampton Qld 4700
	DEVELOPMENT IMPACTING ON A STATE-CONTROLLED ROAD			
2	An aspect of development identified in schedule 9 that— (a) is for a purpose mentioned in schedule 9, column 1; and (b) meets or exceeds the threshold— (i) for development in LGA population 1—mentioned in schedule 9, column 2 for the purpose; or (ii) for development in LGA population 2—mentioned in schedule 9, column 3 for the purpose. However, if the development is for a combination of purposes mentioned in the same item of schedule 9, the threshold is for the combination of purposes and not for each purpose individually.	Department of Infrastructure, Local Government and Planning	Concurrence Agency	Online: *www.dilgp.qld.gov.au/MyDAS* Postal: PO Box 113 Rockhampton Qld 4700
	CLEARING VEGETATION			
10	Material change of use of a lot that is 5ha or larger, if— (a) for development for which a preliminary approval is sought under the Act, section 242, the lot contains native vegetation shown on the regulated vegetation management map as a category A area or category B area; or (b) for other development that is not sole or community residence clearing— (i) additional exempt operational work could be carried out because of the material change of use or the development involves operational work made assessable under schedule 3, part 1, table 4, item 1; and (ii) the additional exempt operational work or assessable operational work includes development other than	Department of Infrastructure, Local Government and Planning	Concurrence Agency	Online: *www.dilgp.qld.gov.au/MyDAS* Postal: PO Box 113 Rockhampton Qld 4700

	For an application involving	Name of agency	Status	Address
	the clearing of regulated regrowth vegetation on freehold land, indigenous land or land the subject of a lease issued under the *Land Act 1994* for agriculture or grazing purposes			

12. SUBMISSIONS NIL

13. RIGHTS OF APPEAL

Rights of appeal in relation to this application are attached.

14. WHEN THE DEVELOPMENT APPROVAL TAKES EFFECT

This development approval takes effect:

- From the time the decision notice is given – if there is no submitter and the applicant does not appeal the decision to the court.

Or

- When the submitter's appeal period ends – if there is a submitter and the applicant does not appeal the decision to the court.

Or

- Subject to the decision of the court, when the appeal is finally decided – if an appeal is made to the court.

This approval will lapse unless substantially commenced within the above stated relevant periods (refer to sections 339 and 340 of *Sustainable Planning Act 2009* for further details).

15. ASSESSMENT MANAGER

Name: **Tarnya Fitzgibbon**
COORDINATOR DEVELOPMENT ASSESSMENT

Signature: 

Date: 16 November 2018

C/C. Department of Infrastructure, Local Government and Planning - RockhamptonSARA@dilgp.qld.gov.au

ADMINISTRATION

1.1 The Developer and his employee, agent, contractor or invitee is responsible for ensuring compliance with the conditions of this development approval.

1.2 Where these Conditions refer to "Council" in relation to requiring Council to approve or to be satisfied as to any matter, or conferring on the Council a function, power or discretion, that role may be fulfilled in whole or in part by a delegate appointed for that purpose by the Council.

1.3 All conditions, works, or requirements of this development approval must be undertaken, completed, and be accompanied by a Compliance Certificate for any operational works required by this development approval:

1.3.1 to Council's satisfaction;

1.3.2 at no cost to Council; and

1.3.3 prior to the commencement of the use;

unless otherwise stated.

1.4 Infrastructure requirements of this development approval must be contributed to the relevant authorities, where applicable, at no cost to Council, prior to the commencement of the use, unless otherwise stated.

1.5 The following further Development Permits must be obtained prior to the commencement of any works associated with their purposes:

1.5.1 Operational Works:

(i) Site Works.

1.6 All works must be designed, constructed and maintained in accordance with the relevant Council policies, guidelines and standards, unless otherwise stated.

1.7 All engineering drawings/specifications, design and construction works must be in accordance with the requirements of the relevant *Australian Standards* and must be approved, supervised and certified by a Registered Professional Engineer of Queensland.

2.0 APPROVED PLANS AND DOCUMENTS

2.1 The approved development must be completed and maintained generally in accordance with the approved plans and documents, except where amended by any condition of this development approval:

Plan/Document Name	Plan/Document Reference	Dated
Current Google Image	GG-003 SP-001 Rev 2	29 June 2017
Site Plan	GG-003 SP-002 Rev 2	29 June 2017
Technical Memorandum	Project No: 123-16-17	16 June 2017
Hopeman Pty Ltd – Midgee Quarry Material Change of Use Environmental Report	Steer Environmental Consulting	27 May 2017

Ecological Assessment Report Proposed Material Change of Use	Document Set ID: 8404932 Version 1	3 July 2017
Detailed Stormwater & Contaminated Water Management Plan	File No: K3626-0006	3 July 2017
Technical Memorandum Re: Midgee Quarry Expansion – 59793 Bruce Highway, Midgee – Storage Pad	File No: K3626-0008	7 September 2017
Permanent – Sediment and Erosion Control Plan	K3626-SE003 Issue A	29 September 2017
Permanent – Sediment and Erosion Control Details	K3626-SE004 Issue A	29 September 2017

2.2 Where there is any conflict between the conditions of this development approval and the details shown on the approved plans and documents, the conditions of this development approval must prevail.

3.0 SITE WORKS

3.1 A Development Permit for Operational Works (site works) must be obtained prior to the commencement of any site works.

3.2 Any application for a Development Permit for Operational Works (site works) must be accompanied by an earthworks' plan which clearly identifies the following:

3.2.1 the location of cut and/or fill;

3.2.2 the type of fill to be used and the manner in which it is to be compacted;

3.2.3 the quantum of fill to be deposited or removed and finished cut and/or fill levels;

3.2.4 details of any proposed access routes to the site which are intended to be used to transport fill to or from the site; and

3.2.5 the maintenance of access roads to and from the site so that they are free of all cut and/or fill material and cleaned as necessary.

3.3 Slope stability must be managed as follows:

3.3.1 all engineering drawings/specifications and designs must comply with the requirements of the relevant *Australian Standard AS3798 "Guidelines on Earthworks for Commercial and Residential Developments"* and must be approved by a Registered Professional Engineer of Queensland;

3.3.2 site inspections must be undertaken by a Registered Professional Engineer of Queensland to confirm the design; and

3.3.3 full engineering certification must be undertaken by a Registered Professional Engineer of Queensland.

3.4 All earthworks must be undertaken in accordance with *Australian Standards, AS3798 "Guidelines on Earthworks for Commercial and Residential Developments".*

3.5 Site works must be constructed such that they do not, at any time, in any way restrict, impair or change the natural flow of runoff water, or cause a nuisance or worsening to adjoining properties or infrastructure.

3.6 The area downstream of the spillway overflow of the sediment basin for the storage pad must be monitored so that scouring of the downstream watercourse is

prevented. If the design width of 5.0m for the spillway concentrates flows into the watercourse causing scouring, the spillway must be widened as required to control any downstream scouring.

4.0 ASSET MANAGEMENT

4.1 Any alteration necessary to electricity, telephone, water mains, sewerage mains, and/or public utility installations resulting from the development or in connection with the development, must be undertaken and completed at no cost to Council.

4.2 Any damage to existing stormwater, water supply and sewerage infrastructure, kerb and channel, pathway or roadway (including removal of concrete slurry from public land and Council infrastructure), that occurs while any works are being carried out in association with this development approval must be repaired at full cost to the developer. This includes the reinstatement of any existing traffic signs or pavement markings that may have been removed or damaged.

5.0 ENVIRONMENTAL

5.1 An Erosion Control and Stormwater Control Management Plan prepared by a Registered Professional Engineer of Queensland in accordance with the *Capricorn Municipal Design Guidelines*, must be implemented, monitored and maintained for the duration of the development site operating under this approval, and until rehabilitation of the site is completed including restoring to a safe, stable landform, functionally resembling the surrounding area. The plan must be available on-site for inspection by Council Officers whilst site is operating as an extractive industry.

6.0 OPERATING PROCEDURES

6.1 The hours of operations for the development site must be limited to:

(i) 0600 hours to 1800 hours on Monday to Friday, and

(ii) 0600 hours to 1800 hours on Saturday,

with no operations on Sundays or Public Holidays.

6.2 No washing of plant equipment and vehicles is permitted on the development site unless an approved washdown bay is built to prevent contamination of land and the stormwater system.

6.3 Cleaning of plant equipment and vehicles must be carried out in an area where wastewater can be suitably managed so as not to cause contaminants to release into waterways or overland flow paths.

7.0 ENVIRONMENTAL HEALTH

7.1 Any lighting devices associated with the development, such as sensory lighting, must be positioned on the development site and shielded so as not to cause glare or other nuisance to nearby residents and motorists. Night lighting must be designed, constructed and operated in accordance with *Australian Standard AS4282 "Control of the obtrusive effects of outdoor lighting"*.

7.2 Noise emitted from the activity must not cause an environmental nuisance.

7.3 Operations on the site must have no significant impact on the amenity of adjoining premises or the surrounding area due to the emission of light, noise, odour or dust.

ADVISORY NOTES

NOTE 1. Aboriginal Cultural Heritage

It is advised that under section 23 of the *Aboriginal Cultural Heritage Act 2003*, a person who carries out an activity must take all reasonable and practicable measures to ensure the activity does not harm Aboriginal cultural heritage (the "cultural heritage duty of care"). Maximum penalties for breaching the duty of

care are listed in the Aboriginal cultural heritage legislation. The information on Aboriginal cultural heritage is available on the Department of Aboriginal and Torres Strait Islander and Partnerships website www.datsip.qld.gov.au.

NOTE 2. General Environmental Duty

General environmental duty under the *Environmental Protection Act 1994* prohibits unlawful environmental nuisance caused by noise, aerosols, particles, dust, ash, fumes, light, odour or smoke beyond the boundaries of the development site during all stages of the development including earthworks, construction and operation.

NOTE 3. Licensable Activities

Should an activity licensable by Rockhampton Regional Council be proposed for the development site, Council's Environment and Public Health Unit must be consulted to determine whether any approvals are required. Such activities may include food preparation, storage of dangerous goods or environmentally relevant activities. Approval for such activities is required before 'fit out' and operation.

NOTE 4. General Safety Of Public During Construction

The *Work Health and Safety Act 2011* and *Manual of Uniform Traffic Control Devices* must be complied with in carrying out any construction works, and to ensure safe traffic control and safe public access in respect of works being constructed on a road.

NOTE 5. Duty to Notify of Environmental Harm

If a person becomes aware that serious or material environmental harm is caused or threatened by an activity or an associated activity, that person has a duty to notify Rockhampton Regional Council.

Concurrence Agency Conditions - Department of Infrastructure, Local Government and Planning

SUSTAINABLE PLANNING ACT 2009

Appeal Rights

SUSTAINABLE PLANNING ACT 2009

The following is an extract from the *Sustainable Planning Act* (Chapter 7).

Division 8 Appeals to court relating to development applications

461 Appeals by applicants

(1) An applicant for a development application may appeal to the court against any of the following—
  (a) the refusal, or the refusal in part, of a development application;
  (b) a matter stated in a development approval, including any condition applying to the development, and the identification of a code under section 424;
  (c) the decision to give a preliminary approval when a development permit was applied for;
  (d) the length of a period mentioned in section 341;
  (e) a deemed refusal of the development application.

(2) An appeal under subsection (1)(a), (b), (c) or (d) must be started within 20 business days (the applicant's appeal period) after the day the decision notice or negotiated decision notice is given to the applicant.

(3) An appeal under subsection (1)(e) may be started at any time after the last day a decision on the matter should have been made.

462 Appeals by submitters

(1) A submitter for a development application may appeal to the court only against—
  (a) the part of the approval relating to the assessment manager's decision about any part of the application requiring impact assessment under section 314; or
  (b) the part of the approval relating to the assessment manager's decision under section 327.

(2) To the extent an appeal may be made under subsection (1), the appeal may be against 1 or more of the following—
  (a) the giving of a development approval;
  (b) any provision of the approval including—
    (i) a condition of, or lack of condition for, the approval; or
    (ii) the length of a period mentioned in section 341 for the approval.

(3) However, a submitter may not appeal if the submitter—
  (a) withdraws the submission before the application is decided; or
  (b) has given the assessment manager a notice under section 339(1)(b)(ii).

(4) The appeal must be started within 20 business days (the submitter's appeal period) after the decision notice or negotiated decision notice is given to the submitter.

464 Appeals by advice agency submitters

(1) The advice agency may, within the limits of its jurisdiction, appeal to the court about—
  (a) any part of the approval relating to the assessment manager's decision about any part of the application requiring impact assessment under section 314; or
  (b) any part of the approval relating to the assessment manager's decision under section 327.

(2) The appeal must be started within 20 business days after the day the decision notice or negotiated decision notice is given to the advice agency as a submitter.

(3) However, if the advice agency has given the assessment manager a notice under section 339(1)(b)(ii), the advice agency may not appeal the decision.

465 Appeals about decisions relating to extensions for approvals

(1) For a development approval given for a development application, a person to whom a notice is given under section 389, other than a notice for a decision under section 386(2), may appeal to the court against the decision in the notice.

(2) The appeal must be started within 20 business days after the day the notice of the decision is given to the person.

(3) Also, a person who has made a request under section 383 may appeal to the court against a deemed refusal of the request.

(4) An appeal under subsection (3) may be started at any time after the last day the decision on the matter should have been made.

466 Appeals about decisions relating to permissible changes

(1) For a development approval given for a development application, the following persons may appeal to the court against a decision on a request to make a permissible change to the approval—
  (a) if the responsible entity for making the change is the assessment manager for the application—
    (i) the person who made the request; or
    (ii) an entity that gave a notice under section 373 or a pre-request response notice about the request;
  (b) if the responsible entity for making the change is a concurrence agency for the application—the person who made the request.

(2) The appeal must be started within 20 business days after the day the person is given notice of the decision on the request under section 376.

(3) Also, a person who has made a request under section 369 may appeal to the court against a deemed refusal of the request.

(4) An appeal under subsection (3) may be started at any time after the last day the decision on the matter should have been made.

467 Appeals about changing or cancelling conditions imposed by assessment manager or concurrence agency

(1) A person to whom a notice under section 378(9)(b) giving a decision to change or cancel a condition of a development approval has been given may appeal to the court against the decision in the notice.

(2) The appeal must be started within 20 business days after the day the notice of the decision is given to the person.

ATTACHMENTS

APPROVED PLANS AND OR REFERRAL AGENCY CONDITIONS

APPROVED PLANS

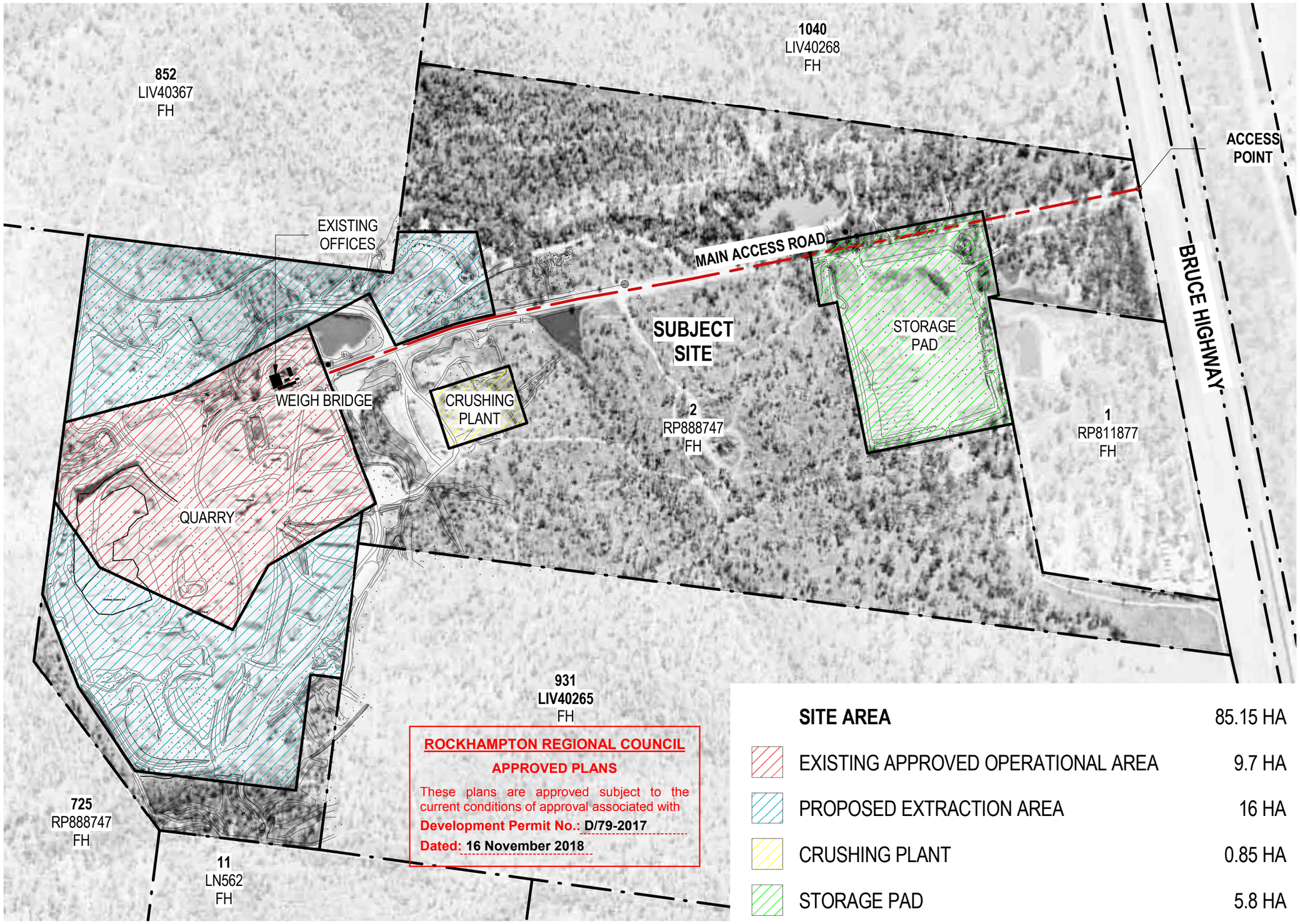


Adobe Acrobat Document

REFERRAL AGENCY CONDITIONS



Adobe Acrobat Document



ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

These plans are approved subject to the current conditions of approval associated with

Development Permit No.: D/79-2017

Dated: 16 November 2018

	SITE AREA	85.15 HA
	EXISTING APPROVED OPERATIONAL AREA	9.7 HA
	PROPOSED EXTRACTION AREA	16 HA
	CRUSHING PLANT	0.85 HA
	STORAGE PAD	5.8 HA

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29/06/2017 12:13:33 PM

drawing title:
SITE PLAN

drawing no: SP-002

project:
MIDGEE QUARRY

A3 DRAWING NOTED SCALES RELATE TO A3 DRAWINGS

location:
59793 BRUCE HIGHWAY, MIDGEE, QUEENSLAND, AUSTRALIA
(LOT 2 - RP888747)

client:

REVISIONS

REVISION	DESCRIPTION	DATE
1	PRELIMINARY	26/06/17
2	PRELIMINARY	29/06/17

PRELIMINARY SKETCH PLANS:
If the drawings are labelled and issued 'preliminary', below, they are not suitable for Building Application, tender or construction purposes!
The intent of preliminary sketch plans are only for presenting the concept for the specific project to the client as nominated in the title sheet.

COPYRIGHT & LIABILITY:
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design+architecture accept no responsibility for the accurary, completeness of electronically transferred documents.

NEVER SCALE OF DRAWINGS, IF IN DOUBT, ASK!

ISSUED FOR
PRELIMINARY

project no: GG-003

scale 1 : 5000

date JUN 17

drawn Author

rev 2

Queensland Government

Department of
State Development, Manufacturing, Infrastructure and Planning

Our reference: SDA-0917-041388
Your reference: D/79-2017

9 October 2018

The Chief Executive Officer
Rockhampton Regional Council
PO Box 1860
Rockhampton QLD 4700
enquiries@rrc.qld.gov.au

Attention: Mr. Thomas Gardiner

Dear Mr. Gardiner

SARA concurrence agency response— 59793 Bruce Highway, Midgee
(Given under section 285 of the *Sustainable Planning Act 2009*)

The referral agency material for the development application described below was received by the Department of State Development, Manufacturing, Infrastructure and Planning (the department) under section 272 of the *Sustainable Planning Act 2009* on 6 September 2017.

Referral triggers

The development application was referred to the department under the following provisions of the Sustainable Planning Regulation 2009:

Referral trigger	Schedule 7, Table 3, Item 1—State-controlled road
	Schedule 7, Table 3, Item 2—State transport infrastructure
	Schedule 7, Table 3, Item 10—Clearing vegetation

Response

Date of response:	9 October 2018
Response details:	Concurrence agency response – with conditions
Development details:	Development permit for a material change of use for an extractive industry, medium impact industry and a warehouse
Conditions:	The conditions set out in Attachment 1 must be attached to any development approval.

Location details

Street address:	59793 Bruce Highway, Midgee QLD 4702

Development Assessment Advisory Team
Level 13, 1 William Street
Brisbane QLD 4000
PO Box 15009, City East QLD 4002

Real property description:	Lot 2 on RP888747
Local government area:	Rockhampton Regional Council

Applicant details

Applicant name:	Hopeman Pty Ltd C/- Gideon Town Planning
Applicant contact details:	PO Box 450 Rockhampton QLD 4700 gg@gideontownplanning.com.au

A copy of this response has been sent to the applicant for their information.

For further information, please contact Duncan Livingstone Principal Planning Officer, on 07 3452 7180 or via email at DAAT@dsdmip.qld.gov.au who will be pleased to assist.

Yours sincerely

Steve Conner
Executive Director – Planning Group

cc: Hopeman Pty Ltd, gg@gideontownplanning.com.au

enc: Attachment 1—Concurrence agency conditions
Attachment 2 – Advice to the applicant
Attachment 3—Reasons for concurrence agency response
Attachment 4—Approved plan and specifications

Our reference: SDA-0917-041388
Your reference: D/79-2017

Attachment 1—Concurrence agency conditions

No.	Conditions	Condition timing
Material change of use		
State-controlled road and State transport infrastructure—Pursuant to section 255D of the *Sustainable Planning Act 2009*, the chief executive administering the Act nominates the Director-General of the Department of Transport and Main Roads to be the assessing authority for the development to which this development approval relates for the administration and enforcement of any matter relating to the following conditions:		
1.	(a) The road access location is to be located at the existing access to the state-controlled road (Bruce Highway) at Latitude: -23.48816; Longitude: 150.54108; Datum: GDA94 (b) Road access works comprising a short Auxiliary Left turn (AUL(S)) must be provided at the road access location (c) The road access works must be designed and constructed in accordance with the following: • Road Planning and Design Manual, prepared by Department of Transport and Main Roads (2nd edition); and • Manual of Uniform Traffic Control Devices (Queensland), prepared by Department of Transport and Main Roads.	(a) At all times (b) and (c) Prior to when the quantity of hauled material leaving the site via the Bruce Highway exceeds 700,000 tonnes in any twelve-month period
2.	(a) Stormwater management of the development must ensure no worsening or actionable nuisance to the state-controlled road. (b) Any works on the land must not: (i) create any new discharge points for stormwater runoff onto the state-controlled road; (ii) interfere with and/or cause damage to the existing stormwater drainage on the state-controlled road; (iii) surcharge any existing culvert or drain on the state-controlled road; (iv) reduce the quality of stormwater discharge onto the state-controlled road. (c) RPEQ certification with supporting documentation must be provided to the Manager of Planning Projects & Corridor Management at CorridorManagement@tmr.qld.gov.au within the Department of Transport and Main Roads, confirming that the development has been constructed in accordance with part (a) and (b) of this condition.	(a) and (b) At all times (c) Prior to the commencement of use
3.	(a) Pay a monetary contribution to the Fitzroy District / Central Queensland Region of the Department of Transport and Main Roads towards protecting or maintaining the safety or efficiency of the Bruce Highway in accordance with section 666(2) of the *Sustainable Planning Act 2009* to be used for any pavement damage as a result of the development. The amount of contribution:	(a) Within 30 days of the end of June each year until the transportation of material hauled from the site by road

<table>
<tr><th>No.</th><th>Conditions</th><th>Condition timing</th></tr>
<tr><td></td><td>
i. Must be calculated at twelve monthly intervals commencing on the first day that material hauled under this approval is transported from the site by road as detailed in Table 1 below; and
ii. Is to be indexed based on the Road and Bridge Construction Index, Queensland – Class 3101, published quarterly by the Australian Bureau of Statistics (ABS Cat No. 6427, Series ID A2333727L) to the date of payment.

<u>Table 1:</u>
<table>
<tr><th>Material Hauled – tonnes/year</th><th>Contribution – cents/tonne</th></tr>
<tr><td>1 - 360,000</td><td>Nil</td></tr>
<tr><td>360,001 – 400,000</td><td>0.80</td></tr>
<tr><td>400,001 - 410,000</td><td>1.37</td></tr>
<tr><td>410,001 - 420,000</td><td>1.90</td></tr>
<tr><td>420,001 - 430,000</td><td>2.55</td></tr>
<tr><td>430,001 - 440,000</td><td>3.93</td></tr>
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<tr><td>950,001 – 1,000,000</td><td>13.64</td></tr>
</table>
</td><td>under this approval ceases</td></tr>
</table>

No.	Conditions	Condition timing
	(b) Maintain records which document the quantity of material hauled on the state-controlled road network and submit these records to the Department of Transport and Main Roads via email to FitzroyDistrict@tmr.qld.gov.au at the time of payment referenced in part (a) of this condition.	(b) As indicated
Clearing native vegetation—Pursuant to section 255D of the *Sustainable Planning Act 2009*, the chief executive administering the Act nominates the Director-General of the Department of Natural Resources, Mines and Energy to be the assessing authority for the development to which this development approval relates for the administration and enforcement of any matter relating to the following conditions:		
4.	The clearing of vegetation under this development approval is limited to the area identified as: (a) Area A (Parts A^1 - A^2) as shown on the attached Technical Agency Response Plan – TARP SDA-0917-041388, Sheet 1 of 1, dated 30 August 2018 (b) Derived reference points for GPS coordinates listed in attachment to Technical Agency Response Plan – TARP SDA-0917-041388, dated 30 August 2018.	At all times

Our reference: SDA-0917-041388
Your reference: D/79-2017

Attachment 2— Advice to the applicant

General advice	
1.	Under sections 62 and 33 of the *Transport Infrastructure Act 1994*, written approval is required from the Department of Transport and Main Roads to carry out road works that are road access works (including driveways) on a state-controlled road. Please contact the Department of Transport and Main Roads (Fitzroy District / Central Queensland Region) on (07) 4931 1500 or at FitzroyDistrict@tmr.qld.gov.au to make an application for road works approval. This approval must be obtained prior to commencing any works on the state-controlled road reserve. The approval process may require the approval of engineering designs of the proposed works, certified by a Registered Professional Engineer of Queensland (RPEQ).

Our reference: SDA-0917-041388
Your reference: D/79-2017

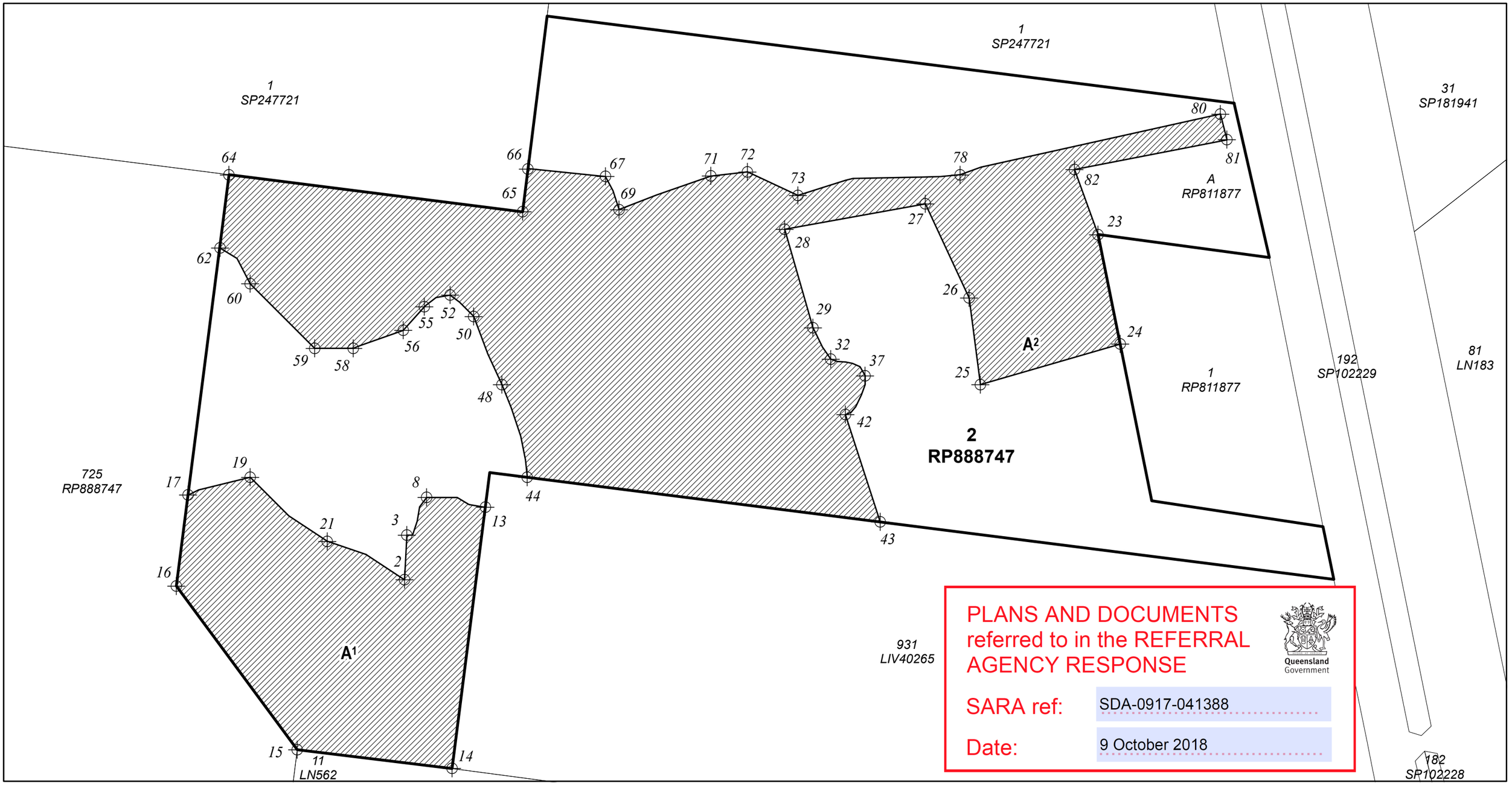
Attachment 3—Reasons for concurrence agency response

Reasons for the department's response:

- To ensure the road access location to the state-controlled road from the site does not compromise the safety and efficiency of the state-controlled road.
- To ensure the design of any road access maintains the safety and efficiency of the state-controlled road.
- To offset the impacts of the development on the safety and efficiency of the state-controlled road.
- To ensure that the impacts of stormwater events associated with development are minimised and managed to avoid creating any adverse impacts on the state-transport corridor.
- To ensure the clearing works are carried out in the location and to the extent specified on the approved plan.

Our reference: SDA-0917-041388
Your reference: D/79-2017

Attachment 4—Approved plan and specifications



PLANS AND DOCUMENTS referred to in the REFERRAL AGENCY RESPONSE

Queensland Government

SARA ref: SDA-0917-041388

Date: 9 October 2018

1:5000 @ A3 size

0 100 200 300 400 500 m

Projection: UTM (MGA Zone 56) Datum: GDA94

Note: Derived Reference Points are provided to assist in the location of area boundaries. Responsibility for locating these boundaries lies solely with the landholder and delegated contractor(s).

The property boundaries shown on this plan are APPROXIMATE ONLY. They are NOT an accurate representation of the legal boundaries.

Note: This plan must be read in conjunction with the Decision Notice SDA-0917-041388

LEGEND

8 Derived Reference Points for GPS (see attachment)

Subject Lot(s)

Area A

Note: This is a colour plan and should only be reproduced in colour.

Technical Agency Response Plan

Plan of Area A (Parts A¹ - A²) in Lot 2 on RP888747

eLVAS Case ID: 2017/004780

N

Queensland Government

Version: 1

CENTRE: MACKAY **LOCALITY OF MIDGEE**	**REGION: CENTRAL** **LOCAL GOVT: ROCKHAMPTON**
Map Reference: 9051	Compiled from: DCDB, PVMP & Assessment Notes
File Reference:	Prepared by: MAT Date: 30 August 2018

TARP

SDA-0917-041388

Sheet 1 of 1

Attachment to Plan: SDA-0917-041388
Derived Reference Points for GPS

Datum: GDA 1994, Projection: Transverse Mercator MGA Zone 56

Notes: Derived Reference Points are provided to assist in the location of area boundaries only.
Responsibility for locating these boundaries lies solely with the landholder and delegated contractor(s).
Coordinates start at a point indicated on the accompanying plan and proceed in a clockwise direction.

Parcel	ID	Easting	Northing
A1	1	247649	7399715
A1	2	247701	7399680
A1	3	247704	7399741
A1	4	247712	7399741
A1	5	247713	7399746
A1	6	247718	7399760
A1	7	247721	7399779
A1	8	247731	7399792
A1	9	247742	7399792
A1	10	247743	7399792
A1	11	247772	7399792
A1	12	247788	7399782
A1	13	247810	7399778
A1	14	247765	7399426
A1	15	247556	7399451
A1	16	247393	7399672
A1	17	247409	7399794
A1	18	247423	7399801
A1	19	247493	7399819
A1	20	247545	7399767
A1	21	247597	7399732
A1	22	247649	7399715
A2	23	248637	7400146
A2	24	248667	7399998
A2	25	248479	7399944
A2	26	248463	7400060
A2	27	248404	7400188
A2	28	248214	7400153
A2	29	248252	7400020
A2	30	248257	7400010
A2	31	248265	7399994
A2	32	248276	7399978
A2	33	248285	7399975
A2	34	248296	7399974
A2	35	248306	7399972
A2	36	248316	7399968
A2	37	248323	7399956
A2	38	248323	7399944
A2	39	248318	7399930
A2	40	248310	7399914
A2	41	248304	7399907
A2	42	248296	7399903
A2	43	248343	7399758
A2	44	247867	7399819
A2	45	247864	7399842
A2	46	247858	7399874
A2	47	247845	7399912
A2	48	247832	7399944
A2	49	247813	7399985
A2	50	247794	7400036
A2	51	247775	7400055
A2	52	247762	7400065
A2	53	247743	7400062
A2	54	247730	7400050
A2	55	247727	7400049
A2	56	247699	7400017
A2	57	247641	7399996
A2	58	247631	7399993
A2	59	247579	7399993
A2	60	247493	7400079

Parcel	ID	Easting	Northing
A2	61	247475	7400114
A2	62	247452	7400128
A2	63	247451	7400128
A2	64	247464	7400227
A2	65	247860	7400177
A2	66	247868	7400235
A2	67	247972	7400224
A2	68	247982	7400206
A2	69	247991	7400180
A2	70	248042	7400200
A2	71	248114	7400225
A2	72	248164	7400231
A2	73	248232	7400199
A2	74	248296	7400220
A2	75	248306	7400222
A2	76	248401	7400224
A2	77	248425	7400224
A2	78	248451	7400227
A2	79	248479	7400237
A2	80	248802	7400309
A2	81	248811	7400274
A2	82	248605	7400234
A2	83	248637	7400146

Parcel	ID	Easting	Northing

ecoaccess
environmental licences and permits

Section 3.3.16 and 3.3.18 *Integrated Planning Act 1997*

DERM Permit[1] number: IPCE01813610

This document replaces the document issued on 18 June 2004, CR0269.

DERM Permit[1] number:	IPCE01813610
Assessment Manager reference:	D/1802-2009
Date application received by DERM:	19 January 2010
Permit[1] Type:	Concurrence Response for a MCU involving an ERA
Date of Decision:	16 February 2010
Decision:	Environmental Authority; EPPR00233813; Prescribed ERA; Hopeman Pty Ltd; ; ;Lot 2/
Relevant Laws and Policies:	*Environmental Protection Act 1994* and any subordinate legislation
Jurisdiction:	Item 1 in Table 2 of Schedule 2 of the *Integrated Planning Regulation 1998*

Development Description

Property	Lot/Plan	Aspect of Development
59 & 793 Bruce Highway MIDGEE	Lot 2 RP888747	**ERA 16 Extractive and screening activities** (2)(c) Extracting, other than by dredging, in a year - more than 100000t to 1000000t (3)(b)Screening, in a year - more than 100000t to 1000000t

Reasons for inclusion of development conditions

In accordance with section 3.3.18(7) of the Integrated Planning Act 1997 and section 27B of the Acts Interpretation Act 1954, the reasons for the inclusion of development conditions are:

1) The Department of Environment and Resource Management is a concurrence agency under the Integrated Planning Regulation 1998 for the purposes of the Environmental Protection Act 1994.
2) Any development conditions placed on this permit[1] for an environmentally relevant activity are in accordance with section 73B of the Environmental Protection Act 1994.

[1] Permit includes licences, approvals, permits, authorisations, certificates, sanctions or equivalent/similar as required by legislation administered by the Department of Environment and Resource Management and the Queensland Parks and Wildlife Service

Additional comments or advice about the application

No additional comments

Additional information for applicants

Contaminated Land

It is a requirement of the *Environmental Protection Act 1994* that if an owner or occupier of land becomes aware a Notifiable Activity (as defined by Schedule 3 of the *Environmental Protection Act 1994*) is being carried out on the land or that the land has been affected by a hazardous contaminant, they must, within 30 days after becoming so aware, give notice to the Department of Environment and Resource Management.

Environmentally Relevant Activities

The aforementioned description of any environmentally relevant activity (ERA) for which this permit is issued is simply a restatement of the ERA as prescribed in the legislation at the time of issuing this permit. Where there is any conflict between the abovementioned description of the ERA for which this permit is issued and the conditions specified herein as to the scale, intensity or manner of carrying out of the ERA, then such conditions prevai to the extent of the inconsistency.

This permit authorises the ERA. It does not authorise environmental harm unless a condition within this permit explicitly authorises that harm. Where there is no such condition, or the permit is silent on a matter, the lack of a condition or silence shall not be construed as authorising harm.

In addition to this permit, the person to carry out the ERA must be a registered operator under the Environmental Protection Act 1994. For the person to become a registered operator, they must apply for a registration certificate under section 73F of the Environmental Protection Act 1994.

Mrs Sandra Flanagan
Delegate
Department of Environment and Resource Management

CONDITIONS OF APPROVAL

ERA 16 Extractive and screening activities
ERA 16 (2)(c) Extracting, other than by dredging, in a year - more than 100000t to 1000000t
ERA 16 (3)(b) Screening, in a year - more than 100000t to 1000000t

Agency Interest: General

(A1) **Prevent and/or minimise likelihood of environmental harm.**

In carrying out an ERA to which this approval relates, all reasonable and practicable measures must be taken to prevent and / or minimise the likelihood of environmental harm being caused.

(A2) **Site Based Management Plan.**

Within one month of commencement of an ERA to which this approval relates, a Site Based Management Plan (SBMP) must be implemented. The SBMP must identify all sources of environmental harm, including but not limited to the actual and potential release of all contaminants, the potential impact of these sources and what actions will be taken to prevent the likelihood of environmental harm being caused. The SBMP must also provide for the review and 'continual improvement' in the overall environmental performance of all ERAs that are carried out.

The SBMP must address the following matters:

(a) Environmental commitments - a commitment by senior management to achieve specified and relevant environmental goals.
(b) Identification of environmental issues and potential impacts.
(c) Control measures for routine operations to minimise likelihood of environmental harm.
(d) Contingency plans and emergency procedures for non-routine situations.
(e) Organisational structure and responsibility.
(f) Effective communication.
(g) Monitoring of contaminant releases.
(h) Conducting environmental impact assessments.
(i) Staff training.
(j) Record keeping.
(k) Periodic review of environmental performance and continual improvement.
(l) A stormwater management plan to address at least the following issues:

- reuse, treatment and disposal of contaminated stormwater; and
- prevention of incident stormwater and stormwater runoff from contacting wastes or contaminants, and
- diversion of upstream runoff away from areas containing wastes or contaminants, and
- minimisation of the size of contaminated areas, and
- cleaning of contaminated areas without water, and
- installation of oil separators, silt and rubbish traps, and stormwater diversion systems, and
- paving and roofing of contaminated areas, and
- construction of sediment ponds in close proximity to sources of sediment, and
- ensuring final treatment ponds are of high enough quality to meet stormwater release limits.

(A3) The site based management plan must not be implemented or amended in a way that contravenes any condition of this approval.

(A4) **Records**

Record, compile and keep all monitoring results required by this approval and present this information to the administering authority when requested.

Agency Interest: Air

(B1) **Dust Nuisance**

The release of dust and/or particulate matter resulting from the environmentally relevant activity must not cause an environmental nuisance at any nuisance sensitive or commercial place.

(B2) Dust and particulate matter must not exceed the following levels when measured at any nuisance sensitive or commercial place:

a) Dust deposition of 120 milligrams per square metre per day, when monitored in accordance with Australian Standard AS 3580.10.1 of 2003 (or more recent editions); OR

b) A concentration of particulate matter with an aerodynamic diameter of less than 10 micrometre (µm) (PM10) suspended in the atmosphere of 150 micrograms per cubic metre over a 24 hour averaging time, at a nuisance sensitive or commercial place downwind of the site, when monitored in accordance with:

- Australian Standard AS 3580.9.6 of 2003 (or more recent editions) 'Ambient air - Particulate matter - Determination of suspended particulate PM10 high-volume sampler with size-selective inlet -Gravimetric method'; or
- any alternative method of monitoring PM10 which may be permitted by the 'Air Quality Sampling Manual' as published from time to time by the administering authority.

(B3) When requested by the administering authority, dust and particulate monitoring must be undertaken to investigate any complaint of environmental nuisance caused by dust and/or particulate matter, and within 14 days of the completion of monitoring the results must be notified to the administering authority. Monitoring must be carried out at a place or places relevant to the potentially affected dust sensitive place and at upwind control sites and must include:

a) for a complaint alleging dust nuisance, dust deposition; and

b) for a complaint alleging adverse health effects caused by dust, the concentration per cubic metre of particulate matter with an aerodynamic diameter of less than 10 micrometre (µm) (PM10) suspended in the atmosphere over a 24hr averaging time.

Agency Interest: Land

(C1) **Land Rehabilitation**.

The site (including all disturbed areas such as slopes, borrow pits, stockpile and screening areas) must be rehabilitated in a manner such that:

(a) suitable native species of vegetation are planted and established;
(b) potential for erosion of the site is minimised;
(c) the quality of stormwater, other water and seepage released from the site is such that releases of contaminants such as suspended solids, turbidity, total dissolved salts, pH, total iron, total aluminium, and total manganese are not likely to cause environmental harm;
(d) the likelihood of environmental nuisance being caused by release of dust is minimised;
(e) the water quality of any residual water body meets relevant criteria for subsequent uses and does not have potential to cause environmental harm; and
(f) the final landform is stable and not subject to slumping.

(C2) Rehabilitation of disturbed areas must take place progressively as works are staged and new areas of extraction are commenced.

(C3) A rehabilitation plan must be compiled by 1 December 2010. The rehabilitation plan must include but not be limited to the requirements outlined in conditions (C1) and (C2).

(C4) Spillage of all chemicals and fuels must be contained within an on-site containment system and controlled in a manner that prevents environmental harm.

NOTE: All petroleum product storage's must be designed, constructed and maintained in accordance with AS 1940 – Storage and Handling of Flammable and Combustible Liquids.

Agency Interest: Noise

(D1) **Noise Nuisance.**

Noise from the environmentally relevant activity must not cause an environmental nuisance at any nuisance sensitive place or commercial place.

(D2) **Noise Monitoring.**

When requested by the administering authority, noise monitoring must be undertaken to investigate any complaint of noise nuisance, and the results notified within 14 days to the administering authority. Monitoring must include:

- LA 10, adj, 10 mins
- LA 1, adj, 10 mins
- the level and frequency of occurrence of impulsive or tonal noise;
- atmospheric conditions including wind speed and direction;
- effects due to extraneous factors such as traffic noise; and
- location, date and time of recording.

(D3) The method of measurement and reporting of noise levels must comply with the latest edition of the Administrating Authority's Noise Measurement Manual.

(D4) The holder of this development approval is not permitted to conduct blasting at the authorised place.

Agency Interest: Social

(E1) **Complaint Response.**

The holder of this development approval must record the following details for all complaints received and provide

this information to the administering authority on request:

a) time, date, name and contact details of the complainant;
b) reasons for the complaint;
c) any investigations undertaken;
d) conclusions formed; and
e) any actions taken.

Agency Interest: Waste

(F1) **Waste Records**

A record of all waste must be kept detailing the following information:

(a) date of pickup of waste;
(b) description of waste;
(c) quantity of waste;
(d) origin of waste; and
(e) destination of waste.

Note: Trackable wastes as listed in Schedule 1 of the Environmental Protection (Waste Management) Regulation 2000 are not covered by this condition. Trackable wastes have similar recording requirements to this condition in accordance with a waste tracking system established under the above Regulation.

Agency Interest: Water

(G1) **Erosion Protection Measures and Sediment Control Measures**
Erosion protection measures and sediment control measures must be implemented and maintained to minimise erosion and the release of sediment.

Stormwater Drainage

(G2) Suitable banks and/or diversion drains must be installed and maintained so that all stormwater falling up gradient from the quarry and storage areas is diverted away from those areas.

(G3) All waters flowing over disturbed areas must be diverted to settling ponds.

(G4) The size of any settling pond must be sufficient to contain the run-off expected from a 1 in 5 year 24 hour storm event.

(G5) Water velocities through temporary watercourse diversions around the works area must be maintained similar to pre-work velocities during such diversions, and must be re-instated once dredging works are completed.

(G6) Settled/treated stormwater runoff waters from those areas of the site that have drained to the final settling pond must only be released in compliance with the release limits listed in Table [1] – Contaminant Release Limits.

Monitoring

(G7) To ensure compliance with condition (G6), monitoring must be undertaken and records kept of contaminant releases to waters at the monitoring point for the parameters and not less frequently than specified in Table [1]. All determinations of the quality of contaminants released must be:

- made in accordance with methods prescribed in the latest edition of the Environmental Protection Agency Water Quality Sampling Manual; and
- carried out on samples that are representative of the discharge.

Table 1 - Contaminant Release Limits

Monitoring point	Quality Characterisic	Maximum release limit	Monitoring frequency
Outlet point of settling pond	pH	6.0 – 8.5	On release from the settling pond and weekly for a continuous release event.
	Suspended Solids(mg/L)	50	On release from the settling pond and weekly for a continuous release event.

DEFINITIONS

Words and phrases used throughout this permit[1] are defined below. Where a definition for a term used in this permit[1] is sought and the term is not defined within this permit[1] the definitions provided in the relevant legislation shall be used.

"administering authority" means the Department of Environment and Resource Management or its successor.

"annual return" means the return required by the annual notice (under section 316 of the *Environment Protection Act 1994*) for the section 73F registration certificate that applies to the development approval.

"approval" means 'notice of development application decision' or 'notice of concurrence agency response' under the *Integrated Planning Act 1997*.

"authorised place" means the place authorised under this development approval for the carrying out of the specified environmentally relevant activities.

"commercial place" means a place used as an office or for business or commercial purposes.

"dredge spoil" means material taken from the bed or banks of waters by using dredging equipment or other equipment designed for use in extraction of earthen material.

"intrusive noise" means noise that, because of its frequency, duration, level, tonal characteristics, impulsiveness or vibration –

- is clearly audible to, or can be felt by, an individual; and
- annoys the individual.
- In determining whether a noise annoys an individual and is unreasonably intrusive, regard must be given to Australian Standard 1055.2 – 1997 Acoustics – Description and Measurement of Environmental Noise Part 2 – Application to Specific Situations.

"$L_{A\ 10,\ adj,\ 10\ mins}$" means the A-weighted sound pressure level, (adjusted for tonal character and impulsiveness of the sound) exceeded for 10% of any 10 minute measurement period, using Fast response.

"$L_{A\ 1,\ adj,\ 10\ mins}$" means the A-weighted sound pressure level, (adjusted for tonal character and impulsiveness of the sound) exceeded for 1% of any 10 minute measurement period, using Fast response.

"$L_{A,\ max\ adj,\ T}$" means the average maximum A-weighted sound pressure level, adjusted for noise character and measured over any 10 minute period, using Fast response.

"land" in the "land schedule" of this document means land excluding waters and the atmosphere.

"mg/L" means milligrams per litre.

"noxious" means harmful or injurious to health or physical well being.

"NTU" means nephelometric turbidity units.

"nuisance sensitive place" includes –

- a dwelling, residential allotment, mobile home or caravan park, residential marina or other residential premises; or
- a motel, hotel or hostel; or
- a kindergarten, school, university or other educational institution; or
- a medical centre or hospital; or
- a protected area under the *Nature Conservation Act 1992*, the *Marine Parks Act 1992* or a World Heritage Area; or
- a public thoroughfare, park or gardens; or
- a place used as a workplace, an office or for business or commercial purposes and includes a place within the curtilage of such a place reasonably used by persons at that place.

"offensive" means causing offence or displeasure; is disagreeable to the sense; disgusting, nauseous or repulsive.

"protected area" means –

- a protected area under the *Nature Conservation Act 1992*; or

- a marine park under the *Marine Parks Act 1992*; or
- a World Heritage Area.

"quarry material" means material on State coastal land, other than a mineral within the meaning of any Act relating to mining. Material includes for example stone, gravel, sand, rock, clay, mud, silt and soil, unless it is removed from a culvert, stormwater drain or other drainage infrastructure as waste material.

"site" means land or tidal waters on or in which it is proposed to carry out the development approved under this development approval.

"watercourse" means a river, creek or stream in which water flows permanently or intermittently-

- in a natural channel, whether artificially improved or not; or
- in an artificial channel that has changed the course of the watercourse.

"waters" includes river, stream, lake, lagoon, pond, swamp, wetland, unconfined surface water, unconfined water natural or artificial watercourse, bed and bank of any waters, dams, non-tidal or tidal waters (including the sea), stormwater channel, stormwater drain, roadside gutter, stormwater run-off, and groundwater and any part-thereof.

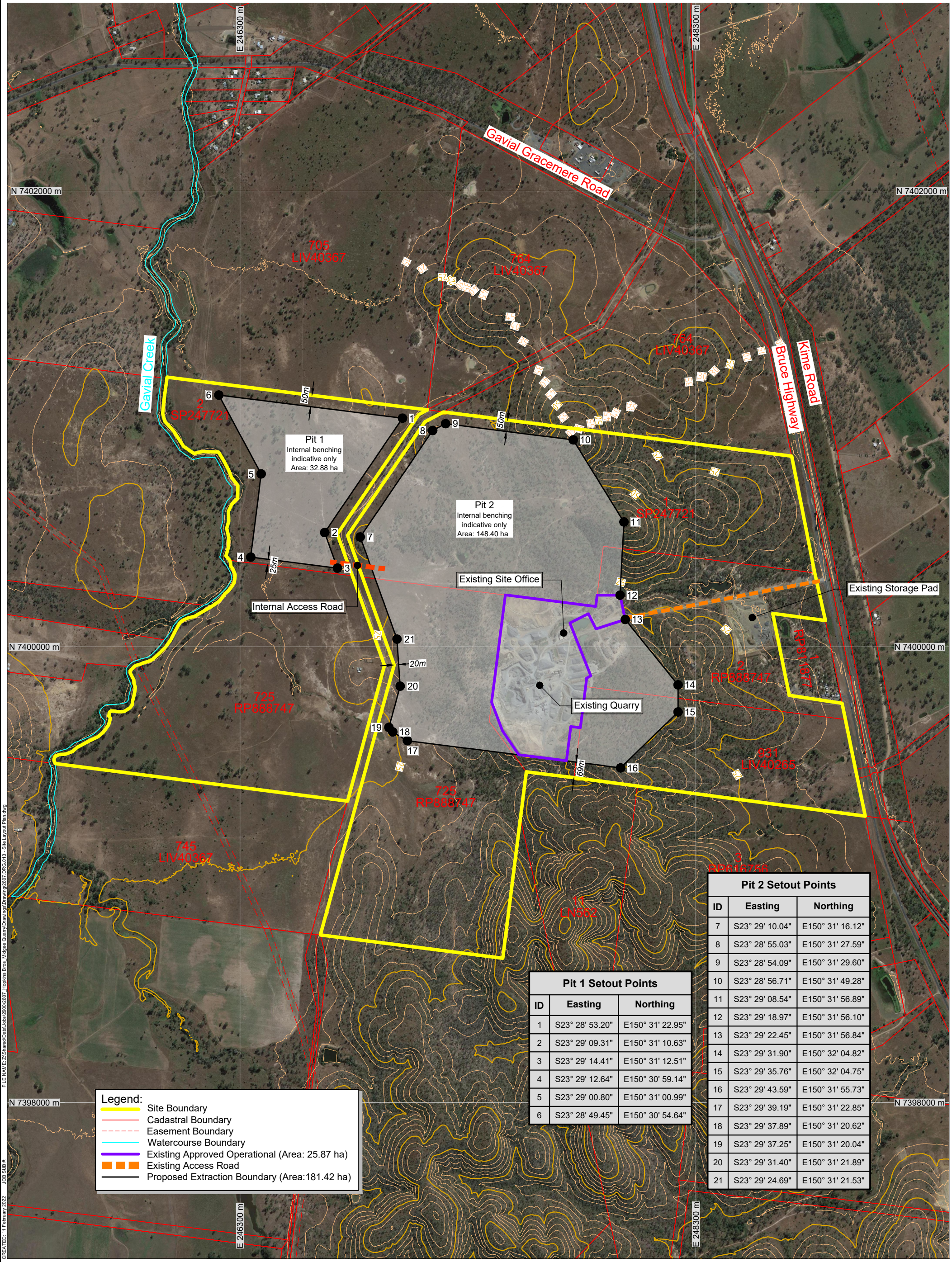
"works" or "operation" means the development approved under this development approval.

"you" means the holder of this development approval or owner / occupier of the land which is the subject of this development approval.

"50th percentile" means not more than three (3) of the measured values of the quality characteristic are to exceed the stated release limit for any six (6) consecutive samples for a release/monitoring point at any time during the environmental activity(ies) works.

"80th percentile" means not more than one (1) of the measured values of the quality characteristic is to exceed the stated release limit for any five (5) consecutive samples for a sampling point at any time during the environmental activity(ies) works

END OF CONDITIONS



Pit 1 Setout Points		
ID	Easting	Northing
1	S23° 28' 53.20"	E150° 31' 22.95"
2	S23° 29' 09.31"	E150° 31' 10.63"
3	S23° 29' 14.41"	E150° 31' 12.51"
4	S23° 29' 12.64"	E150° 30' 59.14"
5	S23° 29' 00.80"	E150° 31' 00.99"
6	S23° 28' 49.45"	E150° 30' 54.64"

Pit 2 Setout Points		
ID	Easting	Northing
7	S23° 29' 10.04"	E150° 31' 16.12"
8	S23° 28' 55.03"	E150° 31' 27.59"
9	S23° 28' 54.09"	E150° 31' 29.60"
10	S23° 28' 56.71"	E150° 31' 49.28"
11	S23° 29' 08.54"	E150° 31' 56.89"
12	S23° 29' 18.97"	E150° 31' 56.10"
13	S23° 29' 22.45"	E150° 31' 56.84"
14	S23° 29' 31.90"	E150° 32' 04.82"
15	S23° 29' 35.76"	E150° 32' 04.75"
16	S23° 29' 43.59"	E150° 31' 55.73"
17	S23° 29' 39.19"	E150° 31' 22.85"
18	S23° 29' 37.89"	E150° 31' 20.62"
19	S23° 29' 37.25"	E150° 31' 20.04"
20	S23° 29' 31.40"	E150° 31' 21.89"
21	S23° 29' 24.69"	E150° 31' 21.53"

Legend:
- Site Boundary
- Cadastral Boundary
- Easement Boundary
- Watercourse Boundary
- Existing Approved Operational (Area: 25.87 ha)
- Existing Access Road
- Proposed Extraction Boundary (Area:181.42 ha)

FILE NAME: Z:\Shared\Data\Jobs\2600\2607 Hopkins Bros Midgee Quarry\Drawings\Drawing\2607.DRG.013 - Site Layout Plan.dwg
JOB SUB #:
CREATED: 11 February 2022

REV	DESCRIPTION	DATE	BY

Data Sources:
Photography: © 2021 Microsoft Corporation; © 2021 Maxar; © CNES (2021) Distribution Airbus DS
Topography: © Commonwealth of Australia (Geoscience Australia) 2015, LiDAR 5m
Cadastre: © The State of Queensland (Department of Resources) 2021
Ecosystem:
Other:

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PROJECT: Midgee Quarry

CLIENT: Hopkins Brothers

TITLE: Site Layout Plan - Quarry Footprint Extension

GROUNDWORK plus
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SCALE: 1:15,000 When Printed On A3 — 0 — 300m
DRAWING NUMBER: 2607.DRG.013
REVISION:
DATE: 17 February 2022 DRAWN: MR
PRINTED: 17 February 2022 CHECKED: MB
DATUM: HORIZONTAL / VERTICAL / ZONE
GDA94 / MGA / AHD / 56

CURRENT TITLE SEARCH
QUEENSLAND TITLES REGISTRY PTY LTD

Request No: 38141368
Search Date: 09/08/2021 14:57 Title Reference: 51140858
Date Created: 23/04/2018

Previous Title: 30191055
51140807

REGISTERED OWNER

Dealing No: 718753296 17/05/2018

MANYFOLD PTY LTD A.C.N. 101 155 382

ESTATE AND LAND

Estate in Fee Simple

LOT 1 SURVEY PLAN 247721
Local Government: ROCKHAMPTON

EASEMENTS, ENCUMBRANCES AND INTERESTS

1. Rights and interests reserved to the Crown by
Deed of Grant No. 10583035 (POR 1040)
Deed of Grant No. 10586036 (POR 852)

ADMINISTRATIVE ADVICES - NIL
UNREGISTERED DEALINGS - NIL

** End of Current Title Search **

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Requested By: D-ENQ DYE & DURHAM

Current Title Search

Queensland Titles Registry Pty Ltd
ABN 23 648 568 101

Title Reference:	**51140859**	**Search Date:**	03/12/2021 15:25
Date Title Created:	23/04/2018	**Request No:**	39500611
Previous Title:	51140807		

ESTATE AND LAND

Estate in Fee Simple

LOT 2 SURVEY PLAN 247721
Local Government: ROCKHAMPTON

REGISTERED OWNER

Dealing No: 718778131 30/05/2018

JOHN EDMOND CARROLL

EASEMENTS, ENCUMBRANCES AND INTERESTS

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Deed of Grant No. 10586036 (POR 852)

ADMINISTRATIVE ADVICES

NIL

UNREGISTERED DEALINGS

NIL

** End of Current Title Search **

COPYRIGHT QUEENSLAND TITLES REGISTRY PTY LTD [2021]
Requested by: D-ENQ TITLES QUEENSLAND

CURRENT TITLE SEARCH
QUEENSLAND TITLES REGISTRY PTY LTD

Request No: 38141369
Search Date: 09/08/2021 14:57 Title Reference: 50071495
Date Created: 23/05/1995

Previous Title: 30031044
30606118

REGISTERED OWNER

Dealing No: 708934376 30/08/2005

HOPKINS BROTHERS GROUP PTY LTD A.C.N. 077 440 192
TRUSTEE
UNDER INSTRUMENT 708934376

ESTATE AND LAND

Estate in Fee Simple

LOT 2 REGISTERED PLAN 888747
Local Government: ROCKHAMPTON

EASEMENTS, ENCUMBRANCES AND INTERESTS

1. Rights and interests reserved to the Crown by
Deed of Grant No. 10366235 (POR 768)
Deed of Grant No. 10473206 (POR 725)

2. MORTGAGE No 714657002 04/09/2012 at 15:48
AUSTRALIA AND NEW ZEALAND BANKING GROUP LIMITED A.C.N. 005 357 522

ADMINISTRATIVE ADVICES - NIL
UNREGISTERED DEALINGS - NIL

Caution - Charges do not necessarily appear in order of priority

** End of Current Title Search **

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Requested By: D-ENQ DYE & DURHAM

Current Title Search

Queensland Titles Registry Pty Ltd
ABN 23 648 568 101

Title Reference:	**50071496**	**Search Date:**	12/11/2021 13:54
Date Title Created:	23/05/1995	**Request No:**	39258004
Previous Title:	30031044		

ESTATE AND LAND

Estate in Fee Simple

LOT 725 REGISTERED PLAN 888747
Local Government: ROCKHAMPTON

REGISTERED OWNER

Dealing No: 700644634 11/05/1995

DARRYL PATRICK CARROLL

EASEMENTS, ENCUMBRANCES AND INTERESTS

1. Rights and interests reserved to the Crown by
Deed of Grant No. 10473206 (POR 725)

2. EASEMENT IN GROSS No 601384091 (C627253X) 07/10/1991
BURDENING THE LAND
TO THE SECRETARY FOR MINES
OVER EASEMENT V ON RP836758

3. TRANSFER No 701655296 13/11/1996 at 12:23
of
EASEMENT IN GROSS: 601384091 (C627253X)
to
PGT AUSTRALIA PTY LIMITED A.C.N. 072 948 451

4. TRANSFER No 703461307 19/07/1999 at 11:16
EASEMENT IN GROSS: 601384091 (C627253X)
DUKE QUEENSLAND PIPELINE PTY LTD A.C.N. 083 050 284
TENANT IN COMMON 3/4
DEI QUEENSLAND PIPELINE PTY LIMITED A.C.N. 083 050 104
TENANT IN COMMON 1/4

5. CHANGE OF NAME No 710146193 30/11/2006 at 15:52
EASEMENT IN GROSS: 601384091 (C627253X)
DUKE QUEENSLAND PIPELINE PTY LTD A.C.N. 083 050 284
TENANT IN COMMON 3/4
ALINTA DEQP PTY LTD A.C.N. 083 050 104 TENANT IN COMMON 1/4

6. CHANGE OF NAME No 710146323 30/11/2006 at 16:02
EASEMENT IN GROSS: 601384091 (C627253X)
ALINTA DQP PTY LTD A.C.N. 083 050 284 TENANT IN COMMON 3/4
ALINTA DEQP PTY LTD A.C.N. 083 050 104 TENANT IN COMMON 1/4

ADMINISTRATIVE ADVICES

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CURRENT TITLE SEARCH
QUEENSLAND TITLES REGISTRY PTY LTD

Request No: 38141370
Search Date: 09/08/2021 14:57 Title Reference: 30469159
Date Created: 14/07/1980

Previous Title: 30026102

REGISTERED OWNER

Dealing No: 718753296 17/05/2018

MANYFOLD PTY LTD A.C.N. 101 155 382

ESTATE AND LAND

Estate in Fee Simple

LOT 931 CROWN PLAN LIV40265
Local Government: ROCKHAMPTON

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UNREGISTERED DEALINGS - NIL

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Requested By: D-ENQ DYE & DURHAM

FORM 1 Queensland REAL PROPERTY ACT 1861-1985 REAL PROPERTY REGULATIONS 1986 BACKING SHEET

C627253x $107.80

[redacted]

7 OCT 1991
1:43 PM

5500 EASEMENT

EASEMENT IN GROSS

I/CODE

ENTERED IN THE REGISTER BOOK

VOLUME ...C31 ...C191

FOLIO ...44 ...54

AT 2.10 AM/PM

22 NOV 1991

DEPUTY REGISTRAR OF TITLES
(CENTRAL DISTRICT)

$107.80
@ 97.80.

601384091

C627253X EAS IN GROSS

BELOW THIS LINE TO BE COMPLETED BY LODGER	LODGER CODE
LODGED BY: CROWN SOLICITOR (STATE) CONVEYANCING BRANCH ADDRESS: BOX 149 GPO BRISBANE Q 4001 DX 40121 BRISBANE UPTOWN	

CERTIFICATES OF TITLE, DEEDS OF GRANT, DECLARATIONS ETC. LODGED WITH THIS DOCUMENT (TO BE COMPLETED BY LODGING PARTIES)

1. ..... LODGED BY .....
2. ....
3. ....

BELOW THIS LINE FOR DELIVERY NOTATIONS

RECEIPT NOTATIONS	OFFICE USE
ITEMS RECEIVED 2 Deed's to Connolly Schurmer + Batts FIRM NAME: 25/11/91 J.J PER: AUTHORITY: DATE:	

ITEMS DELIVERED BY POST

Advise Registration

FORWARDED TO LODGER OF THIS DOCUMENT ON 25/11/91 J.J

CORRESPONDENCE NUMBER .....

REQUISITIONS

INSTRUCTIONS FOR COMPLETION (Form 11)

1. *Document attracts Stamp Duty.*
2. Typewriting and handwriting should be clear, legible and in permanent dense black or *blue ink.*
3. Deletions for the purpose of effecting alterations are not to be made by erasure or painting over. *Items to be deleted are to be ruled through and all alterations are to be* initialled by the parties to the dealing.
4. All panels are to be completed or ruled up. If insufficient space attach annexure FORM 32. The panel should then only contain the words "See Annexure ( )" (inserting appropriate letter).
5. Witness must be qualified in accordance with the Real Property Act 1861-1985 (S. 115).
6. The following instructions relate to the corresponding side notes on the form.

Item	(1)(a)	If the grantor is a body corporate of a Building Units/Group Titles Plan then insert e.g. "The Proprietors (name) Registered Building Units Plan No..... for and on behalf of the registered proprietors".
	(b)	If the grantor holds in trust or as a personal representative, then the trust should be identified, e.g. "as Trustee under Nomination of Trustees No.....", "as personal representative of the estate of ..... deceased".
Item	(2)	Insert e.g., "fee simple", "Lease No.....".
Item	(3)	Insert e.g. "as joint tenants", "as tenants in common in equal shares". (If in unequal shares then show each share as a fraction.)
Item	(4)	Insert the full name of relevant grantor e.g. Crown corporation, instrumentality etc.
Item	(6)(a)	State only the type of document and dealing number of any prior mortgage, encumbrances etc. encumbering the grantor's estate or interest which constitutes the servient tenement.
	(b)	If the easement is over common property under a Building Units/ Group Titles Plan then any interests encumbering the common property should also be included.
	(c)	*If none, then show "nil".*
Item	(8)	Insert e.g. "drainage", "electricity supply".
	(9)(a)	*Schedule should include the rights, liabilities and other covenants* being created.
	(b)	*Covenants may be added to or excluded from the registered* Memorandum by means of the "Schedule".
Item	(11)(a)	If the document is executed by a corporation or other body other than by its attorney, then its seal should be affixed thereto with a certificate that such was affixed by the proper officer verified by his/her signature. The full names of the signatories and their designations should be shown.
	(b)	If an attorney executes the document then the full name of the attorney and the source of the attorney's authority should be shown e.g. "AB by *his duly constituted Attorney XY under Power of Attorney No.....".* The attorney's signature should then follow.
Item	(12)	The document should be executed in the presence of a qualified witness. (See Instruction 5 above).

7. The following should be deposited with the document:-
   - (i) the relevant instrument of title;
   - (ii) if the estate or interest of the grantee is held under a Nomination of Trustees, the duplicate Nomination of Trustees.
   - (iii) if the grantor is a body corporate of a Building Units/Group Titles Plan, FORM 15 of the *Building Units and Group Titles Regulations 1980.*

Jackson & O'Sullivan Pty Ltd, Brisbane

By Authority—Licence 2/85

EXEMPT FROM STAMP DUTY For Queensland BRISBANE, QUEENSLAND

Form 11

Queensland

Real Property Act 1861-1985

Real Property Regulations 1986

EASEMENT IN GROSS

	Item	
GRANTOR *(full name)*	(1)	IVY CARROLL AND JOHN EDMOND CARROLL AS TRUSTEES FOR THE ESTATE OF JAMES JOHN MICHAEL CARROLL DECEASED
ESTATE OR INTEREST BEING BURDENED	(2)	FEE SIMPLE
HOW ESTATE OR INTEREST BEING BURDENED IS HELD *(if more than one grantor)*	(3)	NOT APPLICABLE
GRANTEE *(full name)*	(4)	THE SECRETARY FOR MINES STAMP DUTIES OFFICER

DESCRIPTION OF SERVIENT TENEMENT *(burdened land)* *Delete if inapplicable — (5)

Volume	Folio	County	Parish	Description
*PART OF SEE SEPARATE ANNEXURE "A"				EASEMENT IN LOT ON R.P.

MORTGAGES, ENCUMBRANCES, ETC. (6) NIL

CONSIDERATION (7) ONE THOUSAND EIGHT HUNDRED AND FIVE DOLLARS AND ONE CENT ($1,805.01)

SHORT GENERAL DESCRIPTION OF PURPOSE OF EASEMENT (8) Pipeline Purposes

Delete inapplicable words *(if any)* (*Schedule should be completed in FORM 33 and document securely bound*)

(9) THE GRANTOR FOR THE ABOVE CONSIDERATION HEREBY GRANTS TO THE GRANTEE THE EASEMENT HEREIN DESCRIBED AND THE GRANTOR AND THE GRANTEE HEREBY COVENANT WITH EACH OTHER IN TERMS OF THE #SCHEDULE HERETO AND #MEMORANDUM NO C614857F FILED IN THE OFFICE OF THE REGISTRAR OF TITLES.

(10) SIGNED THIS twenty fourth DAY OF June 19 91

EXECUTION (11) BY GRANTOR *(signature)* J Learoyd

WITNESS (12) IN MY PRESENCE *(signature)* Kerry Carroll (JP)
A Justice of the Peace/Solicitor

(Full name to be printed) KERRY CARROLL

GRANTEE MUST ACCEPT PERSONALLY (13) ACCEPTED BY GRANTEE THE SECRETARY FOR MINES
CERTIFIED CORRECT FOR THE PURPOSE OF REGISTRATION BY—

GRANTEE *(signature)* R J Brock

OR his/her SOLICITOR *(signature)* Robert John Brock, Manager, State Gas Pipeline Unit, who certifies that he is the proper officer to affix the Seal.

(full name of Solicitor to be printed) Sally Jane Munro
Authorised Officer of CROWN SOLICITOR

THE SECRETARY FOR MINES The Official Seal of

NOTE: If the servient tenement is subject to a bill of mortgage/encumbrance, lease etc., then the consent of the mortgagee/encumbrancee/lessee etc. should be completed in FORM 35 and securely bound into this document.

Form 32

Queensland

Real Property Act 1861-1988

Real Property Regulations 1988

ENLARGED PANEL

Annexure " A "

*Insert type of Instrument

ANNEXURE TO * GRANT OF EASEMENT
DATED 24.6.1991
(To be completed by lodging party)

DEALING NO.
(office use only)

VOLUME	FOLIO	COUNTY	PARISH	DESCRIPTION
(1) PART OF				
C31	44	Livingstone	Plews	Easement V in Lot 725 on plan LIV 40367 on RP 836758 Area: 1.424 Hectares
(2) part of				
C191	54	Livingstone	Plews	Easement A in Lot 761 on plan LIV 40367 on RP 836755 Area: 3.436 Hectares

QUEENSLAND LAND REGISTRY
Land Title Act 1994, Land Act 1994 and Water Act 2000

GENERAL REQUEST

Signed: 30/11/06

FORM 14 Version 3
Page 1 of 3

Duty Imprint

710146323

$111.30
30/11/2006 16.02

RN 308

1. **Nature of request**
Request to change name

Lodger (Name, address & phone number)
Barry E Milliken
Lands Coordinator
Alinta Asset Management
PO Box 287
UNANDERRA NSW 2526
02 4261 0500 mobile 0417 299311

Lodger Code

2. **Lot on Plan Description** **County** **Parish** **Title Reference**
See Enlarged Panel page 2 of 3 pages

3. **Registered Proprietor/State Lessee**
Duke Queensland Pipeline Pty Ltd ACN 083 050 284

4. **Interest**
~~Easement under Easement Dealing Number 703461307~~ See Enlarged Panel

5. **Applicant**
Alinta DQP Pty Ltd ACN 083 050 284

6. **Request**
I hereby request that: Name of the Company be changed from Duke Queensland Pipeline Pty Ltd ACN 083 050 284 to Alinta DQP Pty Ltd ACN 083 050 284 in accordance with the Certificate of Registration

7. **Execution by applicant**

Execution Date **Applicant's or Solicitor's Signature**

08/11/06 .....

Alinta DQP Pty Ltd by its duly authorised attorney
Barry Earl Milliken under Power of Attorney
Dealing No 708308346

Note: A Solicitor is required to print full name if signing on behalf of the Applicant

QUEENSLAND LAND REGISTRY
Land Title Act 1994, Land Act 1994
and Water Act 2000

SCHEDULE / ENLARGED PANEL / ADDITIONAL PAGE / DECLARATION

FORM 20 Version 2

Title Reference [ ]

Parcel No	Lot on Plan Description	County	Parish	Title Reference
1	Lot 2 on RP855523	Livingstone	Plews	30649227
2	Lot 745 on CP LIV40367	Livingstone	Plews	30357051
3	Lot 725 on RP888747	Livingstone	Plews	50071496
4	Lot 1 on SP119675	Livingstone	Plews	50287116
5	Lot 2 on SP119675	Livingstone	Plews	~~50278417~~ 50287117
6	Lot 761 on CP LIV40367	Livingstone	Plews	30191054
7	Lot 2 on RP612596 Lot 1 on RP601240	Livingstone	Plews	30443102 30284239
8	Lot 2 on RP607869	Livingstone	Gracemere	30283120
9	Lot 2 on RP619706	Livingstone	Gracemere	30577019
10	Lot 129 on RP619705 Lot 130 on CP P4056	Livingstone	Gracemere	30580016 30333240
11	Lot 1 on RP619702	Livingstone	Gracemere	30582066
12	Lot 221 on CP LN1440 Lot 222 on CP P4013 Lot 223 on CP LN1440 Lot 1 on RP614804	Livingstone	Gracemere	30290146 30643164 30290147 30583070
13	Lot 219 on CP P4014 Lot 220 on CP P4014	Livingstone	Rockhampton	30225140 30225141
14	Lot 249 on CP LN616	Livingstone	Rockhampton	30466236
15	Lot 221 on CP LN616	Livingstone	Rockhampton	50071371
16	Lot 1 on RP601004 Lot 2 on RP601004	Livingstone	Rockhampton	30515156 30515159
17	Lot 14 on RP844281 Lot 20 on RP844281 Lot 13 on RP844280	Livingstone	Rockhampton	30624168 30624172 30624109
18	Lot 299 on CP LN1413	Livingstone	Rockhampton	30415162
19	Lot 4 on RP618627	Livingstone	Rockhampton	30560116
20	Lot 16 on CP L16801	Livingstone	Rockhampton	30623184
21	Lot 131 on RP618627	Livingstone	Rockhampton	30560115
22	Lot 128 on CP PL4010	Livingstone	Rockhampton	30020158
23	Lot 2 and 3 on RP605456	Livingstone	Rockhampton	30462237
24	Lot 6 on CP906611	Livingstone	Karkol Rockhampton	50170034
25	Lot 90 on CP PL4022 Lot 87 on CP PL4022	Livingstone	Karkol Rockhampton	30403080 30014227
26	Lot 7 on SP~~116499 (Previously Lot 3 on RP614995)~~ 117393	Livingstone	Karkol Rockhampton	50543618 ~~50252406~~

Title Reference [ ]

4 INTEREST

Parcel No	Easement No
1	601387270
2	601527936
3	601384091
4	601582863
5	601556816
6	601384091
7	601600713
8	601596715
9	601155955
10	601339529
11	601335284
12	601335284
13	601335284
14	602641242
15	602413094
16	601358899
17	601358899
18	601576858
19	601334095
20	601358777
21	601334095
22	601831616
23	602679106
24	601029851
25	601567653
26	601029851

BLAKE DAWSON WALDRON (LB 4)
ATTN: RONALD CROSSLEY
C/- RONALD CROSSLEY
Level 39
101 Collins Street
MELBOURNE VIC 3000

Remove this top section if desired before framing

Certificate of Registration on Change of Name

This is to certify that

DUKE QUEENSLAND PIPELINE PTY LTD

Australian Company Number 083 050 284

did on the twenty-seventh day of April 2004 change its name to

ALINTA DQP PTY LTD

Australian Company Number 083 050 284

The company is a proprietary company.

The company is limited by shares.

The company is registered under the Corporations Act 2001 and is taken to be registered in Queensland and the date of commencement of registration is the nineteenth day of June, 1998.

CERTIFICATE

Issued by the
Australian Securities and Investments Commission
on this twenty-seventh day of April, 2004.

Jeffrey Lucy
Acting Chairman

RECEIVED
-1 DEC 2005

Queensland Government

Natural Resources and Mines

Author Gary Vansleve
Titles Registration Unit
Phone: (07) 3227 7761
Our Ref:BR05011762
Your Ref:

29 November 2005

Mr Barry Millikin
Lands Coordinator
Alinta Network Services Pty Ltd
PO Box 287
Unanderra NSW 2526

Dear Mr Millikin

Alinta DQP Pty Ltd and Alinta DEQP Pty Ltd Purchase

I refer to your letter of 31 October 2005 seeking an exemption to dispense with certain certificates of title and lease tenure documents to progress the registration of the transfer of the public utility easements to the above corporations.

I also note you seek to apply the same exemption to progress the transfer of both freehold land and non freehold land owned by Duke Queensland Pipeline Pty Ltd and DEI Queensland Pty Ltd.

I am willing to accept your proposal for the exemption to apply to the transfers of public utility easements. However in instances where land owned by Duke Queensland Pipeline Pty Ltd and DEI Queensland Pty Ltd. is transferred the necessary certificates of titles and lease tenure documents will need to be produced to the land registry.

When the transfers of public utility easements are lodged for registration in the land registry please provide a copy of this letter.

Yours sincerely

M G Locke

Max Locke
Registrar of Titles
and Registrar of Water Allocations

Level 14, AXA Centre
144 Edward Street
Brisbane Qld 4000

Postal: GPO Box 1401,
Brisbane Qld 4001

Telephone: (07) 3227 7001
Facsimile: (07) 3227 7764

Website: www.nrm.qld.gov.au
ABN 83 705 537 586

TRAFFIC TRANSPORT plus

Midgee Quarry

TRAFFIC AND PAVEMENT IMPACT ASSESSMENT REPORT

Prepared for: Hopkins Brothers

February 2022

File Ref:
documents / 20220201_10569_TIA

Project / Report Details

Document Title:	Traffic and Pavement Impact Assessment Report
Principal Author:	Margaret Mak
Client:	Hopkins Brothers
Ref. No.	20220201_10569_TIA

Document Status

Issue	*Description*	*Date*	*Author*	*Reviewer*
1	Traffic Report	01 February 2022	Margaret Mak	Bryce Trevilyan

Distribution Record

Recipient	*Distribution Method*
Groundwork Plus	1e

Traffic & Transport Plus ABN: 54 619 700 239

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1 Introduction

Traffic & Transport Plus (**TTPlus**) has been commissioned by Hopkins Brothers (**HB**) to prepare a traffic and pavement impact assessment report as part of a development application for the proposed expansion of the Midgee Quarry located at the Bruce Highway, Midgee, QLD, properly described as Lot 2 RP888747, Lot 93 LIV42065, Lot 725 RP888747, Lot 1 SP747721 and Lot 2 SP747721 (**Subject Site**).

The Midgee Quarry currently enjoys a development approval and an Environmental Authority (**EA**) that allows for haulage / production of up to 1 million tonnes per annum (**Mtpa**). An asphalt plant, located within the Subject Site, has been approved to produce up to 100,000 tpa. One of the existing conditions of approval is the requirement to construct an auxiliary left turn treatment – short turn lane (**AUL(S)**) at the site access on the Bruce Highway once the total material hauled from the Subject Site exceeds 0.7M tonnes (cumulative production of the existing quarry and the asphalt plant) in any 12-month period. TTPlus has been advised that the existing quarry produced a total of 700,000 – 800,000 tonnes over the past 5 years and no permanent asphalt plant was delivered on site, however the intention is that the asphalt plant would ultimately be delivered (either as a permanent facility or temporary plant). The AUL(S) condition has not yet been triggered.

The subject application for the Midgee Quarry seeks approval to be permitted to produce up to 2 Mtpa. For the purpose of this traffic and pavement impact assessment, it is assumed that the expanded quarry would start operation in 2023. Therefore, in accordance with traditional traffic engineering practice, the design year for the expanded quarry is 2033.

A key consideration of this quarry is the possibility that it may be able to supply material to the Rockhampton Ring Road Project (**RRR Project**) – this project requires approximately 3 – 5 million tonnes of material over 5 years (2023 – 2027). HB intends to tender for ~50% of the material that will be required for the RRR Project.

An assessment of the operational impacts of the expanded quarry on the external road network has been undertaken using SIDRA 9 intersection analysis software (**SIDRA**). As part of the SIDRA analysis, the assessment philosophy has included the concept of a "peak hour factor" (more information provided in Section 4.3), to provide additional surety that suitable infrastructure is in place at commencement of, and through the life of the expanded quarry, to cater for the likely 'worst–case–scenario' peak operating conditions of the expanded quarry. This methodology is considered to be a suitably conservative approach to the analysis.

This report addresses the following traffic–related issues:

- The transport routes;
- Additional trips (both heavy and light vehicles) associated with the expanded quarry;
- Traffic impacts associated with the expanded quarry on the adjacent external road network;
- Safety issues on the adjacent external road network in consideration of the additional traffic generated by the expanded quarry, and
- Pavement impacts / contributions associated with the expanded quarry.

A summary of the findings is provided in Section 8 of this report.

2 Subject Site

2.1 Site Location and Site Layout Plan

The Subject Site is located south of Rockhampton. The existing site access on the Bruce Highway is approximately 1.6km south of Gavial Gracemere Road. Figure 2–1 illustrates the location of the site access relative to the Bruce Highway and Gavial Gracemere Road.

The site layout plan for the expanded quarry is included as Appendix A.

2.2 Existing Road Network

The hierarchical classification and characteristics of the roads in the vicinity of the Subject Site are described in Table 2–1 below.

Table 2–1 – Existing Road Hierarchy

Road	Description	Authority	Speed Limit
Bruce Highway	2 lane sealed carriageway	Department of Transport and Main Roads (**DTMR**)	100km/h*
Gavial Gracemere Road	2 lane sealed carriageway	DTMR	100km/h*

**Speed limits have been identified using Google Street View and confirmed by the independent traffic survey company engaged to undertake the traffic surveys completed in conjunction with this project.*

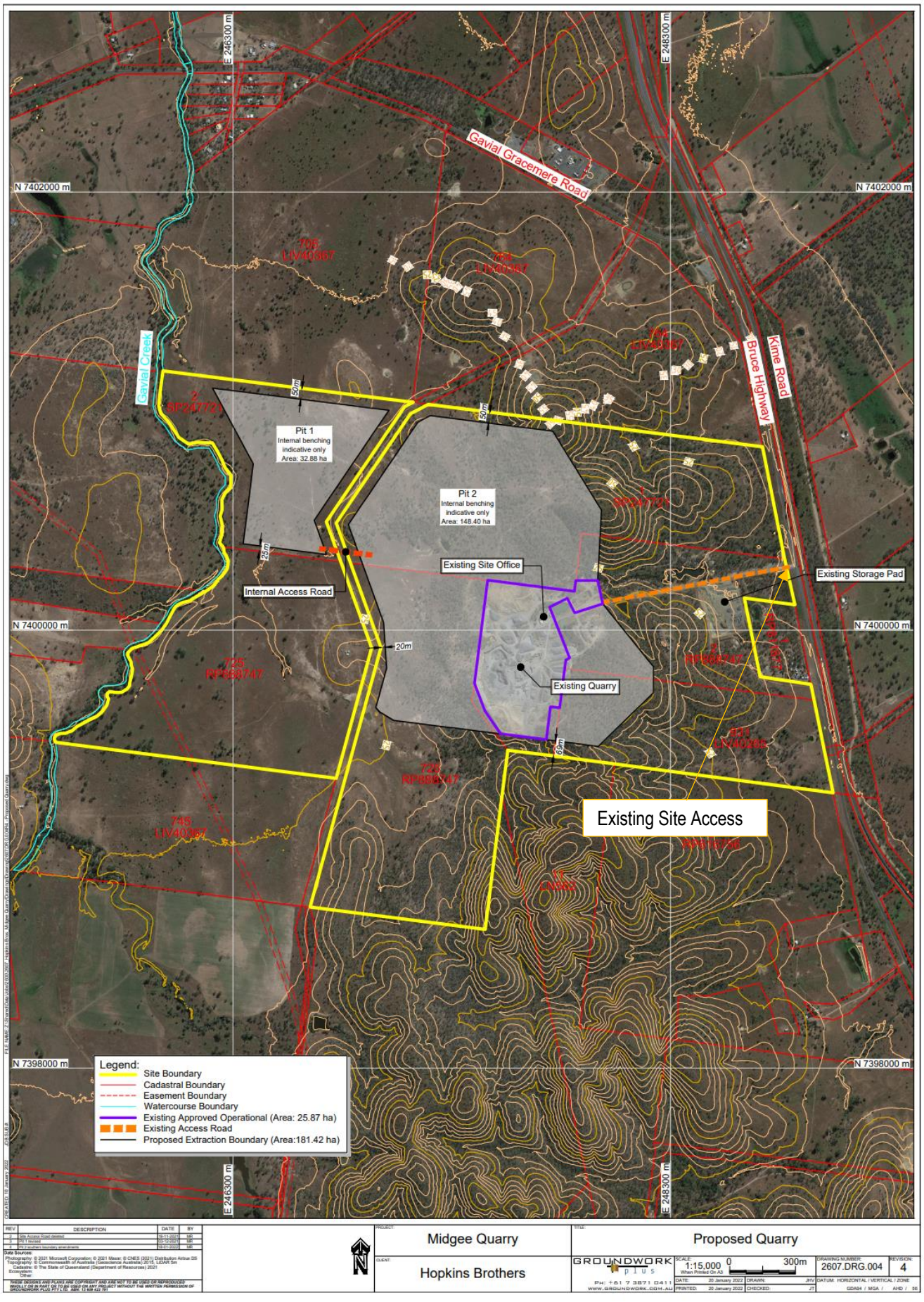


Figure 2–1 – Locality Map

Source: Groundwork Plus [annotations added by TTPlus]

3 The Transport Routes

The existing transport routes related to the Subject Site are the Bruce Highway (north) and the Bruce Highway (south). The Bruce Highway is a State-controlled road (**SCR**). The existing transports routes are illustrated by the blue lines on Figure 3-1.

These existing transport routes are proposed to be continued to be utilised by the expanded quarry.

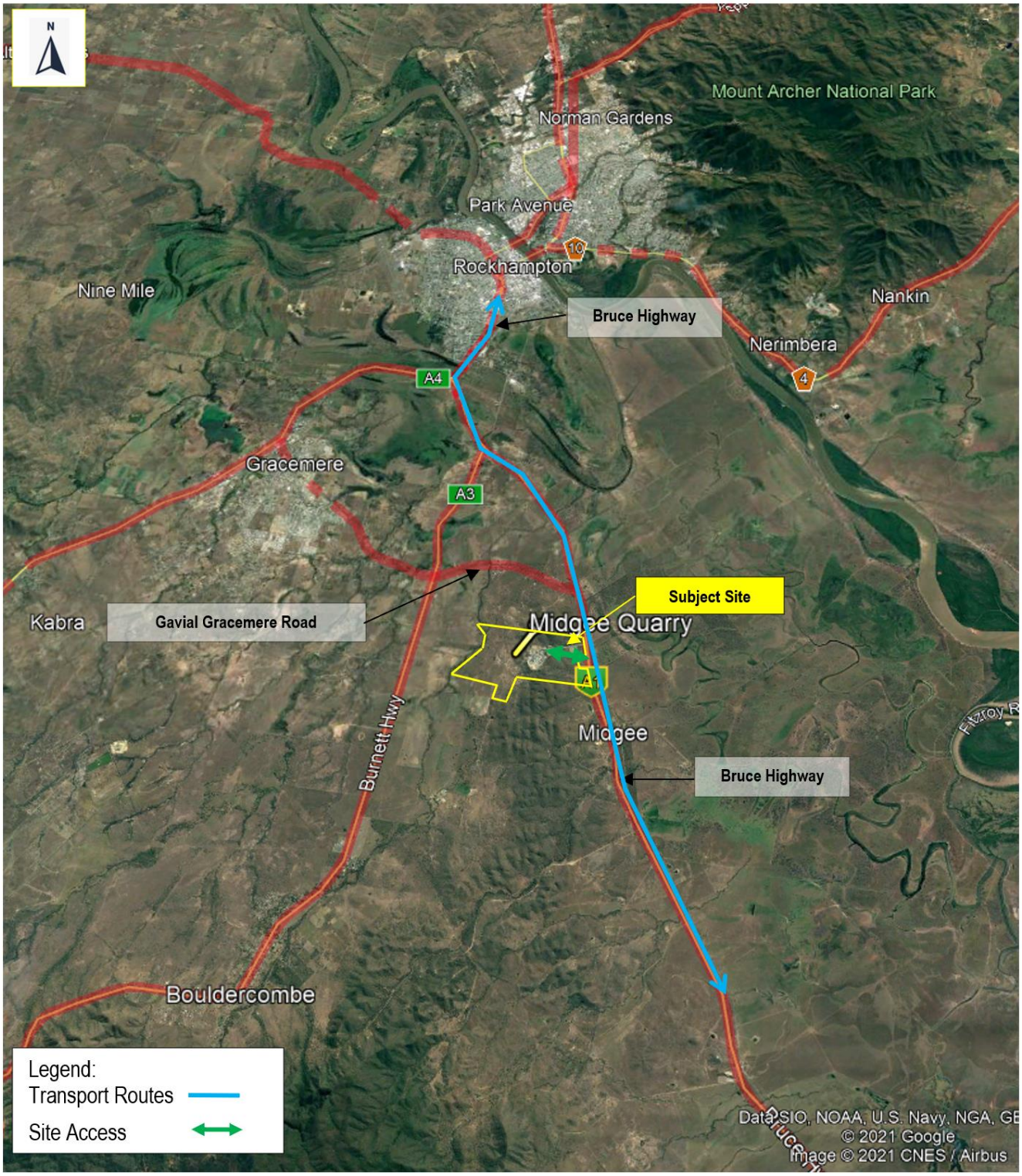


Figure 3–1 – Transport Routes
Source: Google Earth [annotations and road names added by TTPlus]
Note: The red shaded lines indicate State-controlled roads.

The trucks used by the existing quarry, and intended to be used by the approved asphalt plant and the expanded quarry for the loading and hauling activities are a mixture of asphalt trucks, semi-trailers, B-doubles and truck and dogs. No road trains are proposed to be used by the Subject Site.

4 Traffic Volumes

4.1 2021 Traffic Volumes

To assist in the preparation of this assessment, determination of the existing background traffic volumes is required. Traffic surveys were undertaken at the Bruce Highway site access and the Bruce Highway / Gavial Gracemere Road intersection on Wednesday 25 August 2021 from 6:30am to 9:30am and from 2:30pm to 6:00pm.

The locations of the traffic surveys are illustrated on Figure 4–1. The detailed results of the traffic surveys are included in Appendix D.

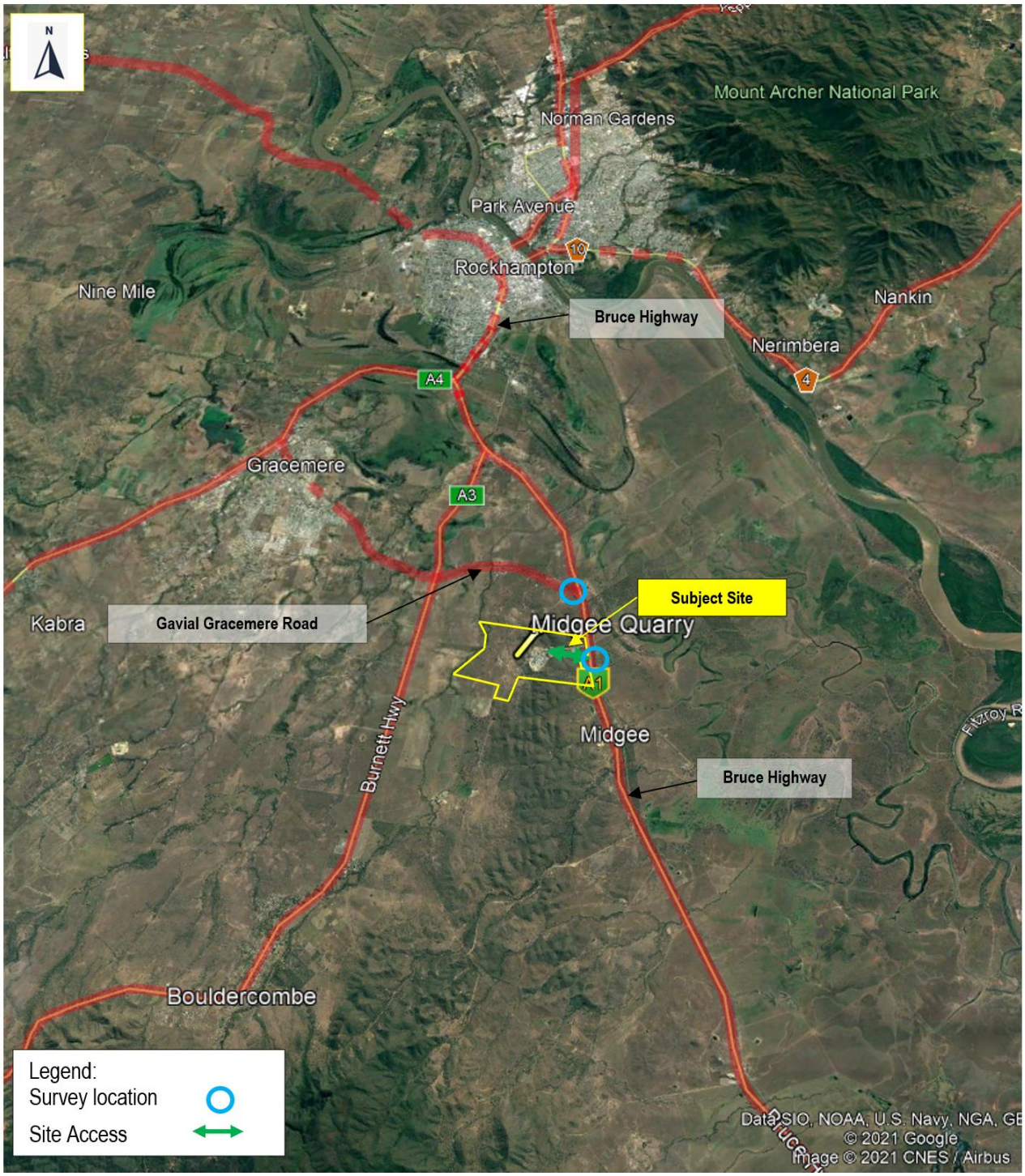


Figure 4–1 – Locations of Traffic Surveys

Source: Google Earth [annotations added by TTPlus]
Note: The red shaded lines indicate State–controlled roads.

The observed AM and PM peak hour periods identified were as follows:

- the Bruce Highway site access:
  - 8:30am to 9:30am and 2:30pm to 3:30pm
- the Bruce Highway / Gavial Gracemere Road intersection:
  - 8:15am to 9:15am and 3:00pm to 4:00pm

Figure B1 within Appendix B illustrates the 2021 Observed AM and PM peak hour traffic volumes.

4.2 Base Traffic Volumes

Background traffic data was sourced from the DTMR traffic census stations along the Bruce Highway and Gavial Gracemere Road to assist in forecasting an appropriate background traffic growth rate. The annual average daily traffic (**AADT**) and growth rates of the nearby SCRs are listed below:

- Bruce Highway (station no. 60130), north of the Bruce Highway site access:
  - From 5,614 vehicles per day (**vpd**) in 2010 to 5,451 vpd in 2020
  - Growth rate: -0.3% p.a. (compound)
- Bruce Highway (station no. 61551), south of the Bruce Highway site access:
  - From 5,869 vpd in 2010 to 7,156 vpd in 2020
  - Growth rate: 2.0% p.a. (compound)
- Gavial Gracemere Road (station no. 60097):
  - From 941 vpd in 2010 to 1,099 vpd in 2020
  - Growth rate: 1.6% p.a. (compound)

Whilst future traffic growth can only be estimated, for the purpose of this assessment, a traffic growth rate of 2% p.a. (compound) has been adopted to estimate future background traffic volumes on the external road network proximate to the Subject Site.

Figures B2 and B3 within Appendix B illustrate the 2023 and 2033 base traffic volumes (with the existing quarry) during the AM and PM peak hour periods.

4.3 Trip Generating Characteristics

TTPlus has been advised that the operational hours of the haulage activities of the existing quarry (1 Mtpa) are from 6:00am to 6:00pm (12 hours) from Monday to Saturday (6 days). The proposed permitted operational hours of the expanded quarry (2 Mtpa) are 24 hours and 7 days, although it would be routine for there to be a number of days where no haulage would occur.

Truck trips associated with the expanded quarry

In order to ensure sufficient infrastructure is in place to cater for the 'worst–case' operational scenario, the analysis has conservatively assumed that the expanded quarry would be likely to generate more than the typical hourly traffic volumes during the peak hour periods by introducing the concept of a "peak hour factor". The peak hour factor is the ratio of the absolute peak operating conditions to the average operating conditions of the critical year as modelled for the expanded quarry. This represents what is considered to be the 'worst–case' peak operational scenario (ie. the appropriate design case) and accounts for all aspects of variations expected throughout each day and the year for the hauling activities.

The estimated trip generation associated with the expanded quarry (2 Mtpa) is outlined below.

- Maximum annual production rate: 2.0 Mtpa;
- Operational days per year: 336 days*;
- Operational hours: 24 hours and 7 days;
- Average mass of material per vehicle**: 32 tonnes per vehicle;
- Peak hour factor***: 5;
- Peak hour traffic volume (IN): [2,000,000 / 336 / 24 / 32 × 5] = 38.8 → 39 vph, and
- Peak hour traffic volume (OUT): 39 vph (assumed same as IN traffic volumes).

** Operational days per year has been advised by HB.*
***TTPlus has been advised that 32t payload truck and dogs (100%) would be used for haulage.*
****The peak hour factor is the ratio of the absolute peak operating conditions to the average operating conditions of a peak production year, as modelled for the expanded quarry. This represents what is considered to be the 'worst-case' peak operational scenario and accounts for all aspects of variations expected throughout each day and the year – as the expanded quarry would be permitted to operate 24 hours a day, 7 days a week, a higher peak hour factor than usually adopted has been assumed.*

These resultant volume forecasts are appropriately conservative for the purpose of this assessment. It is also conservatively assumed within the modelling that the development peak and the on–road peak are coincident.

This 'worst–case' operational scenario is a design consideration only and is unlikely to occur as part of the actual day to day operations. The analysis methodology used is intended to ensure that sufficient infrastructure is provided in the vicinity of the site and to enable the safe and efficient operation of the surrounding road network.

Car Trips

TTPlus has been advised that there are 15 staff working at the expanded quarry.

Staff and visitors would generally not arrive / leave the site during the AM and PM haulage peak periods; notwithstanding this, allowances of 15 vph (10 vph IN + 5 vph OUT) during the AM peak hour period and 15 vph (5 vph IN + 10 vph OUT) during the PM peak hour period have been included in the analysis.

This is a conservatively high allowance for staff / visitor car trips coinciding with the haulage and on–road peak periods (noting that the assumption that haulage and on–road peaks coincide is also conservative). The allowance for additional trips generated by staff and visitors (car trips) is in addition to the additional trips generated by the haulage activities (truck trips) of the expanded quarry. The travel routes of staff / visitors are not known at this stage, however, for the purpose of this assessment, it has been assumed that 80% of the staff / visitors would travel to / from the site from / to the north, and the remaining 20% of the staff / visitors would travel from / to the south.

Trip Distribution

TTPlus has been advised that 50% of the quarried material would be transported to the north (towards Rockhampton) and the remaining 50% of quarried material would be transported to the south; this trip distribution has been adopted in this assessment. Notwithstanding the distribution noted above, the realised distribution could vary, and be affected by large future projects; for example, HB intends to tender for ~50% of the material that will be required by the RRR Project (approx. 3 – 5 million tonnes over 5 years (2023 – 2027)). The location for delivery of material to the RRR Project would likely be north of the Subject Site.

In the absence of more detailed information, the analysis approach adopted herein is considered to be appropriate. The trips estimated to be generated by the expanded quarry are illustrated on Figure B4 within Appendix B.

Truck trips for outgoing material associated with the asphalt plant

TTPlus has been advised that a temporary mobile asphalt plant was utilised on the Subject Site and produced 40,000 tonnes for a single project, however this temporary mobile plant has now been removed. It did not operate on the survey day in August 2021.

The number of trucks that would be likely to be generated by the approved asphalt plant (which was not operational during the survey day) delivering outgoing material has been estimated by adopting the following project operational parameters:

- Maximum annual production rate: 100,000 tpa;
- Operational days per year: 288 days;
- Operational hours: 6:00am to 6:00pm (from Monday to Saturday);
- Average operational hours per day: 12 hours per day;
- Average mass of material per vehicle*: 26.5 tonnes per vehicle;
- Peak hour factor: 3;
- Peak hourly traffic volume (IN): [100,000 / 288 / 12 / 26.5 × 3] = 3.3 vph → 3 vph; and
- Peak hourly traffic volume (OUT): 3 vph (assumed same as IN traffic volumes).

**TTPlus has been advised that 26.5t payload asphalt trucks (100%) would be used for haulage.*
***The peak hour factor is the ratio of the absolute peak operating conditions to the average operating conditions of a peak production year, as modelled for the approved asphalt plant. This represents what is considered to be the 'worst-case' peak operational scenario and accounts for all aspects of variations expected throughout each day and the year.*

TTPlus has been advised that 60% of the asphalt would be transported to the north (towards Rockhampton) and the remaining 40% of the asphalt would be transported to the south.

Truck trips for incoming material associated with the asphalt plant

The approved asphalt plant also requires the importation of raw material for production – it is assumed that ~10% of 'incoming' material is supplied internally from the quarry. Therefore, the approved asphalt plant will require the importation of up to 90,000 tpa [= 100,000 x 90%] of raw material via the external road network. The raw material imported from the quarry itself would of course not impart additional load on the external road network (and in fact arguably would reduce quarry-related impacts).

The number of trucks that would be likely to be generated by the approved asphalt plant related to the importation of material has been estimated by adopting the following project operational parameters:

- Maximum amount of imported material: 90,000 tpa;
- Operational days per year: 288 days;
- Operational hours: 6:00am to 6:00pm (from Monday to Saturday);
- Average operational hours per day: 12 hours per day;
- Average mass of material per vehicle*: 33.25 tonnes per vehicle;
- Peak hour factor: 3;
- Peak hourly traffic volume (IN): [90,000 / 288 / 12 / 33.25 × 3] = 2.35 vph → 2 vph; and
- Peak hourly traffic volume (OUT): 2 vph (assumed same as IN traffic volumes).

**TTPlus has been advised that 26.5t payload semi-trailers (50%) and 40.0t payload B-doubles (50%) will be used. The average mass of material per vehicle of the assumed fleet has been calculated by factoring the mass of material able to be transported by these vehicles and considering the relative proportions of them within the vehicle fleet. Therefore, the average mass of material per vehicle of the assumed fleet = [26.5t × 0.5 + 40.0t × 0.5] = 33.25 tonnes per vehicle.*

For the purpose of this assessment, TTPlus had assumed that the incoming material associated with the approved asphalt plant would be imported via the Bruce Highway (north). Since the preparation of this report, HB has advised that it is likely that 60% of the incoming material associated with the approved asphalt plant would be imported via the Bruce Highway (north), and the remaining 40% of the incoming material would be imported via the Bruce Highway (south). As the activity of importing material to the approved asphalt plant would only generate 2 vph IN trips and 2 vph OUT trips, the change of directional distribution of the incoming material would not affect the conclusions / recommendations drawn in this report – as discussed in the later part of this report, all assessed key intersections (including the site access) would operate with satisfactory operating parameters with the expanded quarry and the approved asphalt plant from a capacity viewpoint.

Car trips associated with the asphalt plant

TTPlus has been advised that there would be 3 staff working at the approved asphalt plant.

Staff and visitors would generally not arrive / leave the site during the AM and PM haulage peak periods; notwithstanding this, allowances of 3 vph (2 vph IN + 1 vph OUT) during the AM peak hour period and 3 vph (1 vph IN + 2 vph OUT) during the PM peak hour period have been included in the analysis. This is a conservatively high allowance for staff / visitor car trips coinciding with the haulage and on-road peak periods. Additionally, it is noted that it is also a conservative assumption to assume that all peaks coincide, as has been adopted in the analyses outlined herein.

The travel routes of staff / visitors associated with the approved asphalt plant are not known at this stage, however, for the purpose of this assessment, it has been assumed that 80% of the staff / visitors would travel to / from the site from / to the north, and the remaining 20% of the staff / visitors would travel from / to the south.

The trips estimated to be generated by the approved asphalt plant are illustrated on Figure B5 within Appendix B.

4.4 Design Traffic Volumes

For the reasons outlined earlier in this report, the resultant traffic volume forecasts are considered to be appropriately conservative for the purpose of this assessment.

The 2023 design peak hour traffic volumes [Figure B6] = 2023 base peak hour traffic volumes [Figure B2]* + Trip generation associated with the expanded quarry [Figure B4] + Trip generation associated with the approved asphalt plant [Figure B5]

The 2033 design peak hour traffic volumes [Figure B7] = 2033 base peak hour traffic volumes [Figure B3]* + Trip generation associated with the expanded quarry [Figure B4] + Trip generation associated with the approved asphalt plant [Figure B5]

*TTPlus has been advised that the existing quarry produced a total of 700,000 – 800,000 tonnes over past 5 years, which was much less than the allowable production rate of 1 Mtpa. The observed peak hour trips associated with the existing quarry were 2-3 vph only. The design peak hour traffic volumes entering and exiting the site access have included the trip generation associated with the expanded quarry and the approved asphalt plant calculated based on the methodology discussed in Section 4.3, however have not included the observed peak hour traffic volumes entering and exiting the site access. For the peak hour traffic volumes at the Bruce Highway / Gavial Gracemere Road intersection, traffic generation modelled has simply been added to the base volumes of the Bruce Highway, therefore there is a modest level of double-counting – this does not materially impact on the ultimate findings of the analysis, and it is considered to be a conservative approach.

5 Traffic Impact Assessment

Future operation of the Bruce Highway site access and the Bruce Highway / Gavial Gracemere Road intersection have been discussed below. The detailed results of the SIDRA analyses for these key intersections are provided as Appendix C.

5.1 Intersection Performance of the Bruce Highway Site Access

The modelled existing configuration of the Bruce Highway site access, as assessed using SIDRA, is shown as Figure 5–1.

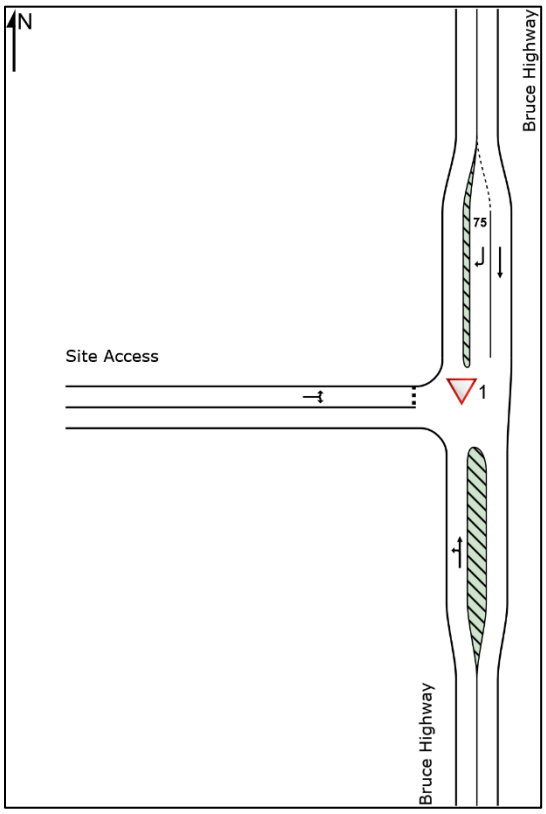


Figure 5–1 – Modelled Existing Configuration of the Bruce Highway Site Access

Results from the analyses of the Bruce Highway site access for the base and design scenarios with the expanded quarry and approved asphalt plant in 2023 (opening year) and in 2033 (10-year design horizon) are summarised in Table 5–1 and Table 5–2.

Table 5–1 – 2023 Operational Characteristics of the Bruce Highway Site Access

Leg	Movement	2023 Base				2023 Design			
		AM		PM		AM		PM	
		DOS (v/c)	95% Back of Queue (m)	DOS (v/c)	95% Back of Queue (m)	DOS (v/c)	95% Back of Queue (m)	DOS (v/c)	95% Back of Queue (m)
Bruce Highway (South)	L	0.15	0	0.18	0	0.17	0	0.19	0
	T	0.15	0	0.18	0	0.17	0	0.19	0
Bruce Highway (North)	T	0.18	0	0.15	0	0.18	0	0.16	0
	R	0.01	0	0.01	0	0.04	2	0.04	2
Site Access (West)	L	0.01	0	0.01	0	0.13	5	0.14	6
	R	0.01	0	0.01	0	0.13	5	0.14	6

*Note: Practical Maximum Degree of Saturation (**DOS**) for a priority intersection is 0.80.*

Table 5–2 – 2033 Operational Characteristics of the Bruce Highway Site Access

Leg	Movement	2033 Base				2033 Design			
		AM		PM		AM		PM	
		DOS (v/c)	95% Back of Queue (m)	DOS (v/c)	95% Back of Queue (m)	DOS (v/c)	95% Back of Queue (m)	DOS (v/c)	95% Back of Queue (m)
Bruce Highway (South)	L	0.19	0	0.22	0	0.21	0	0.23	0
	T	0.19	0	0.22	0	0.21	0	0.23	0
Bruce Highway (North)	T	0.21	0	0.19	0	0.22	0	0.19	0
	R	0.01	0	0.01	1	0.05	2	0.04	2
Site Access (West)	L	0.01	1	0.01	1	0.16	7	0.18	8
	R	0.01	1	0.01	1	0.16	7	0.18	8

Note: Practical Maximum DOS for a priority intersection is 0.80.

The results provided in Table 5–1 and Table 5–2 indicate that the Bruce Highway site access, as assessed, would operate with satisfactory operating parameters in 2023 and 2033 with the expanded quarry and the approved asphalt plant from a capacity viewpoint.

5.2 Intersection Performance of the Bruce Highway / Gavial Gracemere Road Intersection

Based on a review of available Nearmap imagery, it appears that the turn lane treatments of the Bruce Highway / Gavial Gracemere Road intersection have been upgraded from auxiliary left (**AUL**) and "channelised right turn – short" (**CHR(S)**) turn lane treatments to AUL / channelised right (**CHR**) turn lane treatments in 2018 (the right turn treatment has been upgraded).

The modelled existing configuration of the Bruce Highway / Gavial Gracemere Road intersection, as assessed using SIDRA, is shown as Figure 5–2.

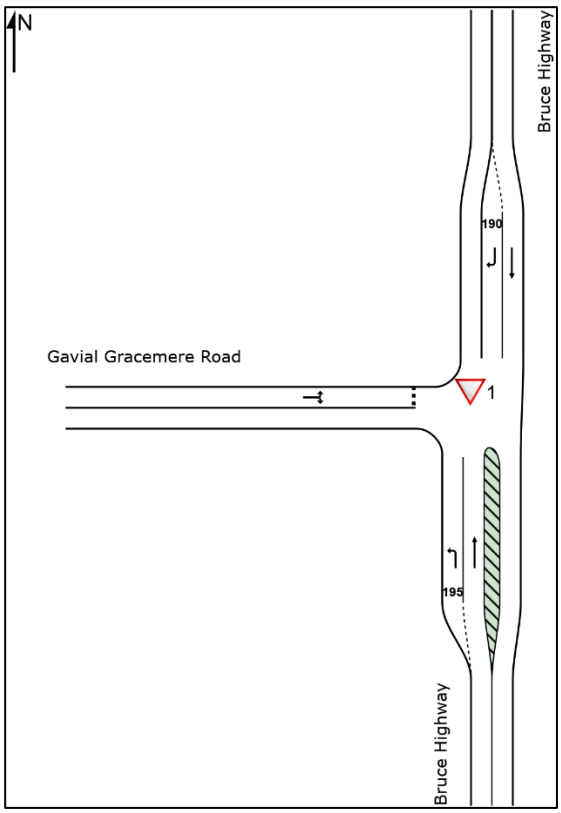


Figure 5–2 – Modelled Existing Configuration of the Bruce Highway / Gavial Gracemere Road Intersection

Results from the analyses of the Bruce Highway / Gavial Gracemere Road intersection for the base and design scenarios with the expanded quarry and approved asphalt plant in 2023 (opening year) and in 2033 (10-year design horizon) are summarised in Table 5–3 and Table 5–4.

Table 5–3 – 2023 Operational Characteristics of the Bruce Highway / Gavial Gracemere Road Intersection

Leg	Movement	2023 Base				2023 Design			
		AM		PM		AM		PM	
		DOS (v/c)	95% Back of Queue (m)	DOS (v/c)	95% Back of Queue (m)	DOS (v/c)	95% Back of Queue (m)	DOS (v/c)	95% Back of Queue (m)
Bruce Highway (South)	L	0.03	0	0.04	0	0.03	0	0.04	0
	T	0.13	0	0.14	0	0.15	0	0.16	0
Bruce Highway (North)	T	0.14	0	0.14	0	0.16	0	0.16	0
	R	0.01	0	0.01	0	0.01	0	0.02	0
Gavial Gracemere Road (West)	L	0.13	4	0.10	3	0.14	4	0.11	3
	R	0.13	4	0.10	3	0.14	4	0.11	3

Note: Practical Maximum DOS for a priority intersection is 0.80.

Table 5–4 – 2033 Operational Characteristics of the Bruce Highway / Gavial Gracemere Road Intersection

Leg	Movement	2033 Base				2033 Design			
		AM		PM		AM		PM	
		DOS (v/c)	95% Back of Queue (m)	DOS (v/c)	95% Back of Queue (m)	DOS (v/c)	95% Back of Queue (m)	DOS (v/c)	95% Back of Queue (m)
Bruce Highway (South)	L	0.03	0	0.05	0	0.03	0	0.05	0
	T	0.16	0	0.17	0	0.17	0	0.19	0
Bruce Highway (North)	T	0.17	0	0.17	0	0.19	0	0.19	0
	R	0.01	0	0.02	0	0.01	0	0.02	0
Gavial Gracemere Road (West)	L	0.18	6	0.15	4	0.21	6	0.16	5
	R	0.18	6	0.15	4	0.21	6	0.16	5

Note: Practical Maximum DOS for a priority intersection is 0.80.

The results provided in Table 5–3 and Table 5–4 indicate that the Bruce Highway / Gavial Gracemere Road intersection, as assessed, would operate with satisfactory operating parameters in 2023 and in 2033 with the expanded quarry and the approved asphalt plant from a capacity viewpoint.

6 Safety Assessment

Whilst the previous section considers the operation of the key intersections related to the expanded quarry and the approved asphalt plant from a capacity viewpoint, safety of these intersections is also required to be assessed.

In consideration of safety, it is important to consider the appropriate geometries and locations of these intersections. The safety review includes consideration of the following features:

- Sight distances;
- Turn lane warrants;
- Crash data, and
- Any other relevant safety features.

There are no other relevant safety features other than sight distances, crash data and the potential need to consider higher order turn lane treatments, which have all been assessed in the following sections.

6.1 Sight Distances

Available sight distances related to the existing Bruce Highway site access have been assessed.

The typically sought safe intersection sight distances (**SISD**) and approach sight distances (**ASD**) as per the requirements identified in Austroads' "*Guide to Road Design Part 4A: Unsignalised and Signalised Intersection, 2017*", and whether the sight distances available comply with the Austroads' requirements are summarised in Table 6–1.

Table 6–1 – Review of Sight Distances at the Bruce Highway Site Access

Intersection	Leg of Intersection	Design Speed of Major Road*	Austroads' Recommended SISD	Austroads' Recommended ASD	Available Sight Distance complies with Austroads' Provision	
					SISD	ASD
Bruce Highway Site Access	North	110km/h	285m	193m	Yes	Yes
	South	110km/h	285m	193m	Yes	Yes

**The analysis has adopted a design speed allowance of 10km/h above the posted speed limit.*

The typically sought SISD (285m) related to the site access and the general contours proximate are illustrated on Figure 6–1.

The Google Maps streetview images from the Bruce Highway proximate to the site access, looking north and south, along the Bruce Highway are illustrated as Image 6–1 and Image 6–2.

Based on a review of the Google Maps streetview images, available aerial imagery and contours on Queensland Globe (refer to Figure 6–1), it is evident that the Bruce Highway is straight and flat proximate to the site access, therefore the sight distances available at the Bruce Highway site access would comply with Austroads' required sight distances.

This would also be verified at the detailed design stage.



Image 6–1 – Looking North from the Site Access along the Bruce Highway
[annotations added by TTPlus]
Source: Google Maps



Image 6–2 – Looking South from the Site Access along the Bruce Highway
[annotations added by TTPlus]
Source: Google Maps

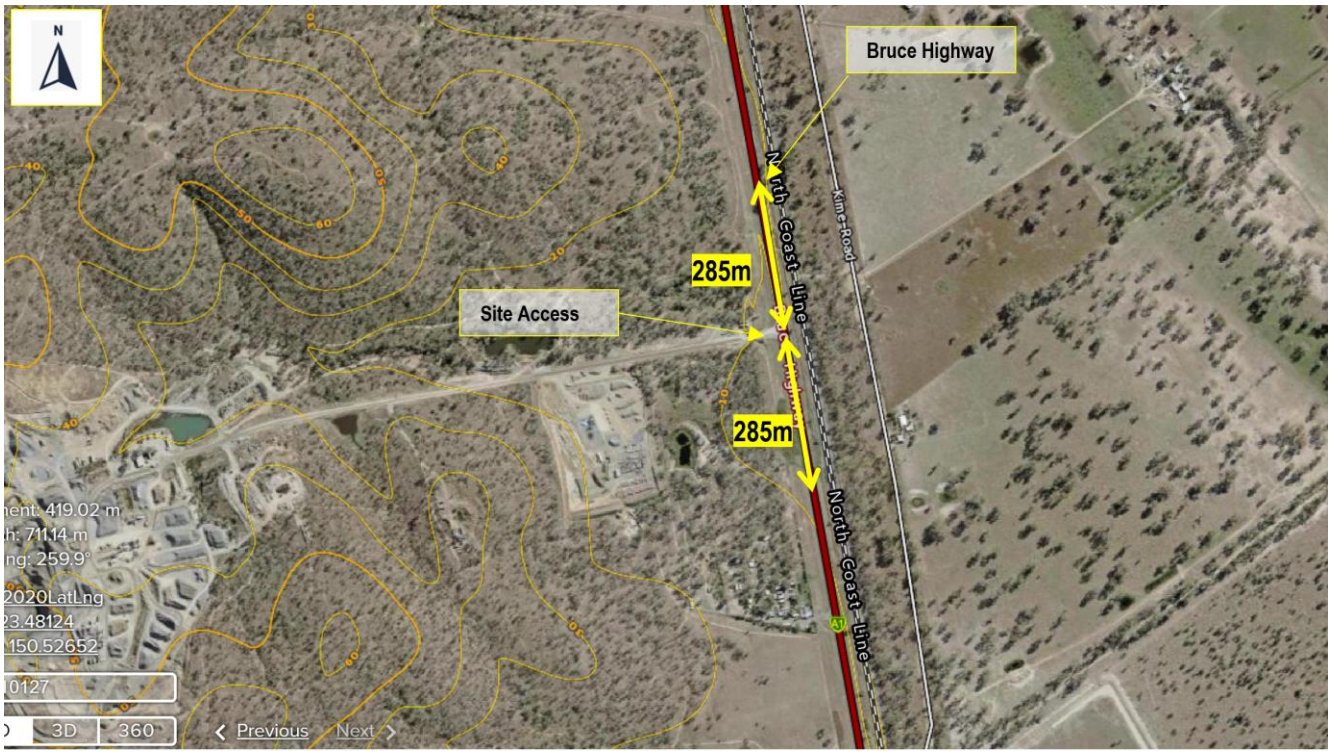


Figure 6–1 – Contour Map and Sight Distances

Source: https://qldglobe.information.qld.gov.au/ [annotations and sight distances added by TTPlus]

6.2 Turn Lane Treatments

As previously identified in Section 5.2 of this report, it appears that the turn lane treatments of the Bruce Highway / Gavial Gracemere Road intersection were upgraded to AUL / CHR turn lane treatments in 2018 – these are the highest standards of turn lane treatments typically adopted on a priority-controlled intersection. In addition, the results of SIDRA analyses included in Section 5.2 of this report indicate that the Bruce Highway / Gavial Gracemere Road intersection, as assessed, would operate with satisfactory operating parameters in 2023 and 2033 with the expanded quarry and the approved asphalt plant from a capacity viewpoint. Therefore, the warrants for the possible need to consider higher order turn lane treatments at the Bruce Highway / Gavial Gracemere Road intersection is not considered to be necessary.

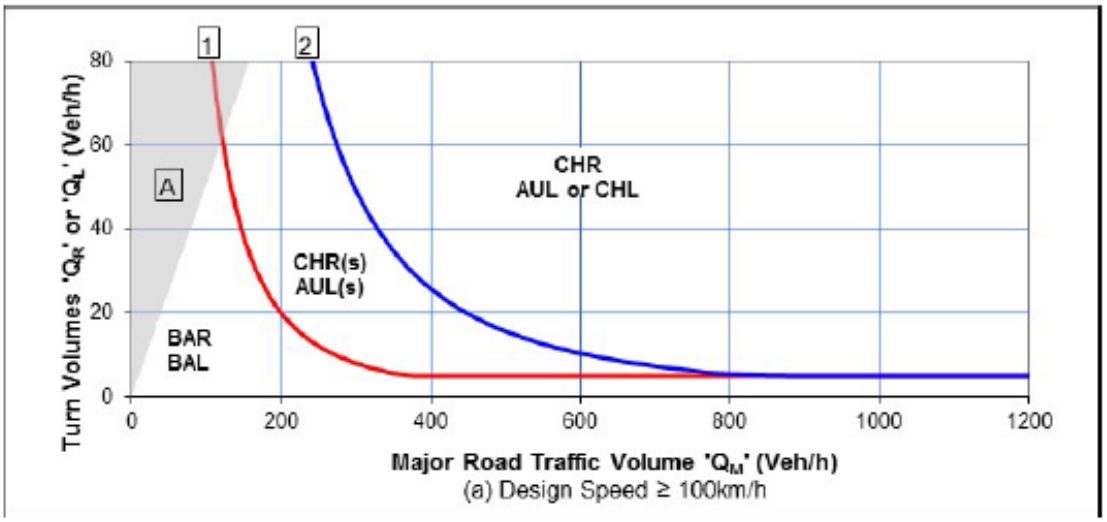
Considering the likely design traffic scenarios for the 10-year design horizon with the expanded quarry and approved asphalt plant (2033 AM and PM design scenarios) ensures that the warrants for the possible need to consider higher order turn lane treatments at the Bruce Highway site access are properly tested for all anticipated traffic conditions with the expanded quarry and approved asphalt plant.

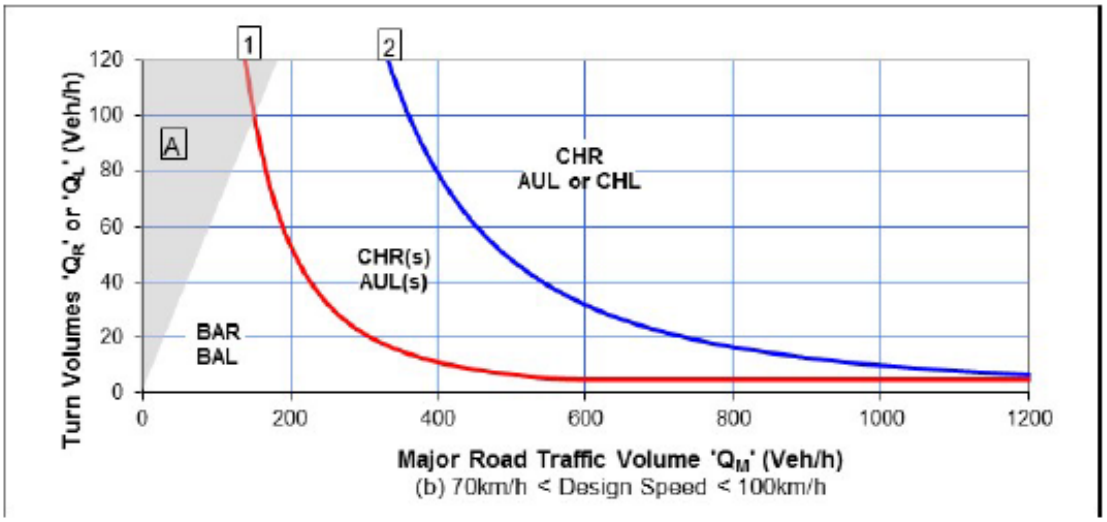
The identified turn lane treatments that would be sought for the Bruce Highway site access to ensure appropriately safe operation are determined by plotting the design traffic volumes on the graphs included as *Figure 4A–1 Warrants – Major Road Turn Treatments – Normal Design Domain* contained within DTMR's "*Supplement to Austroads Guide to Road Design Part 4A: Unsignalised and Signalised Intersections"* (Ref.1) duplicated as Figure 6–2.

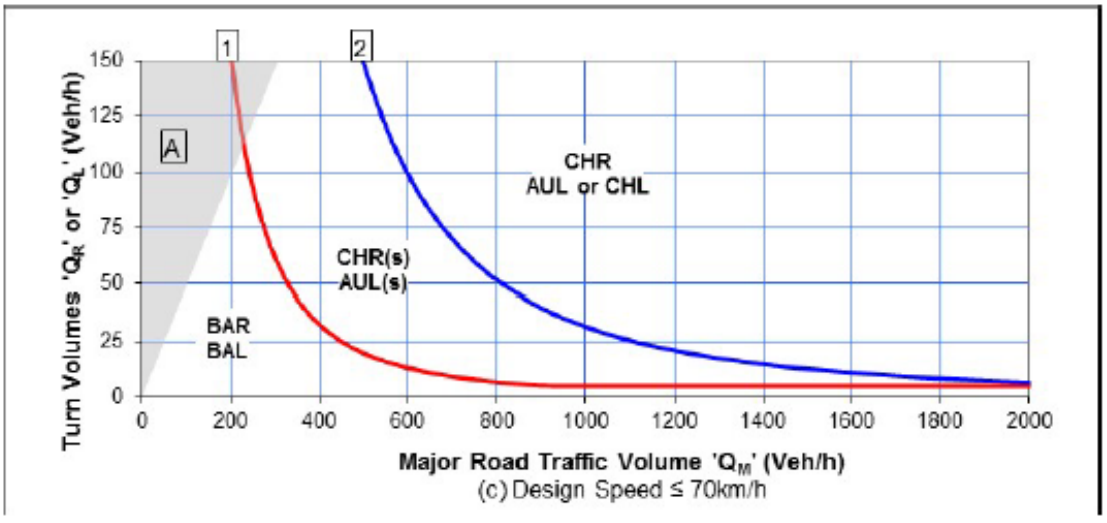
[1] "Supplement to Austroads Guide to Road Design Part 4A: Unsignalised and Signalised Intersections, Road Planning and Design Manual – Edition 2: Volume 3", DTMR, August 2014.

Supplement to Austroads Guide to Road Design Part 4A: Unsignalised and Signalised Intersections

Figure 4A-1 - Warrants - major road turn treatments - Normal Design Domain







(*) the minimum right turn treatment for multi-lane roads is a CHR(s)

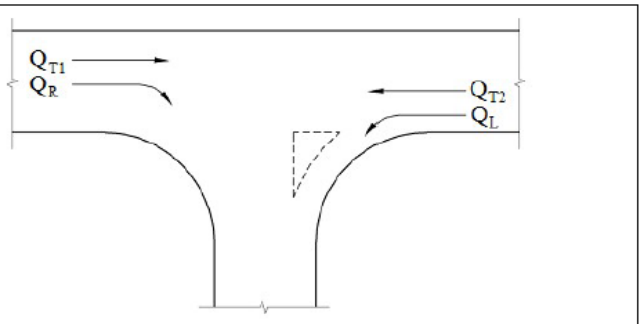
Figure 6–2 – Warrants for Turn Lane Treatments

(Source: Ref.1)

The x–axis (Q_M) and y–axis (Q_L and Q_R) on these graphs relate to the following:

- Q_R = Right turn traffic volume (vph);
- Q_L = Left turn traffic volume (vph), and
- Q_M = Major road traffic volume which is calculated in accordance with *Figure 4A–2 Calculation of the Major Road Traffic Volume Parameter 'Q_M'* (Ref.1), duplicated as Figure 6–3.

Figure 4A-2 - Calculation of the major road traffic volume parameter 'Q_M'



Road Type	Turn Type	Splitter Island	Q_M (veh/h)
2 Lane 2 Way	Right	No	= Q_{T1} + Q_{T2} + Q_L
		Yes	= Q_{T1} + Q_{T2}
	Left	Yes/No	= Q_{T2}
4 Lane 2 Way	Right	No	= 50% x Q_{T1} + Q_{T2} + Q_L
		Yes	= 50% x Q_{T1} + Q_{T2}
	Left	Yes/No	= 50% x Q_{T2}
6 Lane 2 Way	Right	No	= 33% x Q_{T1} + Q_{T2} + Q_L
		Yes	= 33% x Q_{T1} + Q_{T2}
	Left	Yes/No	= 33% x Q_{T2}

Figure 6–3 – Calculation of Major Road Traffic Volumes

(Source: Ref.1)

6.2.1 Turn Lane Assessment of the Bruce Highway Site Access

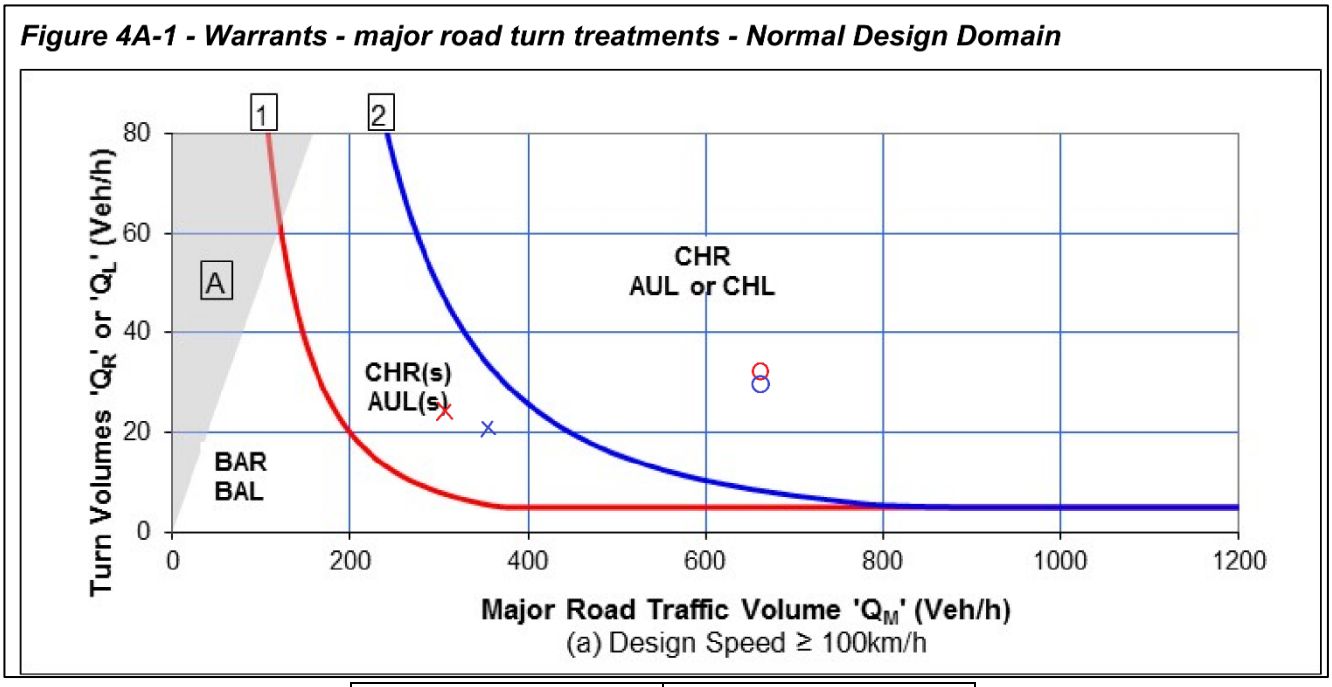
By applying the calculations indicated from within Figure 6–3, the following relevant traffic volume parameters for the left turn, right turn and through movements for the 2033 AM and PM design scenarios were established. The traffic volume parameters for each assessment scenario are summarised in Table 6–2.

Table 6–2 – Design Traffic Volume Parameters – Bruce Highway Site Access

Scenario	Traffic Movement	Traffic Volume (vph)	
		2033 Design	
		AM	PM
Left Turn Scenario	Q_L	23	21
	Q_{ML}	306	350
Right Turn Scenario	Q_R	33	29
	Q_{MR}	676	677

In order to illustrate the identified left and right turn lane treatments ideally sought to be provided at the Bruce Highway site access for each of the above scenarios, the traffic volume parameters determined in Table 6–2 have been plotted on Figure 4A–1(a) (Ref.1) (refer to Figure 6–2). A design speed of 110km/h for the Bruce Highway has been adopted.

The coordinates of the assessed cases are as indicated approximately on Figure 6–4.



x 2033 AM – Left Turn	x 2033 PM – Left Turn
o 2033 AM – Right Turn	o 2033 PM – Right Turn

Figure 6–4 – Warrants for Turn Lane Treatments – Bruce Highway Site Access

Based on a review of available Nearmap imagery, it appears that "basic" left turn (**BAL**) and CHR(S) turn lane treatments are provided at the existing Bruce Highway site access.

Based on the results illustrated on Figure 6–4, it is recommended to provide auxiliary left – short (**AUL(S)**) and CHR turn lane treatments at the Bruce Highway site access.

Timings to provide the recommended turn lane treatments at the Bruce Highway site access are provided below:

- the AUL(S) turn lane treatment should be provided once the total material hauled from the Subject Site exceeds 0.7M tonnes (cumulative production of the existing quarry and the approved asphalt plant) in any 12-month period – note: the current production of the Subject Site has not triggered the need to provide the AUL(S) turn lane treatment; and
- the CHR turn lane treatment is recommended to be provided when the quarry expands, ie. when the production of the quarry exceeds 1M tpa.

It is noted that there are no raised traffic islands proposed to be provided at the Bruce Highway site access; accordingly, additional street lighting is not warranted.

6.3 Crash Statistics

The Queensland Government database (https://www.data.qld.gov.au/dataset/crash–data–from–queensland–roads) provides recorded road crash data that can be used to understand what, if any, crash history exists at the key intersections proximate the Subject Site.

The routinely adopted crash frequency and time window metric utilised when issues may be considered to be significant is 3 casualty crashes in the last 5 years.

From review of the crash data from 2016 to the end of 2020 (ie. the most recent 5 years of available data), there have been no reported crashes near the existing Bruce Highway site access location. There were two crashes (one hospitalisation (overturned crash) in February 2016 and one medical treatment (rear-end crash) in May 2018) at the Bruce Highway / Gavial Gracemere Road intersection. It is noted that the February 2016 crash occurred prior to construction of the higher standard of the right turn lane treatment, and the May 2018 crash occurred during the construction period of these works.

Now fully functional, it is anticipated that the higher order right turn treatment would manifest safer operating conditions.

Whilst crashes can be somewhat arbitrary, it is considered that there are no systematic safety issues at these key intersections that would reasonably require further consideration.

6.4 Conclusions in relation to Safety

Based on the results of the SIDRA analysis, the turn lane treatment assessment and review of the historical crash data, the external road network will continue to operate efficiently and safely with the recommended AUL(S) and CHR turn lane treatments to be provided at the Bruce Highway site access.

The swept path analysis and the detailed design of the recommended turn lane treatments will be undertaken at a later stage of the project.

7 Pavement Contribution Assessment

The Midgee Quarry currently enjoys a development approval and an EA that allows for haulage / production of up to 1 Mtpa. It is proposed to increase the permitted production from 1 Mtpa to 2 Mpta. Conditioned pavement contribution for impacts on SCRs related to the existing Midgee Quarry (production up to 1 Mtpa) are duplicated as Table 7–1. The conditioned pavement contribution are 2018 rates, understood to be subject to indexation.

Table 7–1 – Conditioned Pavement Contribution for Impacts on SCRs related to the Existing Midgee Quarry (Production of up to 1 Mtpa)

Material Hauled – tonnes/year	Contribution – cents/tonne
1 - 360,000	Nil
360,001 – 400,000	0.80
400,001 - 410,000	1.37
410,001 - 420,000	1.90
420,001 - 430,000	2.55
430,001 - 440,000	3.93
440,001 - 450,000	5.16
450,001 - 460,000	5.95
460,001 - 470,000	6.56
470,001 - 480,000	7.69
480,001 - 490,000	8.89
490,001 - 500,000	9.27
500,001 - 510,000	9.96
510,001 - 520,000	10.97
520,001 - 530,000	11.03
530,001 - 540,000	11.64
540,001 - 550,000	11.92
550,001 - 560,000	12.40
560,001 - 570,000	12.62
570,001 - 580,000	12.77
580,001 - 590,000	12.77
590,001 - 600,000	12.92
600,001 - 610,000	12.92
610,001 - 620,000	13.03
620,001 - 630,000	13.10
630,001 - 640,000	13.10
640,001 - 650,000	13.17
650,001 - 660,000	13.17
660,001 - 670,000	13.23
670,001 - 680,000	13.23
680,001 - 690,000	13.28
690,001 - 700,000	13.28
700,001 – 750,000	13.40
750,001 – 800,000	13.43
800,001 – 850,000	13.52
850,001 – 900,000	13.56
900,001 – 950,000	13.60
950,001 – 1,000,000	13.64

The appropriate contribution for pavement impacts associated with the expanded quarry on SCRs has been calculated using DTMR's "*Guide to Traffic Impact Assessment*" (**GTIA**) (Ref.2) and the adopted haulage profile.

7.1.1 Assessment Parameters

The following assessment parameters have been adopted in this pavement contribution assessment:

- Additional annual production rate: 1 Mtpa;
- First assessment year: 2023;
- AADT data: 2020 data sourced from DTMR;
- AADT growth rate: 2.0% p.a. (compound – which is consistent with the traffic growth rate adopted in the traffic impact assessment of this report), and
- Marginal Cost: 2020 data sourced from DTMR.

7.1.2 Project Operational Parameters

The likely operational parameters of the expanded quarry have been previously discussed in Section 4.3 of this report.

7.1.3 Pavement Contributions for Impacts on State–controlled Roads

The calculations of the pavement contributions for the pavement impacts associated with the expanded quarry on SCRs, undertaken based on DTMR's GTIA, have been included as Appendix E (with key example cases of production rates of 1.02 Mtpa, 1.44 Mtpa and 2 Mtpa provided). An electronic copy of the Excel file can be provided (if required) upon request.

The calculated pavement contributions for impacts associated with the expanded quarry on SCRs, determined using DTMR's GTIA, are illustrated in Table 7–2 (for production from 1 Mtpa to 2 Mtpa). The pavement contributions for the production of the first 1 Mtpa of the Midgee Quarry will continue to be paid in accordance with the conditioned pavement contributions illustrated in Table 7–1.

[2] *"Guide to Traffic Impact Assessment", DTMR, 2017.*

Table 7–2 – Appropriate Pavement Contribution of the Midgee Quarry (for production from 1 Mtpa to 2 Mtpa)

Production Rate	Pavement Contribution (cents / tonne)
1,000,001 – 1,020,000	21.21
1,020,001 – 1,040,000	21.26
1,040,001 – 1,060,000	21.32
1,060,001 – 1,080,000	21.42
1,080,001 – 1,100,000	21.48
1,100,001 – 1,120,000	21.56
1,120,001 – 1,140,000	21.56
1,140,001 – 1,160,000	21.73
1,160,001 – 1,180,000	21.80
1,180,001 – 1,200,000	21.88
1,200,001 – 1,220,000	21.96
1,220,001 – 1,240,000	22.13
1,240,001 – 1,260,000	22.27
1,260,001 – 1,280,000	22.46
1,280,001 – 1,300,000	22.65
1,300,001 – 1,320,000	22.73
1,320,001 – 1,340,000	22.89
1,340,001 – 1,360,000	23.03
1,360,001 – 1,380,000	23.18
1,380,001 – 1,400,000	23.18
1,400,001 – 1,420,000	23.29
1,420,001 – 1,440,000	23.41
1,440,001 – 2,000,000	23.41

8 Summary of Findings

TTPlus has been commissioned by Hopkins Brothers to prepare a traffic and pavement impact assessment report as part of a development application for the proposed expansion of the Midgee Quarry located at the Bruce Highway, Midgee QLD, properly described as Lot 2 RP888747, Lot 93 LIV42065, Lot 725 RP888747, Lot 1 SP747721 and Lot 2 SP747721 (**Subject Site**).

The Midgee Quarry currently enjoys a development approval and an Environmental Authority that allows for haulage / production of up to 1 Mtpa. An asphalt plant, located within the Subject Site, has been approved to produce up to 100,000 tpa. One of the existing conditions of approval is the requirement to construct an AUL(S) at the site access on the Bruce Highway once the total material hauled from the Subject Site exceeds 0.7M tonnes (cumulative production of the existing quarry and the asphalt plant) in any 12-month period. TTPlus has been advised that the existing quarry produced a total of 700,000 – 800,000 tonnes over past the 5 years and no permanent asphalt plant was delivered on site, however the intention is that the asphalt plant would ultimately be delivered (either as a permanent facility or temporary plant). The AUL(S) condition has not yet been triggered.

The subject application seeks permission to produce up to 2 Mtpa of quarried material (and retention of permissibility of the approved asphalt plant). For the purpose of this traffic and pavement impact assessment, it is assumed that the expanded quarry would start operation in 2023. Therefore, in accordance with traditional traffic engineering practice, the design year for the expanded quarry is 2033.

The site layout plan for the expanded quarry is included as Appendix A.

Site Access

The existing site access on the Bruce Highway is located approximately 1.6km south of Gavial Gracemere Road and is proposed to be utilised as the access for the site.

Transport Routes

The existing transport routes related to the Subject Site are the Bruce Highway (north) and the Bruce Highway (south); the existing transports routes are illustrated by the blue lines on Figure 3–1. These existing transport routes are proposed to be continued to be utilised by the expanded quarry.

Traffic Impact Assessment and Safety Assessment

The results of the SIDRA analyses included in Section 5 of this report illustrate that the existing Bruce Highway site access and the Bruce Highway / Gavial Gracemere Road intersection, as assessed, would operate with satisfactory operating parameters with the expanded quarry and the approved asphalt plant from a capacity viewpoint.

Based on the results of the SIDRA analysis, the turn lane treatment assessment and review of the historical crash data, the external road network will continue to operate efficiently and safely with the recommended AUL(S) and CHR turn lane treatments to be provided at the Bruce Highway site access.

Timings to provide the recommended turn lane treatments at the Bruce Highway site access are provided below:

- the AUL(S) turn lane treatment should be provided once the total material hauled from the Subject Site exceeds 0.7M tonnes (cumulative production of the existing quarry and the approved asphalt plant) in any 12-month period – note: the current production of the Subject Site has not triggered the need to provide the AUL(S) turn lane treatment; and
- the CHR turn lane treatment is recommended to be provided when the quarry expands, ie. when the production of the quarry exceeds 1M tpa.

Pavement Contributions for Impacts on State–controlled Roads

An assessment of contributions for impacts on the state-controlled road network has been undertaken in accordance with DTMR's "*Guide to Traffic Impact Assessment*".

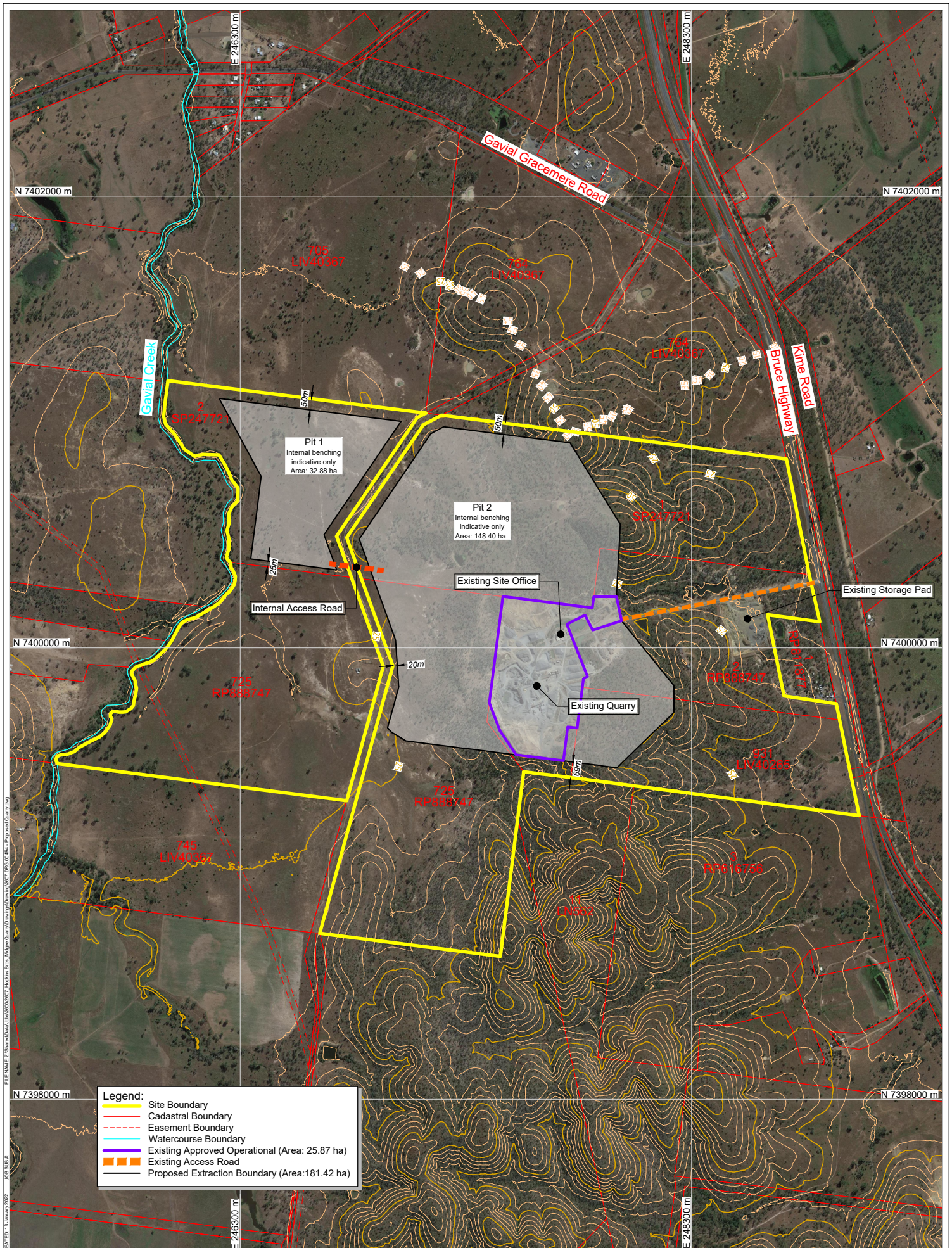
The calculated pavement contributions for impacts associated with the expanded quarry on state-controlled roads, determined using DTMR's GTIA, are illustrated in Table 7–2 (for production from 1 Mtpa to 2 Mtpa). The pavement contributions for the production of the first 1 Mtpa of the Midgee Quarry will continue to be paid in accordance with the conditioned pavement contributions illustrated in Table 7–1.

Conclusion

Based on the assessment and recommendations within this report, the expanded quarry can be approved from a traffic engineering perspective, subject to reasonable and relevant conditions.

Appendix A

Site Layout Plan



REV	DESCRIPTION	DATE	BY
2	Site Access Road deleted	19-11-2021	MR
3	Pit 1 revised	03-12-2021	MR
4	Pit 2 southern boundary amendments	18-01-2022	MR

Data Sources:
Photography: © 2021 Microsoft Corporation; © 2021 Maxar; © CNES (2021) Distribution Airbus DS
Topography: © Commonwealth of Australia (Geoscience Australia) 2015, LiDAR 5m
Cadastre: © The State of Queensland (Department of Resources) 2021
Ecosystem:
Other:

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PROJECT: Midgee Quarry

CLIENT: Hopkins Brothers

TITLE: Proposed Quarry

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DRAWING NUMBER: 2607.DRG.004

REVISION: 4

DATE: 20 January 2022 | DRAWN: JHV | DATUM: HORIZONTAL / VERTICAL / ZONE
PRINTED: 20 January 2022 | CHECKED: JT | GDA94 / MGA / AHD / 56

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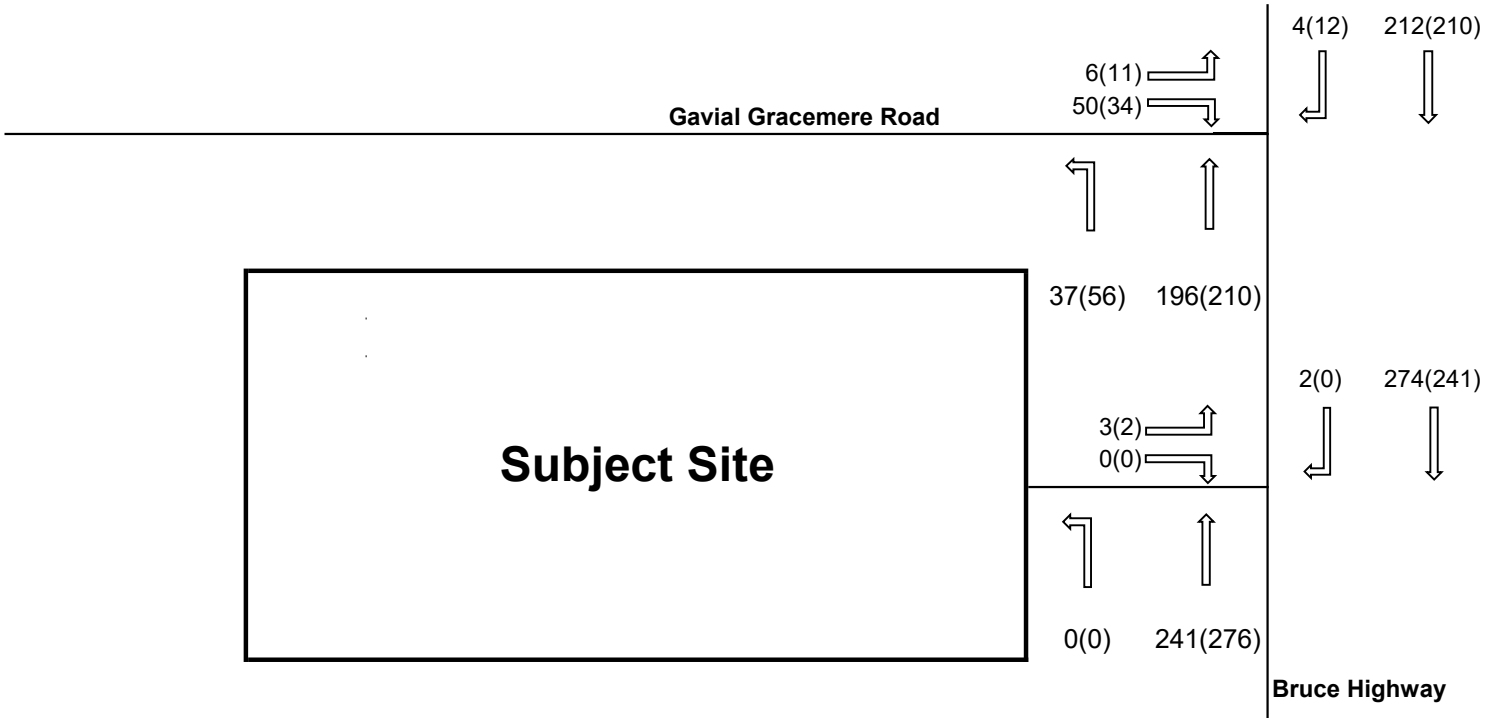
JOB SUB #:
CREATED: 18 January 2022

Appendix B

Traffic Volume Diagrams

Note:

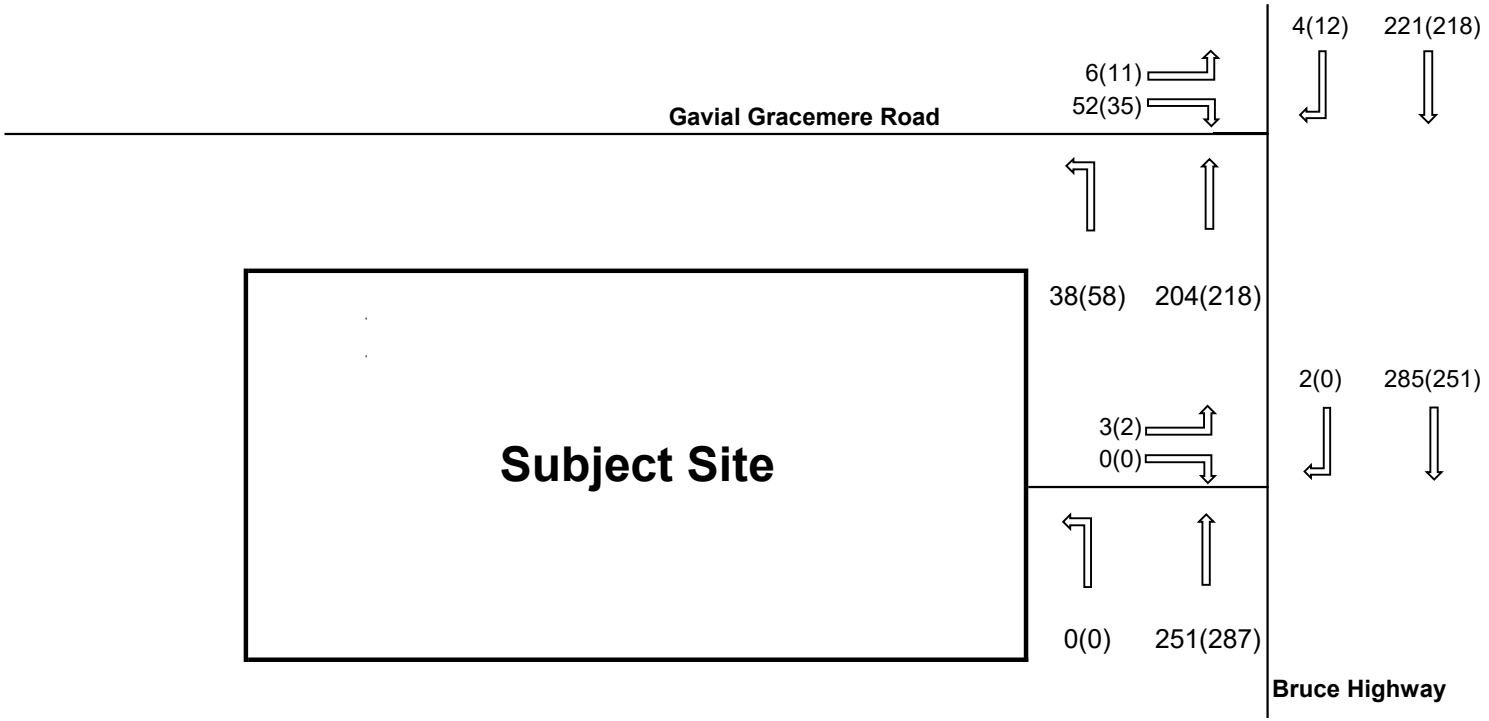
1. all units are vehicles per hour
2. 20(30) = Weekday AM peak hour traffic volume (Weekday PM peak hour traffic volume)



Midgee Quarry	**2021 Observed Traffic Volumes**	November 2021
		TTPlus Project No: 10569
	Figure B1	TRAFFIC TRANSPORT plus

Note:

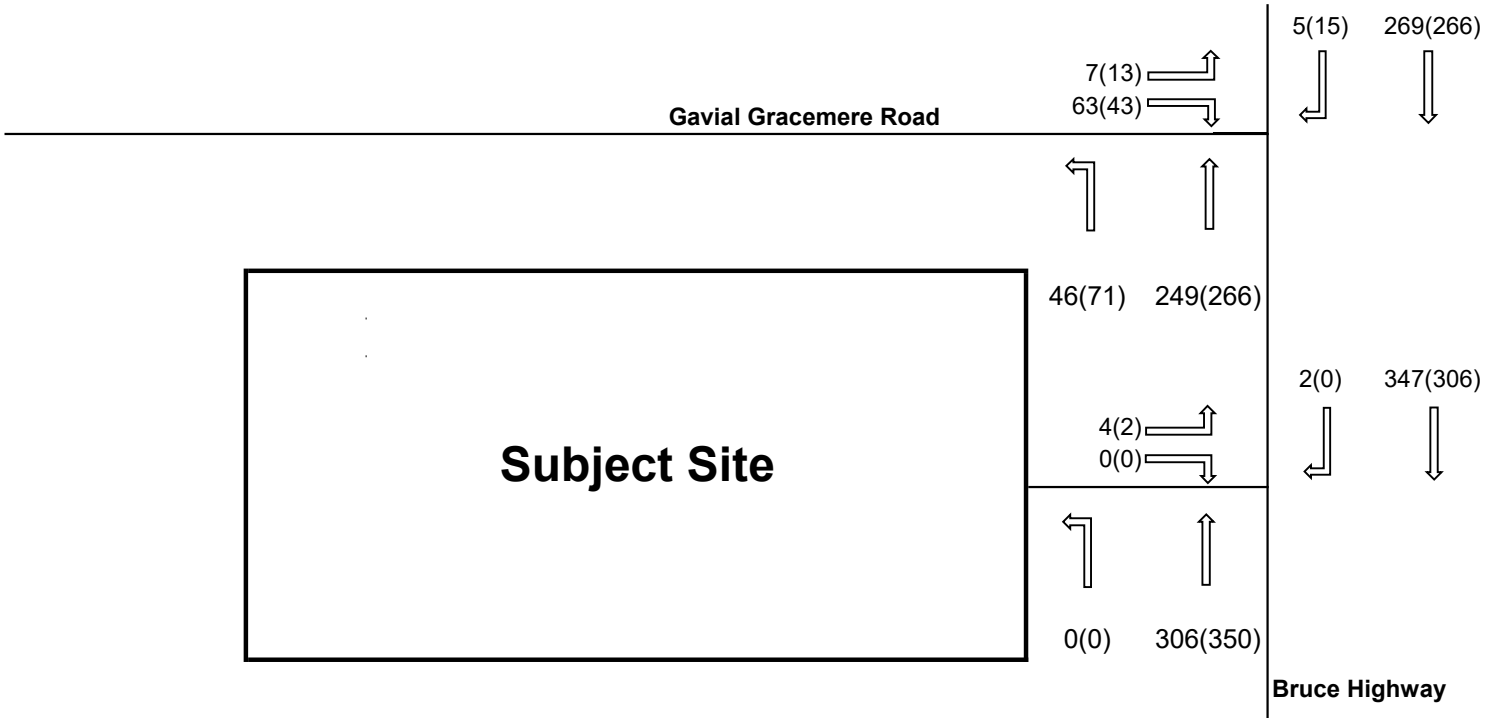
1. all units are vehicles per hour
2. 20(30) = Weekday AM peak hour traffic volume (Weekday PM peak hour traffic volume)



Midgee Quarry	**2023 Base Traffic Volumes**	November 2021
		TTPlus Project No: 10569
	Figure B2	TRAFFIC TRANSPORT plus

Note:

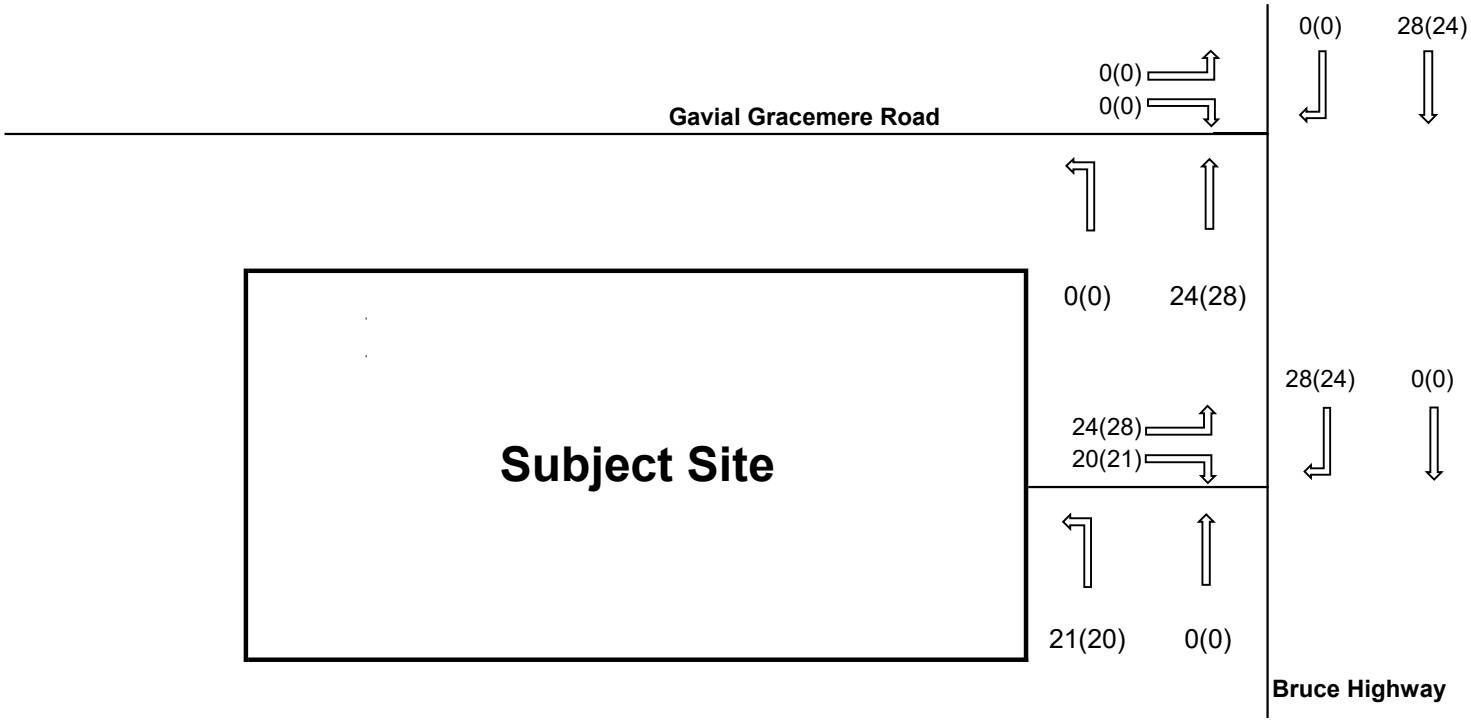
1. all units are vehicles per hour
2. 20(30) = Weekday AM peak hour traffic volume (Weekday PM peak hour traffic volume)



Midgee Quarry	**2033 Base Traffic Volumes**	November 2021
		TTPlus Project No: 10569
	Figure B3	TRAFFIC TRANSPORT plus

Note:

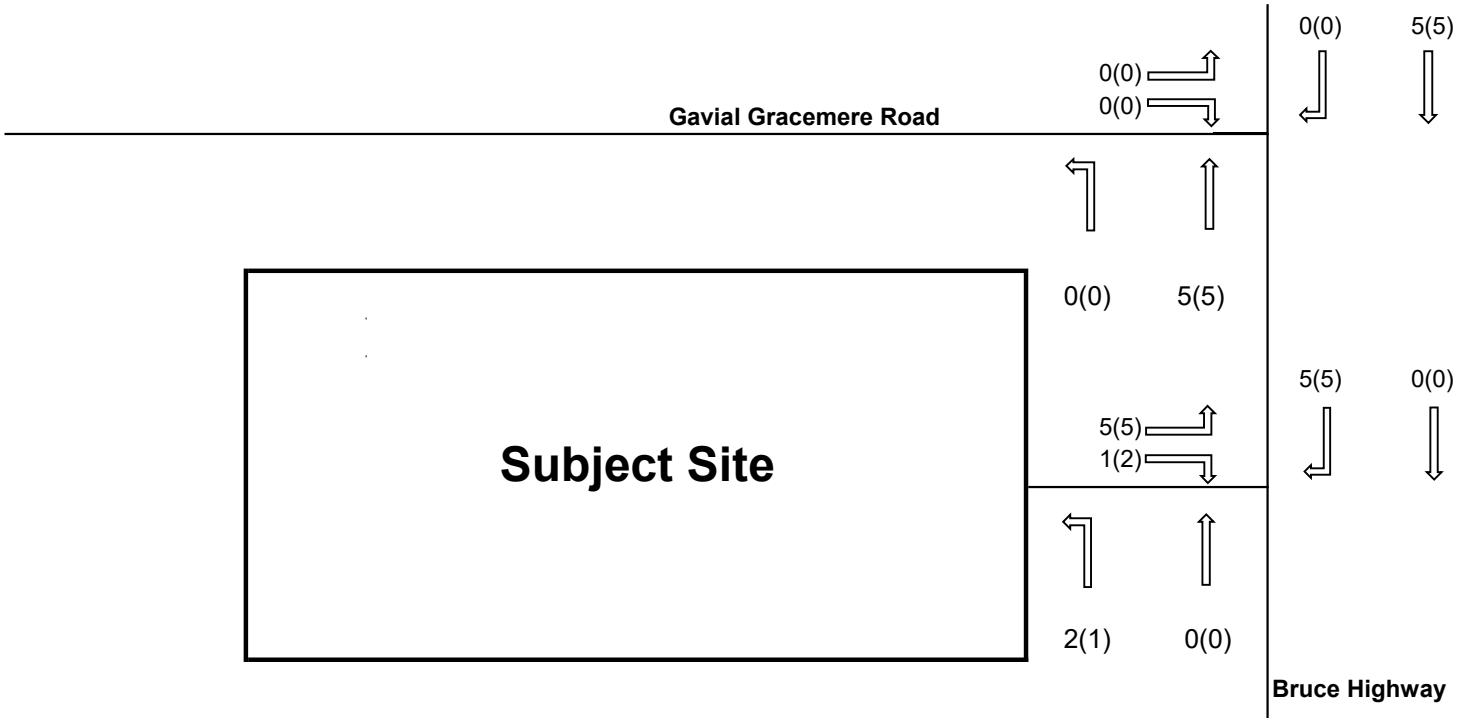
1. all units are vehicles per hour
2. 20(30) = Weekday AM peak hour traffic volume (Weekday PM peak hour traffic volume)



Midgee Quarry	**Trip Generation associated with the expanded quarry**	November 2021
		TTPlus Project No: 10569
	Figure B4	TRAFFIC TRANSPORT plus

Note:

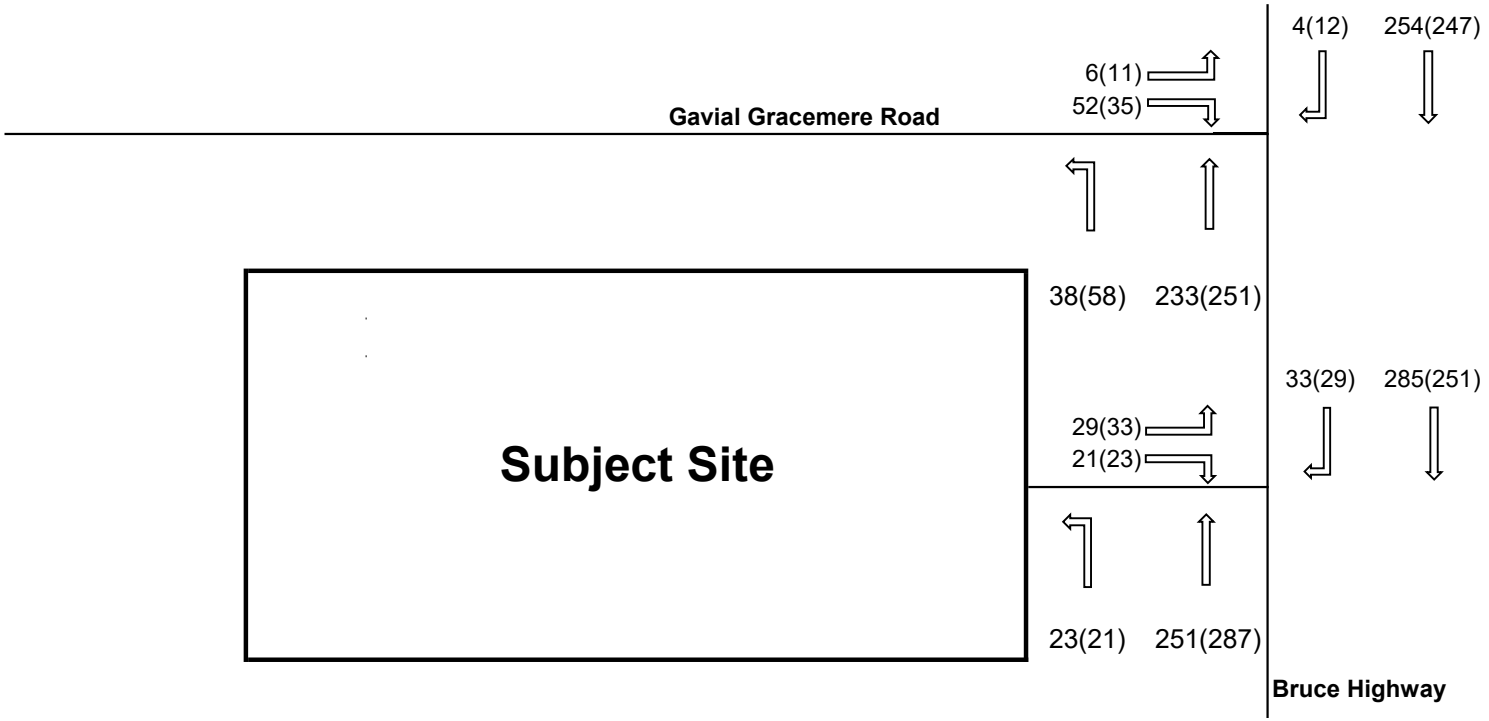
1. all units are vehicles per hour
2. 20(30) = Weekday AM peak hour traffic volume (Weekday PM peak hour traffic volume)



Midgee Quarry	**Trip Generation associated with the approved asphalt plant**	November 2021
		TTPlus Project No: 10569
	Figure B5	TRAFFIC TRANSPORT plus

Note:

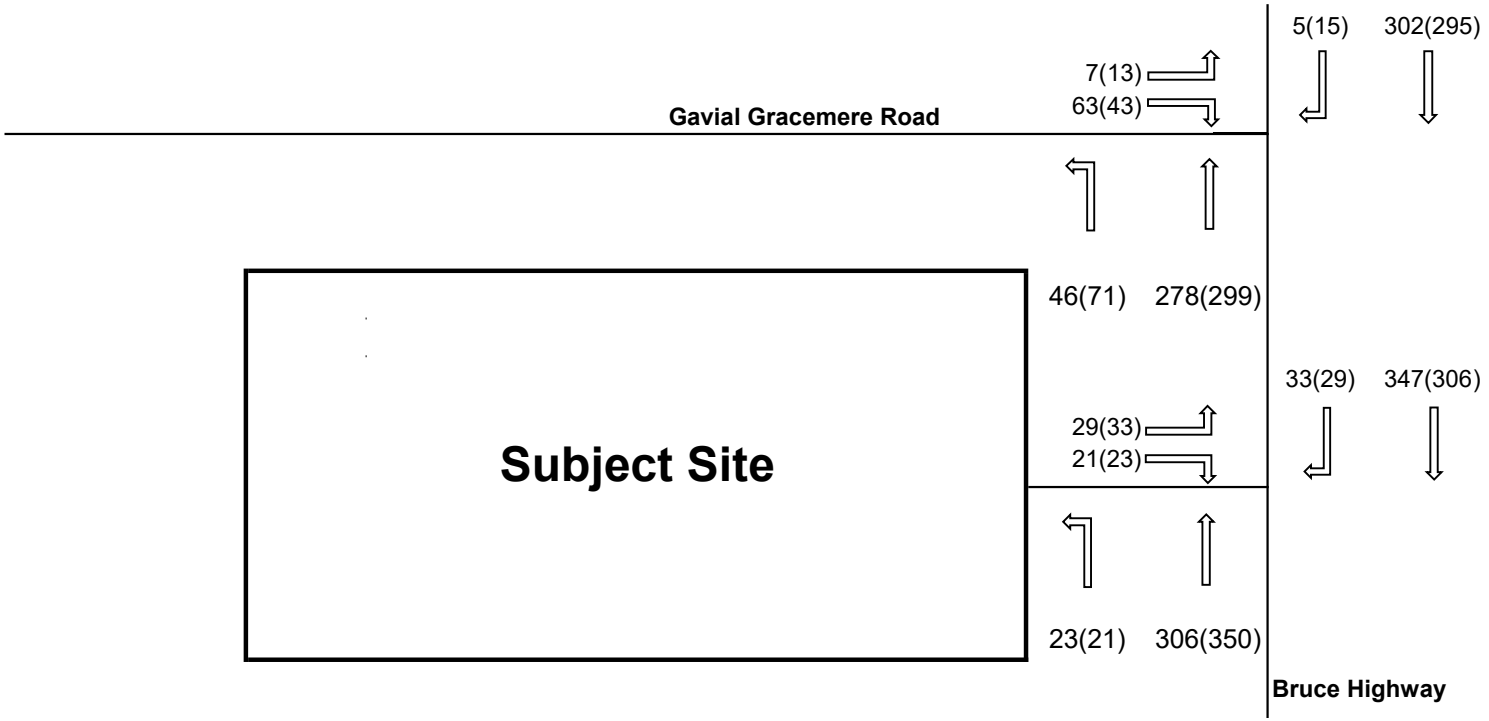
1. all units are vehicles per hour
2. 20(30) = Weekday AM peak hour traffic volume (Weekday PM peak hour traffic volume)



Midgee Quarry	**2023 Design Traffic Volumes**	November 2021
		TTPlus Project No: 10569
	Figure B6	TRAFFIC TRANSPORT plus

Note:

1. all units are vehicles per hour
2. 20(30) = Weekday AM peak hour traffic volume (Weekday PM peak hour traffic volume)



Midgee Quarry	**2033 Design Traffic Volumes**	November 2021
		TTPlus Project No: 10569
	Figure B7	TRAFFIC TRANSPORT plus

Appendix C

Results of SIDRA Analyses

MOVEMENT SUMMARY

Site: 1 [2023 AM Base Peak Hour (Site Folder: General)]

Bruce Highway Site Access
Site Category: Existing Design
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Bruce Highway														
1	L2	1	80.0	1	80.0	0.154	6.5	LOS A	0.0	0.0	0.00	0.00	0.00	54.5
2	T1	251	20.4	264	20.4	0.154	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		252	20.6	265	20.6	0.154	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.9
North: Bruce Highway														
8	T1	285	20.8	300	20.8	0.175	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
9	R2	2	80.0	2	80.0	0.002	8.2	LOS A	0.0	0.1	0.43	0.56	0.43	48.5
Approach		287	21.2	302	21.2	0.175	0.1	NA	0.0	0.1	0.00	0.00	0.00	59.8
West: Site Access														
10	L2	3	80.0	3	80.0	0.008	8.3	LOS A	0.0	0.3	0.48	0.61	0.48	47.8
12	R2	1	80.0	1	80.0	0.008	16.6	LOS C	0.0	0.3	0.48	0.61	0.48	47.2
Approach		4	80.0	4	80.0	0.008	10.4	LOS B	0.0	0.3	0.48	0.61	0.48	47.6
All Vehicles		543	21.4	572	21.4	0.175	0.2	NA	0.0	0.3	0.01	0.01	0.01	59.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: 1 [2023 PM Base Peak Hour (Site Folder: General)]

Bruce Highway Site Access
Site Category: Existing Design
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Bruce Highway														
1	L2	1	80.0	1	80.0	0.176	6.5	LOS A	0.0	0.0	0.00	0.00	0.00	54.5
2	T1	287	20.4	302	20.4	0.176	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		288	20.6	303	20.6	0.176	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.9
North: Bruce Highway														
8	T1	251	20.8	264	20.8	0.154	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
9	R2	1	80.0	1	80.0	0.001	8.6	LOS A	0.0	0.1	0.47	0.56	0.47	48.3
Approach		252	21.0	265	21.0	0.154	0.1	NA	0.0	0.1	0.00	0.00	0.00	59.9
West: Site Access														
10	L2	2	80.0	2	80.0	0.006	8.6	LOS A	0.0	0.3	0.53	0.63	0.53	47.2
12	R2	1	80.0	1	80.0	0.006	16.6	LOS C	0.0	0.3	0.53	0.63	0.53	46.6
Approach		3	80.0	3	80.0	0.006	11.3	LOS B	0.0	0.3	0.53	0.63	0.53	47.0
All Vehicles		543	21.1	572	21.1	0.176	0.1	NA	0.0	0.3	0.00	0.01	0.00	59.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: 1 [2023 AM Design Peak Hour (Site Folder: General)]

Bruce Highway Site Access
Site Category: Existing Design
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Bruce Highway														
1	L2	23	80.0	24	80.0	0.174	6.5	LOS A	0.0	0.0	0.00	0.05	0.00	54.4
2	T1	251	20.4	264	20.4	0.174	0.1	LOS A	0.0	0.0	0.00	0.05	0.00	59.8
Approach		274	25.4	288	25.4	0.174	0.6	NA	0.0	0.0	0.00	0.05	0.00	59.3
North: Bruce Highway														
8	T1	285	20.8	300	20.8	0.176	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
9	R2	33	80.0	35	80.0	0.042	8.7	LOS A	0.2	2.1	0.47	0.65	0.47	48.2
Approach		318	26.9	335	26.9	0.176	0.9	NA	0.2	2.1	0.05	0.07	0.05	58.4
West: Site Access														
10	L2	29	80.0	31	80.0	0.125	8.5	LOS A	0.5	5.4	0.56	0.74	0.56	46.1
12	R2	21	80.0	22	80.0	0.125	19.7	LOS C	0.5	5.4	0.56	0.74	0.56	45.5
Approach		50	80.0	53	80.0	0.125	13.2	LOS B	0.5	5.4	0.56	0.74	0.56	45.8
All Vehicles		642	30.4	676	30.4	0.176	1.7	NA	0.5	5.4	0.07	0.11	0.07	57.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: 1 [2023 PM Design Peak Hour (Site Folder: General)]

Bruce Highway Site Access
Site Category: Existing Design
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Bruce Highway														
1	L2	21	80.0	22	80.0	0.194	6.5	LOS A	0.0	0.0	0.00	0.04	0.00	54.4
2	T1	287	20.4	302	20.4	0.194	0.1	LOS A	0.0	0.0	0.00	0.04	0.00	59.8
Approach		308	24.5	324	24.5	0.194	0.5	NA	0.0	0.0	0.00	0.04	0.00	59.4
North: Bruce Highway														
8	T1	251	20.8	264	20.8	0.155	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
9	R2	29	80.0	31	80.0	0.039	9.0	LOS A	0.2	1.9	0.50	0.66	0.50	48.0
Approach		280	26.9	295	26.9	0.155	1.0	NA	0.2	1.9	0.05	0.07	0.05	58.4
West: Site Access														
10	L2	33	80.0	35	80.0	0.141	8.9	LOS A	0.5	6.1	0.58	0.76	0.58	46.0
12	R2	23	80.0	24	80.0	0.141	19.7	LOS C	0.5	6.1	0.58	0.76	0.58	45.4
Approach		56	80.0	59	80.0	0.141	13.4	LOS B	0.5	6.1	0.58	0.76	0.58	45.8
All Vehicles		644	30.4	678	30.4	0.194	1.8	NA	0.5	6.1	0.07	0.11	0.07	57.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 1 [2033 AM Base Peak Hour (Site Folder: General)]

Bruce Highway Site Access
Site Category: Existing Design
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Bruce Highway														
1	L2	1	80.0	1	80.0	0.188	6.5	LOS A	0.0	0.0	0.00	0.00	0.00	54.5
2	T1	306	20.4	322	20.4	0.188	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		307	20.6	323	20.6	0.188	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.9
North: Bruce Highway														
8	T1	347	20.8	365	20.8	0.213	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
9	R2	2	80.0	2	80.0	0.003	8.8	LOS A	0.0	0.1	0.48	0.58	0.48	48.2
Approach		349	21.1	367	21.1	0.213	0.1	NA	0.0	0.1	0.00	0.00	0.00	59.8
West: Site Access														
10	L2	4	80.0	4	80.0	0.011	8.9	LOS A	0.0	0.4	0.53	0.64	0.53	47.2
12	R2	1	80.0	1	80.0	0.011	21.4	LOS C	0.0	0.4	0.53	0.64	0.53	46.6
Approach		5	80.0	5	80.0	0.011	11.4	LOS B	0.0	0.4	0.53	0.64	0.53	47.1
All Vehicles		661	21.3	696	21.3	0.213	0.2	NA	0.0	0.4	0.01	0.01	0.01	59.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: 1 [2033 PM Base Peak Hour (Site Folder: General)]

Bruce Highway Site Access
Site Category: Existing Design
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Bruce Highway														
1	L2	1	80.0	1	80.0	0.215	6.5	LOS A	0.0	0.0	0.00	0.00	0.00	54.5
2	T1	350	20.4	368	20.4	0.215	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		351	20.6	369	20.6	0.215	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.9
North: Bruce Highway														
8	T1	306	20.8	322	20.8	0.188	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
9	R2	1	80.0	1	80.0	0.001	9.3	LOS A	0.0	0.1	0.51	0.57	0.51	47.9
Approach		307	21.0	323	21.0	0.188	0.1	NA	0.0	0.1	0.00	0.00	0.00	59.8
West: Site Access														
10	L2	2	80.0	2	80.0	0.008	9.3	LOS A	0.0	0.3	0.59	0.67	0.59	46.0
12	R2	1	80.0	1	80.0	0.008	21.3	LOS C	0.0	0.3	0.59	0.67	0.59	45.4
Approach		3	80.0	3	80.0	0.008	13.3	LOS B	0.0	0.3	0.59	0.67	0.59	45.8
All Vehicles		661	21.0	696	21.0	0.215	0.1	NA	0.0	0.3	0.00	0.00	0.00	59.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 1 [2033 AM Design Peak Hour (Site Folder: General)]

Bruce Highway Site Access
Site Category: Existing Design
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Bruce Highway														
1	L2	23	80.0	24	80.0	0.208	6.5	LOS A	0.0	0.0	0.00	0.04	0.00	54.4
2	T1	306	20.4	322	20.4	0.208	0.1	LOS A	0.0	0.0	0.00	0.04	0.00	59.8
Approach		329	24.6	346	24.6	0.208	0.5	NA	0.0	0.0	0.00	0.04	0.00	59.4
North: Bruce Highway														
8	T1	347	20.8	365	20.8	0.215	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
9	R2	33	80.0	35	80.0	0.046	9.3	LOS A	0.2	2.3	0.51	0.68	0.51	47.8
Approach		380	25.9	400	25.9	0.215	0.9	NA	0.2	2.3	0.04	0.06	0.04	58.6
West: Site Access														
10	L2	29	80.0	31	80.0	0.159	9.1	LOS A	0.6	6.7	0.63	0.79	0.63	44.5
12	R2	21	80.0	22	80.0	0.159	25.6	LOS D	0.6	6.7	0.63	0.79	0.63	44.0
Approach		50	80.0	53	80.0	0.159	16.0	LOS C	0.6	6.7	0.63	0.79	0.63	44.3
All Vehicles		759	28.9	799	28.9	0.215	1.7	NA	0.6	6.7	0.06	0.10	0.06	57.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: 1 [2033 PM Design Peak Hour (Site Folder: General)]

Bruce Highway Site Access
Site Category: Existing Design
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Bruce Highway														
1	L2	21	80.0	22	80.0	0.233	6.5	LOS A	0.0	0.0	0.00	0.03	0.00	54.4
2	T1	350	20.4	368	20.4	0.233	0.1	LOS A	0.0	0.0	0.00	0.03	0.00	59.8
Approach		371	23.8	391	23.8	0.233	0.4	NA	0.0	0.0	0.00	0.03	0.00	59.4
North: Bruce Highway														
8	T1	306	20.8	322	20.8	0.188	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
9	R2	29	80.0	31	80.0	0.044	9.8	LOS A	0.2	2.1	0.54	0.70	0.54	47.5
Approach		335	25.9	353	25.9	0.188	0.9	NA	0.2	2.1	0.05	0.06	0.05	58.6
West: Site Access														
10	L2	33	80.0	35	80.0	0.180	9.7	LOS A	0.6	7.6	0.66	0.82	0.66	44.4
12	R2	23	80.0	24	80.0	0.180	25.7	LOS D	0.6	7.6	0.66	0.82	0.66	43.8
Approach		56	80.0	59	80.0	0.180	16.3	LOS C	0.6	7.6	0.66	0.82	0.66	44.1
All Vehicles		762	28.9	802	28.9	0.233	1.8	NA	0.6	7.6	0.07	0.10	0.07	57.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 1 [2023 AM Base Peak Hour (Site Folder: General)]

Bruce Highway / Gavial Gracemere Road Intersection
Site Category: Existing Design
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Bruce Highway														
1	L2	38	20.0	40	20.0	0.025	5.8	LOS A	0.0	0.0	0.00	0.57	0.00	52.8
2	T1	204	25.0	215	25.0	0.128	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		242	24.2	255	24.2	0.128	0.9	NA	0.0	0.0	0.00	0.09	0.00	58.7
North: Bruce Highway														
8	T1	221	25.0	233	25.0	0.139	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
9	R2	4	20.0	4	20.0	0.004	7.0	LOS A	0.0	0.1	0.37	0.57	0.37	51.2
Approach		225	24.9	237	24.9	0.139	0.2	NA	0.0	0.1	0.01	0.01	0.01	59.7
West: Gavial Gracemere Road														
10	L2	6	20.0	6	20.0	0.126	7.0	LOS A	0.5	3.9	0.56	0.79	0.56	48.9
12	R2	52	20.0	55	20.0	0.126	11.7	LOS B	0.5	3.9	0.56	0.79	0.56	48.7
Approach		58	20.0	61	20.0	0.126	11.2	LOS B	0.5	3.9	0.56	0.79	0.56	48.7
All Vehicles		525	24.0	553	24.0	0.139	1.7	NA	0.5	3.9	0.06	0.13	0.06	57.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: 1 [2023 PM Base Peak Hour (Site Folder: General)]

Bruce Highway / Gavial Gracemere Road Intersection
Site Category: Existing Design
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Bruce Highway														
1	L2	58	20.0	61	20.0	0.038	5.8	LOS A	0.0	0.0	0.00	0.57	0.00	52.8
2	T1	218	25.0	229	25.0	0.137	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		276	23.9	291	23.9	0.137	1.2	NA	0.0	0.0	0.00	0.12	0.00	58.3
North: Bruce Highway														
8	T1	218	25.0	229	25.0	0.137	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
9	R2	12	20.0	13	20.0	0.014	7.3	LOS A	0.1	0.4	0.40	0.61	0.40	51.1
Approach		230	24.7	242	24.7	0.137	0.4	NA	0.1	0.4	0.02	0.03	0.02	59.4
West: Gavial Gracemere Road														
10	L2	11	20.0	12	20.0	0.097	7.1	LOS A	0.4	2.9	0.54	0.76	0.54	49.1
12	R2	35	20.0	37	20.0	0.097	12.1	LOS B	0.4	2.9	0.54	0.76	0.54	48.9
Approach		46	20.0	48	20.0	0.097	10.9	LOS B	0.4	2.9	0.54	0.76	0.54	49.0
All Vehicles		552	23.9	581	23.9	0.137	1.7	NA	0.4	2.9	0.05	0.14	0.05	57.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: 1 [2023 AM Design Peak Hour (Site Folder: General)]

Bruce Highway / Gavial Gracemere Road Intersection
Site Category: Existing Design
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Bruce Highway														
1	L2	38	20.0	40	20.0	0.025	5.8	LOS A	0.0	0.0	0.00	0.57	0.00	52.8
2	T1	233	25.0	245	25.0	0.146	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		271	24.3	285	24.3	0.146	0.8	NA	0.0	0.0	0.00	0.08	0.00	58.8
North: Bruce Highway														
8	T1	254	25.0	267	25.0	0.159	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
9	R2	4	20.0	4	20.0	0.005	7.2	LOS A	0.0	0.1	0.40	0.58	0.40	51.1
Approach		258	24.9	272	24.9	0.159	0.2	NA	0.0	0.1	0.01	0.01	0.01	59.8
West: Gavial Gracemere Road														
10	L2	6	20.0	6	20.0	0.142	7.2	LOS A	0.5	4.3	0.59	0.82	0.59	48.1
12	R2	52	20.0	55	20.0	0.142	13.0	LOS B	0.5	4.3	0.59	0.82	0.59	47.9
Approach		58	20.0	61	20.0	0.142	12.4	LOS B	0.5	4.3	0.59	0.82	0.59	47.9
All Vehicles		587	24.1	618	24.1	0.159	1.7	NA	0.5	4.3	0.06	0.12	0.06	57.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: 1 [2023 PM Design Peak Hour (Site Folder: General)]

Bruce Highway / Gavial Gracemere Road Intersection
Site Category: Existing Design
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Bruce Highway														
1	L2	58	20.0	61	20.0	0.038	5.8	LOS A	0.0	0.0	0.00	0.57	0.00	52.8
2	T1	251	25.0	264	25.0	0.158	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		309	24.1	325	24.1	0.158	1.1	NA	0.0	0.0	0.00	0.11	0.00	58.4
North: Bruce Highway														
8	T1	247	25.0	260	25.0	0.155	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
9	R2	12	20.0	13	20.0	0.015	7.5	LOS A	0.1	0.4	0.43	0.62	0.43	50.9
Approach		259	24.8	273	24.8	0.155	0.4	NA	0.1	0.4	0.02	0.03	0.02	59.4
West: Gavial Gracemere Road														
10	L2	11	20.0	12	20.0	0.109	7.4	LOS A	0.4	3.2	0.57	0.79	0.57	48.4
12	R2	35	20.0	37	20.0	0.109	13.5	LOS B	0.4	3.2	0.57	0.79	0.57	48.2
Approach		46	20.0	48	20.0	0.109	12.0	LOS B	0.4	3.2	0.57	0.79	0.57	48.2
All Vehicles		614	24.1	646	24.1	0.158	1.6	NA	0.4	3.2	0.05	0.13	0.05	57.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: 1 [2033 AM Base Peak Hour (Site Folder: General)]

Bruce Highway / Gavial Gracemere Road Intersection
Site Category: Existing Design
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Bruce Highway														
1	L2	46	20.0	48	20.0	0.030	5.8	LOS A	0.0	0.0	0.00	0.57	0.00	52.8
2	T1	249	25.0	262	25.0	0.156	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		295	24.2	311	24.2	0.156	0.9	NA	0.0	0.0	0.00	0.09	0.00	58.7
North: Bruce Highway														
8	T1	269	25.0	283	25.0	0.169	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
9	R2	5	20.0	5	20.0	0.006	7.4	LOS A	0.0	0.2	0.42	0.59	0.42	51.0
Approach		274	24.9	288	24.9	0.169	0.2	NA	0.0	0.2	0.01	0.01	0.01	59.7
West: Gavial Gracemere Road														
10	L2	7	20.0	7	20.0	0.184	7.4	LOS A	0.7	5.6	0.63	0.83	0.63	47.5
12	R2	63	20.0	66	20.0	0.184	14.0	LOS B	0.7	5.6	0.63	0.83	0.63	47.3
Approach		70	20.0	74	20.0	0.184	13.4	LOS B	0.7	5.6	0.63	0.83	0.63	47.4
All Vehicles		639	24.1	673	24.1	0.184	2.0	NA	0.7	5.6	0.07	0.14	0.07	57.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: 1 [2033 PM Base Peak Hour (Site Folder: General)]

Bruce Highway / Gavial Gracemere Road Intersection
Site Category: Existing Design
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Bruce Highway														
1	L2	71	20.0	75	20.0	0.046	5.8	LOS A	0.0	0.0	0.00	0.57	0.00	52.8
2	T1	266	25.0	280	25.0	0.167	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		337	23.9	355	23.9	0.167	1.3	NA	0.0	0.0	0.00	0.12	0.00	58.2
North: Bruce Highway														
8	T1	266	25.0	280	25.0	0.167	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
9	R2	15	20.0	16	20.0	0.019	7.8	LOS A	0.1	0.6	0.45	0.64	0.45	50.7
Approach		281	24.7	296	24.7	0.167	0.5	NA	0.1	0.6	0.02	0.03	0.02	59.3
West: Gavial Gracemere Road														
10	L2	13	20.0	14	20.0	0.145	7.5	LOS A	0.5	4.3	0.61	0.81	0.61	47.8
12	R2	43	20.0	45	20.0	0.145	14.7	LOS B	0.5	4.3	0.61	0.81	0.61	47.5
Approach		56	20.0	59	20.0	0.145	13.0	LOS B	0.5	4.3	0.61	0.81	0.61	47.6
All Vehicles		674	23.9	709	23.9	0.167	1.9	NA	0.5	4.3	0.06	0.14	0.06	57.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: 1 [2033 AM Design Peak Hour (Site Folder: General)]

Bruce Highway / Gavial Gracemere Road Intersection
Site Category: Existing Design
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Bruce Highway														
1	L2	46	20.0	48	20.0	0.030	5.8	LOS A	0.0	0.0	0.00	0.57	0.00	52.8
2	T1	278	25.0	293	25.0	0.174	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		324	24.3	341	24.3	0.174	0.9	NA	0.0	0.0	0.00	0.08	0.00	58.8
North: Bruce Highway														
8	T1	302	25.0	318	25.0	0.190	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
9	R2	5	20.0	5	20.0	0.006	7.6	LOS A	0.0	0.2	0.44	0.60	0.44	50.8
Approach		307	24.9	323	24.9	0.190	0.2	NA	0.0	0.2	0.01	0.01	0.01	59.7
West: Gavial Gracemere Road														
10	L2	7	20.0	7	20.0	0.210	7.8	LOS A	0.8	6.4	0.69	0.86	0.71	46.5
12	R2	63	20.0	66	20.0	0.210	15.9	LOS C	0.8	6.4	0.69	0.86	0.71	46.3
Approach		70	20.0	74	20.0	0.210	15.1	LOS C	0.8	6.4	0.69	0.86	0.71	46.3
All Vehicles		701	24.1	738	24.1	0.210	2.0	NA	0.8	6.4	0.07	0.13	0.07	57.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: 1 [2033 PM Design Peak Hour (Site Folder: General)]

Bruce Highway / Gavial Gracemere Road Intersection
Site Category: Existing Design
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Bruce Highway														
1	L2	71	20.0	75	20.0	0.046	5.8	LOS A	0.0	0.0	0.00	0.57	0.00	52.8
2	T1	299	25.0	315	25.0	0.188	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		370	24.0	389	24.0	0.188	1.2	NA	0.0	0.0	0.00	0.11	0.00	58.4
North: Bruce Highway														
8	T1	295	25.0	311	25.0	0.185	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
9	R2	15	20.0	16	20.0	0.020	8.1	LOS A	0.1	0.6	0.47	0.65	0.47	50.5
Approach		310	24.8	326	24.8	0.185	0.4	NA	0.1	0.6	0.02	0.03	0.02	59.4
West: Gavial Gracemere Road														
10	L2	13	20.0	14	20.0	0.164	7.8	LOS A	0.6	4.8	0.66	0.83	0.66	46.9
12	R2	43	20.0	45	20.0	0.164	16.5	LOS C	0.6	4.8	0.66	0.83	0.66	46.7
Approach		56	20.0	59	20.0	0.164	14.5	LOS B	0.6	4.8	0.66	0.83	0.66	46.7
All Vehicles		736	24.0	775	24.0	0.188	1.9	NA	0.6	4.8	0.06	0.13	0.06	57.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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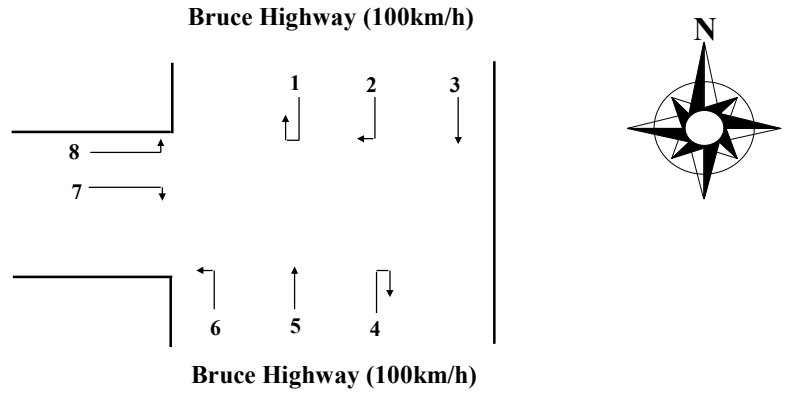
Appendix D

Results of Traffic Surveys

AUSTRAFFIC VIDEO INTERSECTION COUNT

Site No.: 1 **Weather:** Fine
Location: Bruce Highway/Midgee Quarry Access (Hut Road), Midgee
Day/Date: Wednesday, 25 August 2021
AM Peak: *Hour ending - 9:30 AM*
PM Peak: *Hour ending - 3:30 PM*

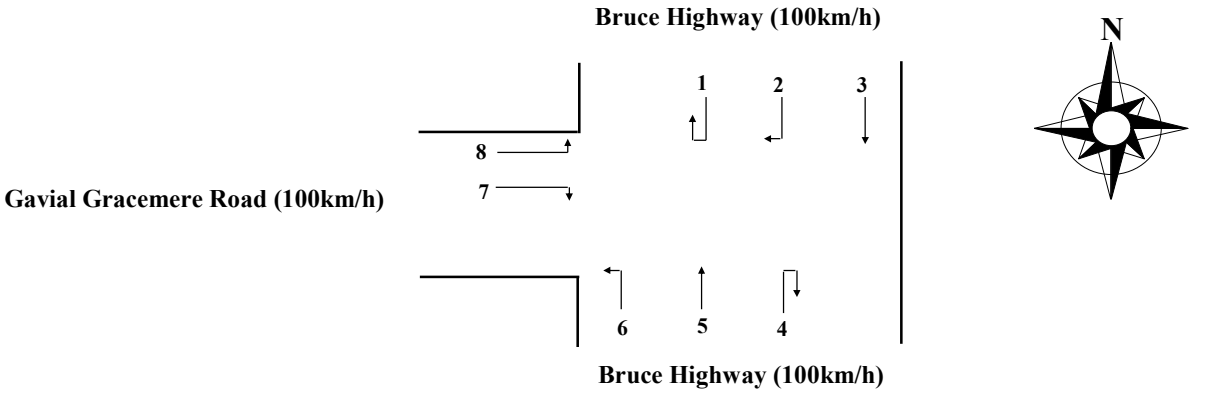


TIME (1/4 hr end)	Movement 1			Movement 2			Movement 3			Movement 4			Movement 5			Movement 6			Movement 7			Movement 8		
	Light Vehicles	*Heavy Vehicles*	***Total***	*Light Vehicles*	*Heavy Vehicles*	***Total***	*Light Vehicles*	*Heavy Vehicles*	***Total***	*Light Vehicles*	*Heavy Vehicles*	***Total***	*Light Vehicles*	*Heavy Vehicles*	***Total***	*Light Vehicles*	*Heavy Vehicles*	***Total***	*Light Vehicles*	*Heavy Vehicles*	***Total***	*Light Vehicles*	*Heavy Vehicles*	***Total***
6:45 AM	0	0	**0**	0	0	**0**	42	11	**53**	0	0	**0**	33	9	**42**	0	0	**0**	0	0	**0**	0	0	**0**
7:00 AM	0	0	**0**	1	1	**2**	28	12	**40**	0	0	**0**	23	12	**35**	0	0	**0**	0	0	**0**	0	0	**0**
7:15 AM	0	0	**0**	0	1	**1**	32	10	**42**	0	0	**0**	29	15	**44**	0	0	**0**	0	0	**0**	0	0	**0**
7:30 AM	0	0	**0**	0	1	**1**	39	13	**52**	0	0	**0**	36	10	**46**	0	0	**0**	0	0	**0**	0	1	**1**
7:45 AM	0	0	**0**	0	0	**0**	49	14	**63**	0	0	**0**	47	13	**60**	0	0	**0**	0	0	**0**	0	1	**1**
8:00 AM	0	0	**0**	0	0	**0**	52	13	**65**	0	0	**0**	34	15	**49**	0	0	**0**	0	0	**0**	0	0	**0**
8:15 AM	0	0	**0**	0	2	**2**	64	14	**78**	0	0	**0**	42	8	**50**	0	0	**0**	0	0	**0**	0	0	**0**
8:30 AM	0	0	**0**	0	1	**1**	44	7	**51**	0	0	**0**	44	9	**53**	0	0	**0**	0	0	**0**	0	0	**0**
8:45 AM	0	0	**0**	0	0	**0**	54	11	**65**	0	0	**0**	60	11	**71**	0	0	**0**	0	0	**0**	0	1	**1**
9:00 AM	0	0	**0**	0	0	**0**	48	15	**63**	0	0	**0**	45	6	**51**	0	0	**0**	0	0	**0**	0	0	**0**
9:15 AM	0	0	**0**	1	1	**2**	67	12	**79**	0	0	**0**	35	12	**47**	0	0	**0**	0	0	**0**	0	1	**1**
9:30 AM	0	0	**0**	0	0	**0**	55	12	**67**	0	0	**0**	57	15	**72**	0	0	**0**	0	0	**0**	0	1	**1**
3 hr Total	**0**	**0**	**0**	**2**	**7**	**9**	**574**	**144**	**718**	**0**	**0**	**0**	**485**	**135**	**620**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	**5**
AM Peak	**0**	**0**	**0**	**1**	**1**	**2**	**224**	**50**	**274**	**0**	**0**	**0**	**197**	**44**	**241**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**3**

TIME (1/4 hr end)	Movement 1			Movement 2			Movement 3			Movement 4			Movement 5			Movement 6			Movement 7			Movement 8		
	Light Vehicles	*Heavy Vehicles*	***Total***	*Light Vehicles*	*Heavy Vehicles*	***Total***	*Light Vehicles*	*Heavy Vehicles*	***Total***	*Light Vehicles*	*Heavy Vehicles*	***Total***	*Light Vehicles*	*Heavy Vehicles*	***Total***	*Light Vehicles*	*Heavy Vehicles*	***Total***	*Light Vehicles*	*Heavy Vehicles*	***Total***	*Light Vehicles*	*Heavy Vehicles*	***Total***
2:45 PM	1	0	**1**	0	0	**0**	51	11	**62**	0	0	**0**	58	14	**72**	0	0	**0**	0	0	**0**	0	0	**0**
3:00 PM	0	0	**0**	0	0	**0**	44	10	**54**	0	0	**0**	51	9	**60**	0	0	**0**	0	0	**0**	0	0	**0**
3:15 PM	0	0	**0**	0	0	**0**	55	13	**68**	0	0	**0**	75	12	**87**	0	0	**0**	0	0	**0**	1	0	**1**
3:30 PM	0	0	**0**	0	0	**0**	41	16	**57**	0	0	**0**	46	11	**57**	0	0	**0**	0	0	**0**	0	1	**1**
3:45 PM	0	0	**0**	0	0	**0**	55	15	**70**	0	0	**0**	40	16	**56**	0	0	**0**	0	0	**0**	0	0	**0**
4:00 PM	0	0	**0**	0	0	**0**	46	12	**58**	0	0	**0**	43	15	**58**	0	0	**0**	0	0	**0**	4	0	**4**
4:15 PM	0	0	**0**	0	0	**0**	47	10	**57**	0	0	**0**	37	6	**43**	0	0	**0**	0	0	**0**	2	0	**2**
4:30 PM	0	0	**0**	0	0	**0**	50	11	**61**	0	0	**0**	52	4	**56**	0	0	**0**	0	0	**0**	0	1	**1**
4:45 PM	0	0	**0**	0	0	**0**	39	16	**55**	0	0	**0**	40	10	**50**	0	0	**0**	0	0	**0**	1	0	**1**
5:00 PM	0	0	**0**	0	0	**0**	35	9	**44**	0	0	**0**	29	7	**36**	0	0	**0**	0	0	**0**	1	0	**1**
5:15 PM	0	0	**0**	0	0	**0**	44	7	**51**	0	0	**0**	47	11	**58**	0	0	**0**	0	0	**0**	0	0	**0**
5:30 PM	0	0	**0**	0	0	**0**	28	6	**34**	0	0	**0**	39	11	**50**	0	0	**0**	0	0	**0**	0	0	**0**
5:45 PM	0	0	**0**	0	0	**0**	29	14	**43**	0	0	**0**	26	8	**34**	0	0	**0**	0	0	**0**	0	0	**0**
6:00 PM	0	0	**0**	0	0	**0**	21	7	**28**	0	0	**0**	34	6	**40**	0	0	**0**	0	0	**0**	0	0	**0**
3.5 hr Total	**1**	**0**	**1**	**0**	**0**	**0**	**585**	**157**	**742**	**0**	**0**	**0**	**617**	**140**	**757**	**0**	**0**	**0**	**0**	**0**	**0**	**9**	**2**	**11**
PM Peak	**1**	**0**	**1**	**0**	**0**	**0**	**191**	**50**	**241**	**0**	**0**	**0**	**230**	**46**	**276**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**2**

AUSTRAFFIC VIDEO INTERSECTION COUNT

Site No.: 2 **Weather:** Fine
Location: Bruce Highway/Gavial-Gracemere Road, Midgee
Day/Date: Wednesday, 25 August 2021
AM Peak: *Hour ending - 9:15 AM*
PM Peak: *Hour ending - 4:00 PM*



TIME (1/4 hr end)	Movement 1			Movement 2			Movement 3			Movement 4			Movement 5			Movement 6			Movement 7			Movement 8		
	Light Vehicles	*Heavy Vehicles*	***Total***	*Light Vehicles*	*Heavy Vehicles*	***Total***	*Light Vehicles*	*Heavy Vehicles*	***Total***	*Light Vehicles*	*Heavy Vehicles*	***Total***	*Light Vehicles*	*Heavy Vehicles*	***Total***	*Light Vehicles*	*Heavy Vehicles*	***Total***	*Light Vehicles*	*Heavy Vehicles*	***Total***	*Light Vehicles*	*Heavy Vehicles*	***Total***
6:45 AM	0	0	**0**	3	0	**3**	36	12	**48**	0	0	**0**	22	8	**30**	6	2	**8**	6	0	**6**	2	0	**2**
7:00 AM	0	0	**0**	6	0	**6**	22	12	**34**	0	0	**0**	23	12	**35**	6	0	**6**	7	2	**9**	1	0	**1**
7:15 AM	0	0	**0**	2	1	**3**	25	9	**34**	0	0	**0**	26	11	**37**	4	4	**8**	4	1	**5**	4	0	**4**
7:30 AM	0	0	**0**	1	0	**1**	33	15	**48**	0	0	**0**	30	12	**42**	7	1	**8**	10	1	**11**	2	1	**3**
7:45 AM	0	0	**0**	2	0	**2**	32	9	**41**	0	0	**0**	35	11	**46**	8	2	**10**	10	2	**12**	3	1	**4**
8:00 AM	0	0	**0**	2	0	**2**	45	14	**59**	0	0	**0**	37	13	**50**	5	1	**6**	11	1	**12**	3	0	**3**
8:15 AM	0	0	**0**	1	0	**1**	52	14	**66**	0	0	**0**	22	7	**29**	6	1	**7**	6	0	**6**	2	2	**4**
8:30 AM	0	0	**0**	1	0	**1**	42	9	**51**	0	0	**0**	38	11	**49**	14	0	**14**	9	1	**10**	0	0	**0**
8:45 AM	0	0	**0**	1	1	**2**	30	8	**38**	0	0	**0**	41	10	**51**	5	1	**6**	12	1	**13**	1	1	**2**
9:00 AM	0	0	**0**	0	0	**0**	41	13	**54**	0	0	**0**	48	7	**55**	7	0	**7**	9	3	**12**	4	0	**4**
9:15 AM	0	0	**0**	1	0	**1**	55	14	**69**	0	0	**0**	29	12	**41**	8	2	**10**	14	1	**15**	0	0	**0**
9:30 AM	0	0	**0**	0	0	**0**	40	11	**51**	0	0	**0**	52	13	**65**	2	2	**4**	4	0	**4**	1	0	**1**
3 hr Total	**0**	**0**	**0**	**20**	**2**	**22**	**453**	**140**	**593**	**0**	**0**	**0**	**403**	**127**	**530**	**78**	**16**	**94**	**102**	**13**	**115**	**23**	**5**	**28**
AM Peak	**0**	**0**	**0**	**3**	**1**	**4**	**168**	**44**	**212**	**0**	**0**	**0**	**156**	**40**	**196**	**34**	**3**	**37**	**44**	**6**	**50**	**5**	**1**	**6**

TIME (1/4 hr end)	Movement 1			Movement 2			Movement 3			Movement 4			Movement 5			Movement 6			Movement 7			Movement 8		
	Light Vehicles	*Heavy Vehicles*	***Total***	*Light Vehicles*	*Heavy Vehicles*	***Total***	*Light Vehicles*	*Heavy Vehicles*	***Total***	*Light Vehicles*	*Heavy Vehicles*	***Total***	*Light Vehicles*	*Heavy Vehicles*	***Total***	*Light Vehicles*	*Heavy Vehicles*	***Total***	*Light Vehicles*	*Heavy Vehicles*	***Total***	*Light Vehicles*	*Heavy Vehicles*	***Total***
2:45 PM	0	0	**0**	2	0	**2**	41	10	**51**	0	0	**0**	42	13	**55**	15	2	**17**	6	0	**6**	1	0	**1**
3:00 PM	0	0	**0**	2	1	**3**	41	9	**50**	0	0	**0**	35	11	**46**	11	1	**12**	6	0	**6**	1	1	**2**
3:15 PM	0	0	**0**	3	0	**3**	38	11	**49**	0	0	**0**	56	10	**66**	13	2	**15**	11	3	**14**	1	0	**1**
3:30 PM	0	0	**0**	1	0	**1**	39	12	**51**	0	0	**0**	40	12	**52**	13	1	**14**	6	2	**8**	4	0	**4**
3:45 PM	0	0	**0**	2	1	**3**	43	16	**59**	0	0	**0**	34	13	**47**	6	3	**9**	7	0	**7**	3	0	**3**
4:00 PM	0	0	**0**	4	1	**5**	40	11	**51**	0	0	**0**	33	12	**45**	15	3	**18**	5	0	**5**	3	0	**3**
4:15 PM	0	0	**0**	1	0	**1**	43	12	**55**	0	0	**0**	33	10	**43**	4	0	**4**	8	0	**8**	8	0	**8**
4:30 PM	0	0	**0**	1	0	**1**	28	8	**36**	0	0	**0**	38	4	**42**	12	1	**13**	18	2	**20**	2	0	**2**
4:45 PM	0	0	**0**	0	0	**0**	26	14	**40**	0	0	**0**	28	8	**36**	9	0	**9**	4	1	**5**	1	0	**1**
5:00 PM	0	0	**0**	3	0	**3**	29	10	**39**	0	0	**0**	28	6	**34**	8	3	**11**	9	0	**9**	1	0	**1**
5:15 PM	0	0	**0**	0	0	**0**	28	7	**35**	0	0	**0**	37	11	**48**	6	0	**6**	11	0	**11**	1	0	**1**
5:30 PM	0	0	**0**	1	0	**1**	21	7	**28**	0	0	**0**	25	9	**34**	14	0	**14**	6	0	**6**	2	0	**2**
5:45 PM	0	0	**0**	1	0	**1**	22	12	**34**	0	0	**0**	20	10	**30**	6	0	**6**	8	0	**8**	1	0	**1**
6:00 PM	0	0	**0**	0	0	**0**	17	7	**24**	0	0	**0**	28	5	**33**	7	1	**8**	3	0	**3**	0	0	**0**
3.5 hr Total	**0**	**0**	**0**	**21**	**3**	**24**	**456**	**146**	**602**	**0**	**0**	**0**	**477**	**134**	**611**	**139**	**17**	**156**	**108**	**8**	**116**	**29**	**1**	**30**
PM Peak	**0**	**0**	**0**	**10**	**2**	**12**	**160**	**50**	**210**	**0**	**0**	**0**	**163**	**47**	**210**	**47**	**9**	**56**	**29**	**5**	**34**	**11**	**0**	**11**

Appendix E

Results of Pavement Contribution Assessment

(for the production rates of 1.02 Mtpa, 1.44 Mtpa and 2.00 Mtpa)

Pavement Impact Assessment

Production Rate (tpa) = 1020000

The methodology of the pavement impact assessment is based on Department of Transport and Main Roads' Guide to Traffic Impact Assessment Practice Note: Pavement Impact Assessment December 2018.

Step 1: Project Parameters and Impact Potential Assessment Area

Production Rate (tpa):	1,020,000
First Operational Year:	2023
Assessment Year (No of Years):	10
Days of operation per year:	336

	Development Generated Tonnages (Year by Year)										
	1	2	3	4	5	6	7	8	9	10	
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	
% of "Base" Annual Tonnage	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	Total
Annual Tonnage	1,020,000	1,020,000	1,020,000	1,020,000	1,020,000	1,020,000	1,020,000	1,020,000	1,020,000	1,020,000	10,200,000

Class	Type	Payload	Unloaded SAR4	Loaded SAR4	Unloaded SAR5	Loaded SAR5	HV %	Weighted Average Payload	No Trip per day (In / Out)	Weighted Average Unloaded SAR4	Weighted Average loaded SAR4
3	Two axle truck	6.5	0.54	2.98	0.43	3.29	0%	0.0	0.0	0.000	0.000
4	Three axle truck	13.0	0.5	3.57	0.41	4.14	0%	0.0	0.0	0.000	0.000
5	Four axle truck	15.0	0.46	4.09	0.37	4.89	0%	0.0	0.0	0.000	0.000
6	Three axle articulated	11.5	0.6	4.43	0.46	4.88	0%	0.0	0.0	0.000	0.000
7	Four axle articulated	18.0	0.56	5.02	0.44	5.73	0%	0.0	0.0	0.000	0.000
8	Five axle articulated	24.5	0.52	5.61	0.41	6.58	0%	0.0	0.0	0.000	0.000
9	Six axle articulated (semi trailer)	26.5	0.51	4.93	0.41	5.61	0%	0.0	0.0	0.000	0.000
10	B-double	40.0	0.53	6.3	0.42	7.09	0%	0.0	0.0	0.000	0.000
11	Double road train (Road train 1)	51.5	0.55	8.34	0.43	9.53	0%	0.0	0.0	0.000	0.000
12	Triple road train	76.5	0.58	11.75	0.44	13.45	0%	0.0	0.0	0.000	0.000
'10' *	Truck and Dog	32.0	0.53	6.3	0.42	7.09	100%	32.0	94.9	0.530	6.300
Total	-	-	-	-	-	-	100%	32.0	94.9	0.53	6.30

* According to Austroads Vehicle Classification System (duplicated as last page of this assessment), Truck and Dog is classified as Class 10.

Contribution (cents / tonne):	21.21
Contribution ($ / tonne)	0.212

Step 2: Road Asset Data from DTMR

Production Rate (tpa) = 1020000

							ARMIS TRAFFIC DATA				
						Sealed		2020			
Sect. No.	Road No.	Road Name	Road Sections	Ch	Ch	Length (km)	AADT 2020	HV %	Growth Adopt	AADT HV	SAR4 per HV
1	10E	Bruce Highway	to the north (Rockhampton)	13.5	11.9	1.6	7156	24.33	2.0%	1741.1	2.9
2	10E	Bruce Highway	to the north (Rockhampton)	11.9	6.5	5.4	5451	31.51	2.0%	1717.6	2.9
3	10E	Bruce Highway	to the north (Rockhampton)	6.5	3.9	2.6	13112	20.38	2.0%	2672.2	2.9
4	10E	Bruce Highway	to the north (Rockhampton)	3.9	1.5	2.5	19223	14.59	2.0%	2804.6	2.9
5	10E	Bruce Highway	to the north (Rockhampton)	1.5	0.0	1.5	19695	12.51	2.0%	2463.8	2.9
6	10E	Bruce Highway	to the south	13.5	35.6	22.1	7156	24.33	2.0%	1741.1	2.9
7	10E	Bruce Highway	to the south	35.6	75.3	39.7	5668	25.54	2.0%	1447.6	2.9
8	10E	Bruce Highway	to the south	75.3	109.5	34.2	4384	31.50	2.0%	1381.0	2.9
9	10E	Bruce Highway	to the south	109.5	121.0	11.5	4975	34.51	2.0%	1716.9	2.9
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Step 3: Calculate Background SAR4s

Production Rate (tpa) = 1020000

Guide to Traffic Impact Assessment Practice Note: Pavement Impact Assessment states:

> The raw road asset data from TMR provides a two-way AADT with a heavy vehicle percentage for each identified road segment. Unfortunately, it is not feasible to calculate background SAR5s and SAR12s as the raw data does not capture loaded and unloaded heavy vehicle movements. As such, the scoping assessment is based on SAR4s (ESAs). This is a reasonable approach noting that 82% of the TMR network is sealed roads with granular pavement (SAR4 / ESA).

									Background SAR4s (Each Direction) Year by Year without Development										
Sect. No.	**Road No.**	**Road Name**	**Ch**	**Ch**	**2020 AADT per Dir.**	**2020 HV%**	**2020 HV per Dir.**	**SAR4 per HV**	**AADT year 2020**	**1 2023**	**2 2024**	**3 2025**	**4 2026**	**5 2027**	**6 2028**	**7 2029**	**8 2030**	**9 2031**	**10 2032**
1	10E	Bruce Highway	13.5	11.9	3578.0	24.33	871	2.9	921453	977854	997411	1017359	1037706	1058460	1079629	1101222	1123246	1145711	1168626
2	10E	Bruce Highway	11.9	6.5	2725.5	31.51	859	2.9	909045	964686	983980	1003659	1023732	1044207	1065091	1086393	1108121	1130283	1152889
3	10E	Bruce Highway	6.5	3.9	6556.0	20.38	1336	2.9	1414275	1500840	1530857	1561474	1592704	1624558	1657049	1690190	1723994	1758474	1793643
4	10E	Bruce Highway	3.9	1.5	9611.5	14.59	1402	2.9	1484353	1575208	1606712	1638846	1671623	1705056	1739157	1773940	1809419	1845607	1882519
5	10E	Bruce Highway	1.5	0.0	9847.5	12.51	1232	2.9	1303990	1383804	1411480	1439710	1468504	1497874	1527832	1558388	1589556	1621347	1653774
6	10E	Bruce Highway	13.5	35.6	3578.0	24.33	871	2.9	921453	977854	997411	1017359	1037706	1058460	1079629	1101222	1123246	1145711	1168626
7	10E	Bruce Highway	35.6	75.3	2834.0	25.54	724	2.9	766146	813040	829301	845887	862805	880061	897662	915616	933928	952606	971659
8	10E	Bruce Highway	75.3	109.5	2192.0	31.5	690	2.9	730873	775608	791121	806943	823082	839543	856334	873461	890930	908749	926924
9	10E	Bruce Highway	109.5	121.0	2487.5	34.51	858	2.9	908655	964272	983557	1003228	1023293	1043759	1064634	1085927	1107645	1129798	1152394
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Step 4: Calculate Development SAR4s

Production Rate (tpa) = 1020000

Class	Type	Unloaded (Towards the Site)				Loaded (Away from the Site)			
		Daily Volumes	SAR4 per veh	SAR4 per day	SAR4 per year	Daily Volumes	SAR4 per veh	SAR4 per day	SAR4 per year
3	Two axle truck	0.0	0.54	0	0	0.0	2.98	0	0
4	Three axle truck (tadem truck)	0.0	0.5	0	0	0.0	3.57	0	0
5	Four axle truck	0.0	0.46	0	0	0.0	4.09	0	0
6	Three axle articulated	0.0	0.6	0	0	0.0	4.43	0	0
7	Four axle articulated	0.0	0.56	0	0	0.0	5.02	0	0
8	Five axle articulated	0.0	0.52	0	0	0.0	5.61	0	0
9	Six axle articulated (semi trailer)	0.0	0.51	0	0	0.0	4.93	0	0
10	B-double	0.0	0.53	0	0	0.0	6.3	0	0
11	Double road train (Road train 1)	0.0	0.55	0	0	0.0	8.34	0	0
12	Triple road train	0.0	0.58	0	0	0.0	11.75	0	0
'10'	Truck and Dog	94.9	0.53	50	16894	94.9	6.3	598	200813
Total	-	-	-	50	16894	-	-	598	200813

Step 5: Assign Development SAR4s onto the SCR Network

Production Rate (tpa) = 1020000

					Towards the Site - Development Generated SAR (Year by Year)										Away from the Site - Development Generated SAR (Year by Year)									
Sect. No.	**Road No.**	**Road Name**	**Road Section**	**Dev. Trip %**	**1 2023**	**2 2024**	**3 2025**	**4 2026**	**5 2027**	**6 2028**	**7 2029**	**8 2030**	**9 2031**	**10 2032**	**1 2023**	**2 2024**	**3 2025**	**4 2026**	**5 2027**	**6 2028**	**7 2029**	**8 2030**	**9 2031**	**10 2032**
1	10E	Bruce Highway	to the north (Rockhampton)	50%	8447	8447	8447	8447	8447	8447	8447	8447	8447	8447	100406	100406	100406	100406	100406	100406	100406	100406	100406	100406
2	10E	Bruce Highway	to the north (Rockhampton)	50%	8447	8447	8447	8447	8447	8447	8447	8447	8447	8447	100406	100406	100406	100406	100406	100406	100406	100406	100406	100406
3	10E	Bruce Highway	to the north (Rockhampton)	40%	6758	6758	6758	6758	6758	6758	6758	6758	6758	6758	80325	80325	80325	80325	80325	80325	80325	80325	80325	80325
4	10E	Bruce Highway	to the north (Rockhampton)	35%	5913	5913	5913	5913	5913	5913	5913	5913	5913	5913	70284	70284	70284	70284	70284	70284	70284	70284	70284	70284
5	10E	Bruce Highway	to the north (Rockhampton)	30%	5068	5068	5068	5068	5068	5068	5068	5068	5068	5068	60244	60244	60244	60244	60244	60244	60244	60244	60244	60244
6	10E	Bruce Highway	to the south	50%	8447	8447	8447	8447	8447	8447	8447	8447	8447	8447	100406	100406	100406	100406	100406	100406	100406	100406	100406	100406
7	10E	Bruce Highway	to the south	40%	6758	6758	6758	6758	6758	6758	6758	6758	6758	6758	80325	80325	80325	80325	80325	80325	80325	80325	80325	80325
8	10E	Bruce Highway	to the south	30%	5068	5068	5068	5068	5068	5068	5068	5068	5068	5068	60244	60244	60244	60244	60244	60244	60244	60244	60244	60244
9	10E	Bruce Highway	to the south	20%	3379	3379	3379	3379	3379	3379	3379	3379	3379	3379	40163	40163	40163	40163	40163	40163	40163	40163	40163	40163
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Step 6: Identify Road Links with >5% Development SAR4 Impacts

Production Rate (tpa) = 1020000

					Towards the Site - Development Generated SAR% (Year by Year)										Away from the Site - Development Generated SAR% (Year by Year)									
Sect. No.	**Road No.**	**Road Name**	**Road Section**	**Dev. Trip %**	**1 2023**	**2 2024**	**3 2025**	**4 2026**	**5 2027**	**6 2028**	**7 2029**	**8 2030**	**9 2031**	**10 2032**	**1 2023**	**2 2024**	**3 2025**	**4 2026**	**5 2027**	**6 2028**	**7 2029**	**8 2030**	**9 2031**	**10 2032**
1	10E	Bruce Highway	to the north (Rockhampton)	50%	0.92%	0.86%	0.85%	0.83%	0.81%	0.80%	0.78%	0.77%	0.75%	0.74%	10.90%	10.27%	10.07%	9.87%	9.68%	9.49%	9.30%	9.12%	8.94%	8.76%
2	10E	Bruce Highway	to the north (Rockhampton)	50%	0.93%	0.88%	0.86%	0.84%	0.83%	0.81%	0.79%	0.78%	0.76%	0.75%	11.05%	10.41%	10.20%	10.00%	9.81%	9.62%	9.43%	9.24%	9.06%	8.88%
3	10E	Bruce Highway	to the north (Rockhampton)	40%	0.48%	0.45%	0.44%	0.43%	0.42%	0.42%	0.41%	0.40%	0.39%	0.38%	5.68%	5.35%	5.25%	5.14%	5.04%	4.94%	4.85%	4.75%	4.66%	4.57%
4	10E	Bruce Highway	to the north (Rockhampton)	35%	0.40%	0.38%	0.37%	0.36%	0.35%	0.35%	0.34%	0.33%	0.33%	0.32%	4.74%	4.46%	4.37%	4.29%	4.20%	4.12%	4.04%	3.96%	3.88%	3.81%
5	10E	Bruce Highway	to the north (Rockhampton)	30%	0.39%	0.37%	0.36%	0.35%	0.35%	0.34%	0.33%	0.33%	0.32%	0.31%	4.62%	4.35%	4.27%	4.18%	4.10%	4.02%	3.94%	3.87%	3.79%	3.72%
6	10E	Bruce Highway	to the south	50%	0.92%	0.86%	0.85%	0.83%	0.81%	0.80%	0.78%	0.77%	0.75%	0.74%	10.90%	10.27%	10.07%	9.87%	9.68%	9.49%	9.30%	9.12%	8.94%	8.76%
7	10E	Bruce Highway	to the south	40%	0.88%	0.83%	0.81%	0.80%	0.78%	0.77%	0.75%	0.74%	0.72%	0.71%	10.48%	9.88%	9.69%	9.50%	9.31%	9.13%	8.95%	8.77%	8.60%	8.43%
8	10E	Bruce Highway	to the south	30%	0.69%	0.65%	0.64%	0.63%	0.62%	0.60%	0.59%	0.58%	0.57%	0.56%	8.24%	7.77%	7.61%	7.47%	7.32%	7.18%	7.04%	6.90%	6.76%	6.63%
9	10E	Bruce Highway	to the south	20%	0.37%	0.35%	0.34%	0.34%	0.33%	0.32%	0.32%	0.31%	0.31%	0.30%	4.42%	4.17%	4.08%	4.00%	3.92%	3.85%	3.77%	3.70%	3.63%	3.55%
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Step 7: Calculate Contribution to Offset Development Impacts (for Road Sections that Development SAR % > 5%)

Production Rate (tpa) = 1020000

Towards the Quarry

Sect. No	Road No	Road Name	Road Section	Carriage way Code	Ch	Ch	Length	Marginal Cost (cents/ SAR-km)	Dev. Trip %	No of Year (>5% increase in SAR)	Pavement Type	Load Damage Exponent	Fleet data (Year 1 to Year 10)				Development Contribution per year (Year 1 to Year 10) ($)
													Average Production Rate for years > 5% increase in SAR	Average trips per year	Loaded SAR per Trip	SAR per year	
1																	
2																	
3																	
4																	
5																	
6																	
7																	

Away from the Quarry

Sect. No	Road No	Road Name	Road Section	Carriage -way Code	Ch	Ch	Sealed Length	Marginal Cost (cents/ SAR-km)	Dev. Trip %	No of Year (>5% increase in SAR)	Pavement Type	Load Damage Exponent	Fleet data (Year 1 to Year 10)				Development Contribution per year (Year 1 to Year 10) ($)
													Average Production Rate for years > 5% increase in SAR	Average trips per year	Loaded SAR per Trip	SAR per year	
1	10E	Bruce Highway	to the north (Rockhampton)	1 / 2 / 3	13.5	11.9	1.6	3.41	50%	10	GN	4	1020000	15938	6.3	100406	5478
2	10E	Bruce Highway	to the north (Rockhampton)	1	11.9	6.5	5.4	3.17	50%	10	GN	4	1020000	15938	6.3	100406	17188
3	10E	Bruce Highway	to the north (Rockhampton)	1	6.5	3.9	2.6	2.71	40%	5	GN/AC	4 / 5	1020000	12750	6.3	80325	2830
4	10E	Bruce Highway	to the north (Rockhampton)	2	3.9	1.5	2.45	3.05	35%	0	GN/AC	5 / 5	0	0	6.3	0	0
5	10E	Bruce Highway	to the north (Rockhampton)	3	1.5	0.0	1.45	2.95	30%	0	GN/AC	6 / 5	0	0	6.3	0	0
6	10E	Bruce Highway	to the south	4	13.5	35.6	22.1	2.82	50%	10	GN/AC	7 / 5	1020000	15938	6.3	100406	62575
7	10E	Bruce Highway	to the south	5	35.6	75.3	39.7	2.60	40%	10	GN/AC	8 / 5	1020000	12750	6.3	80325	82911
8	10E	Bruce Highway	to the south	6	75.3	109.5	34.2	2.20	30%	10	GN/AC	9 / 5	1020000	9563	6.3	60244	45327
9	10E	Bruce Highway	to the south	7	109.5	121.0	11.5	2.55	20%	0	GN/AC	10 / 5	0	0	6.3	0	0

Average Production Rate (Year 1 to Year 10) (tpa):	1020000
Contribution (cents / tonne)	21.21
Contribution ($ / tonne)	0.212

Contribution per year ($) 216310

Pavement Impact Assessment

Production Rate (tpa) = 1440000

The methodology of the pavement impact assessment is based on Department of Transport and Main Roads' Guide to Traffic Impact Assessment Practice Note: Pavement Impact Assessment December 2018.

Step 1: Project Parameters and Impact Potential Assessment Area

Production Rate (tpa):	1,440,000
First Operational Year:	2023
Assessment Year (No of Years):	10
Days of operation per year:	336

	Development Generated Tonnages (Year by Year)										
	1	2	3	4	5	6	7	8	9	10	
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	
% of "Base" Annual Tonnage	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	Total
Annual Tonnage	1,440,000	1,440,000	1,440,000	1,440,000	1,440,000	1,440,000	1,440,000	1,440,000	1,440,000	1,440,000	14,400,000

Class	Type	Payload	Unloaded SAR4	Loaded SAR4	Unloaded SAR5	Loaded SAR5	HV %	Weighted Average Payload	No Trip per day (In / Out)	Weighted Average Unloaded SAR4	Weighted Average loaded SAR4
3	Two axle truck	6.5	0.54	2.98	0.43	3.29	0%	0.0	0.0	0.000	0.000
4	Three axle truck	13.0	0.5	3.57	0.41	4.14	0%	0.0	0.0	0.000	0.000
5	Four axle truck	15.0	0.46	4.09	0.37	4.89	0%	0.0	0.0	0.000	0.000
6	Three axle articulated	11.5	0.6	4.43	0.46	4.88	0%	0.0	0.0	0.000	0.000
7	Four axle articulated	18.0	0.56	5.02	0.44	5.73	0%	0.0	0.0	0.000	0.000
8	Five axle articulated	24.5	0.52	5.61	0.41	6.58	0%	0.0	0.0	0.000	0.000
9	Six axle articulated (semi trailer)	26.5	0.51	4.93	0.41	5.61	0%	0.0	0.0	0.000	0.000
10	B-double	40.0	0.53	6.3	0.42	7.09	0%	0.0	0.0	0.000	0.000
11	Double road train (Road train 1)	51.5	0.55	8.34	0.43	9.53	0%	0.0	0.0	0.000	0.000
12	Triple road train	76.5	0.58	11.75	0.44	13.45	0%	0.0	0.0	0.000	0.000
'10' *	Truck and Dog	32.0	0.53	6.3	0.42	7.09	100%	32.0	133.9	0.530	6.300
Total	-	-	-	-	-	-	100%	32.0	133.9	0.53	6.30

* According to Austroads Vehicle Classification System (duplicated as last page of this assessment), Truck and Dog is classified as Class 10.

Contribution (cents / tonne):	23.41
Contribution ($ / tonne)	0.234

Step 2: Road Asset Data from DTMR

Production Rate (tpa) = 1440000

							ARMIS TRAFFIC DATA				
						Sealed		2020			
Sect. No.	Road No.	Road Name	Road Sections	Ch	Ch	Length (km)	AADT 2020	HV %	Growth Adopt	AADT HV	SAR4 per HV
1	10E	Bruce Highway	to the north (Rockhampton)	13.5	11.9	1.6	7156	24.33	2.0%	1741.1	2.9
2	10E	Bruce Highway	to the north (Rockhampton)	11.9	6.5	5.4	5451	31.51	2.0%	1717.6	2.9
3	10E	Bruce Highway	to the north (Rockhampton)	6.5	3.9	2.6	13112	20.38	2.0%	2672.2	2.9
4	10E	Bruce Highway	to the north (Rockhampton)	3.9	1.5	2.5	19223	14.59	2.0%	2804.6	2.9
5	10E	Bruce Highway	to the north (Rockhampton)	1.5	0.0	1.5	19695	12.51	2.0%	2463.8	2.9
6	10E	Bruce Highway	to the south	13.5	35.6	22.1	7156	24.33	2.0%	1741.1	2.9
7	10E	Bruce Highway	to the south	35.6	75.3	39.7	5668	25.54	2.0%	1447.6	2.9
8	10E	Bruce Highway	to the south	75.3	109.5	34.2	4384	31.50	2.0%	1381.0	2.9
9	10E	Bruce Highway	to the south	109.5	121.0	11.5	4975	34.51	2.0%	1716.9	2.9
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Step 3: Calculate Background SAR4s

Production Rate (tpa) = 1440000

Guide to Traffic Impact Assessment Practice Note: Pavement Impact Assessment states:

> The raw road asset data from TMR provides a two-way AADT with a heavy vehicle percentage for each identified road segment. Unfortunately, it is not feasible to calculate background SAR5s and SAR12s as the raw data does not capture loaded and unloaded heavy vehicle movements. As such, the scoping assessment is based on SAR4s (ESAs). This is a reasonable approach noting that 82% of the TMR network is sealed roads with granular pavement (SAR4 / ESA).

									Background SAR4s (Each Direction) Year by Year without Development										
Sect. No.	**Road No.**	**Road Name**	**Ch**	**Ch**	**2020 AADT per Dir.**	**2020 HV%**	**2020 HV per Dir.**	**SAR4 per HV**	**AADT year 2020**	**1 2023**	**2 2024**	**3 2025**	**4 2026**	**5 2027**	**6 2028**	**7 2029**	**8 2030**	**9 2031**	**10 2032**
1	10E	Bruce Highway	13.5	11.9	3578.0	24.33	871	2.9	921453	977854	997411	1017359	1037706	1058460	1079629	1101222	1123246	1145711	1168626
2	10E	Bruce Highway	11.9	6.5	2725.5	31.51	859	2.9	909045	964686	983980	1003659	1023732	1044207	1065091	1086393	1108121	1130283	1152889
3	10E	Bruce Highway	6.5	3.9	6556.0	20.38	1336	2.9	1414275	1500840	1530857	1561474	1592704	1624558	1657049	1690190	1723994	1758474	1793643
4	10E	Bruce Highway	3.9	1.5	9611.5	14.59	1402	2.9	1484353	1575208	1606712	1638846	1671623	1705056	1739157	1773940	1809419	1845607	1882519
5	10E	Bruce Highway	1.5	0.0	9847.5	12.51	1232	2.9	1303990	1383804	1411480	1439710	1468504	1497874	1527832	1558388	1589556	1621347	1653774
6	10E	Bruce Highway	13.5	35.6	3578.0	24.33	871	2.9	921453	977854	997411	1017359	1037706	1058460	1079629	1101222	1123246	1145711	1168626
7	10E	Bruce Highway	35.6	75.3	2834.0	25.54	724	2.9	766146	813040	829301	845887	862805	880061	897662	915616	933928	952606	971659
8	10E	Bruce Highway	75.3	109.5	2192.0	31.5	690	2.9	730873	775608	791121	806943	823082	839543	856334	873461	890930	908749	926924
9	10E	Bruce Highway	109.5	121.0	2487.5	34.51	858	2.9	908655	964272	983557	1003228	1023293	1043759	1064634	1085927	1107645	1129798	1152394
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Step 4: Calculate Development SAR4s

Production Rate (tpa) = 1440000

Class	Type	Unloaded (Towards the Site)				Loaded (Away from the Site)			
		Daily Volumes	SAR4 per veh	SAR4 per day	SAR4 per year	Daily Volumes	SAR4 per veh	SAR4 per day	SAR4 per year
3	Two axle truck	0.0	0.54	0	0	0.0	2.98	0	0
4	Three axle truck (tadem truck)	0.0	0.5	0	0	0.0	3.57	0	0
5	Four axle truck	0.0	0.46	0	0	0.0	4.09	0	0
6	Three axle articulated	0.0	0.6	0	0	0.0	4.43	0	0
7	Four axle articulated	0.0	0.56	0	0	0.0	5.02	0	0
8	Five axle articulated	0.0	0.52	0	0	0.0	5.61	0	0
9	Six axle articulated (semi trailer)	0.0	0.51	0	0	0.0	4.93	0	0
10	B-double	0.0	0.53	0	0	0.0	6.3	0	0
11	Double road train (Road train 1)	0.0	0.55	0	0	0.0	8.34	0	0
12	Triple road train	0.0	0.58	0	0	0.0	11.75	0	0
'10'	Truck and Dog	133.9	0.53	71	23850	133.9	6.3	844	283500
Total	-	-	-	71	23850	-	-	844	283500

Step 5: Assign Development SAR4s onto the SCR Network

Production Rate (tpa) = 1440000

					Towards the Site - Development Generated SAR (Year by Year)										Away from the Site - Development Generated SAR (Year by Year)									
Sect. No.	**Road No.**	**Road Name**	**Road Section**	**Dev. Trip %**	**1 2023**	**2 2024**	**3 2025**	**4 2026**	**5 2027**	**6 2028**	**7 2029**	**8 2030**	**9 2031**	**10 2032**	**1 2023**	**2 2024**	**3 2025**	**4 2026**	**5 2027**	**6 2028**	**7 2029**	**8 2030**	**9 2031**	**10 2032**
1	10E	Bruce Highway	to the north (Rockhampton)	50%	11925	11925	11925	11925	11925	11925	11925	11925	11925	11925	141750	141750	141750	141750	141750	141750	141750	141750	141750	141750
2	10E	Bruce Highway	to the north (Rockhampton)	50%	11925	11925	11925	11925	11925	11925	11925	11925	11925	11925	141750	141750	141750	141750	141750	141750	141750	141750	141750	141750
3	10E	Bruce Highway	to the north (Rockhampton)	40%	9540	9540	9540	9540	9540	9540	9540	9540	9540	9540	113400	113400	113400	113400	113400	113400	113400	113400	113400	113400
4	10E	Bruce Highway	to the north (Rockhampton)	35%	8348	8348	8348	8348	8348	8348	8348	8348	8348	8348	99225	99225	99225	99225	99225	99225	99225	99225	99225	99225
5	10E	Bruce Highway	to the north (Rockhampton)	30%	7155	7155	7155	7155	7155	7155	7155	7155	7155	7155	85050	85050	85050	85050	85050	85050	85050	85050	85050	85050
6	10E	Bruce Highway	to the south	50%	11925	11925	11925	11925	11925	11925	11925	11925	11925	11925	141750	141750	141750	141750	141750	141750	141750	141750	141750	141750
7	10E	Bruce Highway	to the south	40%	9540	9540	9540	9540	9540	9540	9540	9540	9540	9540	113400	113400	113400	113400	113400	113400	113400	113400	113400	113400
8	10E	Bruce Highway	to the south	30%	7155	7155	7155	7155	7155	7155	7155	7155	7155	7155	85050	85050	85050	85050	85050	85050	85050	85050	85050	85050
9	10E	Bruce Highway	to the south	20%	4770	4770	4770	4770	4770	4770	4770	4770	4770	4770	56700	56700	56700	56700	56700	56700	56700	56700	56700	56700
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Step 6: Identify Road Links with >5% Development SAR4 Impacts

Production Rate (tpa) = 1440000

					Towards the Site - Development Generated SAR% (Year by Year)										Away from the Site - Development Generated SAR% (Year by Year)									
Sect. No.	**Road No.**	**Road Name**	**Road Section**	**Dev. Trip %**	**1 2023**	**2 2024**	**3 2025**	**4 2026**	**5 2027**	**6 2028**	**7 2029**	**8 2030**	**9 2031**	**10 2032**	**1 2023**	**2 2024**	**3 2025**	**4 2026**	**5 2027**	**6 2028**	**7 2029**	**8 2030**	**9 2031**	**10 2032**
1	10E	Bruce Highway	to the north (Rockhampton)	50%	1.29%	1.22%	1.20%	1.17%	1.15%	1.13%	1.10%	1.08%	1.06%	1.04%	15.38%	14.50%	14.21%	13.93%	13.66%	13.39%	13.13%	12.87%	12.62%	12.37%
2	10E	Bruce Highway	to the north (Rockhampton)	50%	1.31%	1.24%	1.21%	1.19%	1.16%	1.14%	1.12%	1.10%	1.08%	1.06%	15.59%	14.69%	14.41%	14.12%	13.85%	13.57%	13.31%	13.05%	12.79%	12.54%
3	10E	Bruce Highway	to the north (Rockhampton)	40%	0.67%	0.64%	0.62%	0.61%	0.60%	0.59%	0.58%	0.56%	0.55%	0.54%	8.02%	7.56%	7.41%	7.26%	7.12%	6.98%	6.84%	6.71%	6.58%	6.45%
4	10E	Bruce Highway	to the north (Rockhampton)	35%	0.56%	0.53%	0.52%	0.51%	0.50%	0.49%	0.48%	0.47%	0.46%	0.45%	6.68%	6.30%	6.18%	6.05%	5.94%	5.82%	5.71%	5.59%	5.48%	5.38%
5	10E	Bruce Highway	to the north (Rockhampton)	30%	0.55%	0.52%	0.51%	0.50%	0.49%	0.48%	0.47%	0.46%	0.45%	0.44%	6.52%	6.15%	6.03%	5.91%	5.79%	5.68%	5.57%	5.46%	5.35%	5.25%
6	10E	Bruce Highway	to the south	50%	1.29%	1.22%	1.20%	1.17%	1.15%	1.13%	1.10%	1.08%	1.06%	1.04%	15.38%	14.50%	14.21%	13.93%	13.66%	13.39%	13.13%	12.87%	12.62%	12.37%
7	10E	Bruce Highway	to the south	40%	1.25%	1.17%	1.15%	1.13%	1.11%	1.08%	1.06%	1.04%	1.02%	1.00%	14.80%	13.95%	13.67%	13.41%	13.14%	12.89%	12.63%	12.39%	12.14%	11.90%
8	10E	Bruce Highway	to the south	30%	0.98%	0.92%	0.90%	0.89%	0.87%	0.85%	0.84%	0.82%	0.80%	0.79%	11.64%	10.97%	10.75%	10.54%	10.33%	10.13%	9.93%	9.74%	9.55%	9.36%
9	10E	Bruce Highway	to the south	20%	0.52%	0.49%	0.48%	0.48%	0.47%	0.46%	0.45%	0.44%	0.43%	0.42%	6.24%	5.88%	5.76%	5.65%	5.54%	5.43%	5.33%	5.22%	5.12%	5.02%
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Step 7: Calculate Contribution to Offset Development Impacts (for Road Sections that Development SAR % > 5%)

Production Rate (tpa) = 1440000

Towards the Quarry

Sect. No	Road No	Road Name	Road Section	Carriage way Code	Ch	Ch	Length	Marginal Cost (cents/ SAR-km)	Dev. Trip %	No of Year (>5% increase in SAR)	Pavement Type	Load Damage Exponent	Fleet data (Year 1 to Year 10)				Development Contribution per year (Year 1 to Year 10) ($)
													Average Production Rate for years > 5% increase in SAR	Average trips per year	Loaded SAR per Trip	SAR per year	
1																	
2																	
3																	
4																	
5																	
6																	
7																	

Away from the Quarry

Sect. No	Road No	Road Name	Road Section	Carriage -way Code	Ch	Ch	Sealed Length	Marginal Cost (cents/ SAR-km)	Dev. Trip %	No of Year (>5% increase in SAR)	Pavement Type	Load Damage Exponent	Fleet data (Year 1 to Year 10)				Development Contribution per year (Year 1 to Year 10) ($)
													Average Production Rate for years > 5% increase in SAR	Average trips per year	Loaded SAR per Trip	SAR per year	
1	10E	Bruce Highway	to the north (Rockhampton)	1 / 2 / 3	13.5	11.9	1.6	3.41	50%	10	GN	4	1440000	22500	6.3	141750	7734
2	10E	Bruce Highway	to the north (Rockhampton)	1	11.9	6.5	5.4	3.17	50%	10	GN	4	1440000	22500	6.3	141750	24265
3	10E	Bruce Highway	to the north (Rockhampton)	1	6.5	3.9	2.6	2.71	40%	10	GN/AC	4 / 5	1440000	18000	6.3	113400	7990
4	10E	Bruce Highway	to the north (Rockhampton)	2	3.9	1.5	2.45	3.05	35%	10	GN/AC	5 / 5	1440000	15750	6.3	99225	7415
5	10E	Bruce Highway	to the north (Rockhampton)	3	1.5	0.0	1.45	2.95	30%	10	GN/AC	6 / 5	1440000	13500	6.3	85050	3638
6	10E	Bruce Highway	to the south	4	13.5	35.6	22.1	2.82	50%	10	GN/AC	7 / 5	1440000	22500	6.3	141750	88341
7	10E	Bruce Highway	to the south	5	35.6	75.3	39.7	2.60	40%	10	GN/AC	8 / 5	1440000	18000	6.3	113400	117051
8	10E	Bruce Highway	to the south	6	75.3	109.5	34.2	2.20	30%	10	GN/AC	9 / 5	1440000	13500	6.3	85050	63992
9	10E	Bruce Highway	to the south	7	109.5	121.0	11.5	2.55	20%	10	GN/AC	10 / 5	1440000	9000	6.3	56700	16627

Average Production Rate (Year 1 to Year 10) (tpa):	1440000
Contribution (cents / tonne)	23.41
Contribution ($ / tonne)	0.234

Contribution per year ($) 337053

Pavement Impact Assessment

Production Rate (tpa) = 2000000

The methodology of the pavement impact assessment is based on Department of Transport and Main Roads' Guide to Traffic Impact Assessment Practice Note: Pavement Impact Assessment December 2018.

Step 1: Project Parameters and Impact Potential Assessment Area

Production Rate (tpa):	2,000,000
First Operational Year:	2023
Assessment Year (No of Years):	10
Days of operation per year:	336

	Development Generated Tonnages (Year by Year)										
	1	2	3	4	5	6	7	8	9	10	
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	
% of "Base" Annual Tonnage	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	Total
Annual Tonnage	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	20,000,000

Class	Type	Payload	Unloaded SAR4	Loaded SAR4	Unloaded SAR5	Loaded SAR5	HV %	Weighted Average Payload	No Trip per day (In / Out)	Weighted Average Unloaded SAR4	Weighted Average loaded SAR4
3	Two axle truck	6.5	0.54	2.98	0.43	3.29	0%	0.0	0.0	0.000	0.000
4	Three axle truck	13.0	0.5	3.57	0.41	4.14	0%	0.0	0.0	0.000	0.000
5	Four axle truck	15.0	0.46	4.09	0.37	4.89	0%	0.0	0.0	0.000	0.000
6	Three axle articulated	11.5	0.6	4.43	0.46	4.88	0%	0.0	0.0	0.000	0.000
7	Four axle articulated	18.0	0.56	5.02	0.44	5.73	0%	0.0	0.0	0.000	0.000
8	Five axle articulated	24.5	0.52	5.61	0.41	6.58	0%	0.0	0.0	0.000	0.000
9	Six axle articulated (semi trailer)	26.5	0.51	4.93	0.41	5.61	0%	0.0	0.0	0.000	0.000
10	B-double	40.0	0.53	6.3	0.42	7.09	0%	0.0	0.0	0.000	0.000
11	Double road train (Road train 1)	51.5	0.55	8.34	0.43	9.53	0%	0.0	0.0	0.000	0.000
12	Triple road train	76.5	0.58	11.75	0.44	13.45	0%	0.0	0.0	0.000	0.000
'10' *	Truck and Dog	32.0	0.53	6.3	0.42	7.09	100%	32.0	186.0	0.530	6.300
Total	-	-	-	-	-	-	100%	32.0	186.0	0.53	6.30

* According to Austroads Vehicle Classification System (duplicated as last page of this assessment), Truck and Dog is classified as Class 10.

Contribution (cents / tonne):	23.41
Contribution ($ / tonne)	0.234

Step 2: Road Asset Data from DTMR

Production Rate (tpa) = 2000000

							ARMIS TRAFFIC DATA				
						Sealed		2020			
Sect. No.	Road No.	Road Name	Road Sections	Ch	Ch	Length (km)	AADT 2020	HV %	Growth Adopt	AADT HV	SAR4 per HV
1	10E	Bruce Highway	to the north (Rockhampton)	13.5	11.9	1.6	7156	24.33	2.0%	1741.1	2.9
2	10E	Bruce Highway	to the north (Rockhampton)	11.9	6.5	5.4	5451	31.51	2.0%	1717.6	2.9
3	10E	Bruce Highway	to the north (Rockhampton)	6.5	3.9	2.6	13112	20.38	2.0%	2672.2	2.9
4	10E	Bruce Highway	to the north (Rockhampton)	3.9	1.5	2.5	19223	14.59	2.0%	2804.6	2.9
5	10E	Bruce Highway	to the north (Rockhampton)	1.5	0.0	1.5	19695	12.51	2.0%	2463.8	2.9
6	10E	Bruce Highway	to the south	13.5	35.6	22.1	7156	24.33	2.0%	1741.1	2.9
7	10E	Bruce Highway	to the south	35.6	75.3	39.7	5668	25.54	2.0%	1447.6	2.9
8	10E	Bruce Highway	to the south	75.3	109.5	34.2	4384	31.50	2.0%	1381.0	2.9
9	10E	Bruce Highway	to the south	109.5	121.0	11.5	4975	34.51	2.0%	1716.9	2.9
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Step 3: Calculate Background SAR4s

Production Rate (tpa) = 2000000

Guide to Traffic Impact Assessment Practice Note: Pavement Impact Assessment states:

> The raw road asset data from TMR provides a two-way AADT with a heavy vehicle percentage for each identified road segment. Unfortunately, it is not feasible to calculate background SAR5s and SAR12s as the raw data does not capture loaded and unloaded heavy vehicle movements. As such, the scoping assessment is based on SAR4s (ESAs). This is a reasonable approach noting that 82% of the TMR network is sealed roads with granular pavement (SAR4 / ESA).

									Background SAR4s (Each Direction) Year by Year without Development										
Sect. No.	**Road No.**	**Road Name**	**Ch**	**Ch**	**2020 AADT per Dir.**	**2020 HV%**	**2020 HV per Dir.**	**SAR4 per HV**	**AADT year 2020**	**1 2023**	**2 2024**	**3 2025**	**4 2026**	**5 2027**	**6 2028**	**7 2029**	**8 2030**	**9 2031**	**10 2032**
1	10E	Bruce Highway	13.5	11.9	3578.0	24.33	871	2.9	921453	977854	997411	1017359	1037706	1058460	1079629	1101222	1123246	1145711	1168626
2	10E	Bruce Highway	11.9	6.5	2725.5	31.51	859	2.9	909045	964686	983980	1003659	1023732	1044207	1065091	1086393	1108121	1130283	1152889
3	10E	Bruce Highway	6.5	3.9	6556.0	20.38	1336	2.9	1414275	1500840	1530857	1561474	1592704	1624558	1657049	1690190	1723994	1758474	1793643
4	10E	Bruce Highway	3.9	1.5	9611.5	14.59	1402	2.9	1484353	1575208	1606712	1638846	1671623	1705056	1739157	1773940	1809419	1845607	1882519
5	10E	Bruce Highway	1.5	0.0	9847.5	12.51	1232	2.9	1303990	1383804	1411480	1439710	1468504	1497874	1527832	1558388	1589556	1621347	1653774
6	10E	Bruce Highway	13.5	35.6	3578.0	24.33	871	2.9	921453	977854	997411	1017359	1037706	1058460	1079629	1101222	1123246	1145711	1168626
7	10E	Bruce Highway	35.6	75.3	2834.0	25.54	724	2.9	766146	813040	829301	845887	862805	880061	897662	915616	933928	952606	971659
8	10E	Bruce Highway	75.3	109.5	2192.0	31.5	690	2.9	730873	775608	791121	806943	823082	839543	856334	873461	890930	908749	926924
9	10E	Bruce Highway	109.5	121.0	2487.5	34.51	858	2.9	908655	964272	983557	1003228	1023293	1043759	1064634	1085927	1107645	1129798	1152394
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Step 4: Calculate Development SAR4s

Production Rate (tpa) = 2000000

Class	Type	Unloaded (Towards the Site)				Loaded (Away from the Site)			
		Daily Volumes	SAR4 per veh	SAR4 per day	SAR4 per year	Daily Volumes	SAR4 per veh	SAR4 per day	SAR4 per year
3	Two axle truck	0.0	0.54	0	0	0.0	2.98	0	0
4	Three axle truck (tadem truck)	0.0	0.5	0	0	0.0	3.57	0	0
5	Four axle truck	0.0	0.46	0	0	0.0	4.09	0	0
6	Three axle articulated	0.0	0.6	0	0	0.0	4.43	0	0
7	Four axle articulated	0.0	0.56	0	0	0.0	5.02	0	0
8	Five axle articulated	0.0	0.52	0	0	0.0	5.61	0	0
9	Six axle articulated (semi trailer)	0.0	0.51	0	0	0.0	4.93	0	0
10	B-double	0.0	0.53	0	0	0.0	6.3	0	0
11	Double road train (Road train 1)	0.0	0.55	0	0	0.0	8.34	0	0
12	Triple road train	0.0	0.58	0	0	0.0	11.75	0	0
'10'	Truck and Dog	186.0	0.53	99	33125	186.0	6.3	1172	393750
Total	-	-	-	99	33125	-	-	1172	393750

Step 5: Assign Development SAR4s onto the SCR Network

Production Rate (tpa) = 2000000

					Towards the Site - Development Generated SAR (Year by Year)										Away from the Site - Development Generated SAR (Year by Year)									
Sect. No.	**Road No.**	**Road Name**	**Road Section**	**Dev. Trip %**	**1 2023**	**2 2024**	**3 2025**	**4 2026**	**5 2027**	**6 2028**	**7 2029**	**8 2030**	**9 2031**	**10 2032**	**1 2023**	**2 2024**	**3 2025**	**4 2026**	**5 2027**	**6 2028**	**7 2029**	**8 2030**	**9 2031**	**10 2032**
1	10E	Bruce Highway	to the north (Rockhampton)	50%	16563	16563	16563	16563	16563	16563	16563	16563	16563	16563	196875	196875	196875	196875	196875	196875	196875	196875	196875	196875
2	10E	Bruce Highway	to the north (Rockhampton)	50%	16563	16563	16563	16563	16563	16563	16563	16563	16563	16563	196875	196875	196875	196875	196875	196875	196875	196875	196875	196875
3	10E	Bruce Highway	to the north (Rockhampton)	40%	13250	13250	13250	13250	13250	13250	13250	13250	13250	13250	157500	157500	157500	157500	157500	157500	157500	157500	157500	157500
4	10E	Bruce Highway	to the north (Rockhampton)	35%	11594	11594	11594	11594	11594	11594	11594	11594	11594	11594	137813	137813	137813	137813	137813	137813	137813	137813	137813	137813
5	10E	Bruce Highway	to the north (Rockhampton)	30%	9938	9938	9938	9938	9938	9938	9938	9938	9938	9938	118125	118125	118125	118125	118125	118125	118125	118125	118125	118125
6	10E	Bruce Highway	to the south	50%	16563	16563	16563	16563	16563	16563	16563	16563	16563	16563	196875	196875	196875	196875	196875	196875	196875	196875	196875	196875
7	10E	Bruce Highway	to the south	40%	13250	13250	13250	13250	13250	13250	13250	13250	13250	13250	157500	157500	157500	157500	157500	157500	157500	157500	157500	157500
8	10E	Bruce Highway	to the south	30%	9938	9938	9938	9938	9938	9938	9938	9938	9938	9938	118125	118125	118125	118125	118125	118125	118125	118125	118125	118125
9	10E	Bruce Highway	to the south	20%	6625	6625	6625	6625	6625	6625	6625	6625	6625	6625	78750	78750	78750	78750	78750	78750	78750	78750	78750	78750
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Step 6: Identify Road Links with >5% Development SAR4 Impacts

Production Rate (tpa) = 2000000

					Towards the Site - Development Generated SAR% (Year by Year)										Away from the Site - Development Generated SAR% (Year by Year)									
Sect. No.	**Road No.**	**Road Name**	**Road Section**	**Dev. Trip %**	**1 2023**	**2 2024**	**3 2025**	**4 2026**	**5 2027**	**6 2028**	**7 2029**	**8 2030**	**9 2031**	**10 2032**	**1 2023**	**2 2024**	**3 2025**	**4 2026**	**5 2027**	**6 2028**	**7 2029**	**8 2030**	**9 2031**	**10 2032**
1	10E	Bruce Highway	to the north (Rockhampton)	50%	1.80%	1.69%	1.66%	1.63%	1.60%	1.56%	1.53%	1.50%	1.47%	1.45%	21.37%	20.13%	19.74%	19.35%	18.97%	18.60%	18.24%	17.88%	17.53%	17.18%
2	10E	Bruce Highway	to the north (Rockhampton)	50%	1.82%	1.72%	1.68%	1.65%	1.62%	1.59%	1.56%	1.52%	1.49%	1.47%	21.66%	20.41%	20.01%	19.62%	19.23%	18.85%	18.48%	18.12%	17.77%	17.42%
3	10E	Bruce Highway	to the north (Rockhampton)	40%	0.94%	0.88%	0.87%	0.85%	0.83%	0.82%	0.80%	0.78%	0.77%	0.75%	11.14%	10.49%	10.29%	10.09%	9.89%	9.69%	9.50%	9.32%	9.14%	8.96%
4	10E	Bruce Highway	to the north (Rockhampton)	35%	0.78%	0.74%	0.72%	0.71%	0.69%	0.68%	0.67%	0.65%	0.64%	0.63%	9.28%	8.75%	8.58%	8.41%	8.24%	8.08%	7.92%	7.77%	7.62%	7.47%
5	10E	Bruce Highway	to the north (Rockhampton)	30%	0.76%	0.72%	0.70%	0.69%	0.68%	0.66%	0.65%	0.64%	0.63%	0.61%	9.06%	8.54%	8.37%	8.20%	8.04%	7.89%	7.73%	7.58%	7.43%	7.29%
6	10E	Bruce Highway	to the south	50%	1.80%	1.69%	1.66%	1.63%	1.60%	1.56%	1.53%	1.50%	1.47%	1.45%	21.37%	20.13%	19.74%	19.35%	18.97%	18.60%	18.24%	17.88%	17.53%	17.18%
7	10E	Bruce Highway	to the south	40%	1.73%	1.63%	1.60%	1.57%	1.54%	1.51%	1.48%	1.45%	1.42%	1.39%	20.56%	19.37%	18.99%	18.62%	18.25%	17.90%	17.55%	17.20%	16.86%	16.53%
8	10E	Bruce Highway	to the south	30%	1.36%	1.28%	1.26%	1.23%	1.21%	1.18%	1.16%	1.14%	1.12%	1.09%	16.16%	15.23%	14.93%	14.64%	14.35%	14.07%	13.79%	13.52%	13.26%	13.00%
9	10E	Bruce Highway	to the south	20%	0.73%	0.69%	0.67%	0.66%	0.65%	0.63%	0.62%	0.61%	0.60%	0.59%	8.67%	8.17%	8.01%	7.85%	7.70%	7.54%	7.40%	7.25%	7.11%	6.97%
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Step 7: Calculate Contribution to Offset Development Impacts (for Road Sections that Development SAR % > 5%)

Production Rate (tpa) = 2000000

Towards the Quarry

Sect. No	Road No	Road Name	Road Section	Carriage way Code	Ch	Ch	Length	Marginal Cost (cents/ SAR-km)	Dev. Trip %	No of Year (>5% increase in SAR)	Pavement Type	Load Damage Exponent	Fleet data (Year 1 to Year 10)				Development Contribution per year (Year 1 to Year 10) ($)
													Average Production Rate for years > 5% increase in SAR	Average trips per year	Loaded SAR per Trip	SAR per year	
1																	
2																	
3																	
4																	
5																	
6																	
7																	

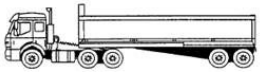
Away from the Quarry

Sect. No	Road No	Road Name	Road Section	Carriage -way Code	Ch	Ch	Sealed Length	Marginal Cost (cents/ SAR-km)	Dev. Trip %	No of Year (>5% increase in SAR)	Pavement Type	Load Damage Exponent	Fleet data (Year 1 to Year 10)				Development Contribution per year (Year 1 to Year 10) ($)
													Average Production Rate for years > 5% increase in SAR	Average trips per year	Loaded SAR per Trip	SAR per year	
1	10E	Bruce Highway	to the north (Rockhampton)	1 / 2 / 3	13.5	11.9	1.6	3.41	50%	10	GN	4	2000000	31250	6.3	196875	10742
2	10E	Bruce Highway	to the north (Rockhampton)	1	11.9	6.5	5.4	3.17	50%	10	GN	4	2000000	31250	6.3	196875	33701
3	10E	Bruce Highway	to the north (Rockhampton)	1	6.5	3.9	2.6	2.71	40%	10	GN/AC	4 / 5	2000000	25000	6.3	157500	11097
4	10E	Bruce Highway	to the north (Rockhampton)	2	3.9	1.5	2.45	3.05	35%	10	GN/AC	5 / 5	2000000	21875	6.3	137813	10298
5	10E	Bruce Highway	to the north (Rockhampton)	3	1.5	0.0	1.45	2.95	30%	10	GN/AC	6 / 5	2000000	18750	6.3	118125	5053
6	10E	Bruce Highway	to the south	4	13.5	35.6	22.1	2.82	50%	10	GN/AC	7 / 5	2000000	31250	6.3	196875	122696
7	10E	Bruce Highway	to the south	5	35.6	75.3	39.7	2.60	40%	10	GN/AC	8 / 5	2000000	25000	6.3	157500	162572
8	10E	Bruce Highway	to the south	6	75.3	109.5	34.2	2.20	30%	10	GN/AC	9 / 5	2000000	18750	6.3	118125	88877
9	10E	Bruce Highway	to the south	7	109.5	121.0	11.5	2.55	20%	10	GN/AC	10 / 5	2000000	12500	6.3	78750	23093

Average Production Rate (Year 1 to Year 10) (tpa):	2000000
Contribution (cents / tonne)	23.41
Contribution ($ / tonne)	0.234

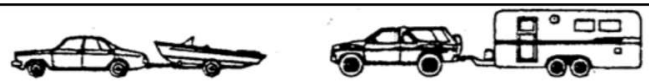
Contribution per year ($) 468129

SAR by Austroads HV class

Class	Typical description	Dominant vehicle in each class
Medium (5.5m to 14.5m)		
3	Two axle truck	
4	Three axle truck	
5	Four axle truck	
Long (11.5m to 19.0m)		
6	Three axle articulated	
7	Four axle articulated	
8	Five axle articulated	
9	Six axle articulated (semi-trailer)	
Medium combination (17.5m to 36.5m)		
10	B Double	
11	Double road train	
Large combination (over 33.0m)		
12	Triple road train	

Austroads vehicle class	3	4	5	6	7	8	9	10	11	12
Legal Loading (t)	15	22.5	27.5	24	31.5	39	42.5	62.5	79	115.5
Base Load per SAR4	13.6	19.2	23	21.8	27.4	33	37.7	56.2	70	102.3
Unloaded Axle Group Load (t)	8.5	9.5	12.5	12.5	13.5	14.5	16	22.5	27.5	39
Unloaded SAR4	0.54	0.5	0.46	0.6	0.56	0.52	0.51	0.53	0.55	0.58
Unloaded SAR5	0.43	0.41	0.37	0.46	0.44	0.41	0.41	0.42	0.43	0.44
Unloaded SAR12	0.11	0.11	0.09	0.11	0.11	0.11	0.11	0.11	0.11	0.11
Loaded Axle Group Load (t)	15	22.5	27.5	24	31.5	39	42.5	62.5	79	115.5
Loaded SAR4	2.98	3.57	4.09	4.43	5.02	5.61	4.93	6.3	8.34	11.75
Loaded SAR5	3.29	4.14	4.89	4.88	5.73	6.58	5.61	7.09	9.53	13.45
Loaded SAR12	6.6	12.08	17.07	9.65	15.13	20.61	14.63	17.17	25.71	36.79
Payload (t)	6.5	13	15	11.5	18	24.5	26.5	40	51.5	76.5

AUSTROADS Vehicle Classification System

Level 1	Level 2		Level 3	AUSTROADS Classification		
Length (indicative)	Axles and Axle Groups		Vehicle Type			
Type	Axles	Groups	Typical Description	Class	Parameters	Typical Configuration
	LIGHT VEHICLES					
Short up to 5.5m		1 or 2	**Short** Sedan, Wagon, 4WD, Utility, Light Van, Bicycle, Motorcycle, etc	**1**	d(1) ≤ 3.2m and axles = 2	
Medium 5.5m to 14.5m	3, 4 or 5	3	**Short - Towing** Trailer, Caravan, Boat, etc	**2**	groups = 3 d(1) ≥ 2.1m, d(1) ≤ 3.2m, d(2) ≥ 2.1m and axles = 3, 4 or 5	
	HEAVY VEHICLES					
	2	2	**Two Axle Truck or Bus**	**3**	d(1) > 3.2m and axles = 2	
	3	2	**Three Axle Truck or Bus**	**4**	axles = 3 and groups = 2	
	> 3	2	**Four Axle Truck**	**5**	axles > 3 and groups = 2	
Long 11.5m to 19.0m	3	3	**Three Axle Articulated** Three axle articulated vehicle, or Rigid vehicle and trailer	**6**	d(1) > 3.2m, axles = 3 and groups = 3	
	4	> 2	**Four Axle Articulated** Four axle articulated vehicle, or Rigid vehicle and trailer	**7**	d(2) < 2.1m or d(1) < 2.1m or d(1) > 3.2m axles = 4 and groups > 2	
	5	> 2	**Five Axle Articulated** Five axle articulated vehicle, or Rigid vehicle and trailer	**8**	d(2) < 2.1m or d(1) < 2.1m or d(1) > 3.2m axles = 5 and groups > 2	
	≥ 6	> 2	**Six Axle Articulated** Six axle articulated vehicle, or Rigid vehicle and trailer	**9**	axles = 6 and groups > 2 or axles > 6 and groups = 3	
Medium Combination 17.5m to 36.5m	> 6	4	**B Double** B Double, or Heavy truck and trailer	**10**	groups = 4 and axles > 6	
	> 6	5 or 6	**Double Road Train** Double road train, or Medium articulated vehicle and one dog trailer (M.A.D.)	**11**	groups = 5 or 6 and axles > 6	
Large Combination Over 33.0m	> 6	> 6	**Triple Road Train** Triple road train, or Heavy truck and three trailers	**12**	groups > 6 and axles > 6	

Definitions:
Group: Axle group, where adjacent axles are less than 2.1m apart
Groups: Number of axle groups
Axles: Number of axles (maximum axle spacing of 10.0m)

d(1): Distance between first and second axle
d(2): Distance between second and third axle

GROUNDWORK plus

MIDGEE QUARRY

STORMWATER MANAGEMENT PLAN

Prepared for: Hopkins Brothers Group Pty Ltd

Date: 7 February 2022

File Reference: 2607.800.001



DOCUMENT CONTROL

PROJECT / DETAILS REPORT

Document Title:	Midgee Quarry – Stormwater Management Plan
Principal Author:	Mark Folker
Client:	Hopkins Brothers Group Pty Ltd
Reference Number:	2607.800.001

DOCUMENT STATUS

Issue	Description	Date	Author	Reviewer
1	Original Issue	7.02.22	M. Folker	M. Benham

DISTRIBUTION RECORD

Recipient	Method
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Figure 1 Stormwater Management Plan (Existing) (Drawing No. 2607.DRG.006)
Figure 2 Stormwater Management Plan (Future) (Drawing No. 2607.DRG.007)

1 Introduction

1.1 Overview

Groundwork Plus have been engaged by Hopkins Brothers Group Pty Ltd (**Hopkins Brothers**) to prepare a Stormwater Management Plan (**SMP**) for the Hopkins Brothers Midgee Quarry, located at 59793 Bruce Highway, Midgee, QLD 4702 properly described as Lot 2 on RP888747 (the **site**).

The proposal includes extending the quarry footprint over four (4) parcels being 1 and 931 Bruce Highway, Midgee, Lot 725 Bruce Highway, Bouldercombe, and 33 Gavial-Gracemere Road Bouldercombe. It is also proposed to increase the extraction volumes to a maximum production limit of 2 million tonnes per annum and also to extend the hours of operation.

The SMP has been prepared to demonstrate adequate stormwater controls are in place for the existing case scenario (including the short to medium term development), and to also support a development application seeking development approval for extractive industry and an Environmental Authority (**EA**) for the following Environmentally Relevant Activities (**ERA's**) including:

- ERA 16(2)(c) – Extracting, in a year, of more than 1,000,000 tonnes;
- ERA 16(3)(c) – Screening, in a year, of more than 1,000,000 tonnes.

1.2 Site Details

The location details of the site for the activities are summarised in **Table 1 – Summary of Land**.

Table 1 – Summary of Land

Property Description	**Lot 2 RP888747**	**Lot 1 SP247721**	**Lot 931 LIV40265**	**Lot 725 RP888747**	**Lot 2 SP247721**
Address	59793 Bruce Highway, Midgee	1 Bruce Highway, Midgee	931 Bruce Highway, Midgee	Lot 725 Bruce Highway, Bouldercombe	33 Gavial-Gracemere Road, Bouldercombe
Property Size	85.15ha	117.8ha	48.967ha	195.7158ha	55.34ha

1.3 Objectives of the SMP

The scope of this SMP includes the following items:

- Demonstrate existing stormwater controls are suitable for the immediate (existing case) scenario and also adequate for the short and medium term development of the quarry;
- Operational Management Procedures to support the DA and EA sought; and
- Implementation and maintenance strategy for stormwater management measures and systems.

This SMP outlines the details and operational management procedures to be adopted in order to integrate stormwater management into daily operations. The objective of water management is to ensure that water resources are utilised efficiently on the site and the quality of water leaving the site does not impact on the environmental values downstream. The guiding principles for water management at the site are:

1. Runoff from clean catchments will be diverted around disturbed areas to the extent practicable;
2. Land disturbance will be minimised to the extent necessary;
3. Stormwater control elements will be installed prior to land disturbance and in a logical progression;
4. Water requirements will be collected on-site and recycled to the maximum practical extent; and
5. Visual monitoring and maintenance will be undertaken to confirm the effectiveness of water treatment systems, erosion and sediment control measures and also to program maintenance.
6. Commence rehabilitation of completed extraction areas as soon as practicable and in a progressive manner.

1.4 Operating Conditions

The site's existing EA (EPPR00233813) prescribes a number of conditions relating to stormwater and water quality management which are summarised in **Table 2 – Proposed Surface Water Operating Conditions** and addressed in **Section 2 – Operational Procedures**.

Table 2 – Proposed Surface Water Operating Conditions

Condition Number	***Proposed Condition Details***
Erosion Protection Measures and Sediment Control Measures	
G1	*Erosion protection measures and sediment control measures must be implemented and maintained to minimise erosion and the release of sediment.*
Stormwater Drainage	
G2	*Suitable banks and/or diversion drains must be installed and maintained so that all stormwater falling up gradient from the quarry and storage areas is diverted away from those areas.*
G3	*All waters flowing over disturbed areas must be diverted to settling ponds.*
G4	*The size of any settling pong must be sufficient to contain the run-off expected from a 1 in 5 year 24 hour storm event.*
G5	*Water velocities through temporary watercourse diversions around the works area must be maintained similar to pre-work velocities during such diversions, and must be re-instated once dredging works are completed.*

<table>
<tr><th><u>Condition Number</u></th><th><u>Proposed Condition Details</u></th></tr>
<tr><td colspan="2">Erosion Protection Measures and Sediment Control Measures</td></tr>
<tr><td>G6</td><td>Settled / treated stormwater runoff waters from those areas of the site that have drained to the final settling pond must only be released in compliance with the release limits listed in Table W1 – Contaminant Release Limits.</td></tr>
<tr><td colspan="2">Monitoring</td></tr>
<tr><td>G7</td><td>To ensure compliance with Condition G6, monitoring must be undertaken and records kept of contaminant releases to waters at the monitoring point for the parameters and not less frequently than specified in Table W1. All determinations of the quality of contaminants released must be:
- Made in accordance with methods prescribed in the latest edition of the Environmental Protection Agency Water Quality Sampling Manual; and
- Carried out on samples that are representative of the discharge.
Table W1 – Water Quality Release Criteria
<table>
<tr><th>Location</th><th>Quality Characteristic Determination</th><th>Maximum Release Limit</th><th>Monitoring Frequency</th></tr>
<tr><td rowspan="2">Outlet point of pond</td><td>Total Suspended Solids</td><td>50mg/L</td><td rowspan="2">On release from the settling pond and weekly for a continuous release event.</td></tr>
<tr><td>pH</td><td>6.0-8.5</td></tr>
</table></td></tr>
</table>

The conditions of the existing approval administered by the Department of Transport and Main Roads (**TMR**) also require the site to also meet the following conditions:

a) Stormwater management of the development must ensure no worsening or actionable nuisance to the state-controlled road.
b) Any works on the land must not:
  i. Create any new discharge points for stormwater runoff onto the state-controlled road;
  ii. Interfere with and/or cause damage to the existing stormwater drainage on the state-controlled road;
  iii. Surcharge any existing culvert or drain on the state-controlled road; and
  iv. Reduce the quality of stormwater discharge onto the state-controlled road.

It is noted that in accordance with State Code 6 - Protection of state transport networks, the development must also no result in actionable nuisance, or worsening of, stormwater, flooding or drainage impacts in a state transport corridor or state transport infrastructure.

The above requirements are addressed in **Section 3 - Stormwater Quantity Management**.

2 Operational Procedures

An overview of the proposed Operational Procedures for implementation at the site are summarised below. These are to be regularly reviewed and updated to reflect changes in quarrying practices.

Aspect	Details
Purpose	The Operational Procedures have been prepared to manage potential environmental impacts that may result from the operation in relation to stormwater management.
Risk Sources and Potential Impacts	Adverse impacts resulting from current and future operations may include the following: • Overtopping of clean water dams and/or sediment basins; • Overland flow from disturbed areas, including unsealed internal access and haulage roads; • Overland flow from topsoil, overburden, raw material and product stockpile areas; • Wastewater from processing plant; • Overland flows from storage and handling areas of oils, greases, fuels and other chemicals; • Wastewater from vehicle wash-down facility; • Construction and maintenance of carpark, roads and hardstands; • Spillage during handling of materials; and • Use and storage of oils, greases, fuels and other chemicals.
Performance Targets	The overarching performance targets for the site relating to monitoring targets will be detailed in the site EA. The proposed targets are outlined in **Section 1.4 – Operating Conditions**.
Responsibilities	The Quarry Manager will be primarily responsible for the implementation of this SMP.
Strategies/mitigation measures	***Sediment basin and clean water dam infrastructure*** The infrastructure required to manage the requirements of the EA conditions and associated performance targets are outlined in **Section 4 – Stormwater Quality Management,** comprising a number of sediment basins and associated drainage features.

The sediment basins will be operated and maintained in accordance with **Section 4 – Stormwater Quality Management** and the requirements below:

- Freeboard must be maintained in each sediment basin and clean water dam prior to rainfall events occurring to ensure adequate capture volume is available to meet EA conditions;
- All releases from the site to waters must be carried out in accordance with the nominated EA water quality limits.

Diversion of clean surface water runoff

The site is subject to upstream surface water from external catchment areas. The quarry must monitor and divert upstream catchments away from site operations wherever practical.

Any drains or bunds proposed for diversion should have greater than 80% vegetation coverage where applicable or stabilised using an alternative material (rock lined, geofabric, erosion matting etc.).

This coverage is required to be in-place at all times. Seeding of the exposed areas using approved native grass species. The grass species will be required to have the following characteristics (as per IECA 2008):

- Plants with a fibrous root system.
- Plants that primarily grow horizontal rather than upright clumping plants.
- Leguminous plants.
- Non-invasive plants.

Oil separators, and Bunding of Fuels and Chemicals

Clearly designate storage areas and do not deviate from assigned bunded areas for storage of chemicals and fuels unless a suitable secondary bund is provided. Oil separators to be provided where necessary.

Storing and handling of hazardous chemicals, corrosive substances, toxic substances, gases, dangerous goods, flammable and combustible liquids in accordance with the relevant legislative requirements and Australian Standards including but not limited to the provisions of:

- *AS 1692-2006* – Steel tanks for flammable and combustible liquids
- *AS 3780:2008* – The storage and handling of corrosive substances
- *AS 1940:2004* – The storage and handling of flammable and combustible liquid
- *AS 3833:2007* – Storage and handling of mixed classes of dangerous goods in packaged and intermediate bulk containers

	Stockpile areas Stockpiles must be: • Adequately protected from wind, rain, concentrated surface flow and excessive upslope stormwater surface flows. • Placated to direct drainage water to sediment basin systems in event of surface water runoff. • Maintained in a moist state including by use of sprinklers to minimise the risk of movement by wind.
Auditing	Stormwater management reviews are required to be carried out on a periodic bases to assess the implementation of the management strategies.
Identification of Incident or Failure	Non-compliance with the performance criteria herein will be identified by: • Lack of monitoring at the frequencies indicated in the EA. • Stormwater in treatment system exceeds capacity after rainfall event due to insufficient freeboard. • Release of contaminants from the site. • Poor vegetation establishment • Poorly maintained, damaged or failed stormwater management devices
Corrective Action	The authorised representative shall be responsible for identification of incident or failure and completion of corrective actions. Following identification of incident or failure, the source/cause is to be immediately identified and rectified with records kept preventing future incidents occurring.
Internal Reporting	A copy of all incidents and complaints will be stored at the site within the incident and complaint register.
External Reporting	Reporting of non-compliance events including discharge of contaminants from the site are to be reported in accordance with EA requirements.

An inspection and maintenance program should be implemented as detailed in **Table 3 - Inspections and Maintenance of Erosion and Sediment Control Devices**. A summary schedule of the various inspections, performance criteria and responses that shall be performed on site is shown below.

Table 3 - Inspections and Maintenance of Erosion and Sediment Control Devices

Device	Minimum Frequency	Performance Criteria	Required Actions
Sediment Basins / Cleanwater Dams	Annually, prior to wet season	• adequate freeboard volume available, excess sediments removed prior to wet season (basin should not lose more than 30% capacity)	• captured water to be reused on site and treated as required for use in operations
Inspect drainage lines including catch drains, Contour drains and diversions	Annually, prior to wet season	• erosion in areas adjacent to water conveyancing structures	• eroded areas shall be rehabilitated / rip rapped as soon as practicable
		• overtopping of water conveyancing structures (i.e. clean water diversion drains) (identified by the scouring of the drain batters perpendicular to the direction of flow)	• eroded areas shall be repaired and stabilised
Waste containers	Weekly	• waste is stored in appropriate containers • waste receptacles labelled	• ensure waste material is stored and disposed of properly and in accordance with conditions of approval
Spill response stations	Weekly and following use	• equipment is properly maintained	• maintain equipment • replace used equipment
Maintenance / refuelling area	Weekly	• fuel, oil spills	• clean up fuel spills and investigate source
		• equipment maintenance	• maintain equipment maintenance records
		• fuel storage integrity maintained	• investigate and repair potential leaks

3 Stormwater Quantity Management

3.1 Existing Case (including short and medium term development)

The existing stormwater management layout is shown on **Figure 1 – Stormwater Management Plan (Existing Layout)**. A number of sediment basins exist on site, which act as stormwater quality measures to manage stormwater runoff, as per the EA condition requirements.

It is noted that due to the progressive nature of quarry development, the footprint (size and shape) of extraction is subject to change with time. The catchment area denoted "Q1" on **Figure 1 – Stormwater Management Plan (Existing Layout)** has been considered as 'fully disturbed' to allow for the short to medium term development of the quarry.

Hence, it has been confirmed that the quarry operations can be developed to the extent of the catchment boundary "Q1" without any change to the existing stormwater controls being required. Details of the existing sediment basins including freeboard requirements to meet the EA conditions are detailed in **Section 4 – Stormwater Quality Management**.

Should the area of disturbance extend to beyond the boundaries of catchment "Q1", a revised SMP will be required to identify any additional stormwater controls needed to manage the site, in order to maintain compliance with the relevant EA stormwater management measures.

3.2 Future Development

In addition to meeting the EA requirements for the short and medium term quarry development, the proposed future quarry expansion must also demonstrate non-worsening peak discharge conditions for a range of AEP events (50% - 1%) to comply with QUDM and TMR requirements, as the site is located in proximity to state transport corridors.

3.2.1 Hydrologic Modelling

Hydrologic modelling was undertaken using DRAINS (a computer simulation program by Watercom) as shown in **Diagram 1 – DRAINS Schematic**. Site-based rainfall polynomial coefficients were obtained using the Design Rainfall Data System 2016, available on the Bureau of Meteorology's website.

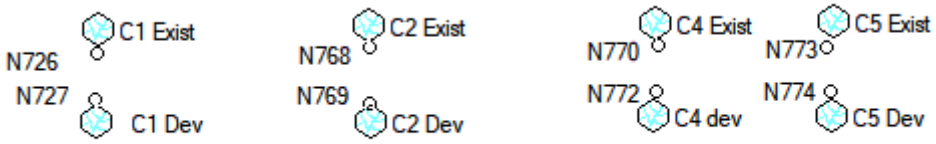


Diagram 1 – DRAINS Schematic

The IFD data is shown in **Table 4 – Intensity Frequency Duration (IFD) Data**. The existing case conditions were modelled and then compared to the future extension of the quarry footprint.

Table 4 – Intensity Frequency Duration (IFD) Data

Duration of Rainfall	Exceedance per Year (EY)						
	6EY	4EY	3EY	2EY	1EY	0.5EY	0.2EY
5 min	40.3	50.6	67.0	77.8	92.0	114	141
10 min	31.7	40.1	53.9	63.2	75.6	95.2	118
15 min	26.3	33.4	45.1	53.1	63.9	81.3	100
20 min	22.6	28.7	38.9	45.9	55.4	71.0	87.6
25 min	19.9	25.3	34.3	40.5	49.0	63.1	77.9
30 min	17.9	22.7	30.7	36.3	44.1	56.9	70.2
45 min	13.8	17.5	23.7	28.0	34.0	44.3	54.7
1.0 hour	11.4	14.3	19.4	23.0	28.0	36.6	45.2
1.5 hour	8.57	10.7	14.5	17.2	21.0	27.6	34.2
2.0 hour	6.97	8.71	11.7	13.9	17.0	22.4	27.9
3.0 hour	5.19	6.45	8.67	10.3	12.6	16.7	20.9
4.5 hour	3.85	4.77	6.41	7.60	9.34	12.4	15.6
6.0 hour	3.12	3.85	5.18	6.15	7.56	10.1	12.8
24 hour	2.32	2.86	3.84	4.56	5.63	7.58	9.66

3.2.2 Peak Discharge Comparison

A comparison of estimated peak discharge between the pre and post development scenarios is shown in **Table 5 – Peak Discharge Comparison.** Peak discharge was modelled on a 1 hour storm duration for each AEP event, as shown.

Table 5 – Peak Discharge Comparison (m3/s)

Catchment	Discharge Location	Scenario	Annual Exceedance Probability (AEP)					
			1%	2%	5%	10%	20%	50%
C1	Bruce Highway (East)	Existing Case	34.6	29.6	24.5	19.1	15.7	7.38
		Future Case	29.8	25.4	21.1	16.4	13.5	6.34
C2	Towards C5	Existing Case	29.8	25.5	21.1	16.5	13.5	6.35
		Future Case	26.9	23.0	19.1	14.9	12.2	5.74
C4	North of Quarry	Existing Case	7.92	6.77	5.61	4.37	3.59	1.69
		Future Case	2.01	1.72	1.42	1.11	0.91	0.43
C5	Gavial Creek	Existing Case	37.0	31.6	26.2	20.4	16.8	7.87
		Future Case	28.7	24.5	20.4	15.9	13.0	6.12

As demonstrated by the DRAINS modelling, there will be non-worsening of peak discharge and associated runoff for all AEP events from the 50% AEP to 1% AEP.

4 Stormwater Quality Management

4.1 Stormwater Quality Management Objective

In accordance with the EA conditions, stormwater runoff from disturbed areas, generated by (up to and including) a 24 hour storm event with an average recurrence interval of 1 in 5 years must be retained on-site, or managed to remove contaminants before release.

4.2 Stormwater Quality Management Objective

The total upper settling storage requirements for sediment basins were estimated based on the following formula (DES 2014):

Vs = A *Cv * R (1 in 5; 24hr), where:

A = Catchment Area (m^2)

Cv = Coefficient of Discharge

R = Rainfall depth (m) from 24 hour storm, and ARI of 1 in 5 years

Table 6 – Sediment Basin Storage Requirements details the sediment basin storage requirements for each stage, based on a rainfall depth (R) of 0.166m, from an adopted average intensity of 6.95mm/h (Source: Bureau of Meteorology). Details of Sediment Basin size criteria is included in **Attachment 2 – Sediment Basin Design Details**.

Table 6 – Sediment Basin Storage Requirements

Scenario	Catchment ID	Upper Settling Volume (ML)	Sediment Storage Volume (ML)	Total Volume (ML)
Existing (includes the short and medium term)	Q1	50.51	25.26	75.77
Future	Q1	197.75	98.88	296.63
	Q2	44.23	22.12	66.35

Sediment basins are to be maintained in accordance with **Section 2 – Operational Procedures**, including ensuring that sediment collected in the basins are removed whenever the basin is reduced by 30%.

Prior to commencement of each proposed development stage, detailed design of stormwater treatment systems (primary & secondary) should be undertaken to validate the suitability of clean water diversion and sediment basin systems.

5 Responsibilities

5.1 Monitoring Management Measures

The following management measures will be implemented during facility operations:

- The Quarry Manager or authorised representative is to regularly inspect the ESC management devices, particularly prior to forecasted wet weather and following major rainfall events to ensure that these devices are in good working order. All inspections are to be documented (including photos) and available on site at all times.
- The Quarry Manager shall carry out general surveillance to qualitatively assess any stormwater releases from site during discharge events.
- A surface water quality monitoring program may be implemented to assess performance from time to time. Any sampling conducted shall be undertaken by a suitability qualified person.

5.2 Auditing and Review

The effectiveness of the SMP will be reviewed as necessary (e.g. following a change in site operations) and at least once every year. The review shall take into account changes to site activities, available surface water monitoring results, any complaints, pollution incidents and any corrective actions taken.

5.3 Responsibility

The following details the responsibilities with regard to the ongoing management of stormwater at the site:

- The Quarry Manager will be responsible for the implementation of this SMP and for training of site personnel in their responsibilities in relation to this SMP.
- The Quarry Manager will be responsible for ensuring that all stormwater devices constructed on the Site have adequate free water storage capacity.
- All complaints pertaining to water quality received will be recorded in the complaints register/log maintained on-site.
- The Quarry Manager or a suitably qualified consultant will prepare water monitoring records if and when required by the regulatory authority.
- Records, including results of any monitoring program undertaken on-site, complaints or incidents will be kept on-site for a minimum of five (5) years.

5.4 Identification of Incident or Failure

An incident or failure may include, but not be limited to:

- Deterioration in surface water quality within waters discharged from site
- Receipt of a stormwater quality release complaint
- Not maintaining on-site stormwater controls or treatment devices.

Any identification of incident or failure will be recorded on site.

6 Environmental Incidents

The **Quarry Manager** will be responsible for ensuring that all employees at the Site are familiar with the procedure for incidents recording. Any employee becoming aware of an incident with actual or potential environmental implications, shall be reported to the **Quarry Manager**, or delegate immediately.

The **Quarry Manager** will notify upper management regarding any environmental incident. An Environmental Incident Report must be completed for all incidents.

Should reporting of an **environmental incident** to the relevant regulatory authority be required, this will be undertaken in accordance with the following.

When an environmental incident occurs, the **Quarry Manager** will notify administering authority via telephone and in writing.

The contact details of the administering authority are as follows:

Department of Environment and Science
Phone: 1300 130 372
Email: PollutionHotline@des.qld.gov.au

Following notification against this condition, an investigation and further reporting will be required, as per Section 6.1 and 6.2 below.

6.1 Investigation

All incidents should be investigated. The investigations should include:

- Determining what activities were being carried out at the time of the complaint/incident and any equipment involved.
- Identifying whether equipment or activities on-site were the cause of the incident or complaint.
- Determining what potential actions may be carried out to resolve the matter and/or minimise the likelihood of further impacts.

An assessment is to be conducted to determine what corrective actions are to be taken to remedy the matter and/or prevent a similar incident from occurring in the future. If monitoring is to be undertaken to investigate an incident or complaint these results should be supplied with the final report to the administering authority.

6.2 Responsibility

A written notice detailing the following information may need to be provided to the administering authority, following the initial notification**.** General information likely to be required for any further reporting to the administering authority may include the following:

- The name of the operator.
- The name and telephone number of a designated contact person.
- A description of the event.
- The results of any monitoring performed in relation to the event.
- Actions taken to mitigate any environmental harm caused by the event.
- Proposed actions to prevent a recurrence of the event.

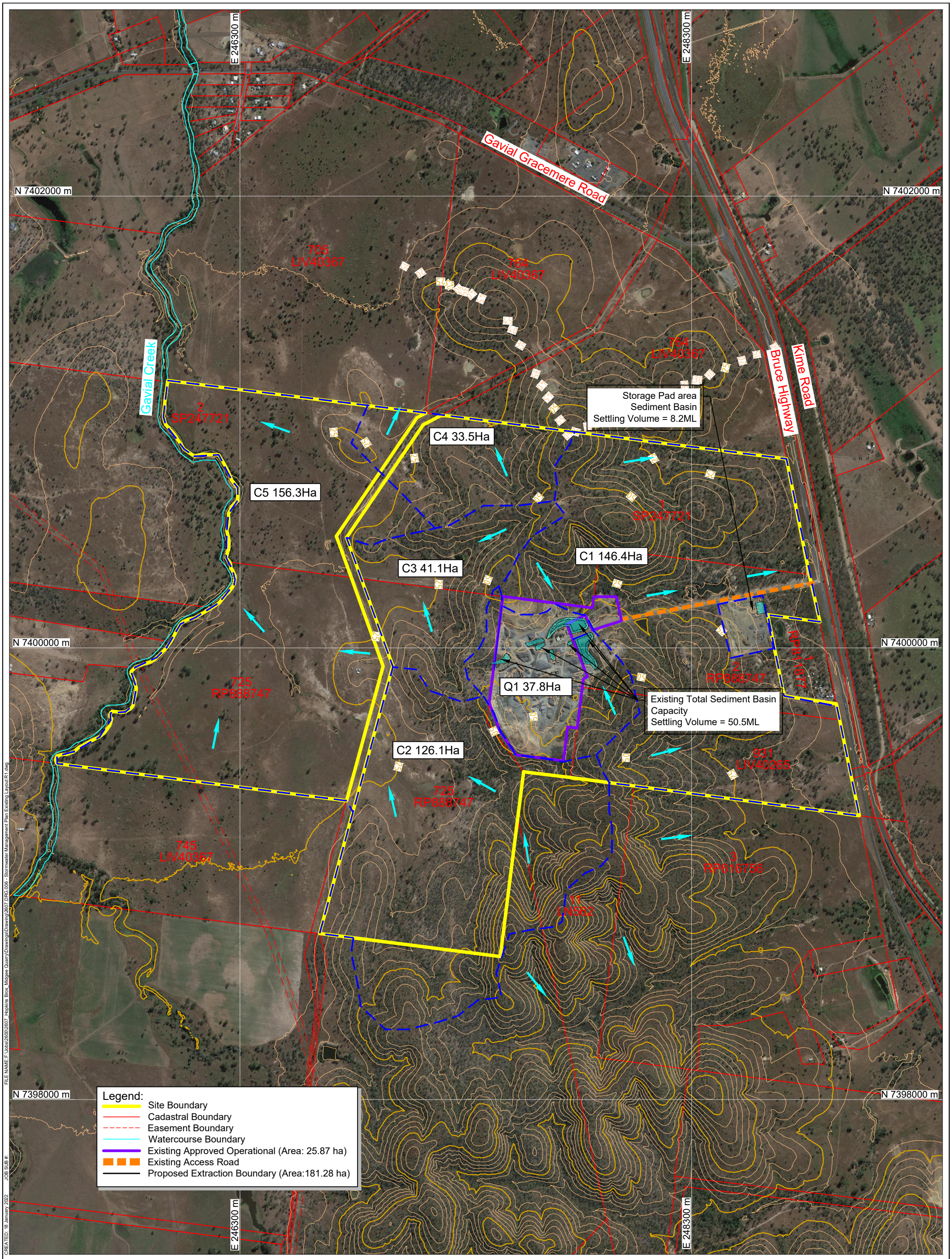
7 Conclusion

This SMP outlines the appropriate treatment measures and operational procedures to be adopted to integrate adequate stormwater management into daily operations and site activity. Specifically, this document has prepared to ensure that appropriate measures have been developed to meet the requirements of the site approval conditions, and support the extension to the quarry footprint.

Operational procedures outlined in this SMP will assist to ensure compliance as a minimum standard.

FIGURES

GROUNDWORK plus



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JOB SUB #:
CREATED: 18 January 2022

REV	DESCRIPTION	DATE	BY
1	Extend Footprint East	16-09-2021	JHV
2	Site Access Road deleted	19-11-2021	MR
3	Pit 1 revised	03-12-2021	MR

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Ecosystem:
Other:

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PROJECT: Midgee Quarry

CLIENT: Hopkins Brothers

TITLE: Stormwater Management Plan (Existing Layout)

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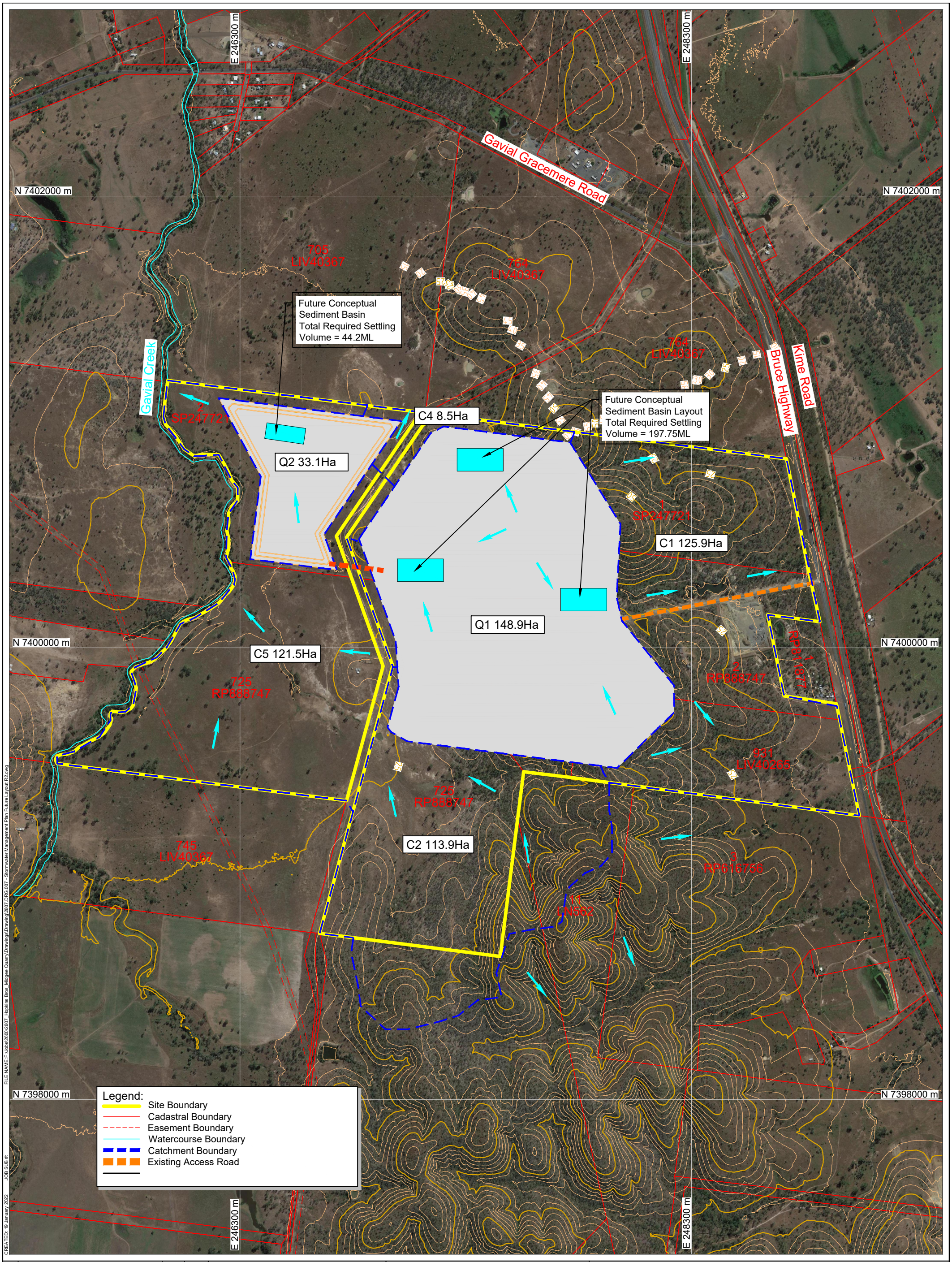
DRAWING NUMBER: 2607.DRG.006
REVISION: 1
DATE: 18 January 2022 — DRAWN: JHV
PRINTED: 20 January 2022 — CHECKED: JT
DATUM: HORIZONTAL / VERTICAL / ZONE
GDA94 / MGA / AHD / 56



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JOB SUB #:
CREATED: 19 January 2022

REV	DESCRIPTION	DATE	BY

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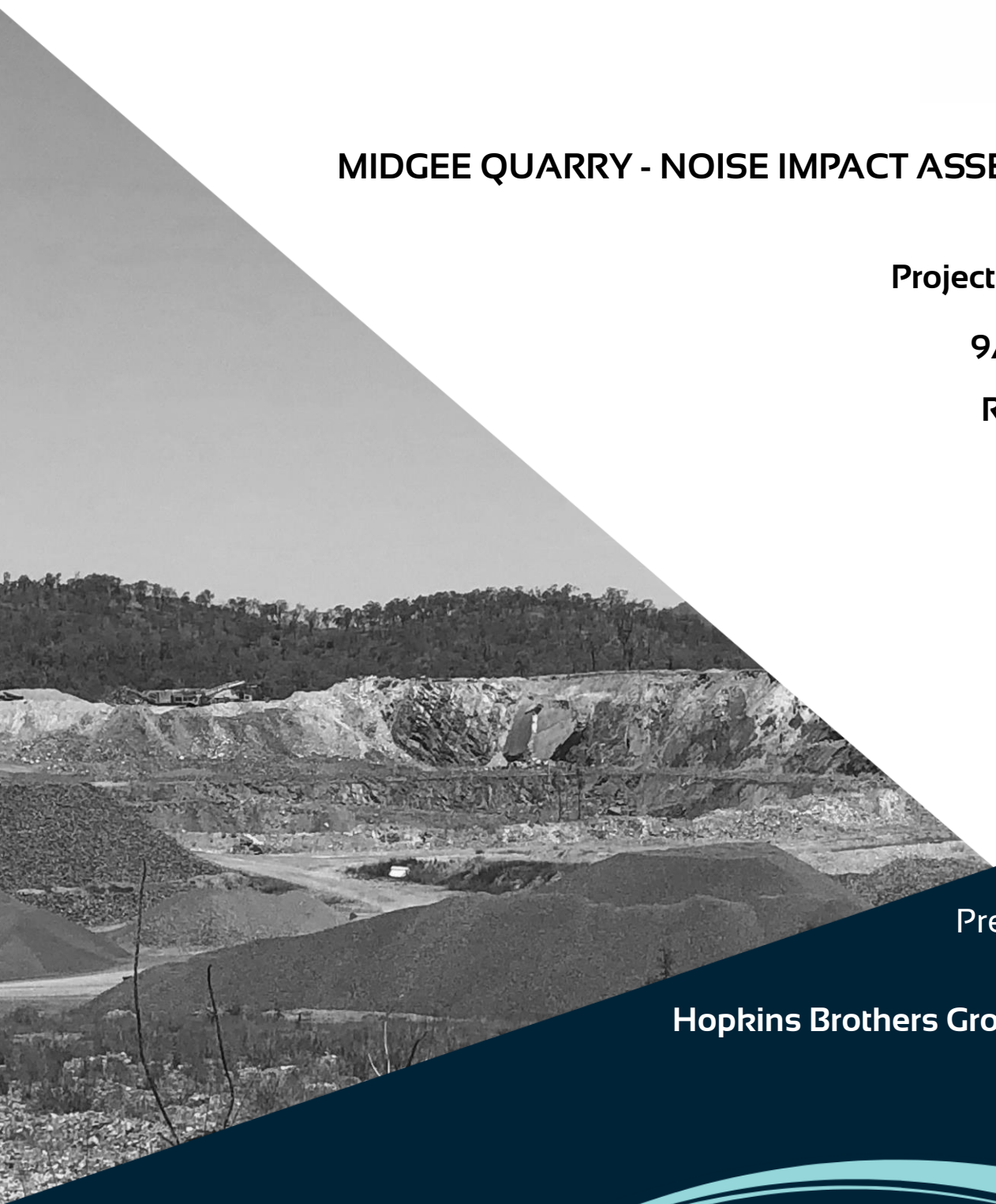
SCALE: 1:15,000 When Printed On A3 — 0 — 300m
DRAWING NUMBER: 2607.DRG.007
REVISION: 2
DATE: 19 January 2022
DRAWN: JHV
DATUM: HORIZONTAL / VERTICAL / ZONE
PRINTED: 20 January 2022
CHECKED: JT
GDA94 / MGA / AHD / 56

MIDGEE QUARRY - NOISE IMPACT ASSESSMENT

Project ID: 14020

9/02/2022

Release: R1



Prepared For:

Hopkins Brothers Group Pty Ltd

Assured Environmental

DOCUMENT CONTROL PAGE

Project Title: MIDGEE QUARRY - NOISE IMPACT ASSESSMENT

Project Reference ID: 14020

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Report Prepared for:

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Author: Aiden Allen

Reviewer: Michelle Clifton

Table 1: History of Revisions

Revision	Date	Issued to	Changes
R0	28/01/2022	M. Benham	Initial Release
R0	9/02/2022	M. Benham	Initial Release

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GLOSSARY

A-Weighting	A response provided by an electronic circuit which modifies sound in such a way that the resulting level is similar to that perceived by the human ear.
Background Noise	Noise level at a given location and time measured in the absence of any alleged noise nuisance sources. Typically, represented by the L_{A90} noise statistic.
Calibrator	An instrument used to carry out 'field calibrations' before and after monitoring to ensure the sound level meter does not drift.
dB (decibel)	This is the scale on which sound pressure level is expressed. It is defined as 20 times the logarithm of the ratio between the root-mean-square pressure of the sound field and the reference pressure (0.00002 N/m^2).
dB(A) or dBA	This is a measure of the overall noise level of sound across the audible spectrum with a frequency weighting (i.e. 'A' weighting) to compensate for the varying sensitivity of the human ear to sound at different frequencies.
Fast Time Weighting	Sound level meters apply a time-smoothing function to the measured sound. Fast time weighting has an exponential smoothing time constant of 125 milliseconds.
Free-field	Refers to a sound pressure level determined at a point away from reflective surfaces other than the ground with no significant contribution due to sound from other reflective surfaces; generally, as measured outside and away from buildings.
L_{Aeq}	This is the equivalent steady sound level in dB(A) containing the same acoustic energy as the actual fluctuating sound level over the given period. Noise levels often fluctuate over a wide range with time. Therefore, when a noise varies over time, the LAeq is the equivalent continuous sound which would contain the same sound energy as the time varying sound. Many studies show that human reaction to level-varying sounds tends to relate closer to the LAeq noise level than any other descriptor.
L_{Amax}	The A-weighted, maximum, sound level. It should be noted that maximum noise levels are not peak levels.
L_{Amin}	The A-weighted, minimum, sound level.

ABBREVIATIONS

DES	Department of Environment and Science
tpa	Tonnes per annum
NPI	National Pollutant Inventory
WTS	Waste Transfer Station

1 INTRODUCTION

1.1 Background

Hopkins Brothers have been operating the Midgee Quarry on the Bruce Highway, Midgee, since the early 2000s. Historically, the site has been used to extract material since the 1960s. The quarry operation has evolved over the years to respond to market demand, resulting in various planning permits having been obtained from Rockhampton Regional Council (RRC).

Local demand for quarry resources is anticipated to increase in the next decade, driven by regional significant infrastructure projects and a general increase in development within the region. As such, Hopkins Brothers are seeking to secure access to the known resource.

The most recent approval was granted by RRC on 6 November 2018, which extended the existing operational area, concrete crushing operations and an outdoor storage area to store extracted material and equipment associated with the extractive and industrial operations on the site.

The permit change aims to increase the current hours of operation, pit area, and output to a to a maximum of 2,000,000 tonnes per annum..

1.2 Scope of Assessment

Assured Environmental (AE) was appointed by Groundwork Plus on behalf of Hopkins Brothers Group Pty Ltd to undertake an noise assessment from the expansion of the quarry.

In undertaking the assessment, reference has also been made to the Department of Environment & Science (DES) Guideline - *Application requirements for activities with impacts to noise* (2020).

In accordance with the requirements of the above guidelines, computational modelling and first principle calculations have been undertaken to assess the potential for adverse amenity and health impacts as a result of the proposed development.

1.3 This Report

This report summarises the methodology, results, and conclusions of the noise and vibration assessment.

2 MIDGEE QUARRY OPERATIONS

2.1 Existing Operations

Hopeman Pty Ltd trading as Hopkins Brothers Group Pty Ltd, operate the existing operations at Lot 2 on RP888747. The existing approvals for this site include the quarry and an asphalt plant.

2.1.1 Quarry

Resource has been sourced from the site since the 1960s. The current operation has evolved over the years to respond to market demand, resulting in various planning permits having been obtained from Council.

On 6 November 2018, Rockhampton Regional Council approved the current operation (Council Ref: D/79-2017). This permit extended the existing operational area, concreate crushing operations and the outdoor storage area to store extracted material and equipment associated with the extractive and industrial operations.

The site also operates pursuant to an Environmental Authority (EA) for Environmentally Relevant Activities 16(2)(b) and 16(3)(b) for extracting and screening between 100,000 to 1,000,000 tonnes of material per year (DES Ref: IPCE01813610), dated 19 January 2010.

Hopkins Brothers has advised that the existing quarry produced a total of 700,000 – 800,000 tonnes over past 5 years.

2.1.2 Asphalt Plant

On 9 April 2020, Rockhampton Regional Council granted approval to establish an asphalt plant on the site (Council Ref: D/83-2019). Council also issued an EA for Environmentally Relevant Activities (ERA) ERA6 for asphalt manufacturing (Council Ref: EPAEA/1/2019), dated 6 April 2020.

An asphalt plant has previously operated on the site under a temporary approval, however, is currently not located at the site. Consideration will be given that an asphalt plant may be established pursuant to the 2020 permit and EA.

The 2020 permit and EA do not provide limits on throughput or operating hours. There are no changes proposed to the approved asphalt plant operations. It is understood that the asphalt plant will produce a maximum of 100,000 tonnes per year. The location of the asphalt plant is where the existing crusher plant is located. Whilst the asphalt plant is approved to operate at the facility, it is currently not operating onsite.

2.2 Proposed Quarry Operations

A conceptual quarry layout has been prepared which incorporates four adjoining properties, properly described as Lot 2 on RP888747, Lot 1 on SP247721, Lot 2 on SP247721, Lot 725 on RP888747 and Lot 931 on LIV40265. Two pits have been proposed, so as to achieve a 50-metre buffer to the road reserve and also as a consequence of the differing resource/materials in each area. Each pit will be developed progressively, to meet market demand.

Midgee Quarry is project driven by blasting and ripping at times, depending on the product being targeted. The quarry will continue to use standard quarrying methodologies that involve clearing, topsoil, and overburden stripping, drilling, and blasting, extraction, processing and

stockpiling with the final products sold for use in the construction industry. The outline of the extraction area is shown in Figure 1

2.3 Comparison of Activities

Table 2 provides a comparison of current activities and proposed activities as part of the increase in production. Despite the increase in extraction, the number of blasts will not increase much as a significant proportion of the additional material will be road base/bulk fill which does not need blasting.

Table 2: Comparison of Quarry Activities

Aspect	Existing Activities	Future Activities
Quarry footprint	As per consent.	Ref to Figure 1
Hours of operation	6am and 6pm Monday to Saturday. No operations occur on public holidays.	24/7
Production and Transportation limits	Current production of approximately 200,000 tpa however is permitted to produce up to 1,000,000 tpa.	Maximum 2 Mtpa from the site.
Extraction method	Extraction by blast and drill	No change to extraction method.
Site infrastructure and plant	Primary and tertiary crushing and screening facilities as fixed and mobile plant	Primary and tertiary crushing and screening facilities as fixed and mobile plant. The locations of the mobile plant are flexible depending on commercial requirements
Asphalt plant	Temporary plant used previous but no longer at site.	Proposed 100,000 tpa of which approximately two thirds of raw material provided by quarry.
Product transport	Via truck	No change to method of transport or access road.
Blasting	4 per year	8 per year
Vegetation clearing	N/A	Approx. 2.5 ha every 5 years

2.4 Stages of Expansion

The expansion of the quarry is not detailed in many stages as the course of the quarry development will depend on customer requirements, however the expected expansion will occur to the east, north and west as shown in Figure 1.

It is predicted that a majority of the material required in the next five years will be general fill, which is generally found in the first bench (15 – 20 m below natural ground level). Pit 1 and Pit 2 will likely occur concurrently, however Pit 2 will remain the main source extraction area for the duration of the Project life. The expected average throughput is 1.6 Mtpa; with a typical breakdown by fraction, however up to 2 Mtpa is expected to be processed per year.

The areas of expansion and operations of the quarry are not finalised due to the client requirements. In consultation with the quarry operators, the following assumptions regarding quantities of material, location and activities are detailed in Table 3.

Table 3: Pit Operations

Activity	Pit Area				
	Existing	Pit 1	Pit 2 (North)	Pit 2 (East)	Pit 2 (West)
Production (tpa)	500,000	300,000	600,000	400,000	200,000
Material Type	Road base/ concrete agg	Bulk fill	Bulk fill	Bulk fill	Road base/ concrete agg
Blasting	Yes	-	-	-	Yes
Screening	Yes	Yes	-	Yes	Yes
Crushing	Yes	Yes	Yes	Yes	Yes
Intermediate product stockpile	Yes	Yes	Yes	Yes	Yes

2.5 Equipment

The quarry currently has a range of equipment. With the increase in capacity, it is expected that the current the equipment will be utilised more efficiently, however additional mobile plant will be added:

- Fixed screening/crushing plant;
- Mobile screening/crushing plants;
- Excavators;
- Wheeled loaders;
- Articulated trucks (including one utilised as a water truck); and
- Dozers.

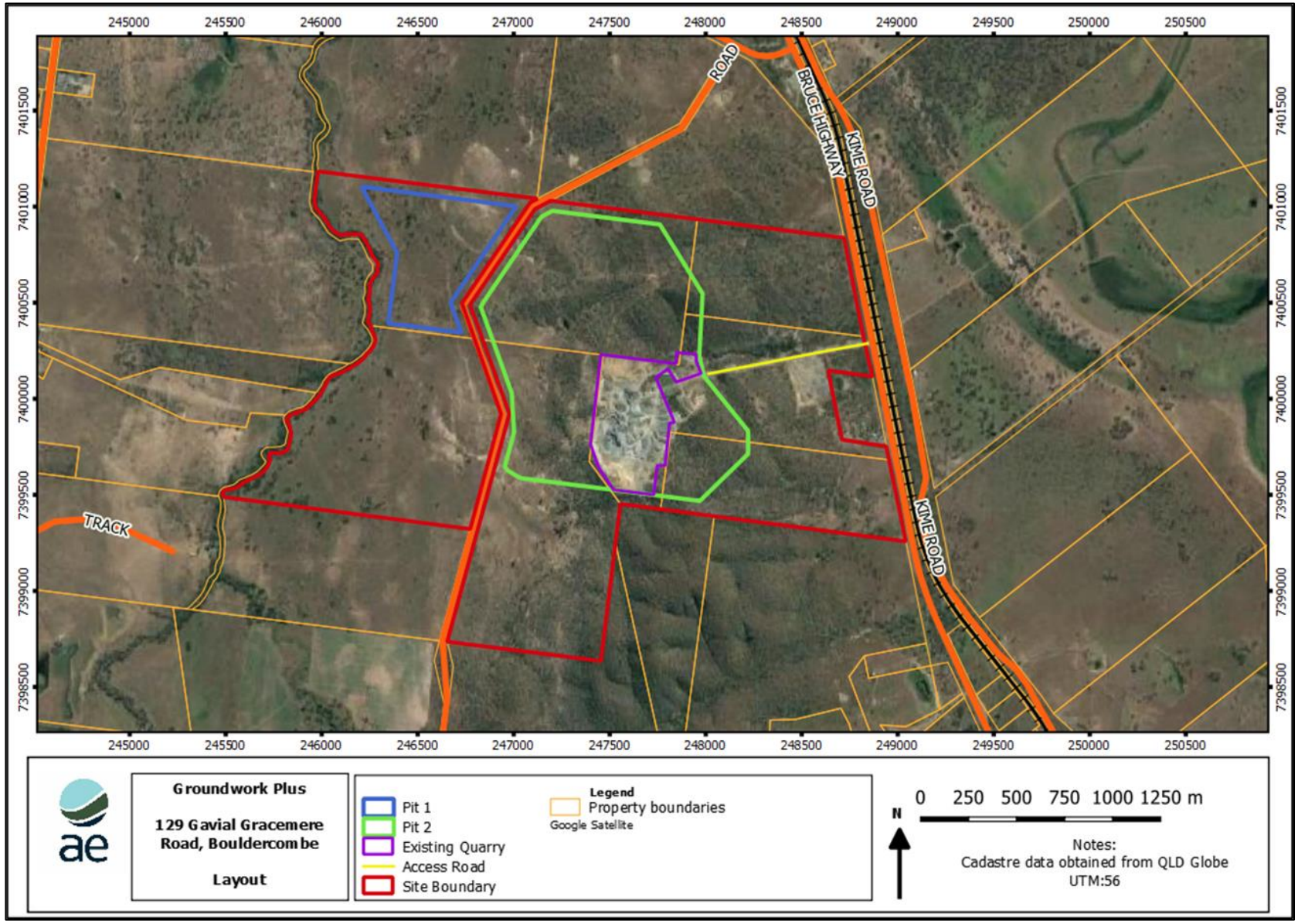


Figure 1: Site Location

3 DESCRIPTION OF ENVIRONMENTAL VALUES

3.1 Location

Midgee Quarry is located at 59793 Bruce Highway Midgee 4702, Lot 2 RP888747. The major regional centre of Rockhampton is approximately 12.5 kilometres to the north and Gracemere is approximately 9.5 kilometres to the north-west.

The surrounding land uses are primarily cattle grazing, with the exception of the adjacent Kangaroo Country Caravan Park (KCCP) which is situated on lot 1/RP811877. The entrance to the Midgee Quarry and the KCCP is situated on the Bruce Highway. The North Coast Rail Line also passes directly opposite the Midgee Quarry entrance and the caravan park. The North Coast line is also the major freight corridor from Brisbane to Cairns, with connecting services travelling as far west as Longreach and Mount Isa. The North Coast Line also connects to the central line which is the main coal freight corridor which services the Central Highlands Coal Fields.

The Subject Site covers five lots (Lot 2 on RP888747, Lot 1 on SP247721, Lot 2 on SP247721, Lot 725 on RP888747 and Lot 931 on LIV40265. The Subject Site location is shown in Figure 1.

3.2 Terrain

Figure 2 illustrates the local topography, as obtained from a combination of Lidar data at 5 m resolution.

3.3 Receptors

When completing this report, consideration has been given to the potential impacts of the changed operation to sensitive receptors within 3 - 5 kilometres of the operation. When considering the impacts, the nearby receptors have been identified as shown in Figure 3.

The closest receptors located in the KCCP to the east of the Subject Site boundary.

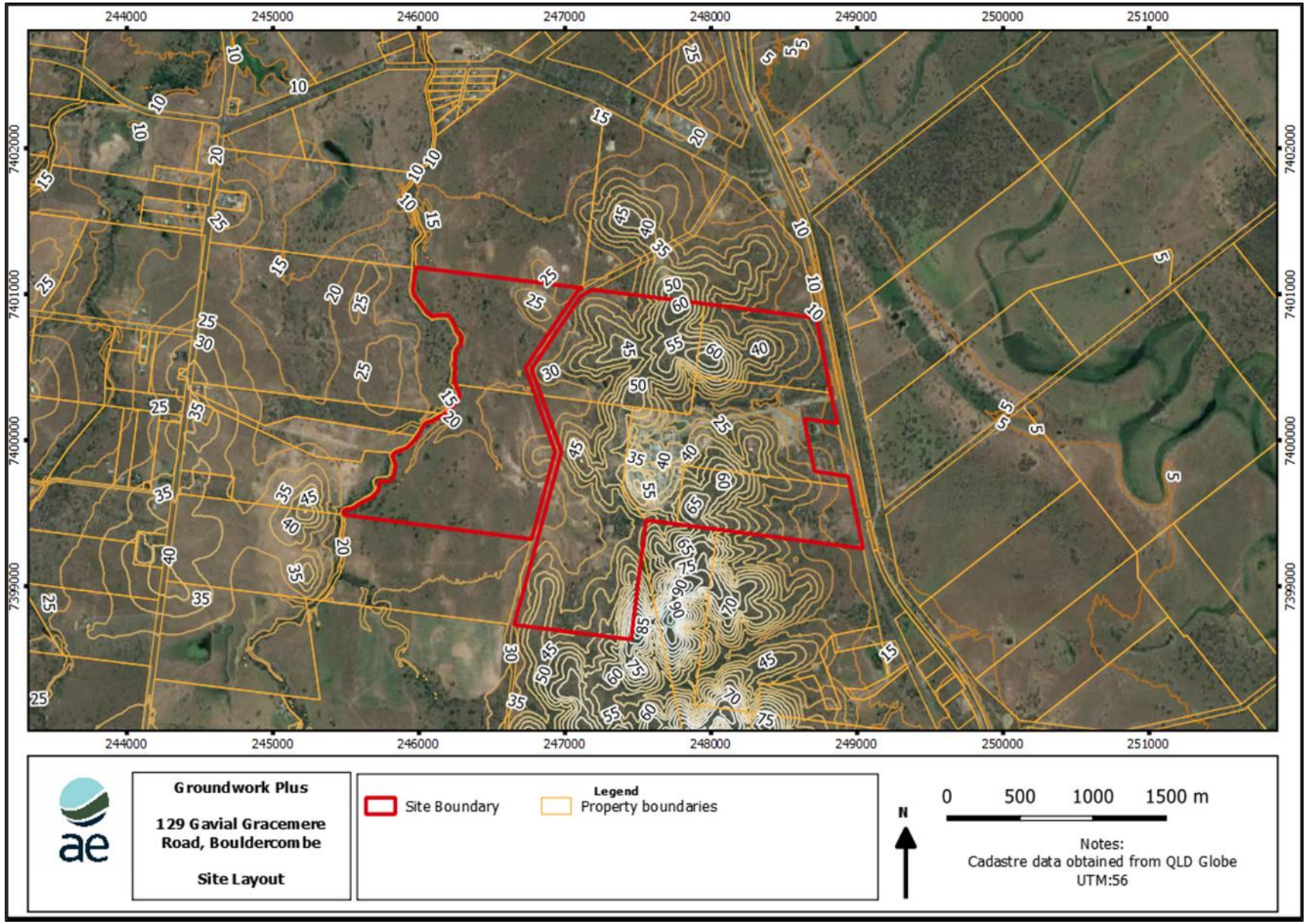


Figure 2: Surrounding Topography at 5 m Intervals (Extracted from LiDAR Data)

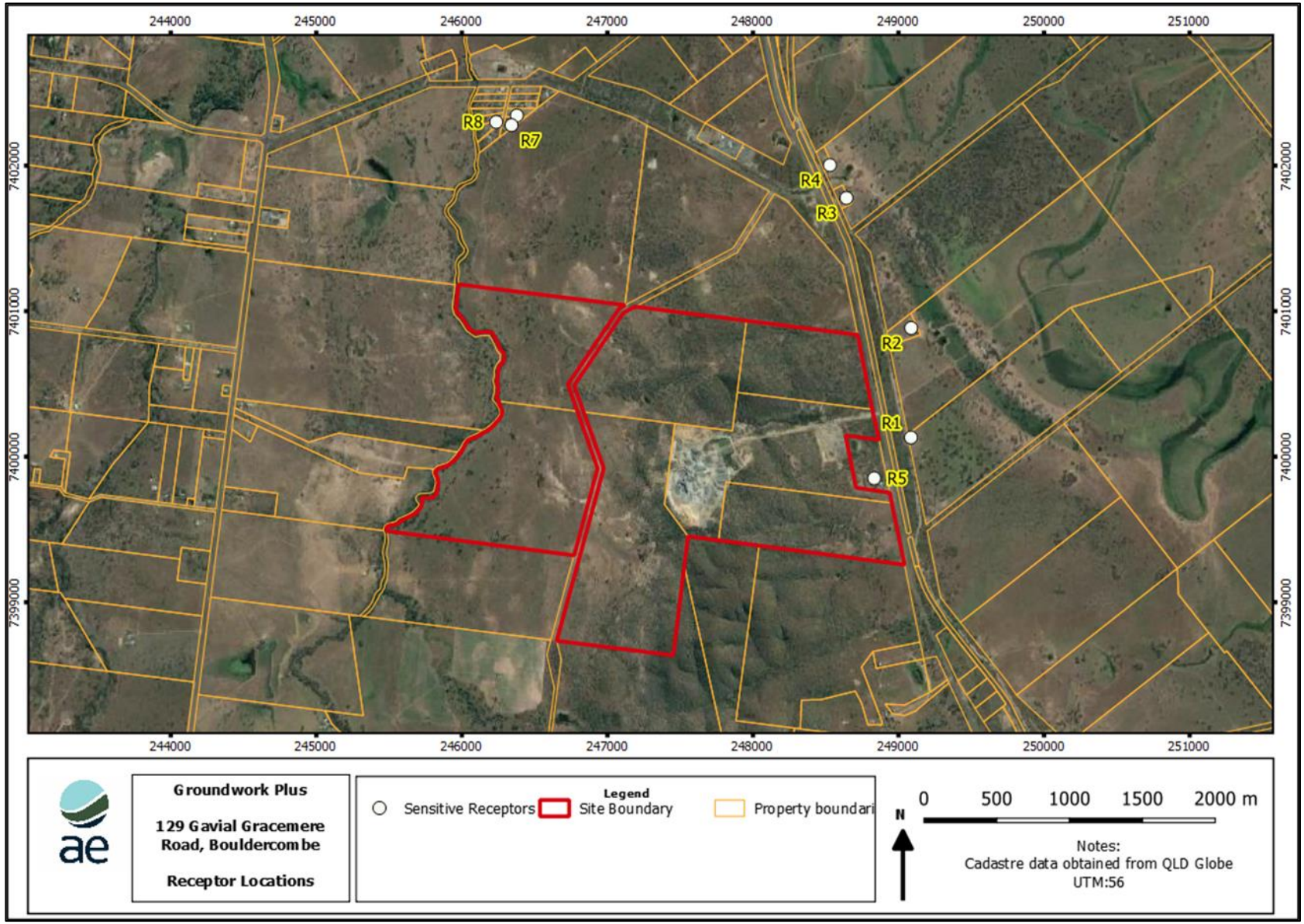


Figure 3: Modelled Sensitive Receptors

4 EXISTING NOISE ENVIRONMENT

4.1 Existing Sources of Noise

The existing acoustic environment in the area is influenced by traffic on the Bruce Highway and train pass-bys. Additional noise sources include birds and wind through vegetation at receptors.

4.2 Baseline Noise Monitoring

Background noise monitoring was undertaken from 2 December to 10 December 2021 at two locations in order to quantify the background noise levels at nearby sensitive receptors. The noise monitoring locations (NML) information is presented in Appendix A. The Subject Site could not be heard at either NML monitoring location.

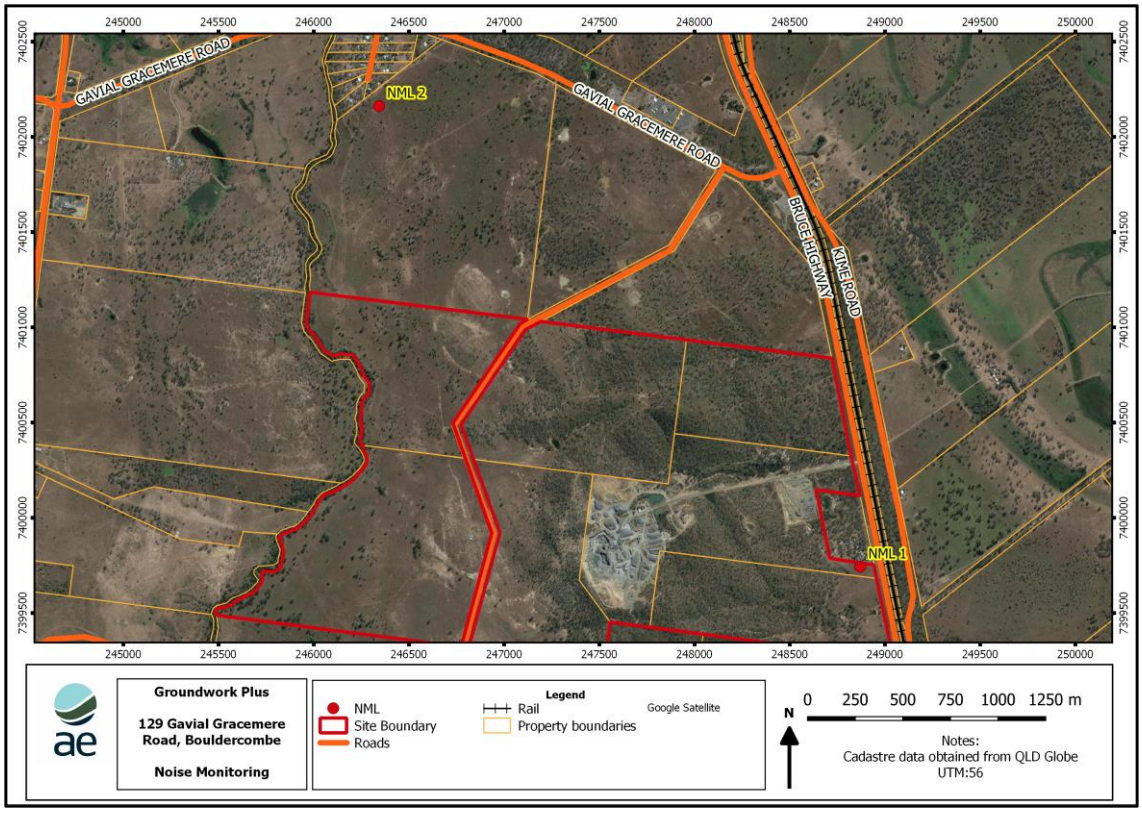


Figure 4: Monitoring Locations

Noise measurements were undertaken in accordance with the requirements of Australian Standard AS 1055-2018 *'Acoustics – Description and measurement of environmental noise'*. One sound level meter (SLM) was used for the continuous monitoring. The SLM was situated in a free-field position and a data logging time of 15 minutes was adopted. The microphone was positioned at a height of 1.2 metres above ground level and fitted with a windshield throughout the measurements. The serial numbers and calibration information for the instruments as well as daily measurement data and time histories are presented in Appendix A.

Noise monitoring has a potential to be affected by rainfall and wind speeds above 5 m/s. A review of meteorological data from the weather station co-located with the sound level meter at NML 1, found that one hour were potentially affected by high wind speeds and/or rain during the monitoring period (7 days). To avoid weather-related bias, and in accordance with the Noise

Measurement Manual noise data collected during the weather-affected periods have not been considered in the analysis.

Analysis of the noise monitoring data from NML 2, which was located close to the residential area, identified that on 5 December, there was an event which altered the noise monitoring profile. Communications with the company manager (James Hoseason-Smith) confirmed that the windshield was not on the equipment when collected on 10 December. As such, only three valid days of monitoring data was obtained for this location. Refer to Appendix A for more information.

Table 4 below provides a summary of noise levels of each period for a variety of statistical noise parameters.

Table 4: Summary of Noise Monitoring Results

Location	Period	L_{Amax}	L_{A1}	L_{A10}	L_{A90}	L_{Aeq}	RBL
NML 1	Day (7 am to 6 pm)	81	66	60	48	58	45
(2-10 Dec)	Evening (6 pm to 10 pm)	80	67	63	55	60	49
	Night (10 pm to 7 am)	83	66	61	50	59	43
NML 2	Day (7 am to 6 pm)	75	54	50	45	49	43
(2-5 Dec)	Evening (6 pm to 10 pm)	71	52	48	43	47	41
	Night (10 pm to 7 am)	77	50	46	40	46	37

Detailed noise monitoring analysis is presented in Appendix A.

5 LEGISLATIVE REQUIREMENTS

5.1 Environmental Authority

Conditions of Environmental Authority EPPR00233813 (dated 16 February 2010) issued by the Department of Environment and Science provides specific requirements relating to emissions of air from the activity as summarised in Table 5.

Table 5: Conditions Relevant to Air

Condition Number	Condition
D1	Noise Nuisance: Noise from the environmentally relevant activity must not cause an environmental nuisance at any **nuisance sensitive** or **commercial place**.
D2	Noise Monitoring: When requested by the administering authority, noise monitoring must be undertaken to investigate any complaint of noise nuisance, and the results of notified within 14 days to the administering authority.
D3	The method of measurement and reporting of noise levels must comply with the latest edition of the Administrating Authority's Measurement Manual
D4	The holder of this development approval is not permitted to conduct blasting at the authorised place

5.2 Environmental Protection (Noise) Policy 2019

The EPP (Noise) provides acoustic quality objectives for a range of receptors with respect to the potential impact of an activity upon on the health and well-being and biodiversity of the receptors. Specifically, the objectives are intended to enhance or protect the following environmental values:

- The qualities of the acoustic environment that are conducive to protecting the health and biodiversity of ecosystem.
- The qualities of the acoustic environment that are conducive to human health and wellbeing, including by ensuring a suitable acoustic environment for individuals to do any of the following:
- sleep
- study or learn
- be involved in recreation, including relaxation and conversation.
- The qualities of the acoustic environment that are conducive to protecting the amenity of the community.

Table 6 presents a summary of the acoustic quality objectives applicable to the receptors surrounding the Project.

Table 6: EPP(Noise) Schedule 1 Acoustic Quality Objectives

Sensitive receptor	Time of day	Acoustic quality objectives (measured at the receptor) *dB(A)*			Environmental value
		$L_{Aeq,adj,1hr}$	$L_{A10,adj,1hr}$	$L_{A1,adj,1hr}$	
Residence (for outdoors)	daytime and evening	50	55	65	health and wellbeing
Residence (for indoors)	daytime and evening	35	40	45	health and wellbeing
	night-time	30 (45)	35 (50)	40 (55)	health and wellbeing (ability to sleep)
Commercial and retail activity (for indoors)	When the activity is open for business	45 (60)	-	-	health and wellbeing (ability to converse)
Protected area or critical area	-	the level of noise that preserves the amenity of the existing area or place			-

Note: Brackets ( ) denote the external noise criteria assuming a 15 dB(A) façade transmission loss.

The EPP(Noise) provides amenity objectives which do not take into consideration the surrounding environment, which could be sensitive to any increase in noise environment. The EPP(Noise) explanatory note states:

> *The acoustic quality objectives are considered in assessment processes and help inform the decision-making process, including any conditions that may be placed on approvals for environmentally relevant activities. The acoustic quality objectives are not individual point source emission standards but are total levels of noise in the surrounding environment. They assist to inform what the point source acoustic emission level as a condition of approval for a particular activity at a site may be.*
>
> *It is not intended that, as part of achieving the acoustic quality objectives, any part of the existing acoustic environment be allowed to deteriorate. That means in using this policy for making decisions including under the Environmental Protection Act 1994, the acoustic quality objectives should not be seen as a noise limit without consideration of whether the acoustic environment is being allowed to deteriorate due to an existing acoustic environment that is better than the acoustic quality objective.*

The adopted project noise level criteria based on the EPP(Noise) 2019 are shown in Table 7.

Table 7: Project Noise Level Criteria (Outdoors)

Receiver Type	Receptors	$L_{Aeq,adj,1\ hr}$ dB(A)			$L_{A1,\ adj,\ 1\ hr}$ dB(A)
		Day	Evening	Night	Night
Residential Dwellings	R01-R08	50	50	45	55

Note: Assuming 15 dB(A) façade transmission loss is accounted for

In addition to the above acoustic quality objectives, the EPP (Noise) 2019 requires that, where reasonable to do so, background creep should be prevented or minimised [Section 9(2)(b)]. While specific noise limits to achieve this outcome are not provided in the EPP (Noise) 2019,

reference is made to the previous objectives provided in the now repealed EPP (Noise) 2008 as follows:

(a) for noise that is continuous noise measured by $L_{A90,T}$—more than nil dB(A) greater than the existing acoustic environment measured by $L_{A90,T}$; or

(b) for noise that varies over time measured by $L_{Aeq,adj,T}$—more than 5 dB(A) greater than the existing acoustic environment measured by $L_{A90,T}$.

Given the results of the baseline noise monitoring (see Table 4), Table 8 below presents indicative noise levels targets that may be considered appropriate to prevent or minimise background creep at nearby sensitive uses.

Table 8: Noise Level Targets for the Prevention of Background Creep

Monitoring Location	Receptors	Parameter	Day	Evening	Night
NML1	R01-R05	Continuous Noise ($L_{A90,T}$)	48	55	50
		Variable Noise ($L_{Aeq,adj,T}$)	53	60	55
NML2	R06-R08	Continuous Noise ($L_{A90,T}$)	45	43	40
		Variable Noise ($L_{Aeq,adj,T}$)	50	48	45

Since the EPP(Noise) 2019 does not nominate noise levels in relation to Background Creep, the noise level targets shown in Table 8 are not used as criteria in this assessment. However, the predicted noise levels have been included to provide a qualitative comment in relation to the requirements of the EPP(Noise) 2019 Clause 9 (2)(b).

6 NOISE ASSESSMENT

6.1 Modelling Methodology

For the purposes of predicting impacts associated with noise emissions from the Subject Site on nearby sensitive receptors, noise modelling of the sources was completed using the proprietary software CadnaA (version 2021 build 181.5100) developed by DataKustik. CadnaA incorporates the influence of meteorology, terrain, ground type and air absorption in addition to source characteristics to predict noise impacts at receptor locations. All predictions have been undertaken in accordance with the CONCAWE calculation method.

6.1.1 Meteorology

Noise levels were predicted using the CONCAWE propagation methodology, which incorporates the influence of meteorological conditions on the propagation of noise through the atmosphere. The modelled meteorological parameters shown in Table 9 were selected to predict the worst-case noise levels at all receptors during all seasons and all time periods.

Table 9: Model Parameters

Parameter	Day (Noise-Enhancing)	Evening (Noise-Enhancing)	Night (Noise-Enhancing)
Temperature (night)	20°C	10°C	10°C
Relative Humidity	75%	75%	75%
Wind Speed (m/s)	3.0	3.0	2.0
Stability Class	D	D	F
Wind Direction:	Worst Case	Worst Case	Worst Case
Ground Absorption	1	1	1

6.1.2 Topographical Data

Topographical data was based on that publicly available LiDAR data at one-meter intervals as well as contours provided by the client

6.1.3 Scenario Assessed

Three modelling scenarios are assessed:

1. Existing quarry operations;
2. Future quarry operations; and
3. Future quarry operations with asphalt plant.

6.2 Noise Sources

Most noise sources associated with the quarry are generally continuous in nature and are associated with fixed plant items operating in the production process. Short-term or variable sources include operation of the excavators and truck movements. It should be noted that some sources will be operated on a campaign basis but to account for worst-case scenario, they have been modelled on continuous day-time operation.

AE have taken undertaken measurements at a similar mobile asphalt plant to be installed at the quarry. For the purpose of this assessment, these measurements and layout will be used to represent the proposed asphalt plant.

Table 10 provides a summary of the noise sources adopted for this assessment and the operational details of each source. Sound power levels have been taken from AE's database and typical levels taken from verified sources.

Heights for all sources inside the pits where set to 15m above the approximate bench height, which is 0m. This is to represent the sources on top of the bench before the bench decreases to an unknown depth.

Table 10: Sound Power Levels Quarry

Activity	Noise Source	Qty	Height above Ground Level (m)	Sound Power Level (dB(A))		Corrections (tonality, low frequency, impulsiveness)	Usage (%) during Modelled Period
				L_{Aeq}	L_{Amax}		
Existing Site	Excavators	1	2	115	125	+5dB tonal and impulsiveness correction	100
	Cone crusher [a)]	2	2.5	103	113	-	100
	Screen [a)]	1	2.5	108	118	-	100
	Conveyor belts [a)]	4	2.5	89	-	-	100
	Conveyor Motors [a)]	6	2.5	84	-	-	100
	Drilling	1	2.5	118	-	-	100
	Truck Idling	1	2.5	112	-	-	100
	Screens	8	2.5	108	118	+5dB Tonal Correction	100
	Crushers	6	2.5	110	120	-	100
	Excavators	2	2.5	115	125	+5dB tonal and impulsiveness correction	100
Pit 1 - Quarry	Screens	4	19.5	108	118	+5dB Tonal Correction	100
	Crushers	3	19.5	110	120	-	100
	Excavators	2	19.5	115	125	-	100
Pit 2 - Northern Quarry Face	Crushers	3	19.5	110	120	-	100
	Excavators	1	19.5	115	125	-	100
Pit 2 - Eastern Quarry face	Screens	4	19.5	108	118	+5dB Tonal Correction	100
	Crushers	3	19.5	110	120	-	100
	Excavators	1	19.5	115	125	+5dB tonal and impulsiveness correction	100

Activity	Noise Source	Qty	Height above Ground Level (m)	Sound Power Level (dB(A))		Corrections (tonality, low frequency, impulsiveness)	Usage (%) during Modelled Period
				L_{Aeq}	L_{Amax}		
Pit 2 - Western Quarry face	Screens	4	19.5	108	118	+5dB Tonal Correction	100
	Crushers	3	19.5	110	120	-	100
	Excavators	1	19.5	115	125	+5dB tonal and impulsiveness correction	100
	Drilling	1	19.5	118	-	-	100
Overall	Articulated Trucks	3	19.5	107	117	-	100
	Water trucks	1	19.5	107	117	-	100
	B-Double	7/hr	2	100	110	-	100
	D9 Cat Dozer	1	19.5	108	118	+5dB Tonal Correction	100
	Cat D9H	1	19.5	108	118	+5dB Tonal Correction	100
Asphalt Plant	Bag House	1	2	96	-	-	100
	Burner/Blower	1	2	88	-	-	100
	Conveyor Motor	7	2	84	-	-	100
	Compressor	2	2	84	-	+5dB Tonal Correction	100
	Drum	1	2	93	-	-	100
	Exhaust Fan	2	2	93	-	+5dB Tonal Correction	100
	Fuel Pump	3	2	84	-	+5dB Tonal Correction	100
	Front Loader - Reverse Beeper	1	2	121	-	-	5
	FEL loading into bins	1	2	96	106	-	100
	Truck Idling	1	2	112	122	-	100
	Vibrating Hopper	5	2	80	-	-	100
	FEL	1	2	115	125	-	100

Activity	Noise Source	Qty	Height above Ground Level (m)	Sound Power Level (dB(A)		Corrections (tonality, low frequency, impulsiveness)	Usage (%) during Modelled Period
				L_{Aeq}	L_{Amax}		
	Conveyor	4	2	90	-	-	288

a) Fixed plant

Note: Contours have been imported that includes the future quarry bench. Sources at 19.5m and 50m represent equipment at the surface level before moving down and creating the bench

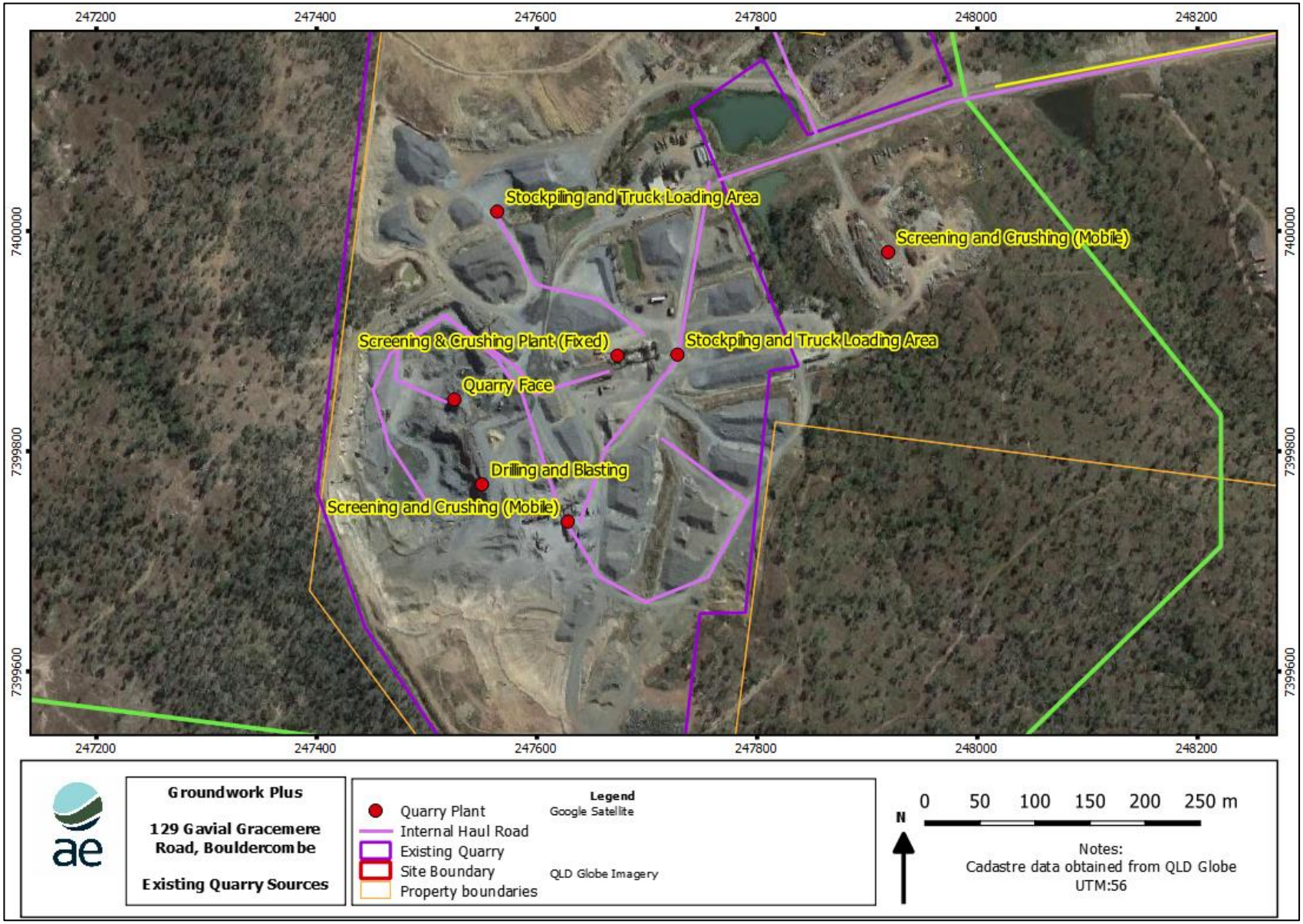


Figure 5: Modelled Source Location for Existing Quarry

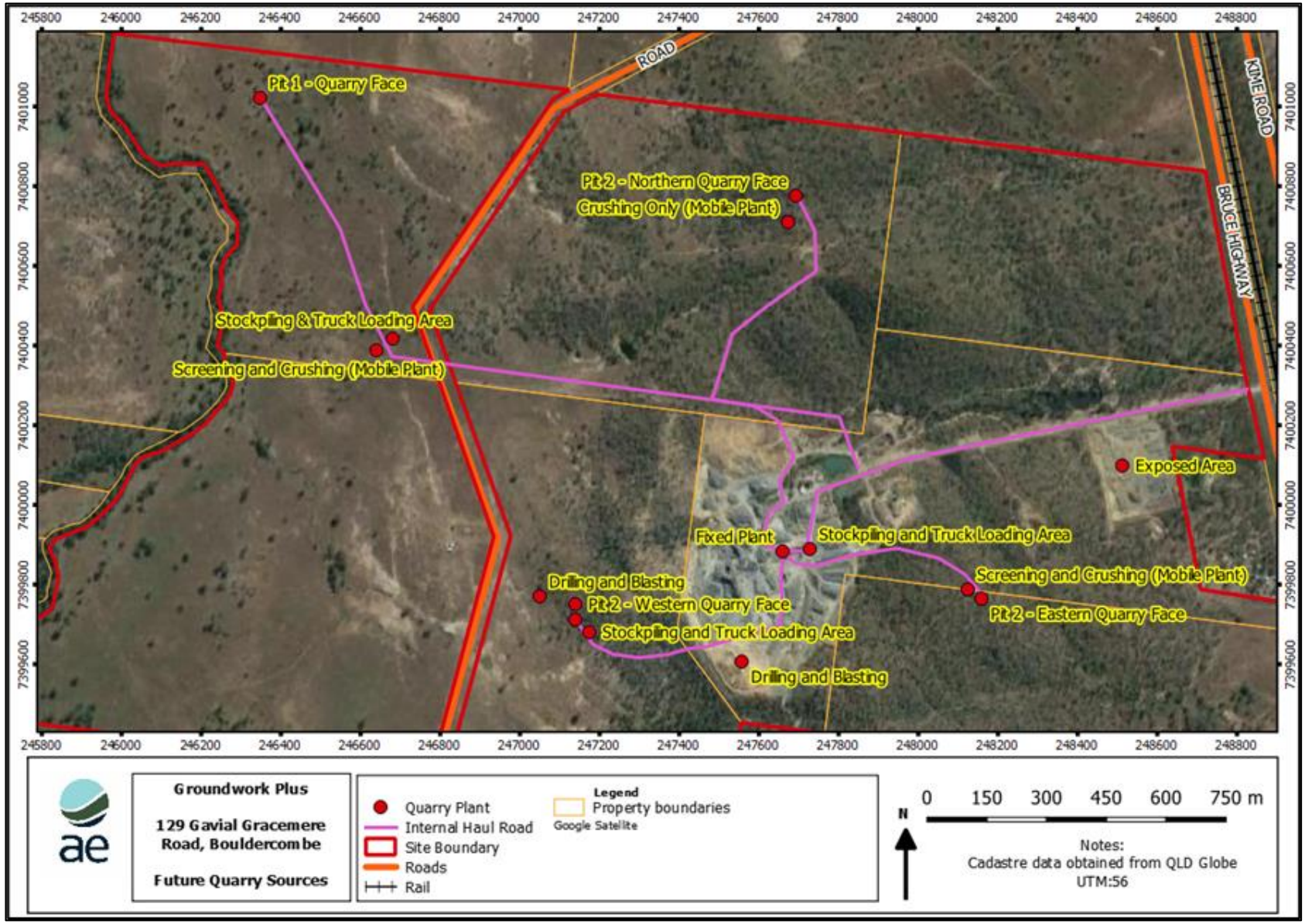


Figure 6: Modelled Source Location for Future Quarry Operations

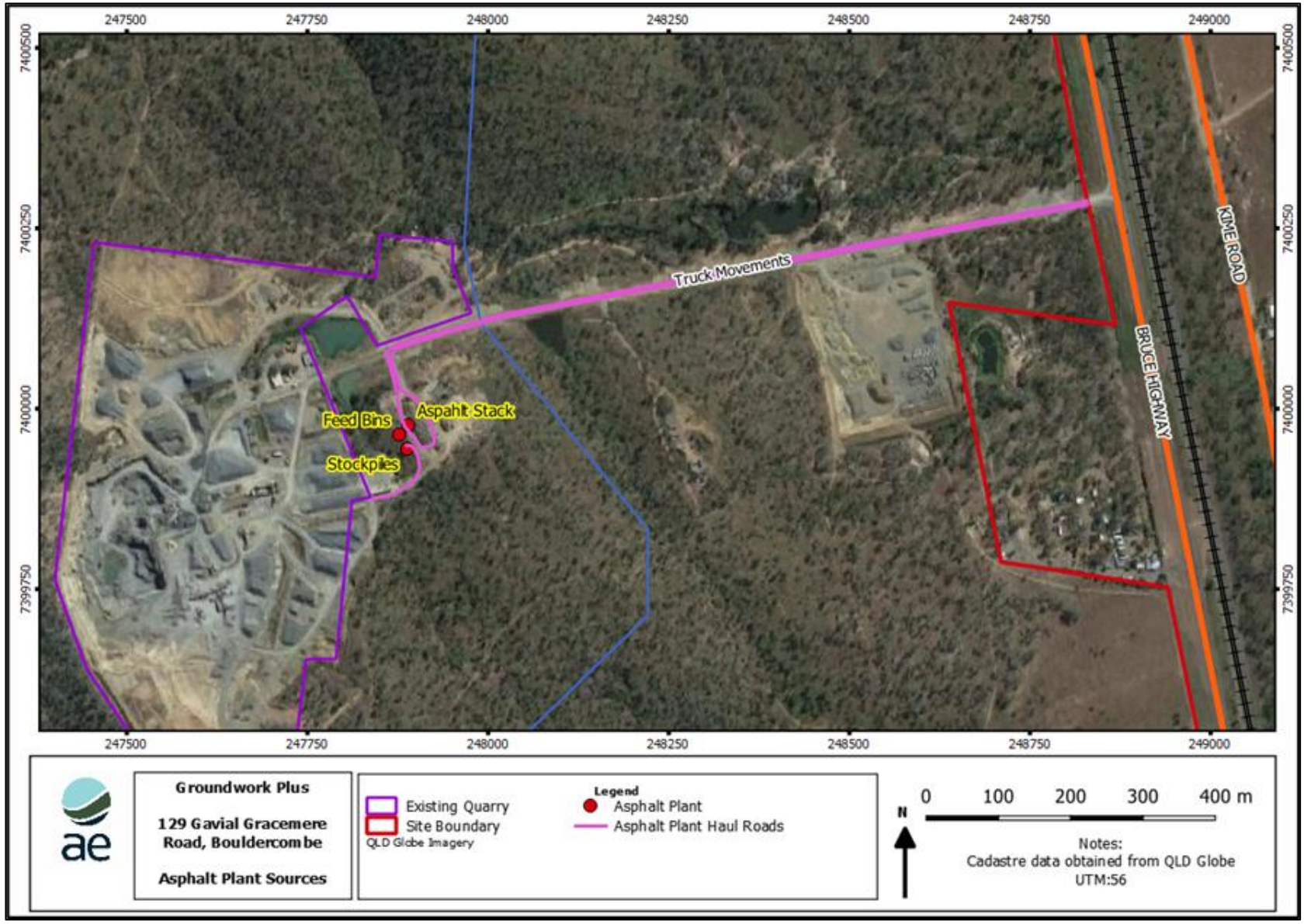


Figure 7: Asphalt Plant Source Locations

7 PREDICTED NOISE LEVELS

7.1 Overview

Criteria chosen was the lowest of the Project Noise Criteria (Table 7) and the Noise Level Targets for the Prevention of Background Creep (Table 8) over all monitoring locations. Appendix B provides contour noise level for each scenario.

7.2 Existing Quarry Activities

Table 11 provides the predicted noise for the existing quarry activities. All receptors comply with the EPP criteria.

Table 11: Maximum Predicted Results - Existing Quarry Activities

Receptor	Predicted Operational Noise Levels, $L_{Aeq,}$				Criteria Levels, $L_{Aeq,}$				Complies
	Day	Eve	Night	L_{AMax}	Day	Eve	Night	L_{AMax}	
R01	34	34	34	50	45	43	40	55	Y
R02	37	37	37	45	45	43	40	55	Y
R03	5	5	5	25	45	43	40	55	Y
R04	1	1	1	23	45	43	40	55	Y
R05	33	33	33	46	45	43	40	55	Y
R06	<10	<10	<10	<10	45	43	40	55	Y
R07	<10	<10	<10	<10	45	43	40	55	Y
R08	<10	<10	<10	<10	45	43	40	55	Y

7.3 Future Quarry Activities

Table 12 provides the predicted noise for the future quarry activities. All receptors comply with the EPP criteria.

Table 12: Maximum Predicted Results - Future Quarry Activities

Receptor	Predicted Operational Noise Levels, $L_{Aeq,}$				Criteria Levels, $L_{Aeq,}$				Complies
	Day	Eve	Night	L_{AMax}	Day	Eve	Night	L_{AMax}	
R01	38	38	38	50	45	43	40	55	Y
R02	37	37	37	45	45	43	40	55	Y
R03	19	19	19	28	45	43	40	55	Y
R04	18	18	18	26	45	43	40	55	Y
R05	40	40	40	49	45	43	40	55	Y
R06	33	33	33	42	45	43	40	55	Y
R07	34	34	34	43	45	43	40	55	Y

Receptor	Predicted Operational Noise Levels, $L_{Aeq,}$				Criteria Levels, $L_{Aeq,}$				Complies
	Day	Eve	Night	L_{AMax}	Day	Eve	Night	L_{AMax}	
R08	34	34	34	43	45	43	40	55	Y

7.4 Asphalt Activities

Table 13 provides the predicted noise for the Asphalt activities only. All receptors comply with the EPP criteria.

Table 13: Maximum Predicted Results - AshapIt Activities

Receptor	Predicted Operational Noise Levels, $L_{Aeq,}$				Criteria Levels, $L_{Aeq,}$				Complies
	Day	Eve	Night	L_{AMax}	Day	Eve	Night	L_{AMax}	
R01	34	34	34	50	45	43	40	55	Y
R02	34	34	34	38	45	43	40	55	Y
R03	20	20	20	25	45	43	40	55	Y
R04	<10	<10	<10	23	45	43	40	55	Y
R05	34	34	34	46	45	43	40	55	Y
R06	<10	<10	<10	<10	45	43	40	55	Y
R07	<10	<10	<10	<10	45	43	40	55	Y
R08	<10	<10	<10	<10	45	43	40	55	Y

7.5 Future Quarry Activities with Asphalt Plant

Table 14, provided the predicted noise for the future scenario, which includes benches, current plant and future plant. All receptors comply with the EPP criteria.

Table 14: Maximum Predicted Results - Future Quarry with Ashpalt Activities

Receptor	Predicted Operational Noise Levels, $L_{Aeq,}$				Predicted Operational Noise Levels, $L_{Aeq,}$				Complies
	Day	Eve	Night	L_{AMax}	Day	Eve	Night	L_{AMax}	
R01	38	38	38	50	45	43	40	55	Y
R02	39	39	39	45	45	43	40	55	Y
R03	22	22	22	28	45	43	40	55	Y
R04	18	18	18	26	45	43	40	55	Y
R05	40	40	40	49	45	43	40	55	Y
R06	33	33	33	42	45	43	40	55	Y
R07	34	34	34	43	45	43	40	55	Y

Receptor	Predicted Operational Noise Levels, $L_{Aeq,}$				Predicted Operational Noise Levels, $L_{Aeq,}$				Complies
	Day	Eve	Night	L_{AMax}	Day	Eve	Night	L_{AMax}	
R08	34	34	34	43	45	43	40	55	Y

8 VIBRATION ASSESSMENT

8.1 Introduction

An assessment of the potential for vibration impacts has been undertaken to determine potential impacts as a result of vibration generated by plant and equipment during quarry operation. In particular, the assessment has considered the potential for impacts on both human comfort and structural damage for the nearest residence to the quarry expansion.

8.2 Vibration Assessment Criteria

8.2.1 Criteria for Vibration from Non-Blasting Sources

The vibration criteria presented in the Environmental Noise Management – Assessing Vibration: A Technical Guideline (2006) published by the NSW Department of Environment Climate Change and Water (DECCW) have been adopted for the assessment. The technical guide provides vibration criteria associated with amenity impacts (human annoyance) for the three categories of vibration:

- Continuous vibration – e.g. road traffic, continuous construction activity;
- Impulsive vibration – includes less than 3 distinct vibration events in an assessment period (e.g. occasional dropping of heavy equipment); and
- Intermittent vibration – includes interrupted periods of continuous vibration (e.g. drilling), repeated periods of impulsive vibration (e.g. crushers) or continuous vibration that varies significantly in amplitude.

Table 15 and Table 16 present the criteria for continuous and impulsive vibration and intermittent vibration, respectively.

Table 15: Continuous & Impulsive Vibration Criteria for Residences – Peak Velocity

Location	Vibration Type	Preferred Limit (mm/s)	Maximum Limit (mm/s)
Residences	Continuous	0.28	0.56
Residences	Impulsive	8.6	17

Table 16: Intermittent Vibration Criteria for Residences

Location	Assessment Period	Preferred Limit (mm/s)	Maximum Limit (mm/s)
Residences	Day-time	0.20	0.40

The above criteria are suitable for assessing human annoyance in response to vibration levels. In order to assess potential damage to buildings, reference has been made to British Standard *BS 7385-2: 1993 Evaluation and measurement for vibration in buildings – Part 2: Guide to damage levels from ground borne vibration.* Table 17 presents vibration criteria for assessing the potential for building damage.

Table 17: Transient Vibration Guide Values for Cosmetic Damage

Type of Building	Peak Particle Velocity (mm/s)	
	4 Hz to 15 Hz	15 Hz and above

Unreinforced or light framed structures – residential or light commercial type buildings	15 mm/s at 4 Hz increasing to 20 mm/s at 15 Hz	20 mm/s at 15 Hz increasing to 50 mm/s at 40 Hz and above

8.2.2 Blasting Criteria

For blasting, the *Noise and Vibration Guideline*, states the following summarised in Table 18

Table 18: Noise and Vibration Criteria for Blasting For construction and quarry

Blasting Limits Surface Mining	Sensitive or commercial place criteria
	9am to 3pm Monday to Friday and 9am to 1pm Saturday
Airblast overpressure	115 dB (Linear) Peak for 9 out of 10 consecutive blasts initiated and not greater than 120 dB (Linear) Peak at any time
Ground vibration peak particle velocity	5 mm/second peak particle velocity for 9 out of 10 consecutive blasts and not greater than 10 mm/second peak particle velocity at any time

8.3 Assessment of Vibration Impacts

8.3.1 Assessment of Impacts – Operations (Except Blasting)

8.3.1.1 Vibration Sources

Table 19 provides indicative vibration source levels for the vibration-significant equipment used at the quarry. It should be noted that there are no vibration source levels for the processing plant, however these plant elements typically do not create high levels of ground vibration, as they are designed to constrain and direct almost all of their vibration energy into performing their primary functions on the product material.

Table 19: Intermittent Vibration Sources

Location	Preferred Limit (mm/s)	Source
Loaded trucks (rough surface)	5	USA DT [a)]
Loaded trucks (smooth surface)	1 – 2	USA DT [a)]
Excavator	2.5 – 4	DECCW
Loader	6 – 8	USA DT [a)]

a) Transit Noise and Vibration Impact Assessment, US Department of Transportation, May 2006.

8.3.1.2 Assessment of Potential Impacts

Based on the vibration source levels at 10 metres (presented in Table 19), peak particle velocities have been predicted at various separation distances. The NSW DECCW indicates that in predicting vibration levels, it can be assumed that the vibration level is inversely proportional to distance (with the relationship varying between $d^{-0.8}$ to $d^{-1.6}$ based on field data).

The US Department of Transportation's Transit Noise and Vibration Impact Assessment (May 2006) presents the following construction vibration propagation formula assuming an inverse relationship:

$$PPV@d_2 = PPV@d_1 \times (d_1/d_2)^{1.5}$$

where: d_1 = distance 1 (reference distance for source data) (m)

d_2 = distance 2 (separation distance for predicted PPV) (m)

PPV = peak particle velocity (mm/s)

The above formula has been considered for predicted PPVs at various distances from construction equipment. Based on the above information, Table 20 presents PPV predictions for the various construction equipment.

Table 20: Predicted Peak Particle Velocity at Sensitive Receptors (mm/s)

Distance from Source	Predicted Peak Particle Velocity (mm/s)			
	Loaded trucks (rough surface)	Loaded trucks (smooth surface)	Excavator	Loader
10	5	1 - 2	2.5 - 4	6 - 8
20	1.77	0.35 - 0.71	0.88 - 1.41	2.12 - 2.83
30	0.96	0.19 - 0.38	0.48 - 0.77	1.15 - 1.54
40	0.63	0.13 - 0.25	0.31 - 0.5	0.75 - 1
50	0.45	0.09 - 0.18	0.22 - 0.36	0.54 - 0.72
60	0.34	0.07 – 0.14	0.17 – 0.27	0.41 – 0.54
80	0.22	0.04 – 0.09	0.11 – 0.18	0.27 – 0.35
100	0.16	0.03 - 0.06	0.08 - 0.13	0.19 - 0.25
150	0.09	0.02 - 0.03	0.04 - 0.07	0.1 - 0.14
200	0.06	0.01 - 0.02	0.03 - 0.04	0.07 - 0.09
250	0.04	0.01 - 0.02	0.02 - 0.03	0.05 - 0.06
Type	Intermittent	Intermittent	Continuous	Continuous
Nuisance Criteria	8.6 (preferred) / 17 (max)		0.28 (preferred) / 0.56 (max)	
Building Criteria	15 mm/s at 4 Hz increasing to 20 mm/s at 15 Hz 20 mm/s at 15 Hz increasing to 50 mm/s at 40 Hz and above			

The predicted vibration levels presented in Table 20 indicate compliance with the continuous preferred vibration nuisance criteria for locations at a separation distance of 40-80 metres. As the closest receptors are beyond these distances, nuisance vibration criteria will be achieved.

Compliance with the building damage criteria is predicted at 10 metres from operations for each source.

For intermittent vibration associated with haul vehicles, it is difficult to provide an appropriate comparison with the relevant criteria (which is presented as a Vibration Dose Value (VDV) in $m/s^{1.75}$). The calculation of a VDV requires both the overall weighted RMS (root mean square), and acceleration (m/s^2), typically obtained from on-site measurements and the estimated time period for vibration events.

It is noted that, however, that haul truck movements (on rough surfaces) at distances of >50 m is predicted to comply within the maximum continuous criteria of 0.56 mm/s. This comparison with the continuous criteria (as a conservative approach) indicates that vibration levels associated with operation of the quarry are not considered to be significant (which is expected given the significant separation distances).

8.3.2 Assessment of Impacts - Blasting

8.3.2.1 Existing Monitoring and Blasting

During blasting events the contractor undertaking the blasting did not conduct any monitoring as receptors are about 2km away from the current blast location.

A drilling and blasting report provided the client conducted on the 30 April 2021 stated that the Heaviest Charge Detonated at any Instance (MIC) was 130kg, which was adopted for this assessment

8.3.2.2 Airblast Overpressure

Airblast levels have been estimated using the following equation from AS 2187.2-2006, *"Explosives - Storage and use - Use of explosives"*:

$$P = K_a \left(\frac{R}{Q^{1/3}}\right)^a$$

Where:

P = pressure (kPa)

Q = explosives mass charge (kg)

R = distance from charge (m)

K_a = site constant (10 – 100)

A = site exponent (-1.45)

Applying a site constant (K_a) of 10 for receptor R05, a conservative MIC of 130 kg results in predicted compliance with the criterion of 100 dB(Lin Peak) at all nearby receptors.

8.3.2.3 Ground Vibration

Ground vibration levels have been estimated using the following equation from AS 2187.2-2006 *"Explosives - Storage and use - Use of explosives"*:

$$V = K_g \left(\frac{R}{Q^{1/2}}\right)^{-B}$$

Where:

V = ground vibration as PPV (mm/s)

Q = explosives mass charge (kg)

R = distance from charge (m)

K_g = site constant (1140)

B = site constant (1.6)

Applying the MIC as determined from the air blast overpressure calculation of 130 kg, the ground vibration level predicted to occur at receptor R05 is 0.3 mm/s, which complies with the criterion of 5 mm/sec.

It should be noted however that the impacts of blasting are dependent on-site specific factors including the blast management techniques, ground conditions and geological strata types and locations.

9 CONCLUSIONS

9.1 Noise

A noise impact assessment has been undertaken to confirm the suitability of the proposal in terms of acoustic amenity for nearby sensitive uses. Specifically, the assessment has considered the potential for adverse impacts upon existing residential land uses as a result of noise emissions associated with current quarry, future quarry, asphalt plant and a combined scenario.

Predictive noise modelling has been undertaken for the site to assess the potential impacts of noise emission from quarry operations and traffic generation. The results of the predictive noise modelling have determined that compliance with the adopted noise criteria is expected to be achieved without any additional acoustic mitigation for the proposed modification.

9.2 Vibration

A vibration impact assessment has been undertaken to confirm the suitability of the proposed modification in terms of amenity for nearby sensitive uses. Specifically, the assessment has considered the potential for adverse impacts upon existing residential land uses from plant and equipment during quarry operations. In particular, the assessment has considered the potential for impacts on both human comfort and structural damage for the nearest residence to the quarry. The assessment indicates that the current and proposed quarry operations comply with the applicable vibration criteria.

Predictive screening assessment has been undertaken for the proposed modification to assess the potential impacts of ground vibration and airblast from blasting at the quarry based on conservative blasting assumptions. The results of the screening assessment have determined that compliance with the adopted criteria for ground vibration and airblast are expected to be achieved with a MIC size less than 1000 kg. Blasting at the quarry will be able to continue to achieve compliance with vibration and airblast limits using different sizes of MIC along with a combination of appropriate site-specific blast design parameters.

APPENDIX A: BACKGROUND NOISE MONITORING

Table 21: NML 1 - Site Details

Site Details: NML 1	
Coordinates:	-23.4930991 "S, 150.5410027"E
Start / End Date	2 Dec 2021 at 16:00 hours to 10 Dec 2021 at 15:00 hours
Logger Details	Norsonic 139 (serial number – 1392970) Next Laboratory Calibration Due: 10 October 2023
Calibration Details	Norsonic 1256 (serial number 125626741) Start / End Calibration Level: 94.0 dB(A) / 94.0 dB(A) Next Laboratory Calibration Due: 28 Oct 2022
Measurement Details:	Fast/ A-weighting / 15-min duration / 1.2 m microphone height / Free field position
Weather Details	Onsite weather station indicated during the monitoring period one hour of data was affected by rainfall.
On-site Observations:	Located on boundary of caravan park. Dominant noise sources were traffic, wind through trees, and birdsong.
Site Photo	

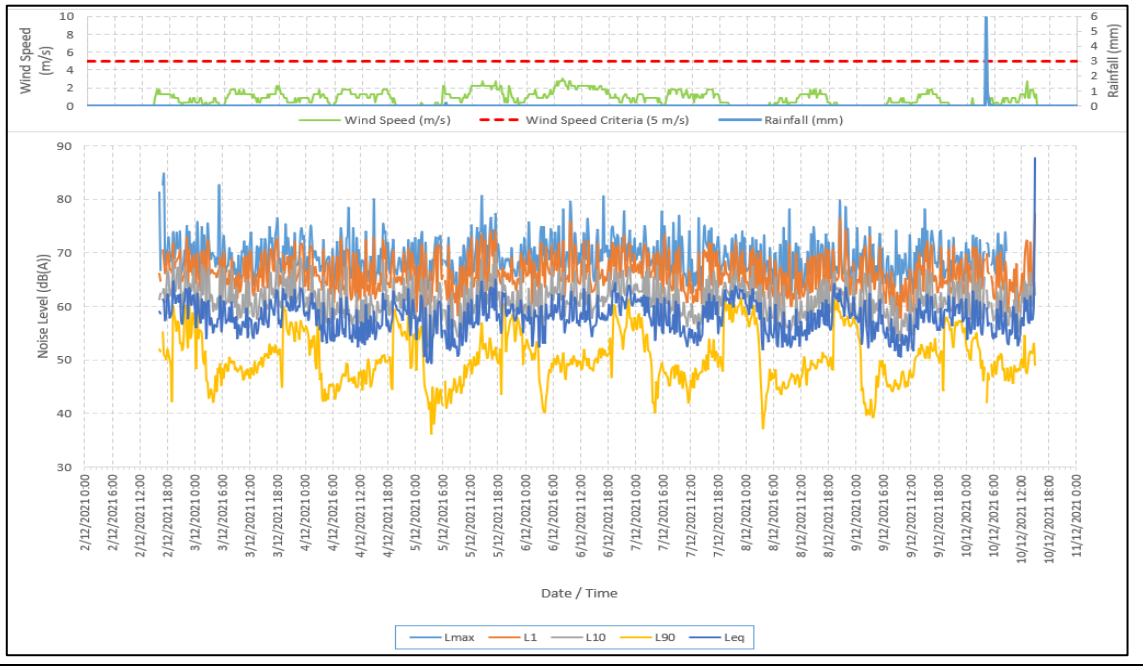
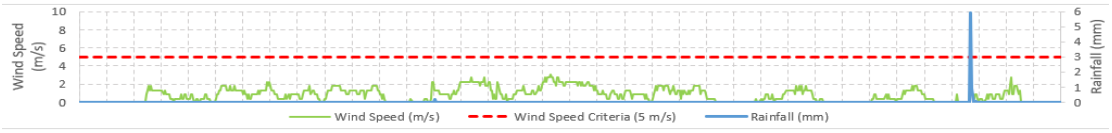


Table 22: NML 1 - Noise Monitoring Results

Date	Period	L_{max}	L_1	L_{10}	L_{90}	L_{eq}	minL_{90}, 1-hour	medianL_{eq}, 1-hour
2/12/2021	Day	-	-	-	-	-	-	-
	Evening	73.9	67.8	64.2	53.7	61.0	49.3	60.9
	Night	82.7	67.3	62.7	50.4	59.8	43.8	59.2
3/12/2021	Day	74.7	66.1	61.3	49.2	58.0	47.2	58.0
	Evening	76.3	67.2	63.5	54.4	60.6	49.5	60.5
	Night	75.1	66.3	61.3	50.2	58.9	42.7	58.3
4/12/2021	Day	80.0	65.7	59.7	47.4	57.2	45.0	56.2
	Evening	72.3	65.9	61.4	53.9	59.1	47.6	59.2
	Night	73.8	65.8	59.5	47.5	57.9	40.9	57.0
5/12/2021	Day	80.6	66.2	60.8	48.6	59.1	44.0	58.1
	Evening	71.6	65.6	61.4	54.7	59.5	49.5	59.1
	Night	75.7	66.8	60.8	49.9	58.3	43.2	58.4
6/12/2021	Day	80.6	66.6	61.9	49.7	58.9	48.2	58.7
	Evening	77.7	68.7	64.1	54.8	61.1	51.1	60.9
	Night	77.6	67.5	62.8	52.0	60.3	44.3	60.4
7/12/2021	Day	76.8	65.7	60.3	47.8	57.7	44.8	57.7
	Evening	73.2	66.4	62.8	56.1	60.9	48.8	61.5
	Night	74.0	65.7	61.7	52.4	59.9	42.8	59.7
8/12/2021	Day	78.1	64.9	59.5	47.5	56.6	44.7	56.2
	Evening	79.8	67.2	62.9	55.7	61.0	48.5	61.4
	Night	74.8	65.8	60.7	48.4	58.1	40.2	57.7
9/12/2021	Day	78.1	64.1	59.5	48.5	57.0	44.9	55.2
	Evening	74.1	65.4	60.9	53.9	58.8	49.9	59.1
	Night	73.2	65.8	61.0	51.6	58.4	47.0	58.4

Table 23: NML 2 - Site Details

Site Details: NML 2	
Coordinates:	-23.470884"S, 150.516685"E
Start / End Date	2 Dec 2021 at 13:27 hours to 5 Dec 2021 at 15:12 hours
Logger Details	Rion NL42 (serial number – 01047100) Next Laboratory Calibration Due: 13 August 2023
Calibration Details	Norsonic 1256 (serial number 125626741) Start / End Calibration Level: 94.0 dB(A) / 93.0 dB(A) Next Laboratory Calibration Due: 28 Oct 2022
Measurement Details:	Fast/ A-weighting / 15-minute duration / 1.2 m microphone height / Free field position
Weather Details	Onsite weather station indicated during the monitoring period 15 minutes of data was affected by rainfall.
On-site Observations:	Located near the northern aspect of site near the residential area off Gavial Gracemere Road. Dominant noise sources were animals, wind through trees, and birdsong.
Site Photo	



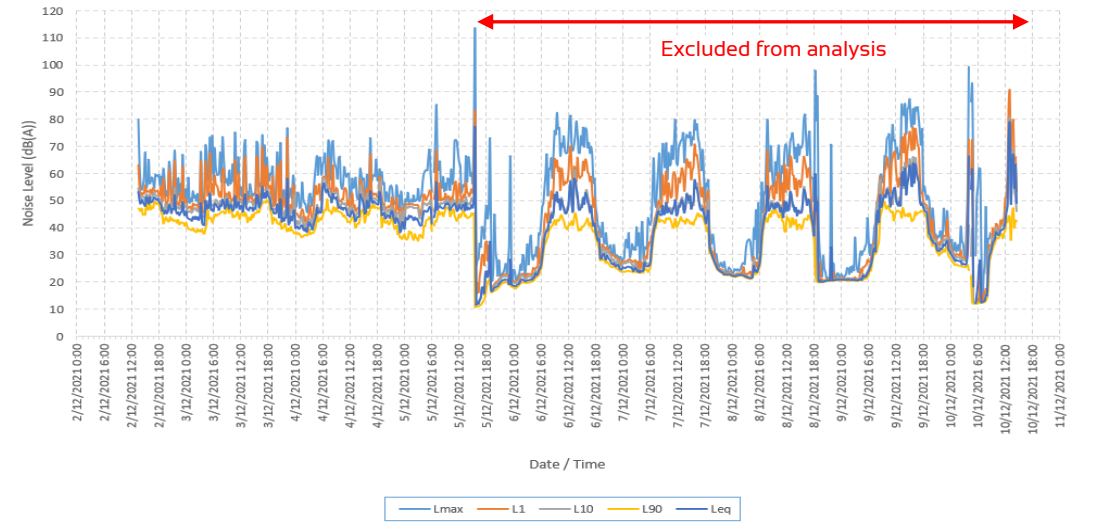
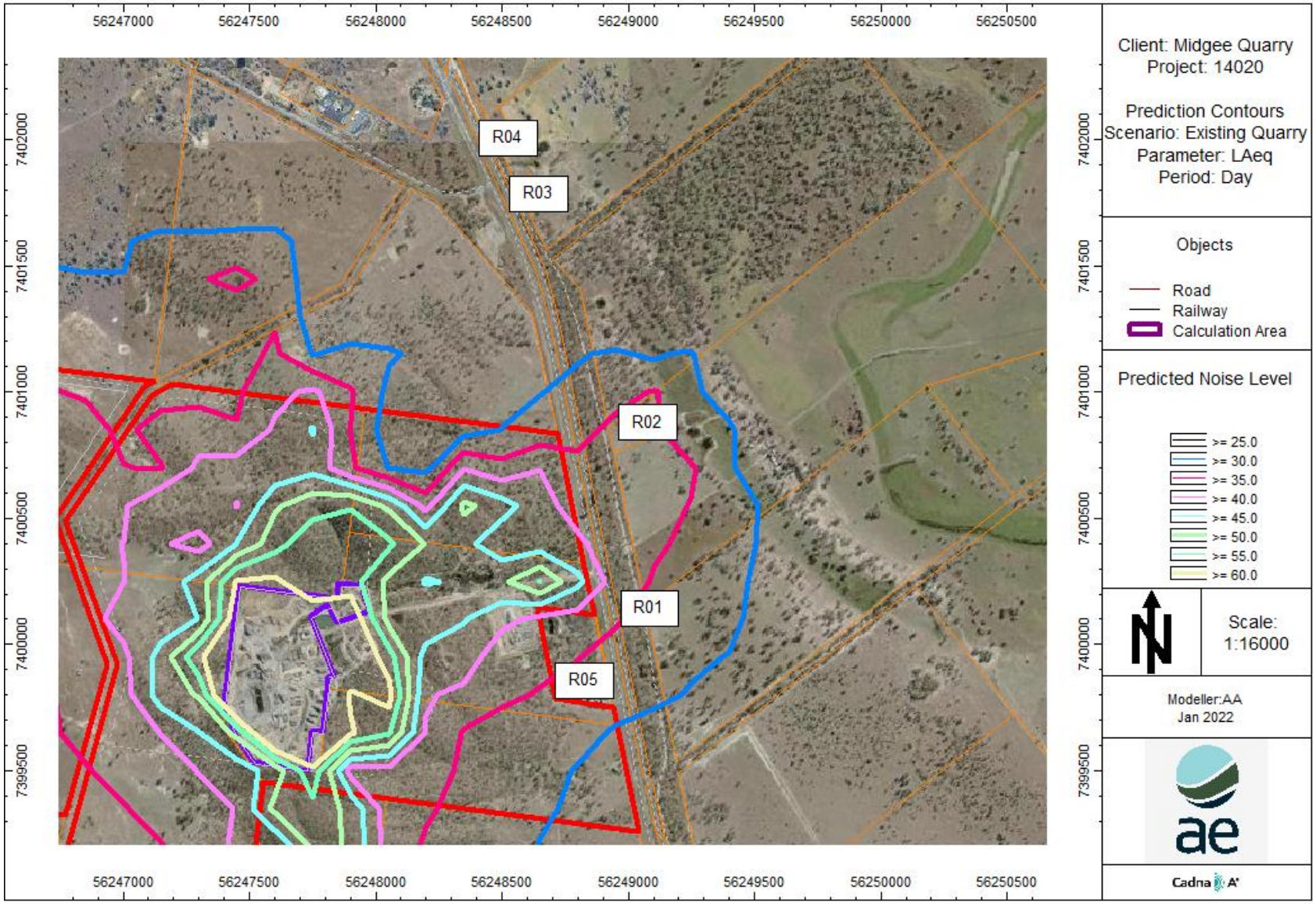


Table 24: NML 2 - Noise Monitoring Results

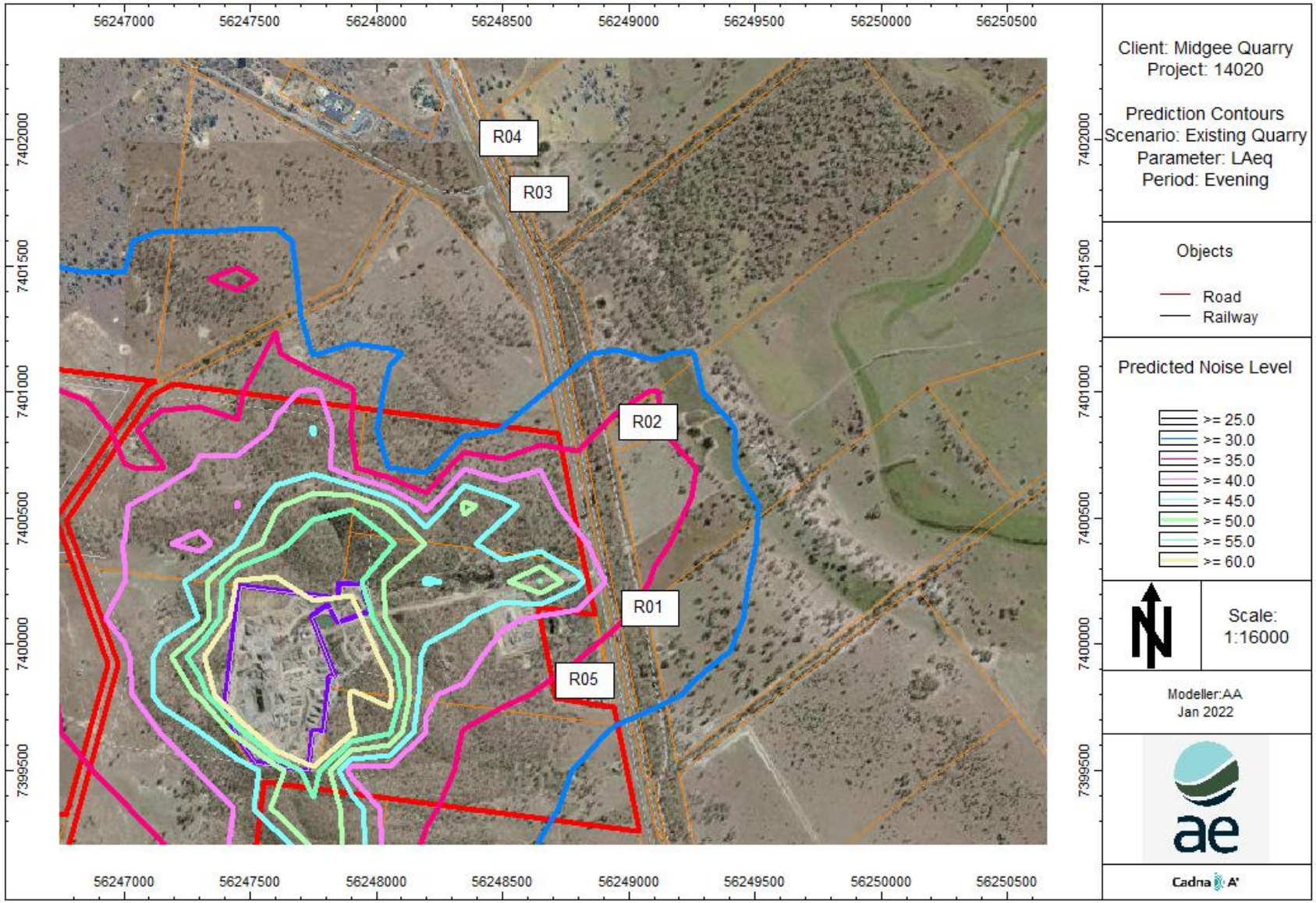
Date	Period	L_{max}	L_1	L_{10}	L_{90}	L_{eq}	minL_{90}, 1-hour	medianL_{eq}, 1-hour
2/12/2021	Day	-	-	-	-	-	-	-
	Evening	68.4	53.5	48.9	43.7	47.7	42.3	47.7
	Night	73.9	51.8	47.2	41.0	46.3	38.7	45.2
3/12/2021	Day	75.1	54.5	49.7	45.6	49.3	43.7	48.7
	Evening	71.2	53.1	47.6	43.1	47.5	40.1	46.8
	Night	76.7	49.5	45.6	39.8	48.3	37.2	44.5
4/12/2021	Day	73.0	52.7	49.8	45.0	49.1	41.9	49.1
	Evening	61.6	49.8	47.9	43.3	47.0	40.8	44.7
	Night	71.3	48.5	46.3	38.4	43.8	35.9	43.2

APPENDIX B: NOISE CONTOURS

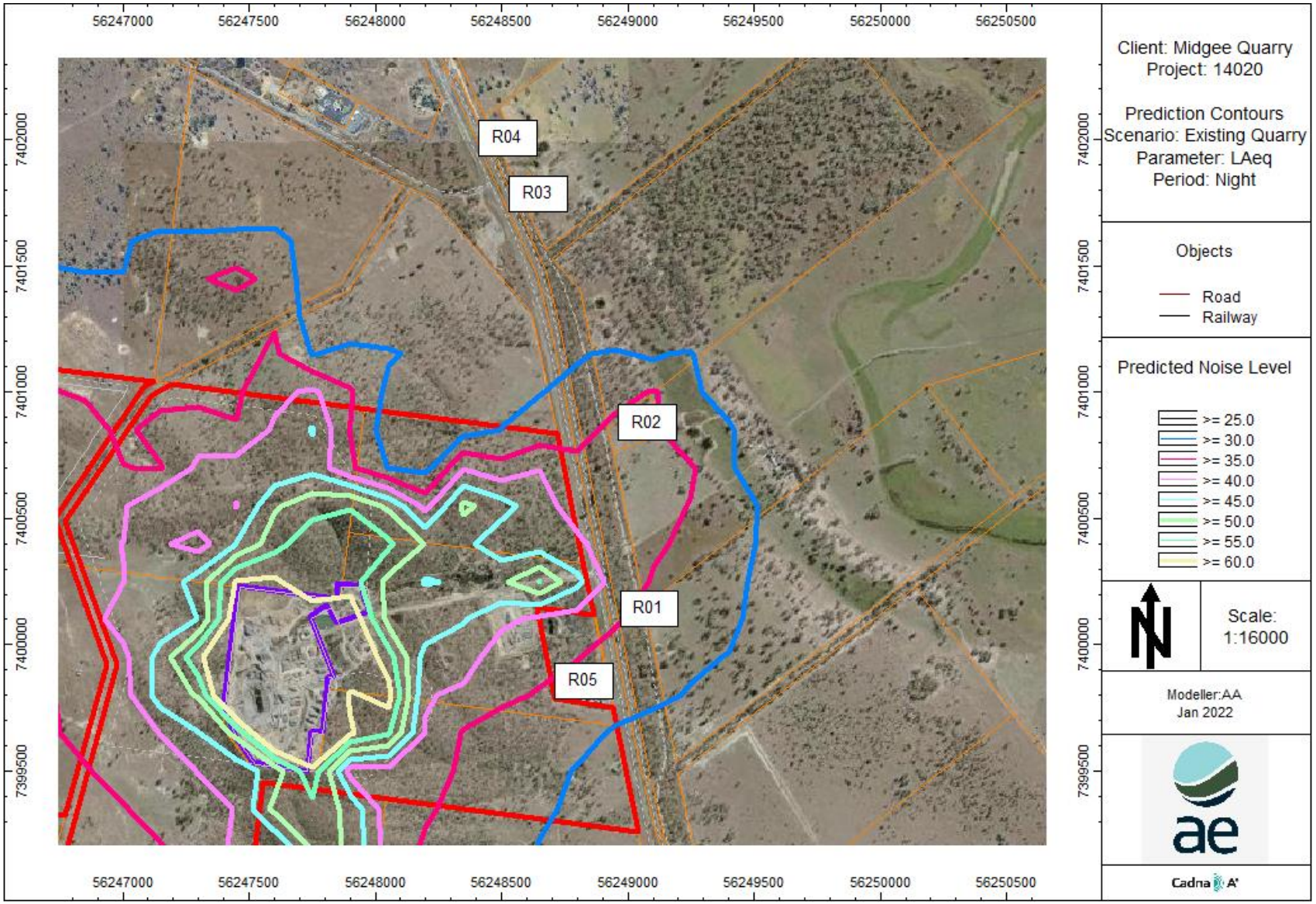
Contour plots illustrate the spatial distribution of ground-level concentrations across the modelling domain for each time period of interest. However, this process of interpolation causes a smoothing of the base data that can lead to minor differences between the contours and receptor model predictions.



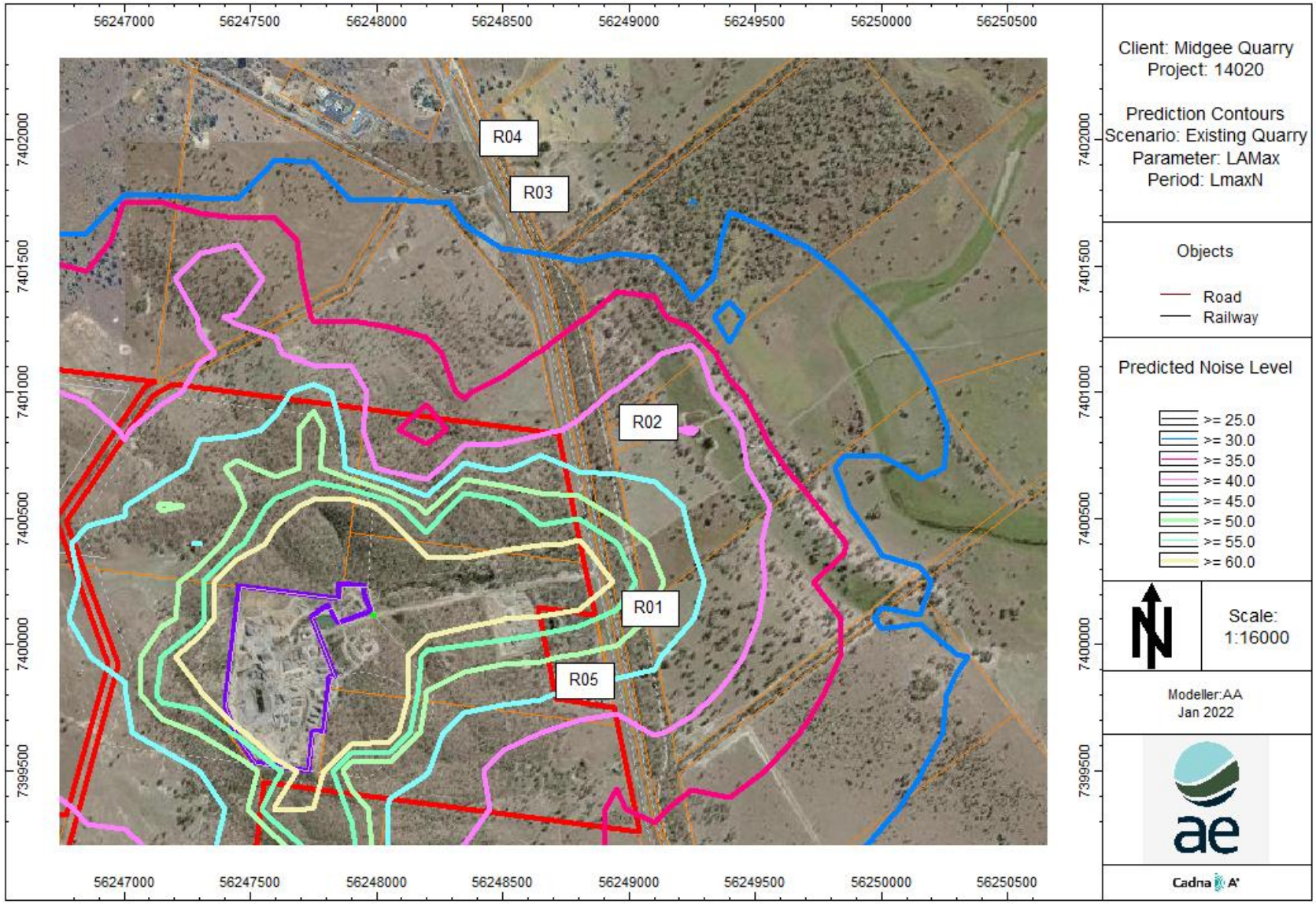
Noise Contours Day Time for Existing Quarry at 1.5m- L_{Aeq}



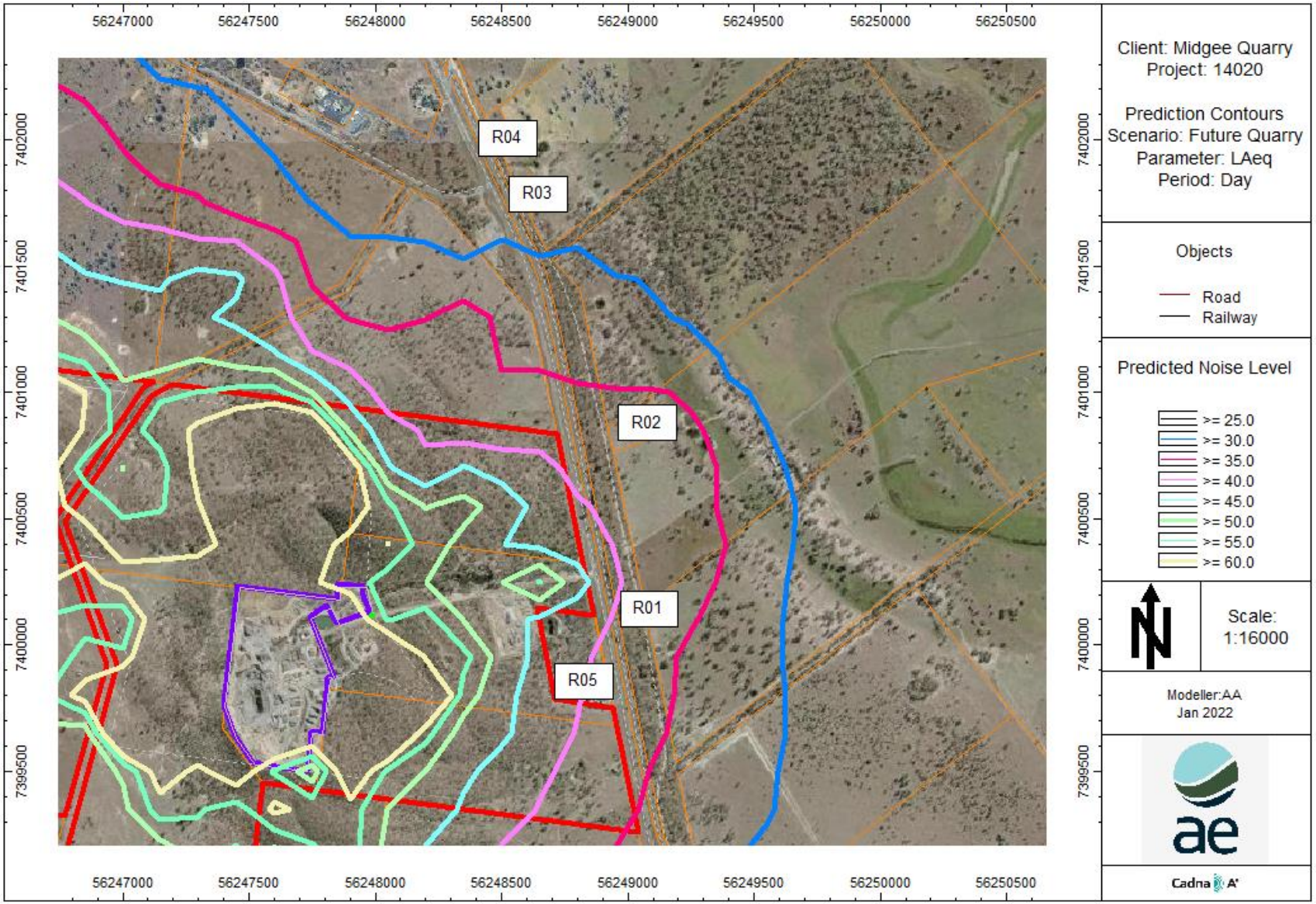
Noise Contours Evening Time for Existing Quarry at 1.5m- L_{Aeq}



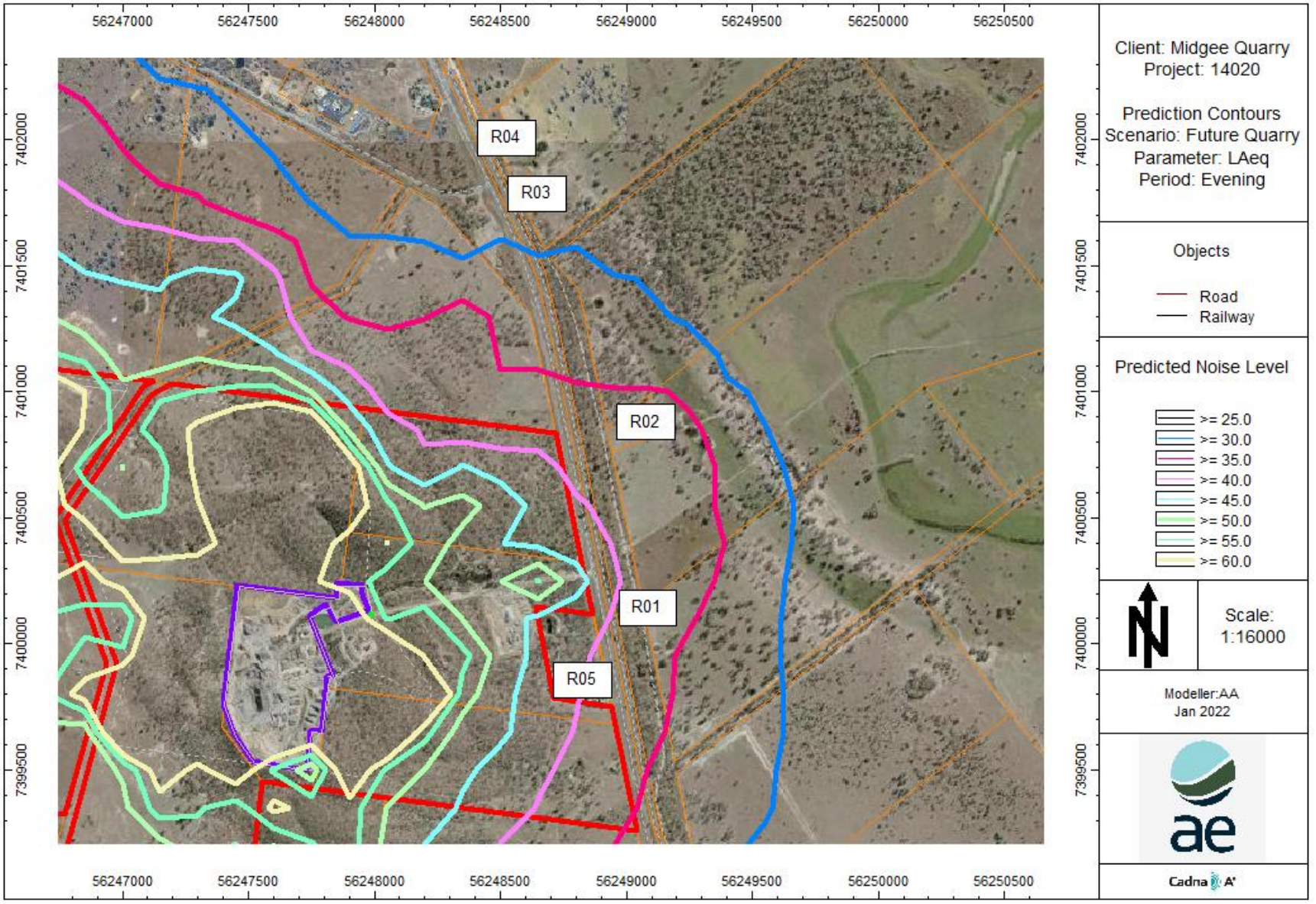
Noise Contours Night Time for Existing Quarry at 1.5m- L_{Aeq}



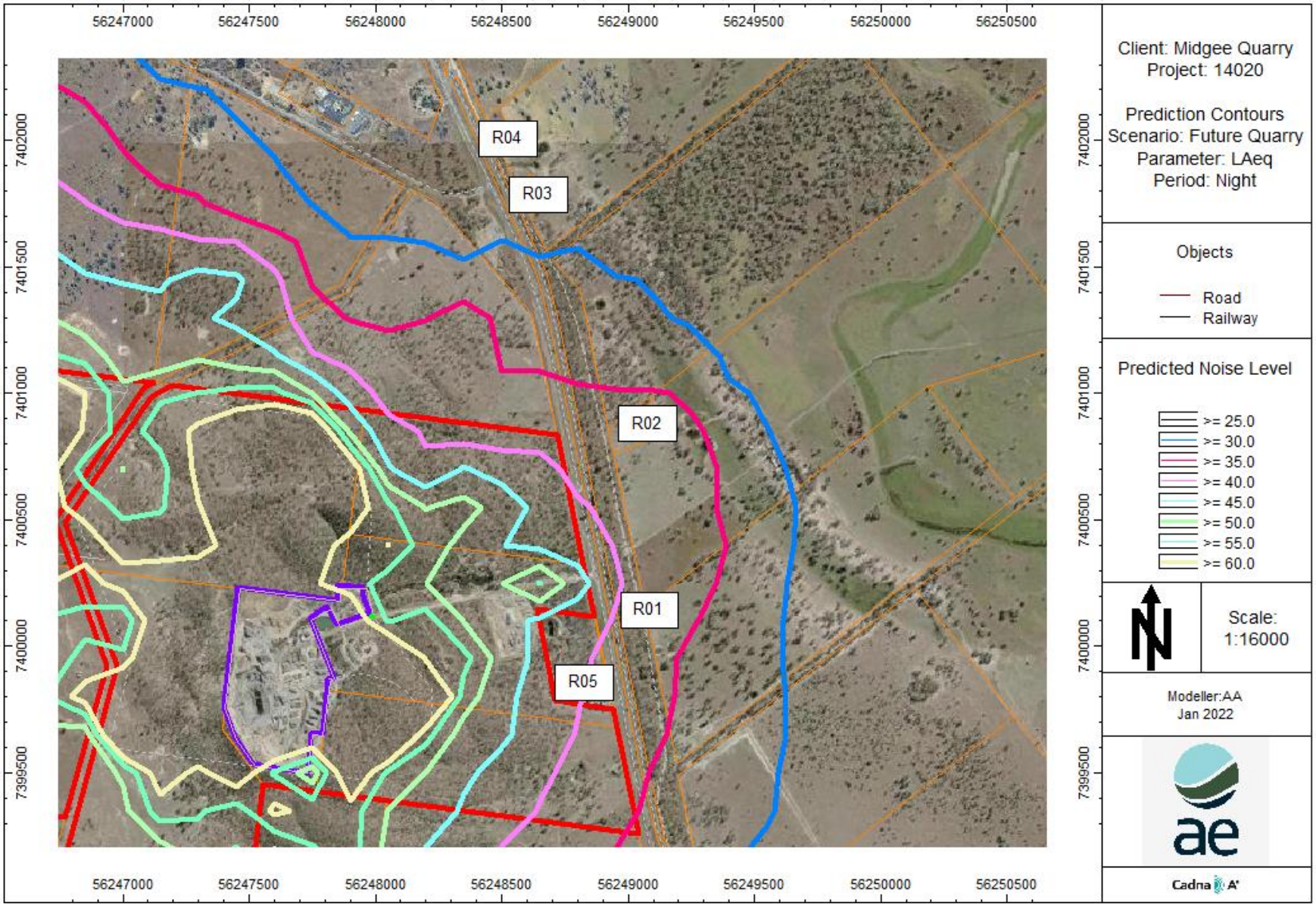
Noise Contours Night Time for Existing Quarry at 1.5m- L_{Amax}



Noise Contours Day Time for Future Quarry at 1.5m- L_{Aeq}



Noise Contours Evening Time for Future Quarry at 1.5m- L_{Aeq}



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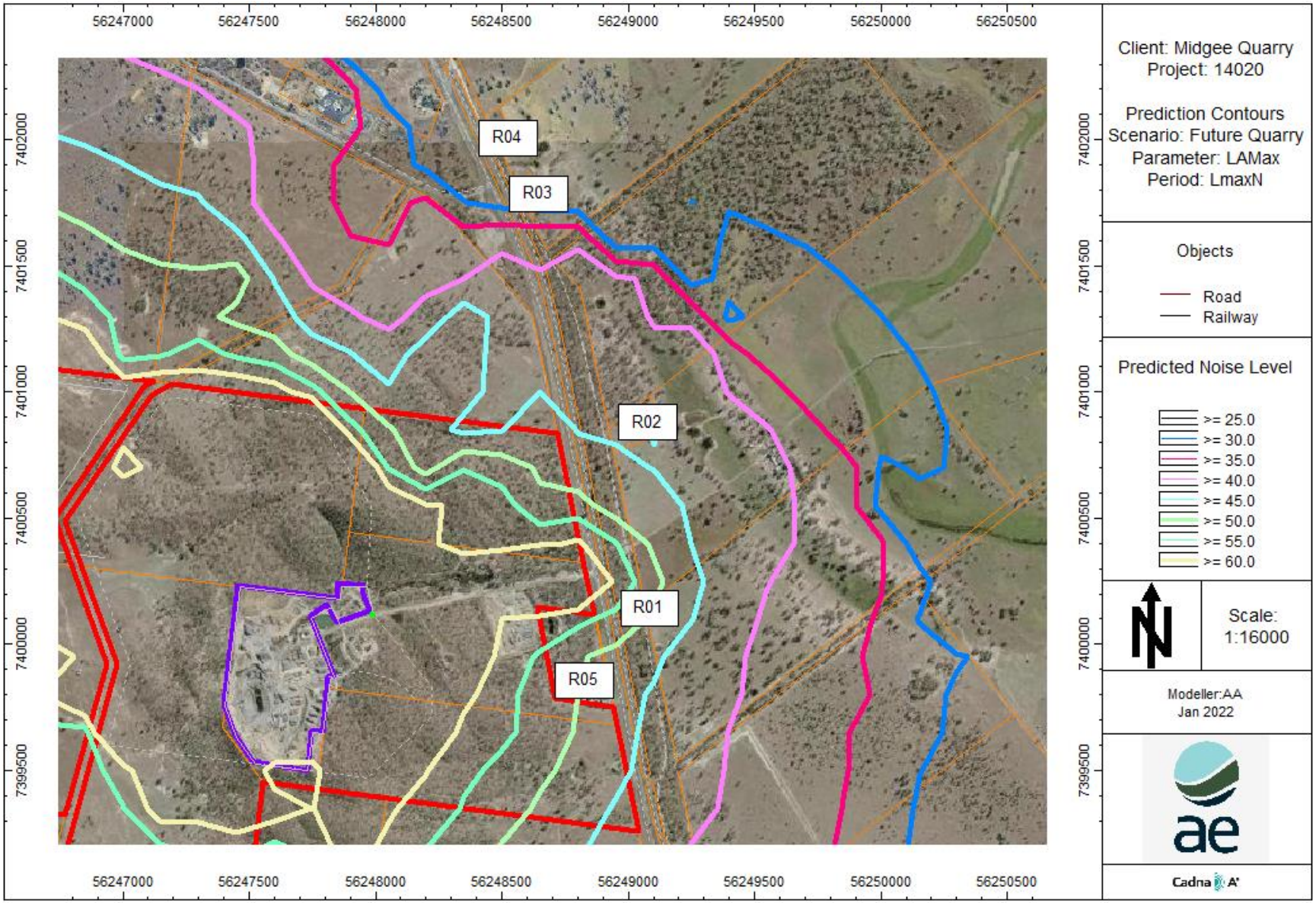

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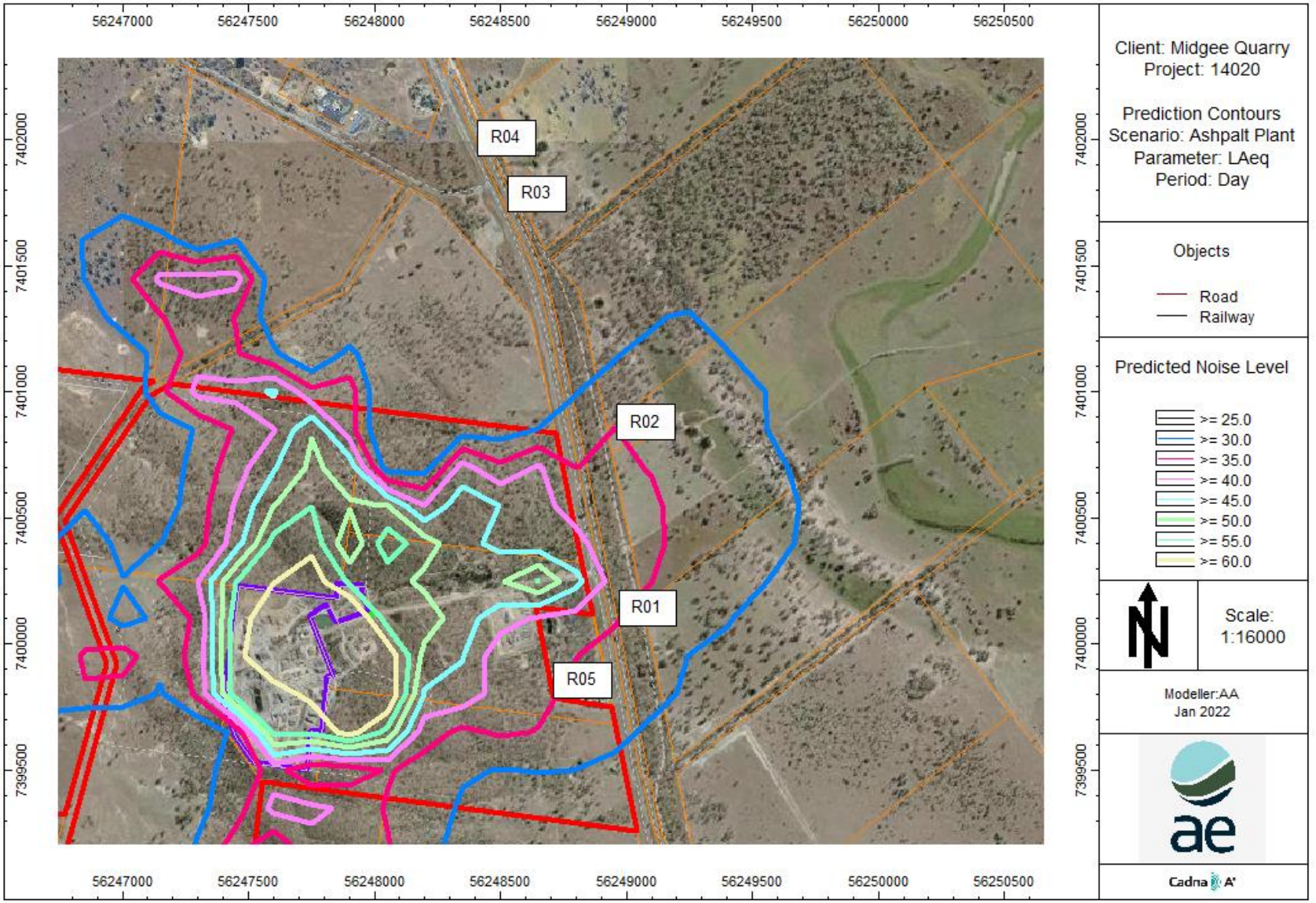

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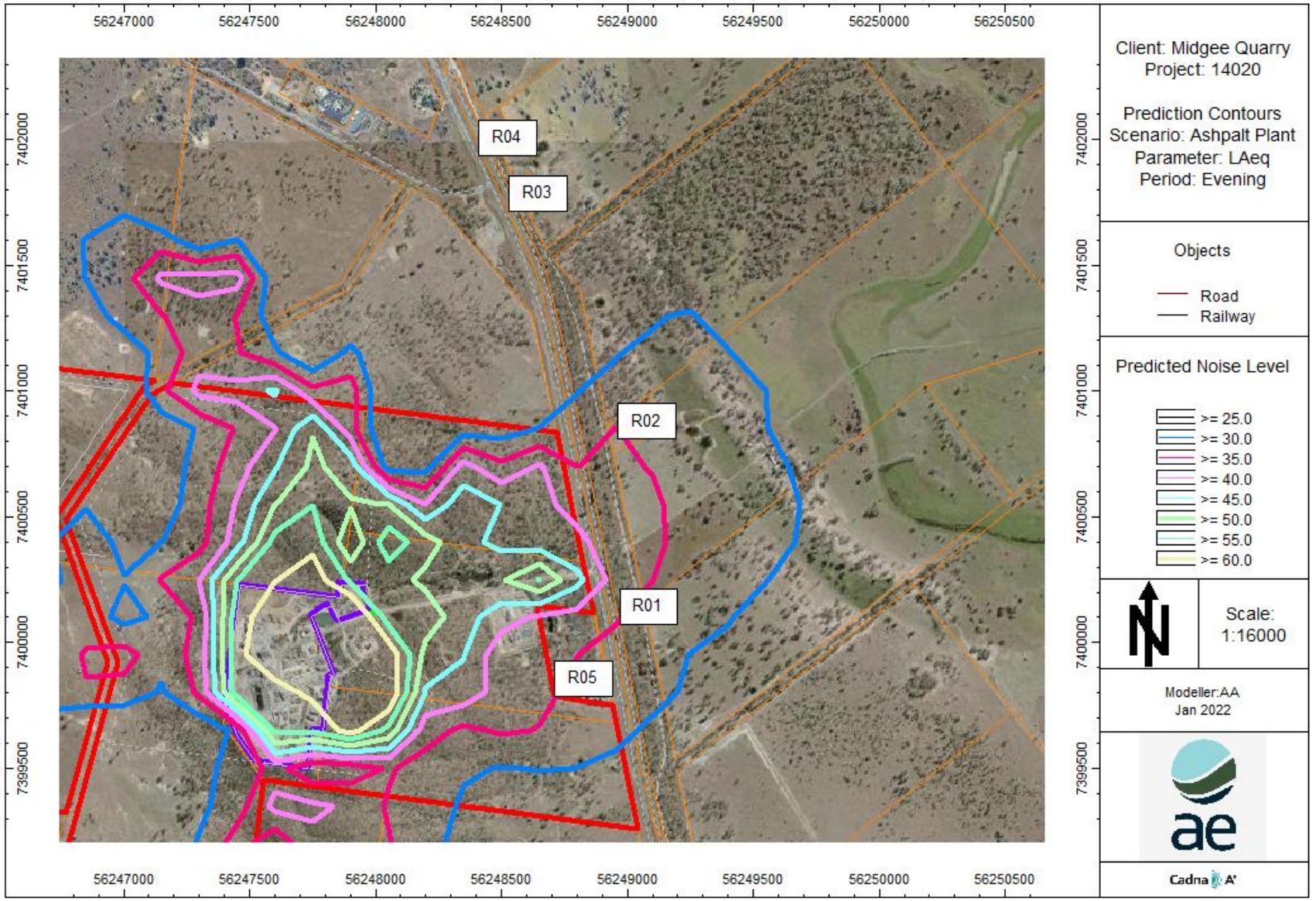

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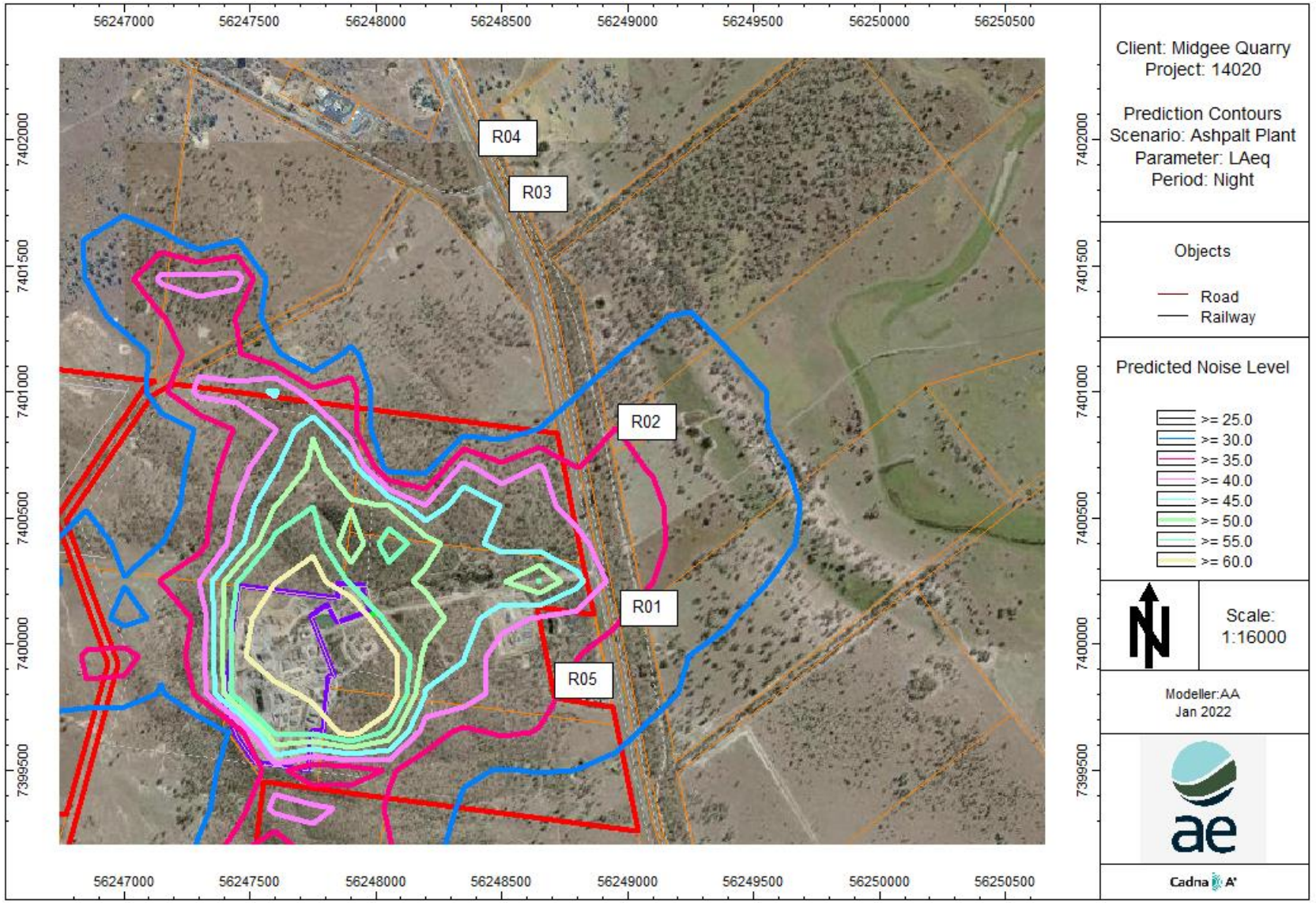

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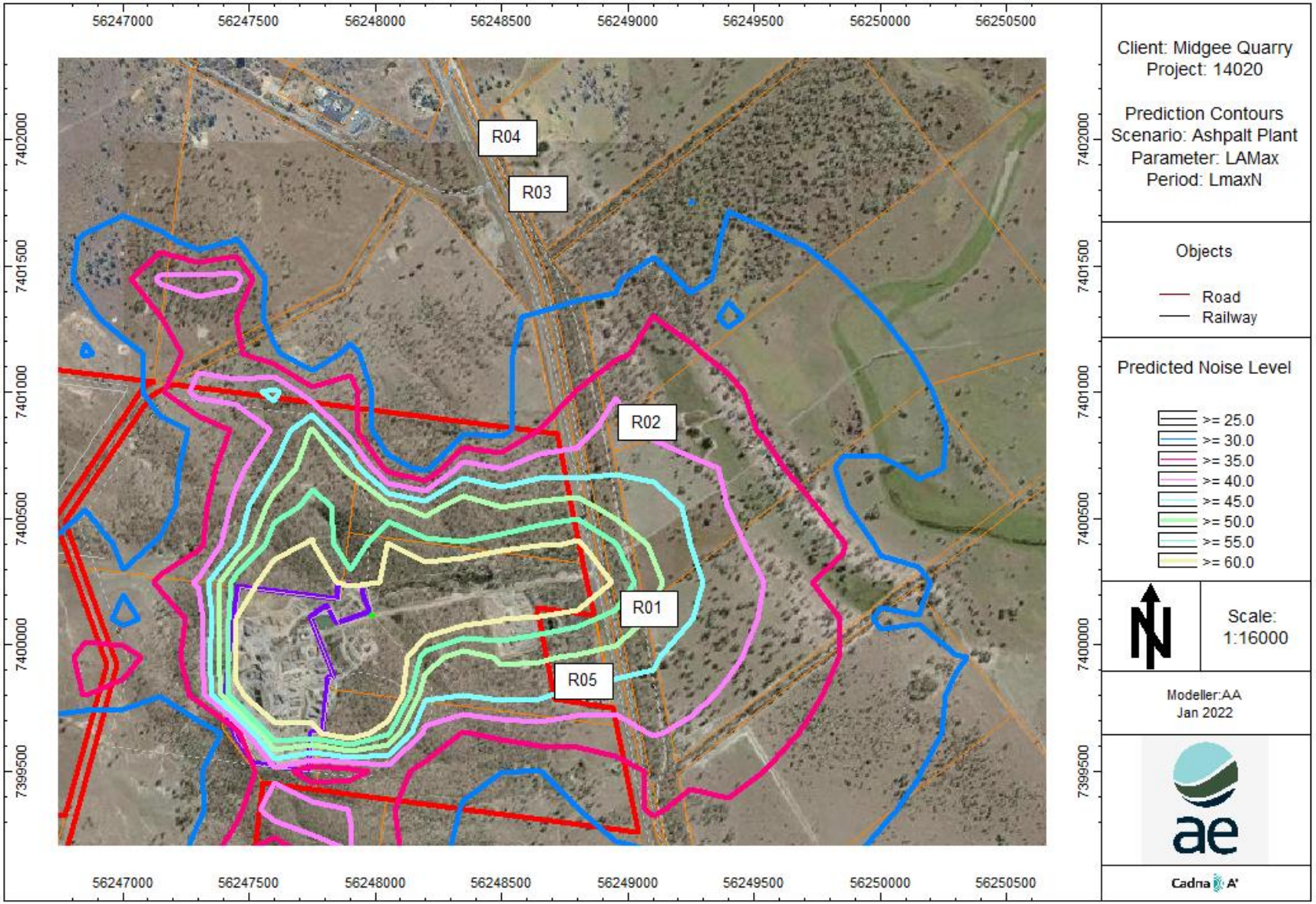

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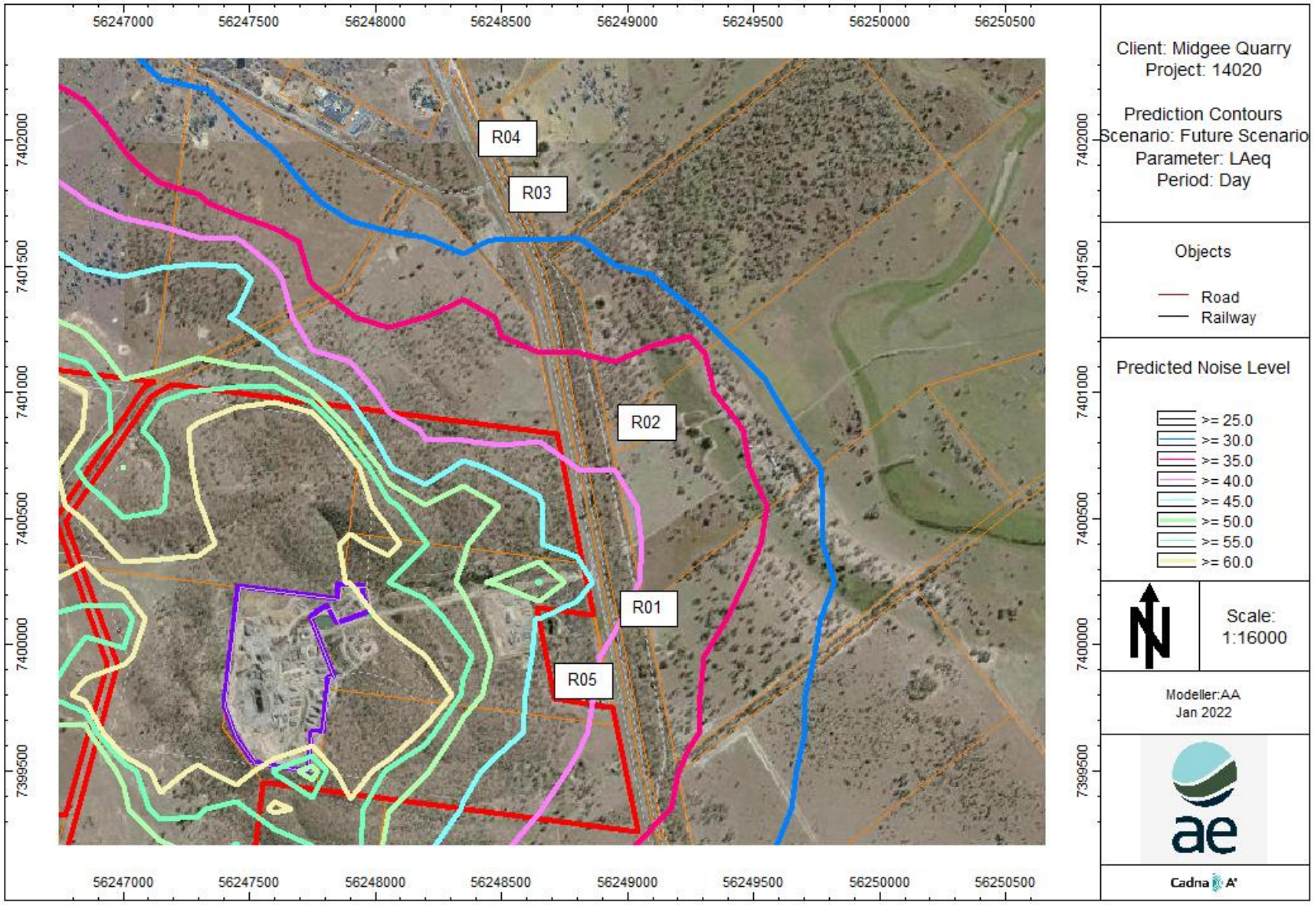

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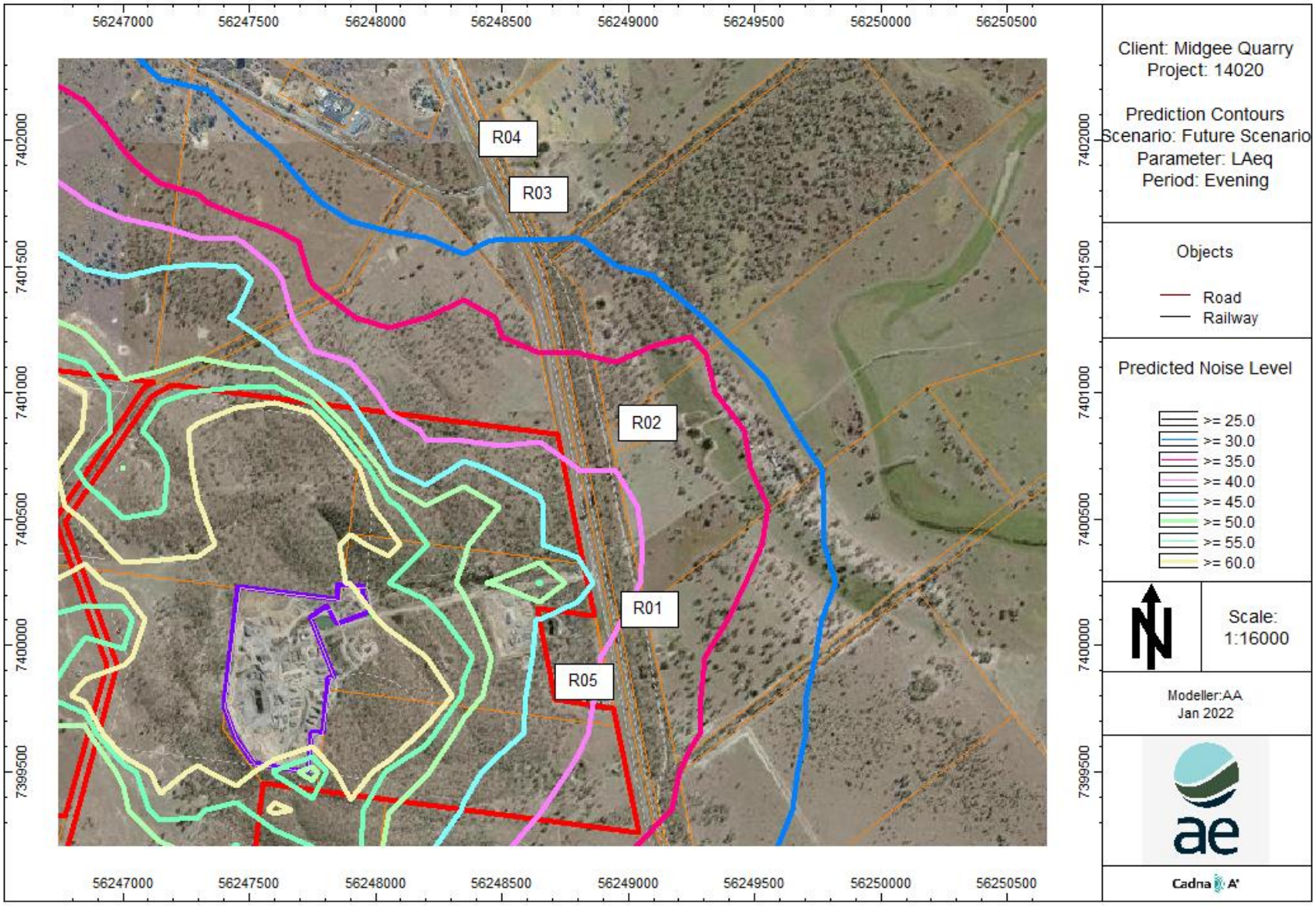

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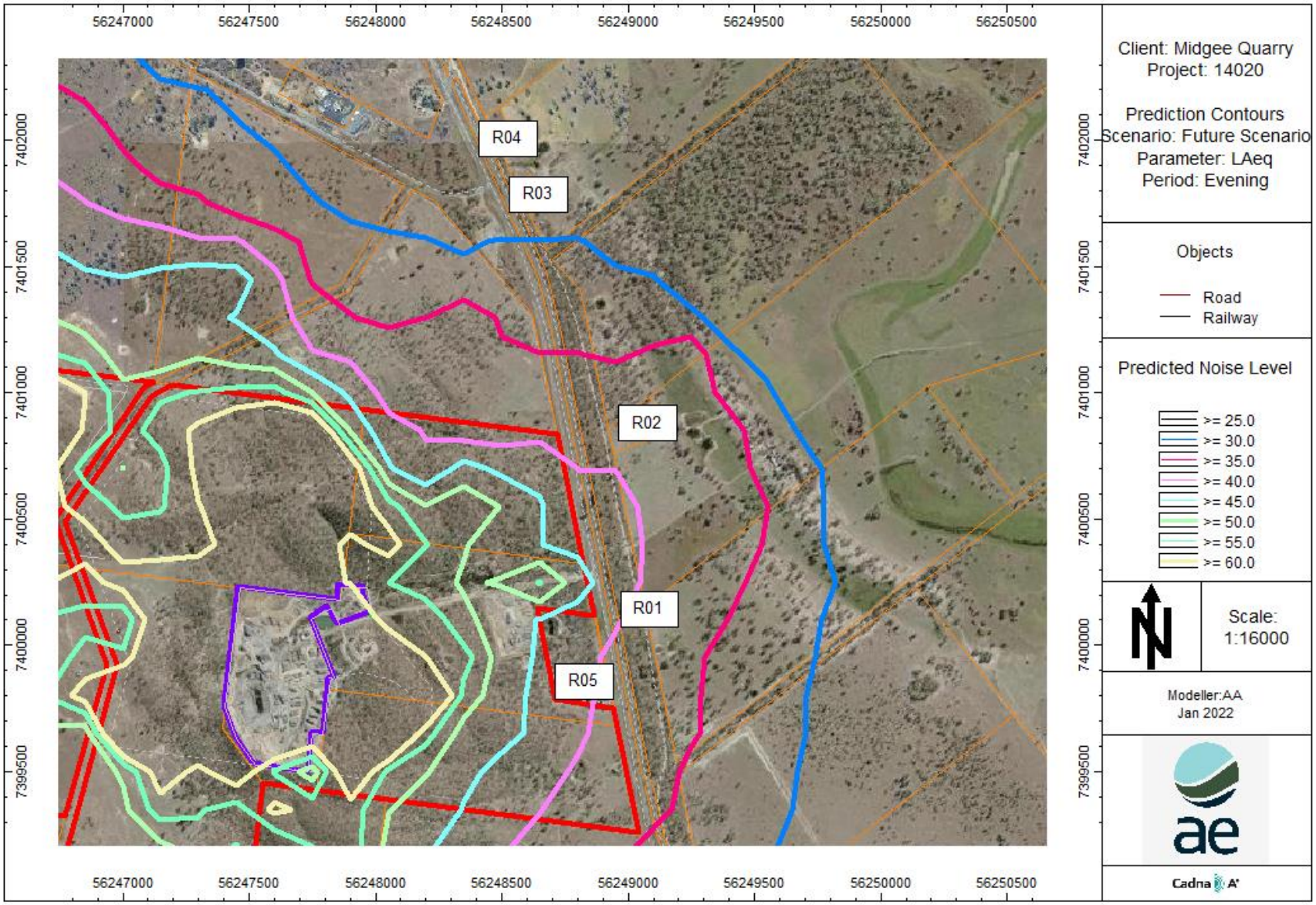

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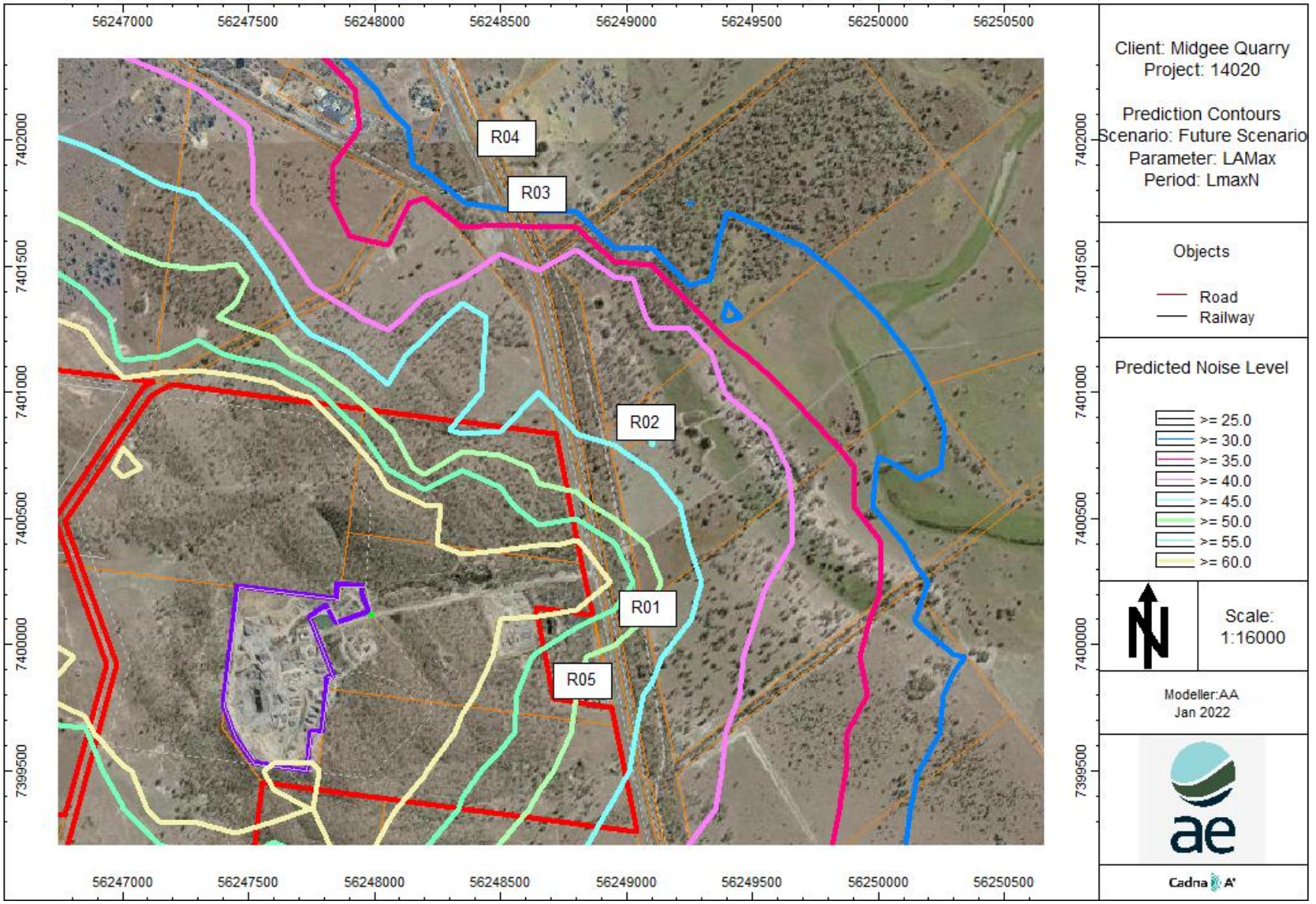

Noise Contours Night Time for Future Scenario at 1.5m- L_{AMax}

MIDGEE QUARRY - AIR QUALITY ASSESSMENT

Project ID: 14020

8/02/2022

Release: R2



Prepared For:

Hopkins Brothers Group Pty Ltd

Assured Environmental

DOCUMENT CONTROL PAGE

Project Title: MIDGEE QUARRY - AIR QUALITY ASSESSMENT

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Table 1: History of Revisions

Revision	Date	Issued to	Changes
R0	22/12/2021	M. Benham	Draft Release for Comment
R1	25/01/2022	M. Benham	Formal Release
R2	8/02/2022	M. Benham	Typos

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GLOSSARY

°C	Degrees centigrade
Conversion of ppm to mg/m^3	Where R is the ideal gas constant; T, the temperature in kelvin (273.16 + T°C); and P, the pressure in mm Hg, the conversion is as follows: $mg\ m^3 = (P/RT) \times Molecular\ weight \times (concentration\ in\ ppm)$ $= \frac{P \times Molecular\ weight \times (concentration\ in\ ppm)}{62.4 \times (273.2 + T°C)}$ For the purposes of the air quality assessment all conversions were made at 0°C unless stated otherwise.
g/s	Grams per second.
g/m^2	Gram per metre square.
g/m^2/month	Gram per metre square per month.
ha	Hectares.
m	Metre.
m/s	Metres per second
mg/m^3	Milligrams (10-3) per cubic metre. Conversions from mg/m^3 to parts per volume concentrations (i.e., ppm) are calculated at 0 °C.
kg	Kilograms.
kg/annum	Kilograms per annum.
km	Kilometre
$\mu g/m^3$	Micrograms (10-6) per cubic metre. Conversions from $\mu g/m^3$ to parts per volume concentrations (i.e., ppb) are calculated at 0 °C.
ppb	Parts per billion.
ppm	Parts per million.
PM_{10}, $PM_{2.5}$, PM_1	Fine particulate matter with an equivalent aerodynamic diameter of less than 10, 2.5 or 1 micrometres, respectively. Fine particulates are predominantly sourced from combustion processes. Vehicle emissions are a key source in urban environments.
TSP	Total suspended particulate.
70th percentile	The value exceeded for 70 % of the time.

ABBREVIATIONS

AQMP	Air Quality Management Plan
DES	Department of Environment and Science
EA	Environmental Authority
ERA	Environmentally Relevant Activities
GLC	Ground Level Concentration
tpa	Tonnes per annum

Mtpa	Million tonnes per annum
NPI	National Pollutant Inventory
RRC	Rockhampton Regional Council

1 INTRODUCTION

1.1 Background

Hopkins Brothers have been operating the Midgee Quarry on the Bruce Highway, Midgee, since the early 2000s. Historically, the site has been used to extract material since the 1960s. The quarry operation has evolved over the years to respond to market demand, resulting in various planning permits having been obtained from Rockhampton Regional Council (RRC).

Local demand for quarry resources is anticipated to increase in the next decade, driven by regional significant infrastructure projects and a general increase in development within the region. As such, Hopkins Brothers are seeking to secure access to the known resource.

The most recent approval was granted by RRC on 6 November 2018, which extended the existing operational area, concrete crushing operations and an outdoor storage area to store extracted material and equipment associated with the extractive and industrial operations on the site.

The permit change aims to increase the current hours of operation, pit area, and output to a maximum of 2,000,000 tonnes per annum.

1.2 Scope of Assessment

Assured Environmental (AE) was appointed by Groundwork Plus on behalf of Hopkins Brothers Group Pty Ltd to undertake an air quality assessment from the expansion of the quarry.

In undertaking the assessment, reference has also been made to the Department of Environment & Science (DES) *Guideline - Application requirements for activities with impacts to air* (2019).

In accordance with the requirements of the above guidelines, computational modelling and first principle calculations have been undertaken to assess the potential for adverse amenity and health impacts as a result of the proposed development.

1.3 This Report

This report summarises the methodology, results, and conclusions of the air quality assessment.

2 MIDGEE QUARRY OPERATIONS

2.1 Existing Operations

Hopeman Pty Ltd trading as Hopkins Brothers Group Pty Ltd, operate the existing operations at Lot 2 on RP888747. The existing approvals for this site include the quarry and an asphalt plant.

2.1.1 Quarry

Resource has been sourced from the site since the 1960s. The current operation has evolved over the years to respond to market demand, resulting in various planning permits having been obtained from Council.

On 6 November 2018, Rockhampton Regional Council approved the current operation (Council Ref: D/79-2017). This permit extended the existing operational area, concreate crushing operations and the outdoor storage area to store extracted material and equipment associated with the extractive and industrial operations.

The site also operates pursuant to an Environmental Authority (EA) for Environmentally Relevant Activities 16(2)(b) and 16(3)(b) for extracting and screening between 100,000 to 1,000,000 tonnes of material per year (DES Ref: IPCE01813610), dated 19 January 2010.

Hopkins Brothers has advised that the existing quarry produced a total of 700,000 – 800,000 tonnes over past 5 years.

2.1.2 Asphalt Plant

On 9 April 2020, Rockhampton Regional Council granted approval to establish an asphalt plant on the site (Council Ref: D/83-2019). Council also issued an EA for Environmentally Relevant Activities (ERA) ERA6 for asphalt manufacturing (Council Ref: EPAEA/1/2019), dated 6 April 2020.

An asphalt plant has previously operated on the site under a temporary approval, however, is currently not located at the site. Consideration will be given that an asphalt plant may be established pursuant to the 2020 permit and EA. .

The 2020 permit and EA do not provide limits on throughput or operating hours. There are no changes proposed to the approved asphalt plant operations. It is understood that the asphalt plant will produce a maximum of 100,000 tonnes per year. The location of the asphalt plant is where the existing crusher plant is located. Whilst the asphalt plant is approved to operate at the facility, it is not permanent. As such, the asphalt plant is discussed in more detail in Section 7.4.

2.2 Proposed Quarry Operations

A conceptual quarry layout has been prepared which incorporates five adjoining properties, properly described as Lot 2 on RP888747, Lot 1 on SP247721, Lot 2 on SP247721, Lot 725 on RP888747 and Lot 931 on LIV40265. Two pits have been proposed, so as to achieve a 50-metre buffer to the road reserve and also as a consequence of the differing resource/materials in each area. Each pit will be developed progressively, to meet market demand.

Midgee Quarry is project driven by blasting and ripping at times, depending on the product being targeted. The quarry will continue to use standard quarrying methodologies that involve clearing, topsoil, and overburden stripping, drilling, and blasting, extraction, processing and

stockpiling with the final products sold for use in the construction industry. The outline of the extraction area is shown in Figure 1.

2.3 Comparison of Activities

Table 2 provides a comparison of current activities and proposed activities as part of the increase in production. Despite the increase in extraction, the number of blasts will not increase much as a significant proportion of the additional material will be road base/bulk fill which does not need blasting.

Table 2: Comparison of Quarry Activities

Aspect	Existing Activities	Future Activities
Quarry footprint	As per consent.	Ref to Figure 1.
Hours of operation	6am and 6pm Monday to Saturday. No operations occur on public holidays.	24/7
Production and Transportation limits	Current production of approximately 200,000 tpa however is permitted to produce up to 1,000,000 tpa.	Maximum 2 Mtpa from the site.
Extraction method	Extraction by blast and drill	No change to extraction method.
Site infrastructure and plant	Primary and tertiary crushing and screening facilities as fixed and mobile plant	Primary and tertiary crushing and screening facilities as fixed and mobile plant. The locations of the mobile plant are flexible depending on commercial requirements
Asphalt plant	Temporary plant used previous but no longer at site.	Proposed 100,000 tpa of which approximately two thirds of raw material provided by quarry.
Product transport	Via truck	No change to method of transport or access road.
Blasting	4 per year	8 per year
Vegetation clearing	N/A	Approx. 2.5 ha every 5 years

2.4 Stages of Expansion

The expansion of the quarry is not detailed in many stages as the course of the quarry development will depend on customer requirements, however the expected expansion will occur to the east, north and west as shown in Figure 1.

It is predicted that a majority of the material required in the next five years will be general fill, which is generally found in the first bench (15 – 20 m below natural ground level). Pit 1 and Pit 2 will likely occur concurrently, however Pit 2 will remain the main source extraction area for the duration of the Project life. The expected average throughput is 1.6 Mtpa; with a typical breakdown by fraction, however up to 2 Mtpa is expected to be processed per year.

The areas of expansion and operations of the quarry are not finalised due to the client requirements. In consultation with the quarry operators, the following assumptions regarding quantities of material, location and activities are detailed in Table 3.

Table 3: Pit Operations

Activity	Pit Area				
	Existing	Pit 1	Pit 2 (North)	Pit 2 (East)	Pit 2 (West)
Production (tpa)	500,000	300,000	600,000	400,000	200,000
Material Type	Road base/ concrete agg	Bulk fill	Bulk fill	Bulk fill	Road base/ concrete agg
Blasting	Yes	-	-	-	Yes
Screening	Yes	Yes	-	Yes	Yes
Crushing	Yes	Yes	Yes	Yes	Yes
Intermediate product stockpile	Yes	Yes	Yes	Yes	Yes

2.5 Equipment

The quarry currently has a range of equipment. With the increase in capacity, it is expected that the current the equipment will be utilised more efficiently, however additional mobile plant will be added:

- Fixed screening/crushing plant;
- Mobile screening/crushing plants;
- Excavators;
- Wheeled loaders;
- Articulated trucks (including one utilised as a water truck); and
- Dozers.

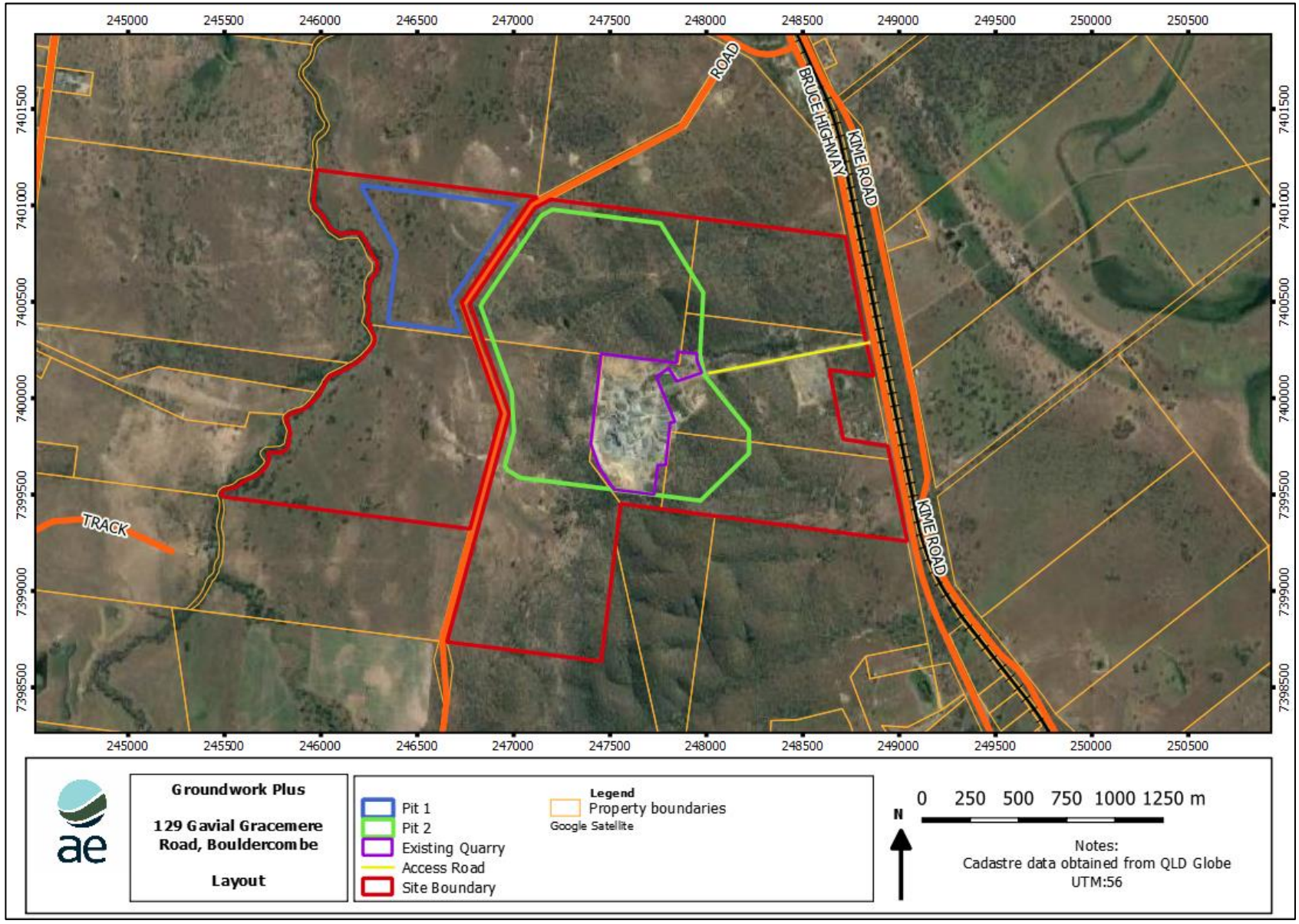


Figure 1: Site Location

3 DESCRIPTION OF ENVIRONMENTAL VALUES

3.1 Location

Midgee Quarry is located at 59793 Bruce Highway Midgee 4702, Lot 2 RP888747. The major regional centre of Rockhampton is approximately 12.5 kilometres to the north and Gracemere is approximately 9.5 kilometres to the north-west.

The surrounding land uses are primarily cattle grazing, with the exception of the adjacent Kangaroo Country Caravan Park (KCCP) which is situated on lot 1/RP811877. The entrance to the Midgee Quarry and the KCCP are situated on the Bruce Highway. The North Coast Rail Line also passes directly opposite the Midgee Quarry entrance and the caravan park. The North Coast line is also the major freight corridor from Brisbane to Cairns, with connecting services travelling as far west as Longreach and Mount Isa. The North Coast Line also connects to the central line which is the main coal freight corridor which services the Central Highlands Coal Fields.

The Subject Site covers five lots (Lot 2 on RP888747, Lot 1 on SP247721, Lot 2 on SP247721, Lot 725 on RP888747 and Lot 931 on LIV40265. The Subject Site location is shown in Figure 1.

3.2 Terrain

Figure 3 illustrates the local topography, as obtained from a combination of Lidar data at 5 m resolution.

3.3 Climate

The Rockhampton climate may be classified as Subtropical. little over 800 mm across an average of 82 rain days. Rainfall averages suggest a distinct wet and dry season, with the wet generally December to March and the dry June to September. Typical daytime temperature ranges are 32°C max, 22°C min in the summer /wet season and 23°C max, 9°C min in the winter/dry season.

The prevailing winds are predominately southeast but during spring and summer late afternoon northeast sea breezes give some relief from the higher temperatures. During winter and early spring the high-pressure systems of the sub-tropical ridge can be far enough north to replace the southeast trades with southwesterlies winds behind the trough systems that split the high cells. Figure 3 presents a summary of average rainfall per month across a typical year.

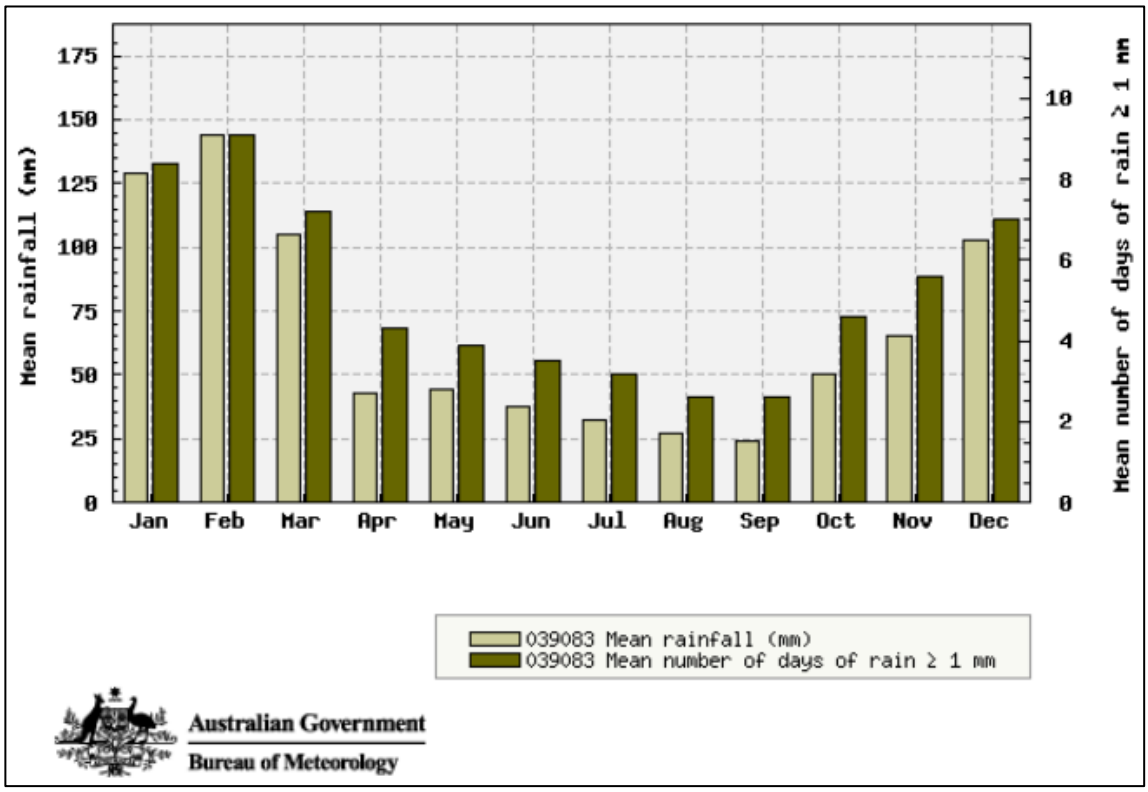


Figure 2: Long-Term Rainfall Patterns for Rockhampton Airport (Average 1939 - 2021)

3.4 Receptors

When completing this report, consideration has been given to the potential impacts of the changed operation to sensitive receptors within 3 - 5 kilometres of the operation. When considering the impacts, the nearby receptors have been identified as shown in Figure 4.

The closest receptors located in the Kangaroo Country Caravan Park to the east of the Subject Site boundary.

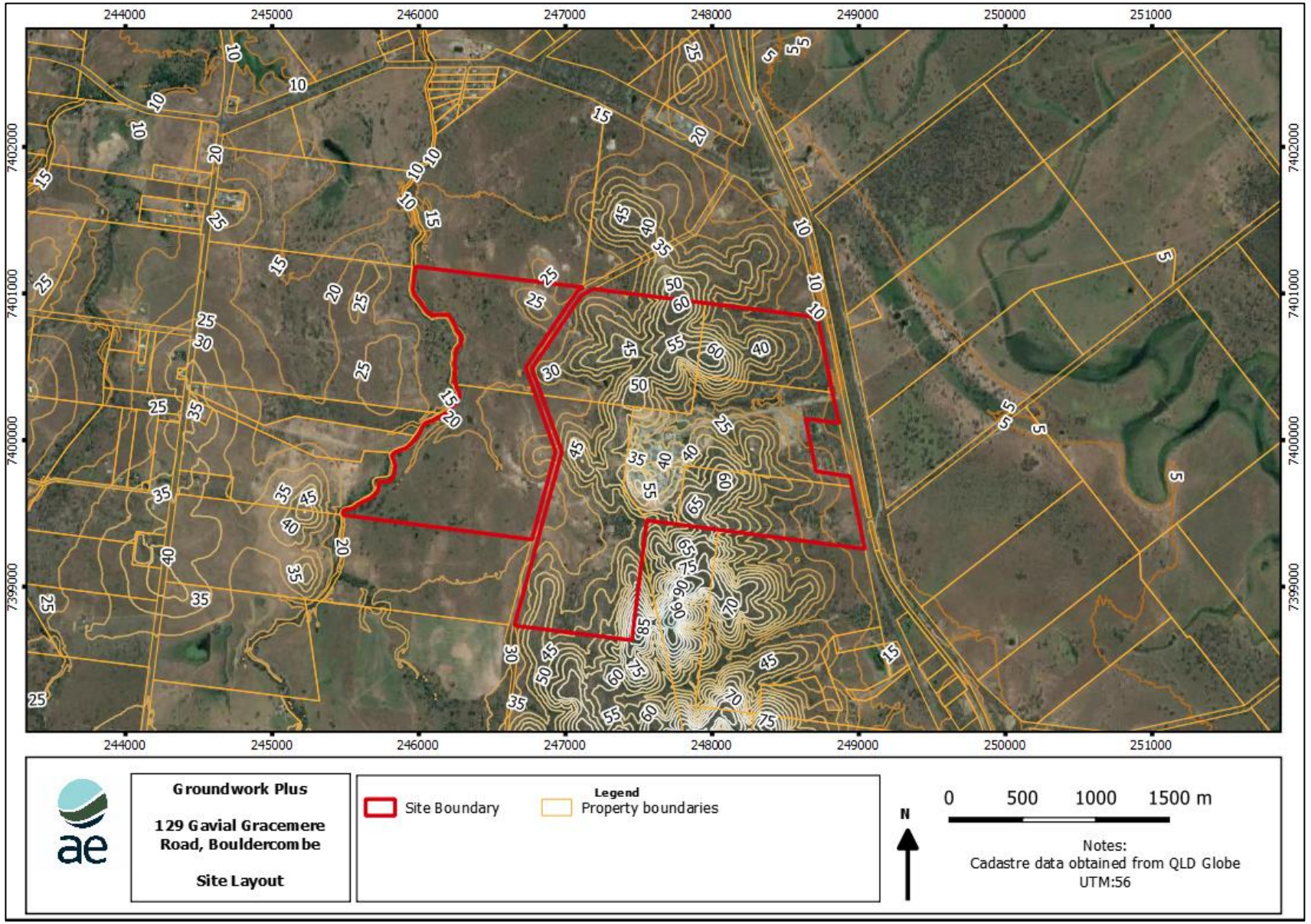


Figure 3: Surrounding Topography at 5 m Intervals (Extracted from LiDAR Data)

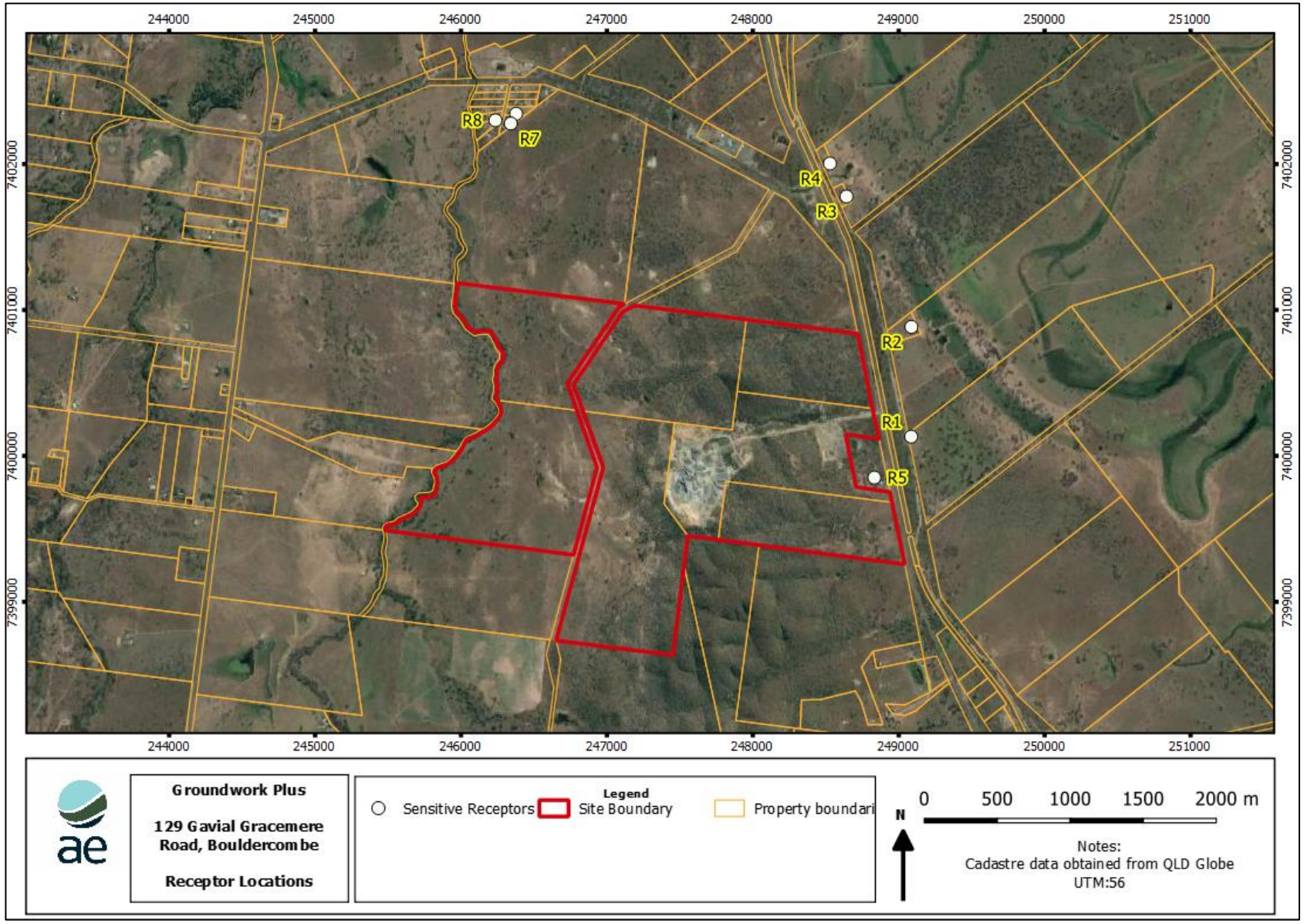


Figure 4: Modelled Sensitive Receptors

4 LEGISLATIVE REQUIREMENTS

4.1 Environmental Authority

Conditions of Environmental Authority EPPR00233813 (dated 16 February 2010) issued by the Department of Environment and Science provides specific requirements relating to emissions of air from the activity as summarised in Table 4.

Table 4: Conditions Relevant to Air

Condition number	Condition
B1	Dust Nuisance: The release of dust and/or particulate matter resulting from the environmentally relevant activity must not cause an environmental nuisance at any **nuisance sensitive** or **commercial place**.
B2	Dust and particulate matter must not exceed the following levels when measured at any nuisance sensitive or commercial place: a) Dust deposition of 120 milligrams per square metre per day, when monitored in accordance with Australian Standard AS 3580.10.1 of 2003 (or more recent editions); OR b) A concentration of particulate matter with an aerodynamic diameter of less than 10 micrometre (µm) (PM_{10}) suspended in the atmosphere of 150 micrograms per cubic metre over a 24-hour averaging time, at a nuisance sensitive or commercial place downwind of the site, when monitored in accordance with - Australian Standard AS 3580.9.6 of 2003 (or more recent editions) 'Ambient air – Particulate matter – Determination of suspended particulate PM10 high-volume sampler with size-sensitive inlet -Gravimetric method'; or - any alternative method of monitoring PM10 which may be permitted by the 'Air Quality Sampling Manual' as published from time to time by the administering authority.
B3	When requested by the administering authority, dust and particulate monitoring must be undertaken to investigate any complaint of environmental nuisance caused by dust and/or particulate matter, and within 14 days of the completion of monitoring the results must be notified to the administering authority. Monitoring must be carried out at a place or places relevant to the potentially affected dust sensitive place and at upwind control sites and must include: a) For a complaint alleging dust nuisance, dust deposition; and b) For a complaint alleging adverse health effects caused by dust, the concentration per cubic metre of particulate matter with an aerodynamic diameter of less than 10 micrometre (µm) (PM10) suspended in the atmosphere over a 24hr averaging time.

4.2 Environmental Protection (Air Quality) Policy 2019

The Environmental Protection (Air Quality) Policy 2019 (EPP (Air)) provides air quality objectives for a range of compounds with the potential to impact on the health and well-being and aesthetics of the environment. Specifically, the objectives are intended to enhance or protect the following environmental values:

> *(a) the qualities of the air environment that are conducive to protecting the health and biodiversity of ecosystems; and*

(b) the qualities of the air environment that are conducive to human health and wellbeing; and

(c) the qualities of the air environment that are conducive to protecting the aesthetics of the environment, including the appearance of buildings, structures, and other property; and

(d) the qualities of the air environment that are conducive to protecting agricultural use of the environment.

Table 5 presents a summary of the air quality objectives applicable to the assessment.

Table 5: Schedule 1 Air Quality Objectives

Indicator	Environmental value	Air quality objectives ($\mu g/m^3$)	Period
PM_{10}	health and wellbeing	50	24 hours
		25	1 year
$PM_{2.5}$	health and wellbeing	25	24 hours
		8	1 year
Total suspended particles	health and wellbeing	90	1 year

5 EXISTING AIR ENVIRONMENT

5.1 Ambient Monitoring

To assess cumulative impacts, ambient monitoring data has been obtained from the Department of Environment and Science (DES) for 2017, as this is the same year as the meteorological dataset utilised in this assessment.

There are no ambient air monitoring stations in Rockhampton; the nearest NEPM reportable monitoring station is located at South Gladstone, approximately 89 km SE from the Project. Pollutants monitored at this site, which are relevant to this assessment are PM_{10} and $PM_{2.5}$.

The *Queensland Air Monitoring 2017 (National Environment Protection (Ambient Air Quality) Measure Report* (DES, 2018) confirms that there was one exceedence of the $PM_{2.5}$ 24-hour objective as a result of bushfire smoke. This exceedence occurred on 29 September 2017 and has been removed from the data analysis.

The nearest station that records total suspended particles (TSP) is located at Townsville. In lieu of this, research indicates that in rural areas, PM_{10} typically represents 49% of total TSP, therefore, TSP concentrations have been estimated based on the application of this ratio[a].

Table 6 provides the background concentrations for particulates for 2017. For this assessment, the hourly background concentrations presented in Figure 5 to Figure 6 have been modelled contemporaneously. Where no data is available, the annual average has been applied.

Table 6: Background Concentrations for 2017

Compound	Time Period	24-hour Concentration (µg/m³)			Annual Average (µg/m³)	DES Station
		Max	90th Percentile	70th Percentile		
TSP	Annual	82.1	39.9	31.8	28.2	Calculated from PM_{10}
PM_{10}	24-hour	40.2	19.5	15.6	13.8	South Gladstone
$PM_{2.5}$	24-hour	22.7	8.6	6.2	5.6	

[a] Air Noise Environment Pty Ltd (1999) 'Fine dust and the implications for the coal industry', ACARP Project C7009.

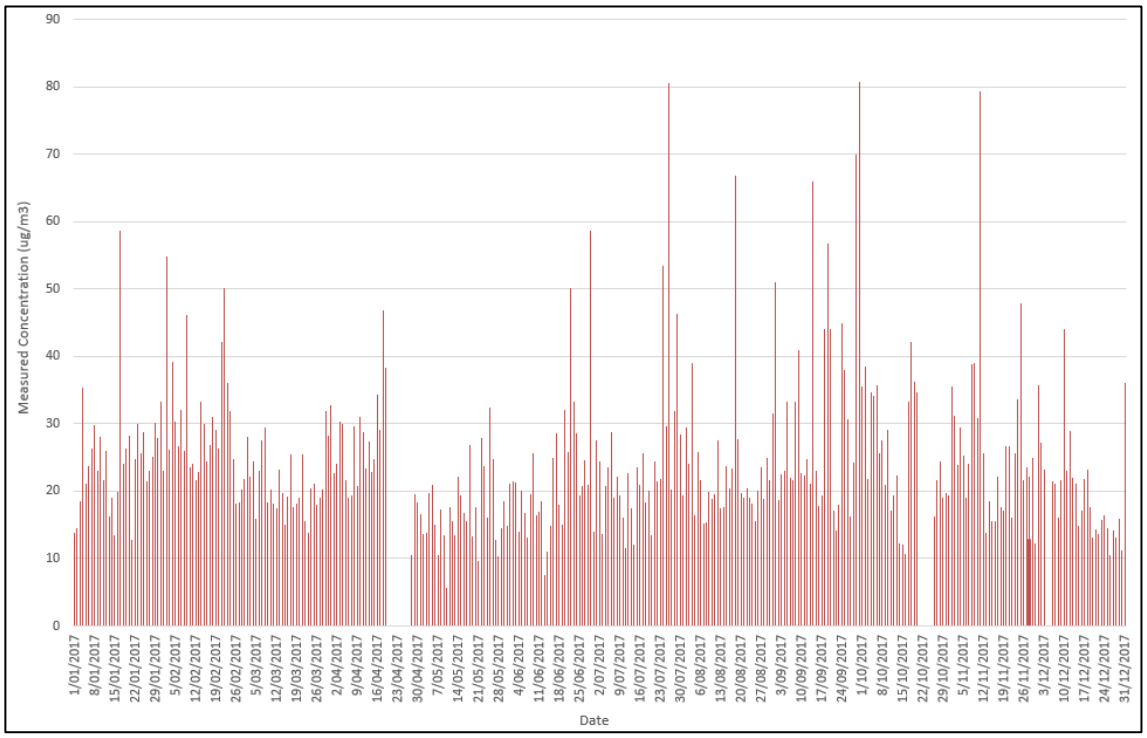


Figure 5: Hourly PM_{10} Concentrations at South Gladstone for 2017

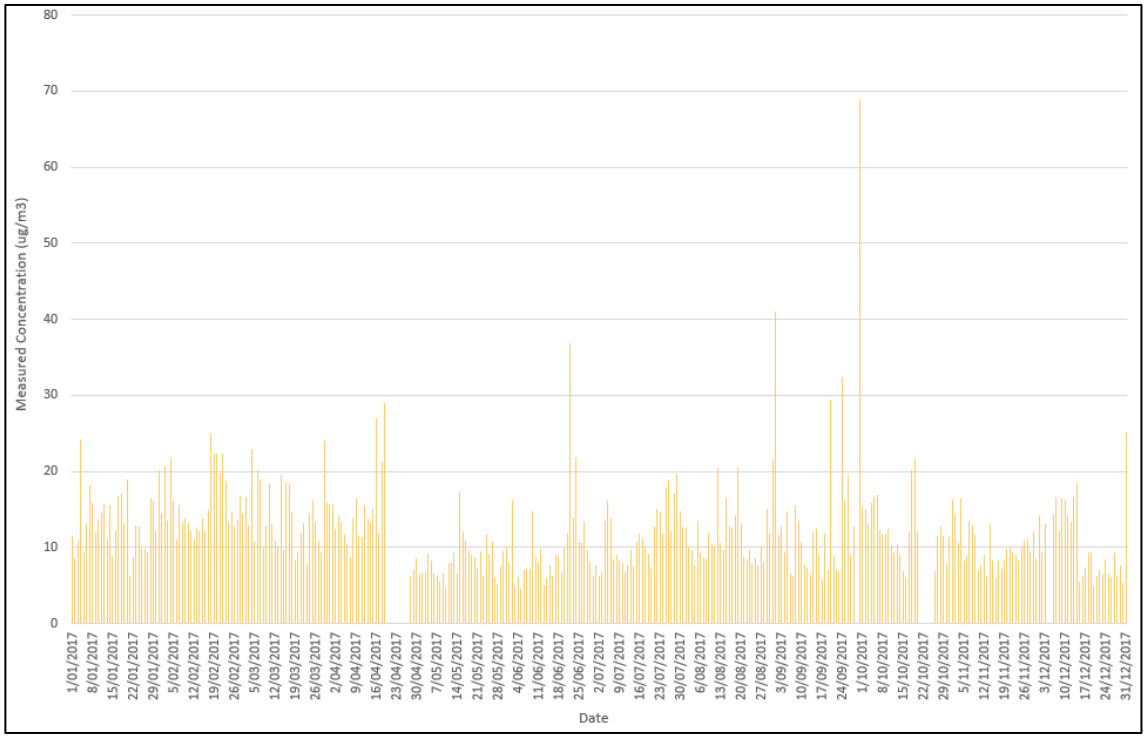


Figure 6: Hourly $PM_{2.5}$ Concentrations at South Gladstone for 2017

DES does not monitor dust deposition, however for the purposes of this assessment background dust deposition has been assumed to be 40 mg/m^2/day, which is typical for the surrounding environment.

5.2 National Pollution Inventory (NPI)

A review of the National Pollution Inventory (NPI) database has identified there are no nearby industrial activities that have to submit an annual report to NPI.

6 MODELLING METHODOLOGY

6.1 TAPM Predictions

Atmospheric dispersion modelling involves the mathematical simulation of the dispersion of air contaminants in the environment. The modelling utilises a range of information to estimate the dispersion of pollutants released from a source, including:

- Meteorological data for surface and upper air winds, temperature, and pressure profiles, as well as humidity, rainfall, cloud cover and ceiling height information;
- Emissions parameters including source, location, and height, source dimensions and physical parameters (e.g. exit velocity and temperature) along with pollutant mass emission rates;
- Terrain elevations and land use both at the source and throughout the surrounding region; and
- The location, height, and width of any obstructions (such as buildings or other structures) that could significantly impact on the dispersion of the plume.

For the purpose of the assessment, meteorological modelling has been undertaken using TAPM (The Air Pollution Model) and CALMET to predict localised meteorological conditions. The meteorological data derived from these models have been used as an input for the CALPUFF dispersion modelling.

A site-specific meteorological dataset has been determined using the prognostic model TAPM (The Air Pollution Model). Prognostic models, such as TAPM, permit the development of localised meteorological datasets, based on synoptic weather conditions. The model predicts the regional flows important to dispersion, such as sea breezes and terrain induced flows, against a background of larger-scale meteorology provided by synoptic analyses.

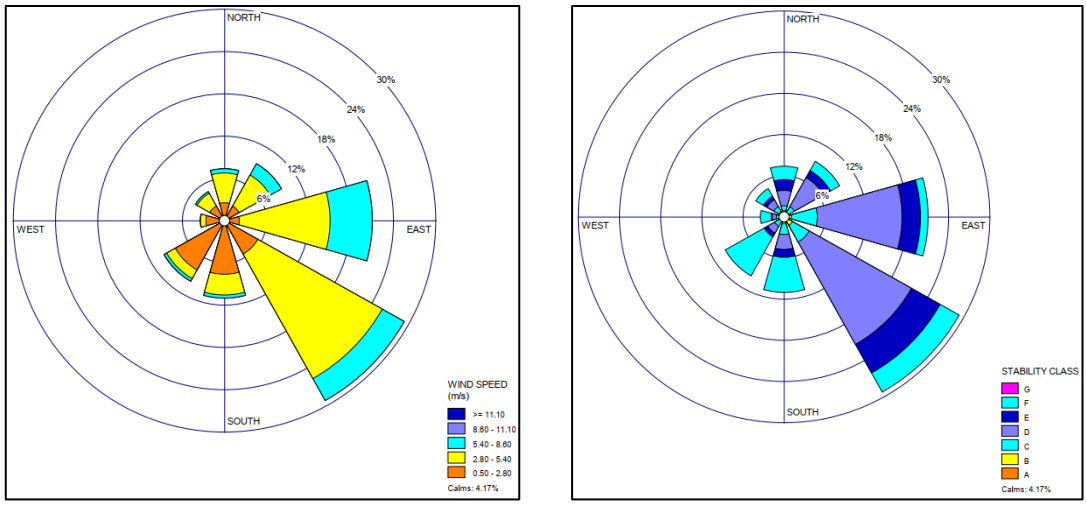
The output of this model, when used with a diagnostic meteorological model, such as CALMET, provides a meteorological dataset suitable for introduction into the wind field results. This methodology is the recommended approach for the modelling of contaminant concentrations using CALMET[b].

[b] TRC Environmental Corporation (March 2011) 'Generic Guidance and Optimum Model Settings for the CALPUFF Modelling System for Inclusion into the 'Approved Methods for the Modelling and Assessments of Air Pollutants in NSW, Australia' prepared on behalf of the NSW Office of Environment and Heritage

Table 7: Summary of Meteorological Modelling Parameter

Model	Aspect	Assigned Parameter
TAPM (v4.04)	Year Modelled	One full year - 2017 which is compared to long-term observations to demonstrate suitability. Observations from BOM Rockhampton Airport were assimilated into TAPM
	Coordinates	Latitude: -23.28 / Longitude: 150.31
	Domain Grids	30 x 30 x 25 grid points
	Nesting Spacing	30 km, 10 km, 3 km, and 1 km
CALMET (v 7.1)	Databases	Default databases for sea temperature, terrain and land cover applied
	Model Domain	27-km x 27-km grid (100 m grid intervals)
	Terrain Data	Nasa Shuttle Radar Topography Mission (SRTM) 1-second (approximately 30 m) digital elevation model
	Land Use	Default from USGS for 1 km spacing. Review of the land use was undertaken and updated based on recent aerial imagery
	Vertical Layers	12 Layers - 20 m, 50 m, 75 m, 150 m, 200 m, 500 m, 750 m, 1,000 m, 1,500 m, 2,000 m, 3,000 m, and 4,000 m

Figure 7 presents the annual wind rose for the Subject Site during 2017. Detailed meteorological analysis of the dataset is presented in Appendix A.



Wind Rose

Stability Class Rose

Figure 7: Predicted Annual Wind and Stability Class Roses at Subject Site for 2017

6.2 CALPUFF Dispersion Modelling

The CALPUFF modelling system treats emissions as a series of puffs. These puffs are then dispersed throughout the modelling area and allowed to grow and bend with spatial variations in meteorology. In doing so, the model can retain a memory of the plume's movement throughout a single hour and from one hour to the next while continuing to better approximate the effects of complex air flows.

CALPUFF utilises the meteorological processing and prediction model CALMET to provide three-dimensional wind field predictions for the area of interest. The final wind field developed

by the model (for consideration by CALPUFF) includes an approximation of the effects of local topography, the effects of varying surface temperatures (as is observed in land and sea bodies) and surface roughness (resulting from varied land uses and vegetation cover in an area). The CALPUFF model can resolve complex terrain influences on local wind fields including consideration of katabatic flows and terrain blocking.

Post processing of modelled emissions is undertaken using the CALPOST package. This allows the rigorous analysis of pollutant predictions generated by the CALPUFF system. CALPOST is able to provide an analysis of predicted pollutant concentrations for a range of averaging periods from 1 hour to 1 year.

6.3 Receptors

A computational grid of 11 km by 11 km at 200 m spacing has been modelled. A nested grid centred on the Subject Site was modelled as follows:

- 500 m at 50 m spacing; and
- 3,000 m at 100 m spacing.

In addition, existing and future receptors were modelled as shown in Figure 4 and receptors were placed at 50 m intervals along the boundary of the Subject Site.

6.4 Other Settings

For the purposes of the assessment, the air dispersion modelling has utilised the following settings for CALPUFF:

- three-dimensional mode using meteorological data file from CALMET;
- ISC rural wind speed profile;
- no chemical transformation;
- no gaseous deposition;
- transitional plume rise;
- stack tip downwash for point sources;
- partial plume penetration for point sources;
- dispersion coefficients using Pasquill–Gifford coefficients or turbulence calculated from micro-meteorology;
- no adjustment of dispersion curves for roughness;
- partial plume path adjustment method for terrain using default coefficients; and
- no building wakes were modelled
- no pit retention was applied

7 AIR EMISSION ESTIMATION

7.1 Scenario Assessed

For the purposes of the assessment, the following scenario is assessed:

- Existing quarry operations for 200,000 tpa; and
- Future quarry operations for 2 Mtpa based on final extent designs with asphalt plant at maximum daily production.

7.2 Sources of Emissions

Dust emissions from the quarry are fugitive particulates TSP, PM_{10} and $PM_{2.5}$. The main sources of fugitive particulates are from the following sources:

- wheel generated emissions on unpaved roads;
- material unloading from trucks;
- drilling and blasting rock;
- screening, crushing, and conveying of material; and
- wind erosion from stockpiles and exposed surfaces.

The auxiliary asphalt plant also generates fugitive emissions from similar activities listed above but also direct emissions from the dryer stack.

7.3 Quarry Emissions

Emission estimates for the above activities have been derived based on the USEPA AP-42: Compilation of Air Emission Factors (US Environmental Protection Agency, Various Dates) and National Pollution Inventory (NPI) *Emission Estimation Technique Manual for Mining* (2012).

Emission factors within these documents are used to estimate emissions of TSP, PM_{10} and $PM_{2.5}$ to the air from various sources. Emission factors relate to the quantity of a substance emitted from a source to some measure of activity associated with the source.

7.3.1 Existing Quarry Operations

As detailed in Section 2, the existing quarry operates at an average of 200,000 tpa without the asphalt plant. Table 8 presents the emission rates for the quarry based on the operational information detailed in Appendix B.

Table 8: Summary of Emission Rates: Quarry Existing

Activity	Emission Rate (kg/annum)			Emissions Control
	TSP	PM_{10}	$PM_{2.5}$	
Drill	378	196	11	
Blast	76	40	2	
Trucks Loading in Pit	395	187	28	
Truck Unloading at Processing Area	395	187	28	
Screening (5 transfer points)	12500	4300	291	
Crushing (3 transfer points)	1620	720	133	
Stockpile Loading	300	110	31	

Activity	Emission Rate (kg/annum)			Emissions Control
	TSP	PM_{10}	$PM_{2.5}$	
Trucks loading to stockpiles	300	110	31	
Trucks Unloading from stockpiles	395	187	28	
FEL in Materials Storage Area	395	187	28	
Internal Haul Roads (Unpaved)	11306	779	117	Level 2 watering
Truck Movements Unpaved (Access Road)	9509	655	98	Level 2 watering
Wind erosion area exposed area	7719	3859	579	
Wind erosion on stockpiles	8135	4068	610	
Total	**53,423**	**15,584**	**2,017**	

Figure 8 presents the location of existing sources. In addition to the sources identified below, the equipment storage area located close to the Bruce Highway is also modelled as exposed areas for wind erosion.

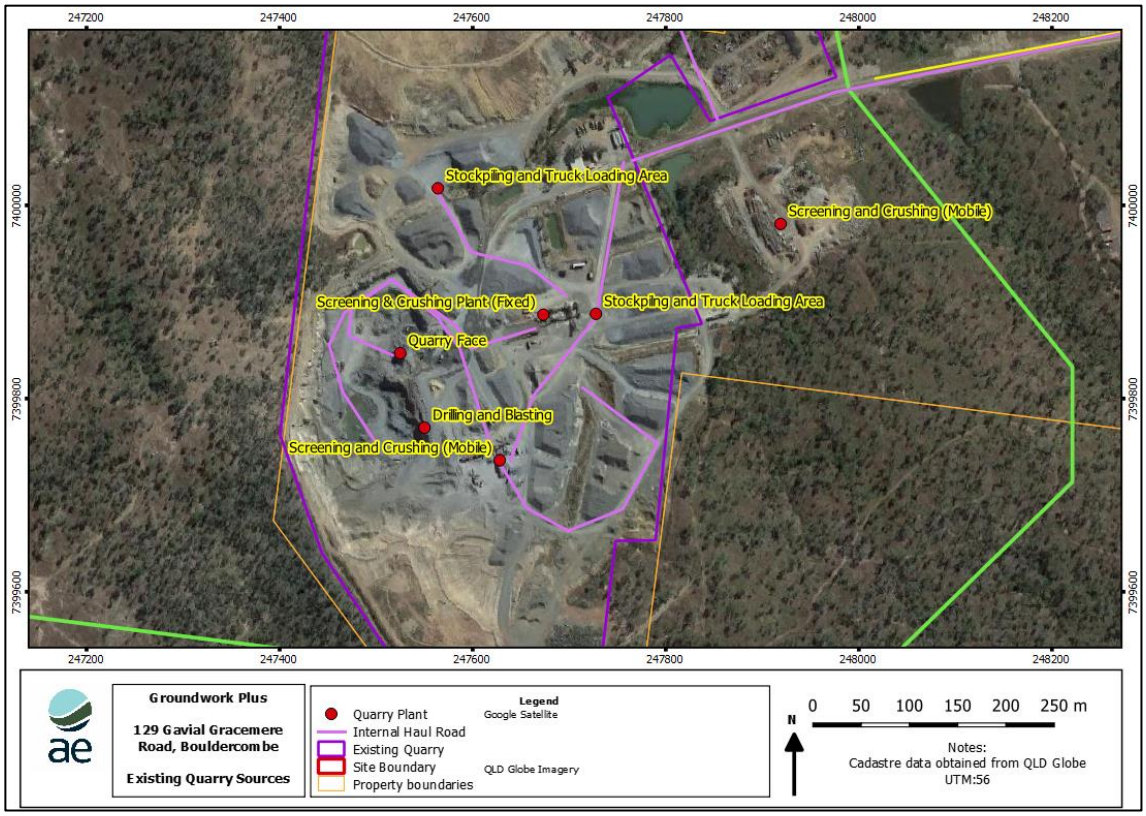


Figure 8: Modelled Source Location for Existing Quarry

7.3.2 Future Quarry Operations

As detailed in Section 2.4, the future quarry anticipates annual production of 1.6 Mtpa, however the maximum will be no more than 2 Mtpa. The expansion of the quarry will depend on customer requirements; a worst-case scenario has been applied as described in Table 3. This report compares the average existing production volume with the maximum future volume. It is noted that the current operation is approved to produce up to 1 Mtpa.

Table 8 presents the emission rates for the quarry based on the operational information detailed in Appendix B whilst Figure 8 presents the location of future sources.

Table 9: Summary of Emission Rates: Quarry Future

Activity	Emission Rate (kg/annum)			Emissions Control
	TSP	PM_{10}	$PM_{2.5}$	
Drill	755	393	23	
Blast	153	79	5	
Trucks Loading in Pit	3948	1867	283	
Truck Unloading at Processing Area	3948	1867	283	
Screening	125000	43000	2905	
Crushing	16200	7200	1333	
Stockpile Loading	3000	1100	311	
Trucks loading to stockpiles	3000	1100	311	
Trucks Unloading from stockpiles	3948	1867	283	
FEL in Materials Storage Area	3948	1867	283	
Internal Haul Roads (Unpaved)	129942	8954	1343	Level 2 watering
Truck Movements Unpaved (Access Road)	95088	6552	983	Level 2 watering
Wind erosion area exposed area	10702	5351	803	
Wind erosion on stockpiles	33973	16987	2548	
Total	**433606**	**98185**	**11695**	

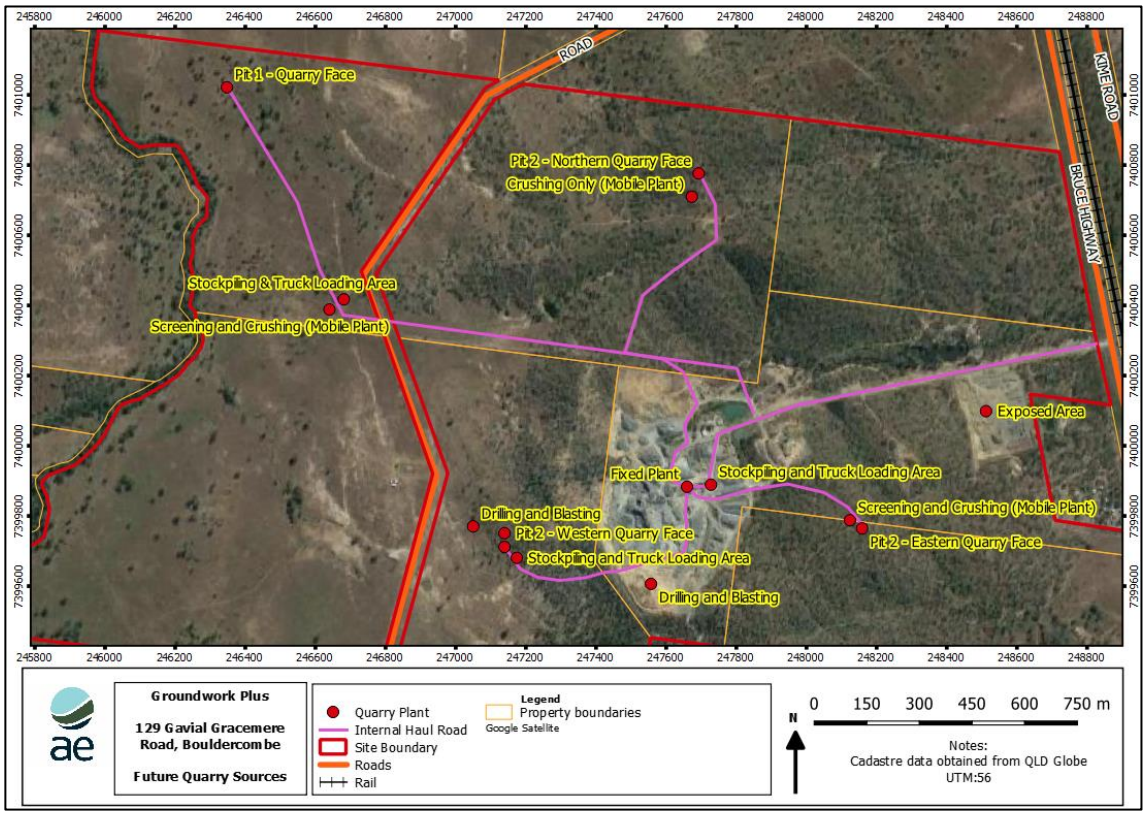


Figure 9: Modelled Source Location for Future Quarry Operations

7.4 Asphalt Plant

As detailed in Section 2.1.2, there is an existing approval for an asphalt plant to be located on the Subject Site as shown in Figure 6. Based on the predicted quarry output over a three-year period, the asphalt plant is expected to produce 100,000 tpa with an estimated 68,050 tpa of raw materials provided by the quarry. The maximum daily production is 2,500 tpd as shown in Table 10.

Table 10: Asphalt Production

	Production Rates	
Activity	Annual Maximum	Daily Maximum
Raw Material Incoming from Quarry	65,000 – 70,000	1,750
Product Material Outgoing	100,000	2,500

Emissions estimations of the fugitive dust is presented in Table 13 and based on information detailed in Appendix B.

Emissions from the stack are presented in Table 11 and are from the Environmental Authority for the approved asphalt plant. Due to the separation distance of the asphalt plant and the sensitive receptors, only particulates are cumulative to the dust emissions to the quarry and therefore only particulates will be assessed form the stack.

The Development Application for the asphalt plant identifies that a baghouse is installed to mitigate the particulate emissions and operates 24/7.

Based on an similar Colas facility, a diameter of 0.85 m has been used to calculate the flow rate and a temperature of 70°C has been used. The calculated TSP emission rate is 0.709 g/sec. For the purposes of this assessment, PM_{10} is considered to be 100% of TSP and $PM_{2.5}$ is considered to be 96% of PM_{10}.

Table 11: Condition 8 of EPAEA/1/2019

Release Point	Minimum Release Height (m)	Minimum Velocity (m/sec)	Contaminant Release	Maximum Release Limit (15% O_2)
Asphalt plant stack	10	25	Total suspended particulates	50 mg/Nm^3
			Nitrogen Oxides (as NO_X)	350 mg/Nm^3
			Carbon Monoxide (CO)	400 mg/Nm^3
			Total Heavy Metals	1 mg/Nm^3
			Hydrogen Sulphide (H_2S)	5 mg/Nm^3
			Volatile Organic Compounds (VOC)	40 mg/Nm^3

a) Total heavy metals includes the elements of antimony, arsenic, cadmium, lead, beryllium, chromium, cobalt, manganese, nickel, selenium, tin, vanadium, mercury, and any compound containing one of those elements.

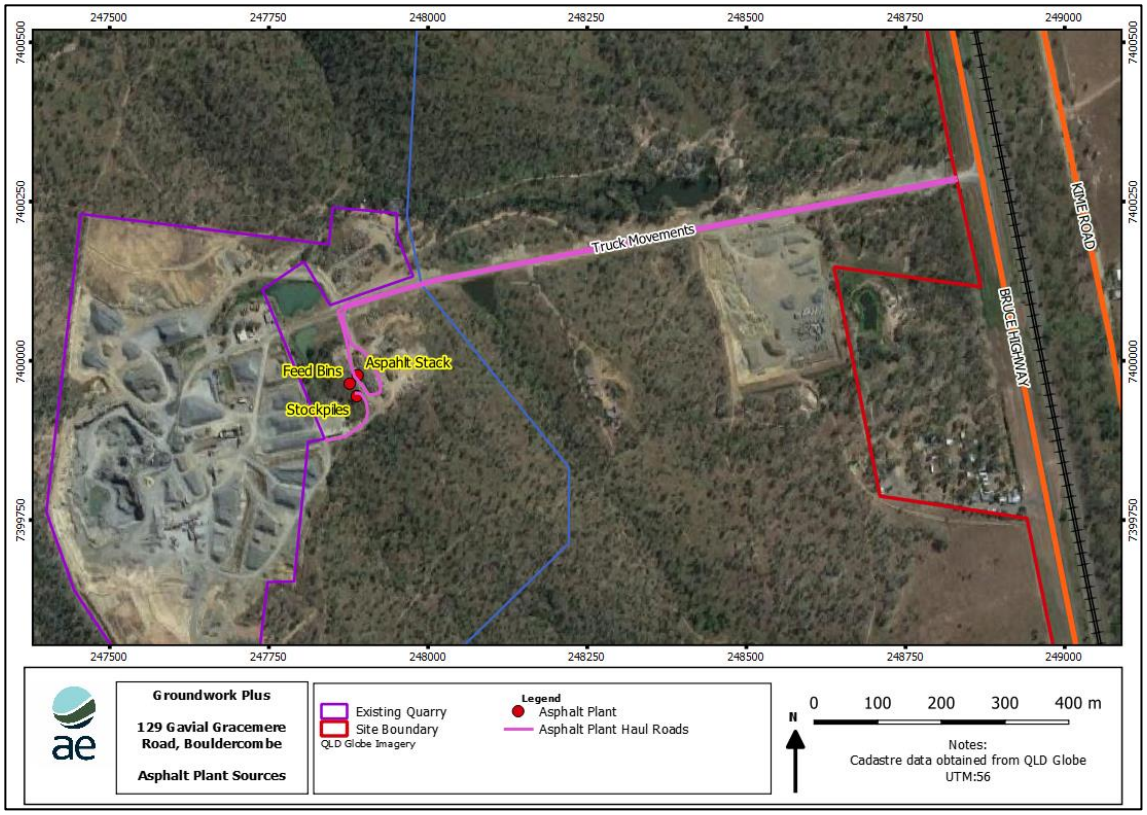


Figure 10: Asphalt Plant Source Locations

The emissions from the dryer stack are presented in Table 12 based on the Condition 8 of the EPAEA//1/2019.

Table 12: Stack Emissions

Source	Location (UTM 56)	Stack Parameters [a]				Emission Rates		
		Height (m)	Dia (m)	Velocity (m/s)	Temp (K)	TSP (g/s)	PM_{10} (g/s)	$PM_{2.5}$ (g/s)
Dryer Stack	247888, 7399977	10	0.85	25	343	0.709 [a]	0.709 [a]	0.680 [a]

a) Exhaust is fitted with a baghouse. PM_{10} is 100% TSP and $PM_{2.5}$ is 96% of PM_{10}

Table 13: Summary of Fugitive Emissions: Asphalt

Activity	Maximum Daily (kg/year)			Mitigation Applied
	TSP	PM_{10}	$PM_{2.5}$	
Raw Material Haulage (unpaved)	6128	1689	169	Level 2 watering (>2 litres/m^2/h)
Product Haulage (unpaved)	48737	13433	1343	Level 2 watering (>2 litres/m^2/h)
Truck unloading (raw materials)	1515	717	109	N/A
FEL Loading	1515	717	109	N/A
Feed bin loading	1515	717	109	N/A
Truck Loading (product)	1136	537	81	Dust suppression chute
Wind Erosion (stockpile)	155	77	12	N/A
Wind Erosion (exposed areas)	1291	646	97	N/A
Total	**61,993**	**18,532**	**2,028**	

7.5 Source Parameters

Source parameters adopted in the preparation of the model are presented in Table 14 with the location of sources as modelled presented in Figure 8, Figure 9 and Figure 10.

Table 14: Source Parameters

Activity	Source Type	Source Parameters			
		Area (m^2)	Effective Height (m)	Sigma Y (m)	Sigma (z)
Asphalt Plant Sources					
Unpaved Road	Line volume	N/A	5.1	N/A	2.55
Truck unloading	Volume	N/A	4.0	1.16	0.93
Truck loading		N/A	4.0	1.16	0.93
Feed bin loading		N/A	3.0	0.47	0.93
Wind erosion from stockpiles	Area	Refer to App B	3.0	N/A	2.0
Wind erosion from exposed areas			1.0	N/A	1.0
Quarry Sources (Existing and Future)					
Drilling and Blasting	Volume	N/A	20	10.3	2.0

Activity	Source Type	Source Parameters			
		Area (m^2)	Effective Height (m)	Sigma Y (m)	Sigma (z)
Unpaved Roads	Line volume	N/A	5.1	N/A	2.55
Truck Loading	Volume	N/A	4.0	7.0	0.93
Processing Plant	Volume	N/A	10.0	9.3	1.4
Stockpile Loading	Volume	N/A	8.0	9.3	1.4
Quarry Extraction	Volume	N/A	5.0	6.9	0.93
Wind erosion from stockpiles	Area	Refer to App B	7.0	N/A	1.0
Wind erosion from exposed areas			1.0	N/A	1.0

8 PREDICTED GROUND LEVEL CONCENTRATIONS

8.1 Summary

In accordance with the EPP(Air Quality), the maximum predicted concentrations at the discrete receptors identified in Figure 4 are presented as well as the maximum predicted concentrations at the Subject Site boundary.

The results presented in this section are the total predictions which include the emissions from the Subject Site as presented in Table 8, surrounding industrial emissions as presented in Appendix B and contemporaneous background concentrations detailed in Section 5.

Table 15 presents a summary of the maximum predicted cumulative ground level concentrations at the sensitive receptors. It can be seen that the predicted concentrations comply at all sensitive receptors and at the site boundary for all pollutants and time periods.

Table 15: Summary of Maximum Predicted Ground Level Concentrations at Sensitive Receptors

Pollutant	Averaging Period	Maximum Predicted GLC (including Background Concentrations) at Sensitive Receptors (µg/m^3)			Criteria (µg/m^3)
		Existing Operations	Future Operations	Future Operations with Asphalt Plant	
TSP	Annual	28.4	29.7	30.2	90
PM_{10}	24 hours	41.8	65.8	81.4	50
	Annual	14.1	19.8	20.7	25
$PM_{2.5}$	24 hours	21.7	22.6	23.4	25
	Annual	5.6	6.4	6.6	8
Deposited Dust	Month	42.5	61.6	67.7	120 mg/m^2/day

As detailed in Appendix B, the only emission control applied to the scenarios is level 2 watering. A review of the monitoring results in Table 15 identifies the following:

- The predicted ground level concentrations from the existing quarry operations are compliant at all sensitive receptors.
- The future quarry operations identified significant exceedences in the 24-hour PM_{10} concentration at two receptors (R1 and R5).
- The future quarry operations with the asphalt plant identified significant exceedences in the 24-hour PM_{10} concentration at two receptors (R1 and R5).

The following sections provide individual sensitive receptors results for all scenarios and concentration isopleths.

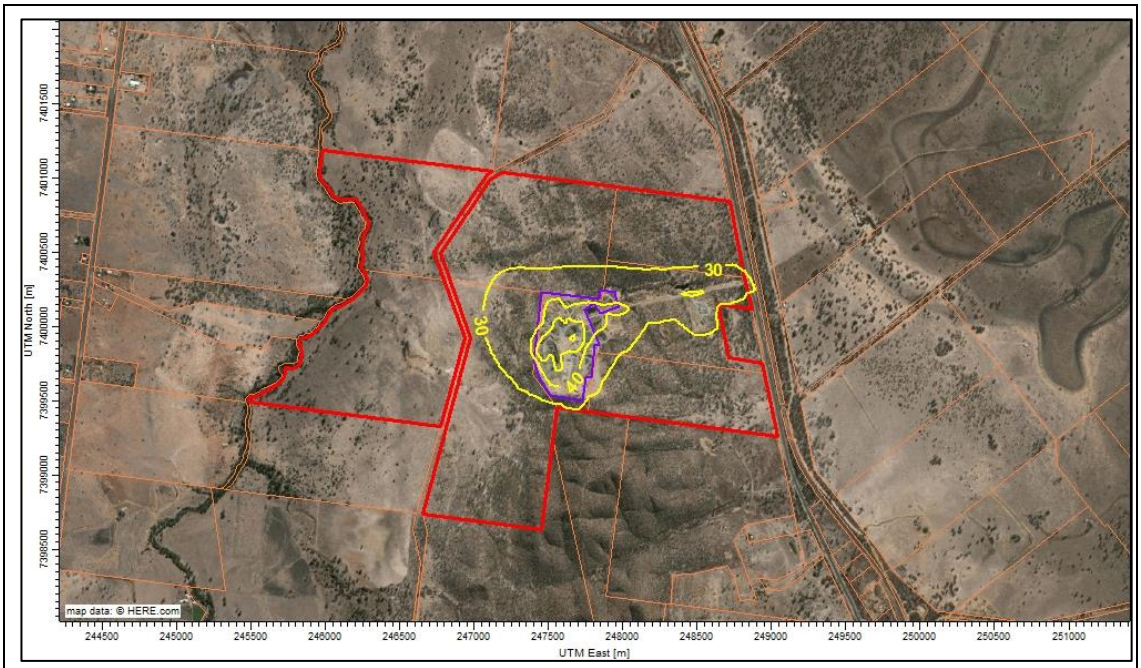
8.2 Existing Quarry Operations

Table 16 presents the maximum predicted cumulative ground level concentrations at each sensitive receptor and are driven by background concentrations. It can be seen that the predicted concentrations comply at all sensitive receptors and at the site boundary for all pollutants and time periods.

Table 16: Existing Quarry Operations – Predicted GLC at Sensitive Receptors

Predicted Pollutant Concentration (µg/m³) from Existing Quarry Operations							
Pollutant / Period	TSP	PM_{10}		$PM_{2.5}$		Deposited Dust	Complaint?
	1 year	24 hrs	1 year	24 hrs	1 year	Month	
Criteria	90 µg/m³	50 µg/m³	25 µg/m³	25 µg/m³	8 µg/m³	120 mg/m²/day	
R1	28.4	41.5	14.1	21.7	5.6	41.8	Yes
R2	28.4	41.7	14.0	21.7	5.6	40.8	Yes
R3	28.3	41.4	14.0	21.7	5.6	40.9	Yes
R4	28.3	41.3	14.0	21.7	5.6	40.8	Yes
R5	28.4	41.8	14.1	21.7	5.6	42.5	Yes
R6	28.3	41.2	13.9	21.7	5.6	40.1	Yes
R7	28.3	41.2	14.0	21.7	5.6	40.5	Yes
R8	28.3	41.2	14.0	21.7	5.6	40.6	Yes

Figure 11 to Figure 16 present the predicted contours for the existing quarry operations.



Pollutant:	Period:	Percentile:	Criteria:
TSP	1 Year	100th	90 µg/m³

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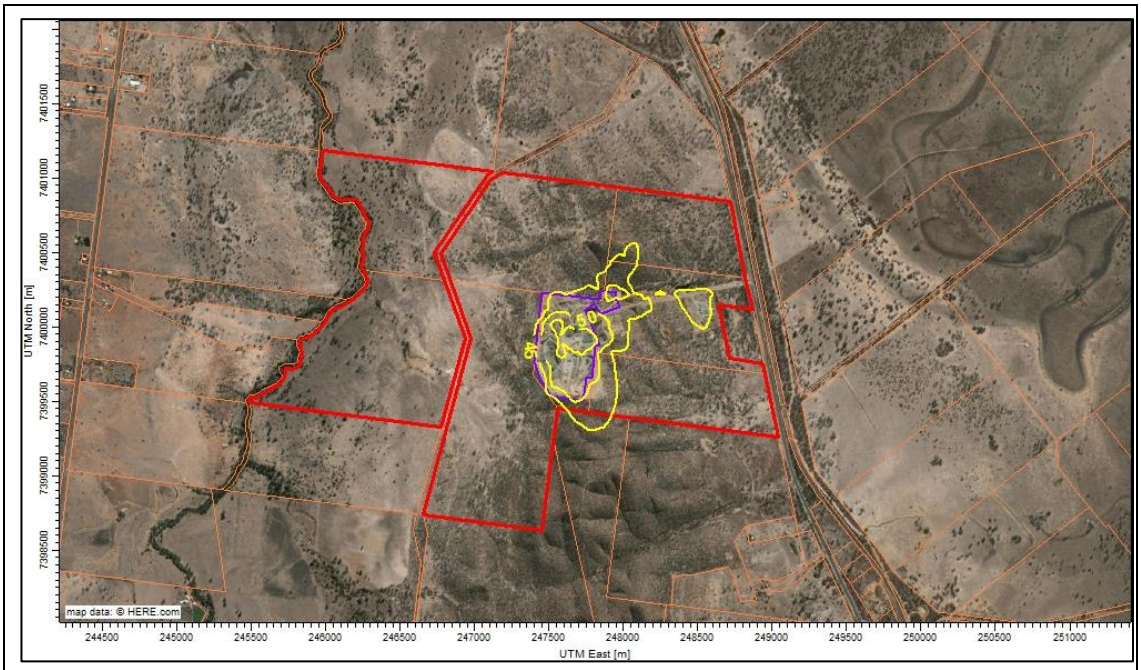
Figure 11: Existing TSP concentrations from quarry operations at 200,000 tpa as detailed in Table 23

Background Concentrations: Included



Pollutant:	Period:	Percentile:	Criteria:
PM_{10}	24 Hour	100th	50 µg/m3

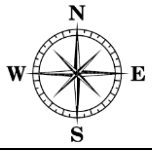
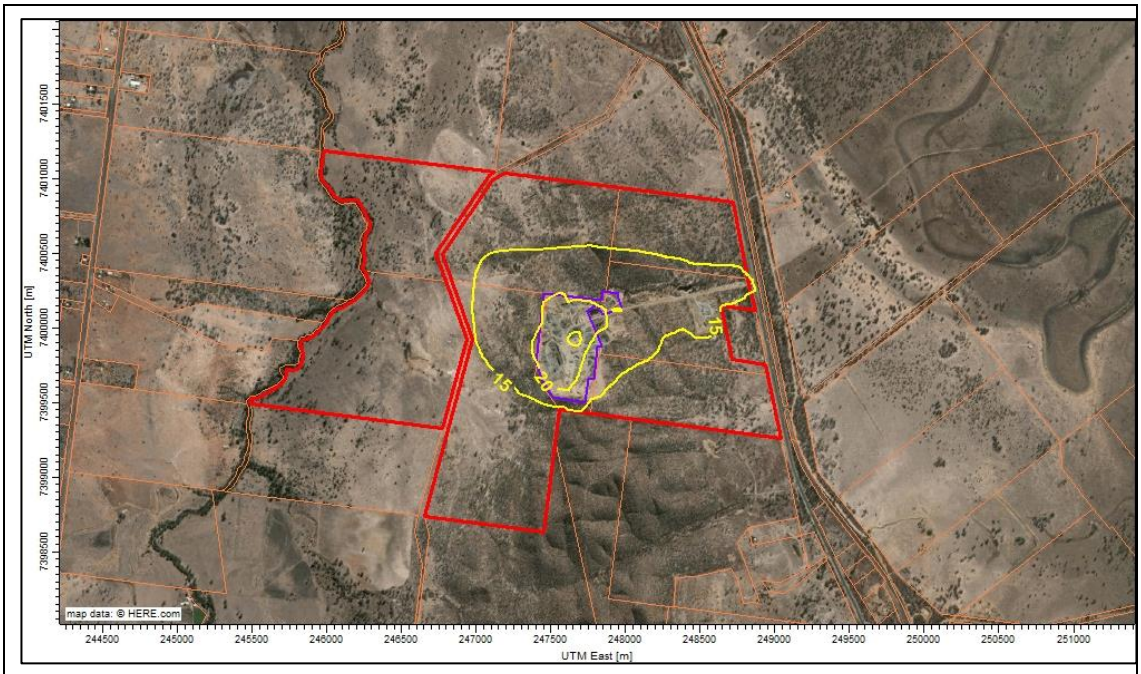


Figure 12: Existing PM_{10} 24-hour concentrations from quarry operations at 200,000 tpa as detailed in Table 23

Background Concentrations: Included



Pollutant:	Period:	Percentile:	Criteria:
PM_{10}	1 Year	100th	25 µg/m3

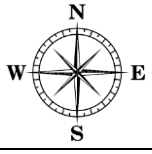
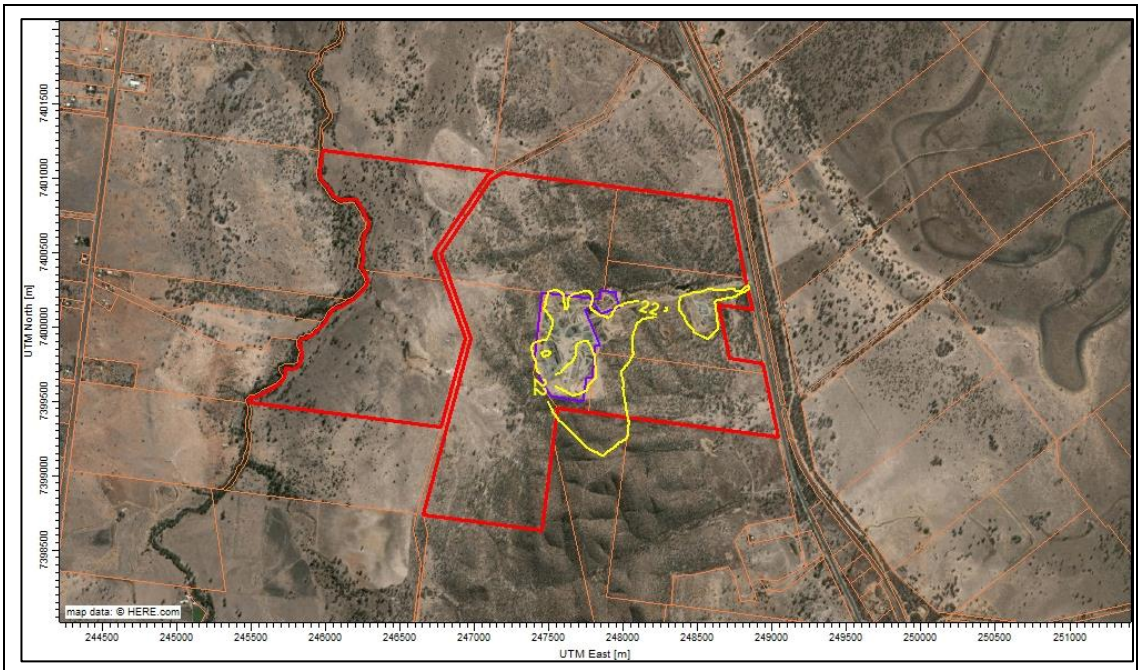


Figure 13: Existing PM_{10} annual concentrations from quarry operations at 200,000 tpa as detailed in Table 23

Background Concentrations: Included



Pollutant:	Period:	Percentile:	Criteria:
$PM_{2.5}$	24 hours	100th	25 µg/m³

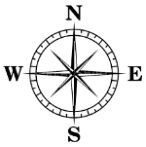
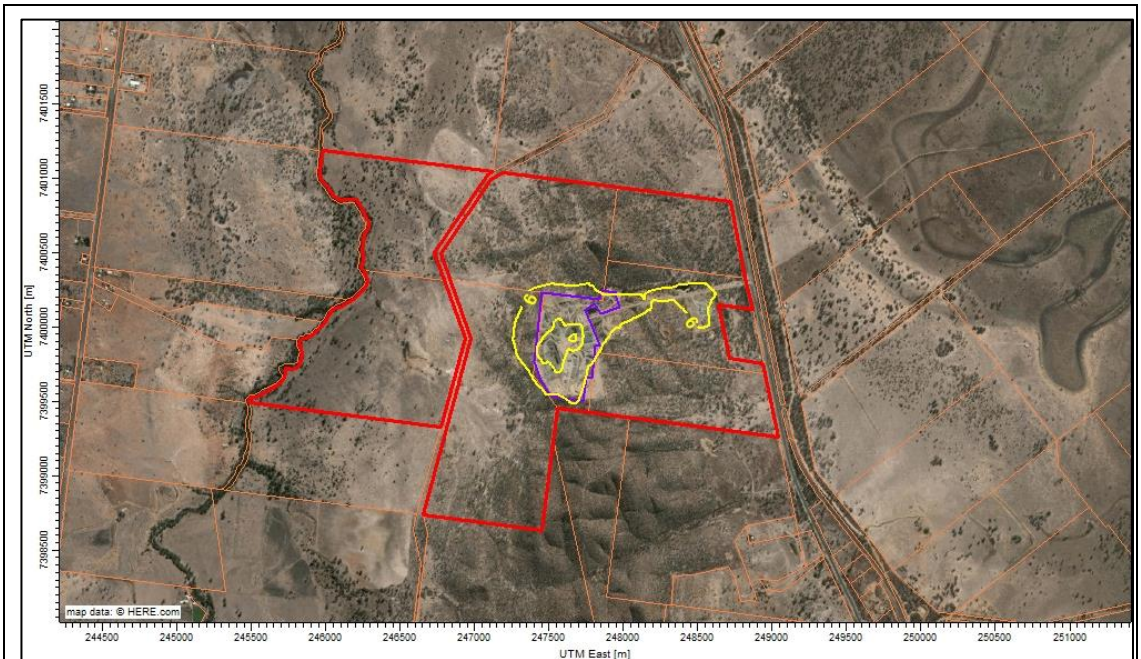


Figure 14: Existing $PM_{2.5}$ 24-hour concentrations from quarry operations at 200,000 tpa as detailed in Table 23

Background Concentrations: Included



Pollutant:	Period:	Percentile:	Criteria:
$PM_{2.5}$	1 Year	100th	8 µg/m³

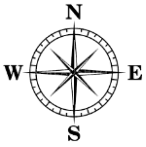
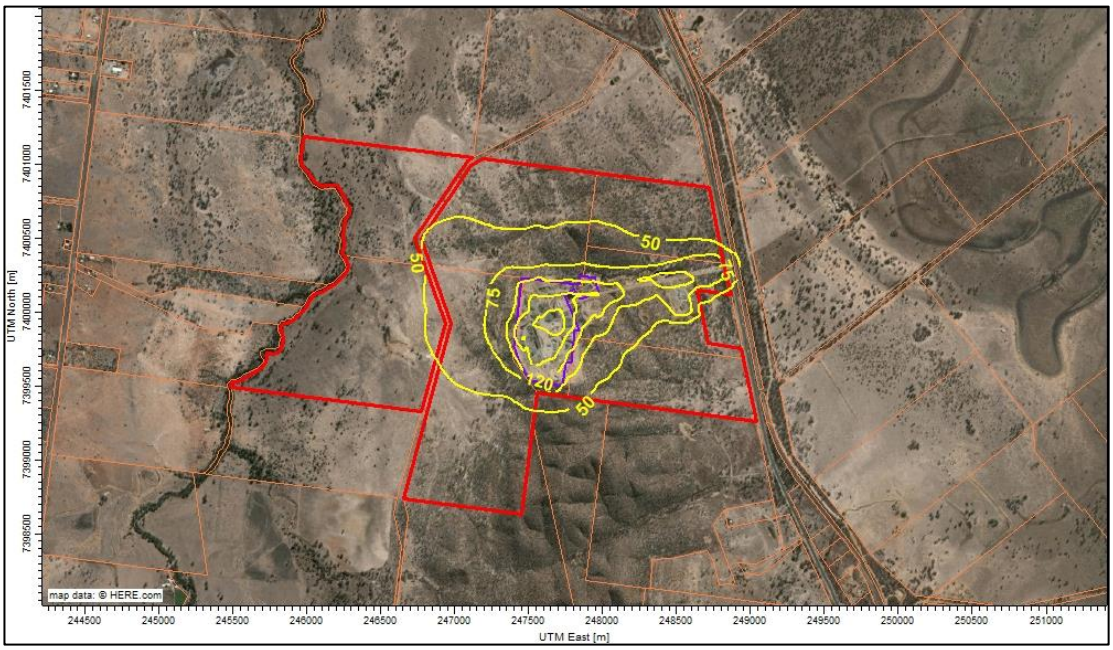


Figure 15: Existing $PM_{2.5}$ annual concentrations from quarry operations at 200,000 tpa as detailed in Table 23

Background Concentrations: Included



Pollutant:	Period:	Percentile:	Criteria:
Deposited Dust	1 Month	100th	120 mg/m²/day

Figure 16: Existing deposited dust from quarry operations at 200,000 tpa as detailed in Table 23

Background Concentrations: Included

8.3 Future Quarry Operations

Table 17 presents the maximum predicted cumulative ground level concentrations at each sensitive receptor for future quarry operations without and with the asphalt plant in operation. The activities upon which the scenarios are based are presented in Appendix B.

It can be seen that the predicted concentrations exceed the PM_{10} 24-hour concentration at two sensitive receptors. A review of the individual activities has identified the following activities primarily contribute to predicted PM_{10} concentrations:

- The main haul road which extends from Bruce Highway to the quarry entrance; and
- Screening and crushing activities at the Pit 2 East operations.

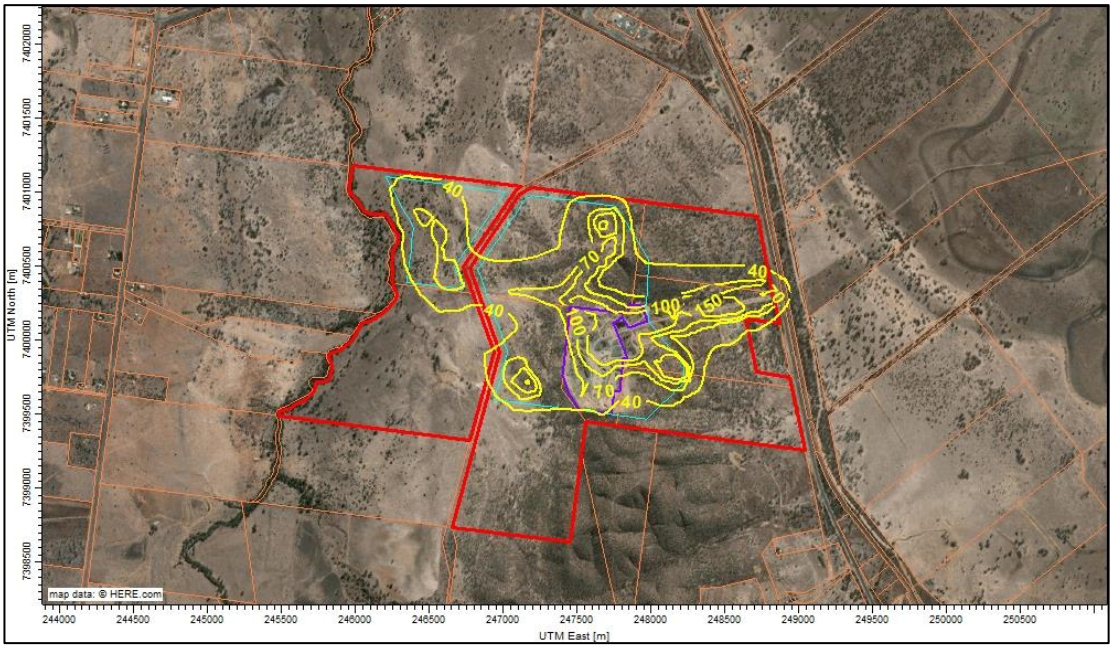
Figure 17 to Figure 22 present the predicted contours for the future quarry operations of 2 Mtpa with the asphalt plant in operation under maximum daily operations.

Table 17: Future Quarry Operations Without Asphalt Plant – Predicted GLC at Sensitive Receptors

Predicted Pollutant Concentration (µg/m³) from Existing Quarry Operations							
Pollutant / Period	TSP	PM_{10}		$PM_{2.5}$		Deposited Dust	Complaint?
	1 year	24 hrs	1 year	24 hrs	1 year	Month	
Criteria	90 µg/m³	50 µg/m³	25 µg/m³	25 µg/m³	8 µg/m³	120 mg/m²/day	
R1	29.1	**65.2**	18.7	21.8	6.2	52.0	No
R2	28.8	46.9	19.8	21.7	6.4	46.6	Yes
R3	28.5	45.5	17.3	21.7	6.0	44.3	Yes
R4	28.5	44.3	16.9	21.7	6.0	44.1	Yes
R5	29.7	**65.8**	19.7	22.6	6.4	61.6	No
R6	28.3	41.4	14.9	21.7	5.7	40.7	Yes
R7	28.7	42.4	17.0	21.7	6.0	46.0	Yes
R8	28.8	44.4	17.2	21.7	6.0	47.0	Yes

Table 18: Future Quarry Operations with Asphalt Plant – Predicted GLC at Sensitive Receptors

Predicted Pollutant Concentration (µg/m³) from Existing Quarry Operations							
Pollutant / Period	TSP	PM_{10}		$PM_{2.5}$		Deposited Dust	Complaint?
	1 year	24 hrs	1 year	24 hrs	1 year	Month	
Criteria	90 µg/m³	50 µg/m³	25 µg/m³	25 µg/m³	8 µg/m³	120 mg/m²/day	
R1	29.5	**79.9**	19.5	22.1	6.4	58.1	No
R2	28.9	47.4	20.3	21.7	6.5	49.2	Yes
R3	28.6	49.3	17.6	21.7	6.1	45.8	Yes
R4	28.6	47.2	17.2	21.7	6.1	45.3	Yes
R5	30.2	**81.4**	20.7	23.4	6.6	67.7	No
R6	28.3	41.4	14.9	21.7	5.7	40.8	Yes
R7	28.8	42.7	17.2	21.7	6.1	46.9	Yes
R8	28.9	44.7	17.4	21.7	6.1	48.0	Yes



Pollutant:	Period:	Percentile:	Criteria:
TSP	1 Year	100th	90 µg/m³

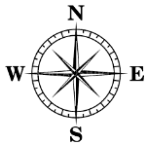
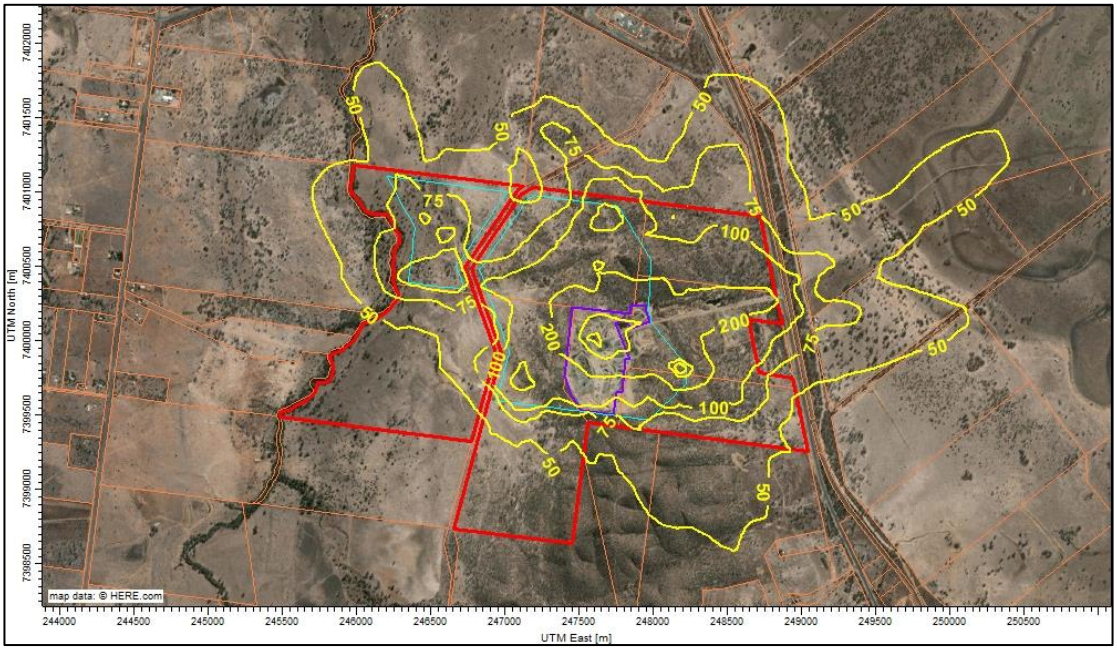


Figure 17: Future TSP concentrations from quarry operations at 2,000,000 tpa as detailed in Table 23 and asphalt plant as detailed in Table 24

Background Concentrations: Included



Pollutant:	Period:	Percentile:	Criteria:
PM_{10}	24 Hour	100th	50 µg/m³

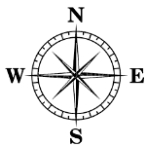
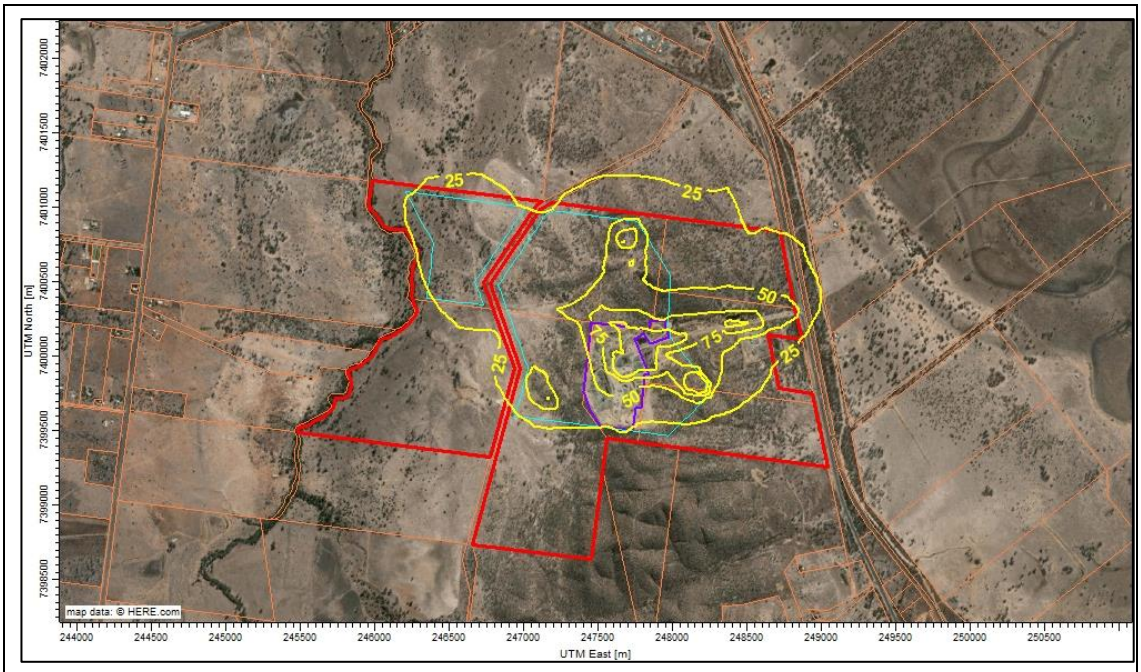


Figure 18: Future PM_{10} 24-hour concentrations from quarry operations at 2,000,000 tpa as detailed in Table 23 and asphalt plant as detailed in Table 24

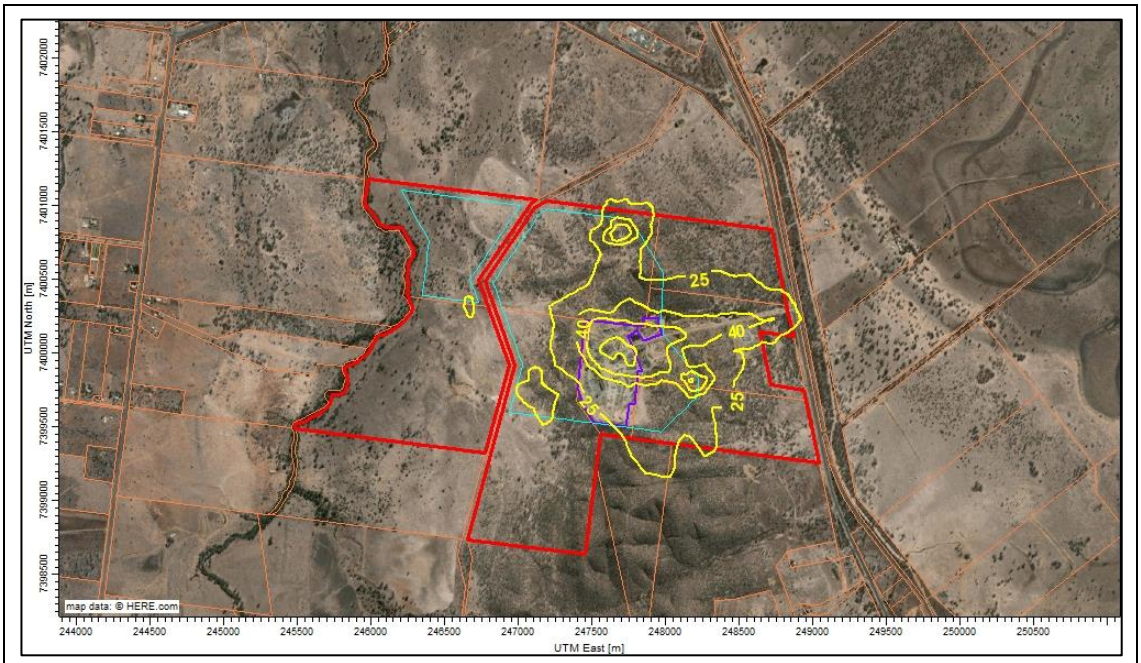
Background Concentrations: Included



Pollutant:	Period:	Percentile:	Criteria:
PM_{10}	1 Year	100th	25 µg/m³

Figure 19: Future PM_{10} annual concentrations from quarry operations at 2,000,000 tpa as detailed in Table 23 and asphalt plant as detailed in Table 24

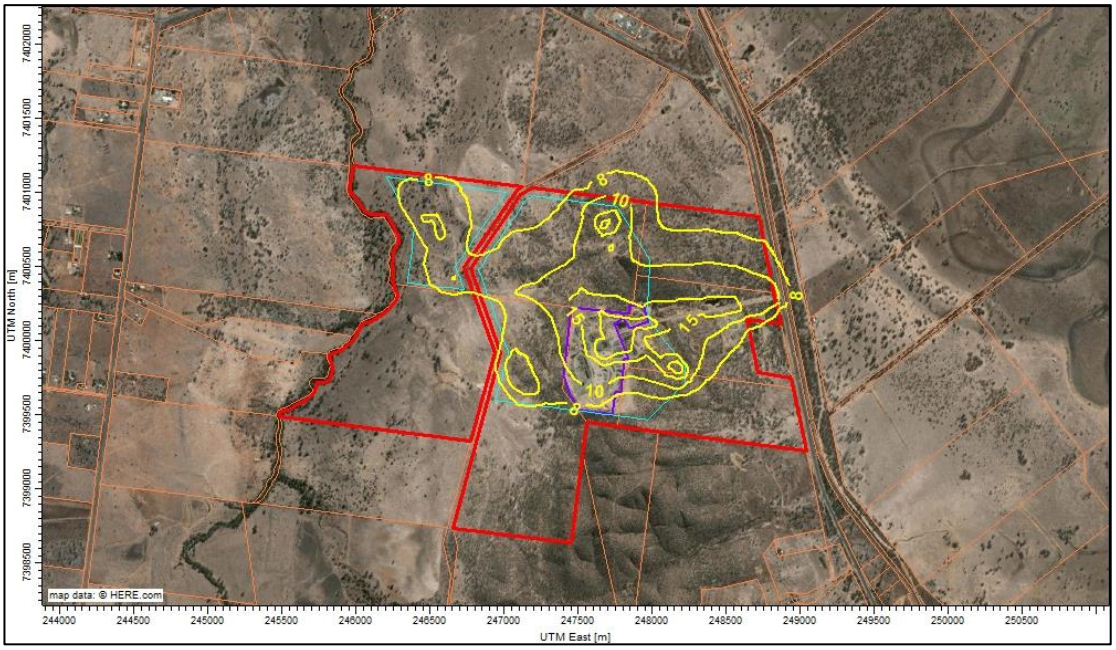
Background Concentrations: Included



Pollutant:	Period:	Percentile:	Criteria:
$PM_{2.5}$	24 hours	100th	25 µg/m³

Figure 20: Future $PM_{2.5}$ 24-hour concentrations from quarry operations at 2,000,000 tpa as detailed in Table 23 and asphalt plant as detailed in Table 24

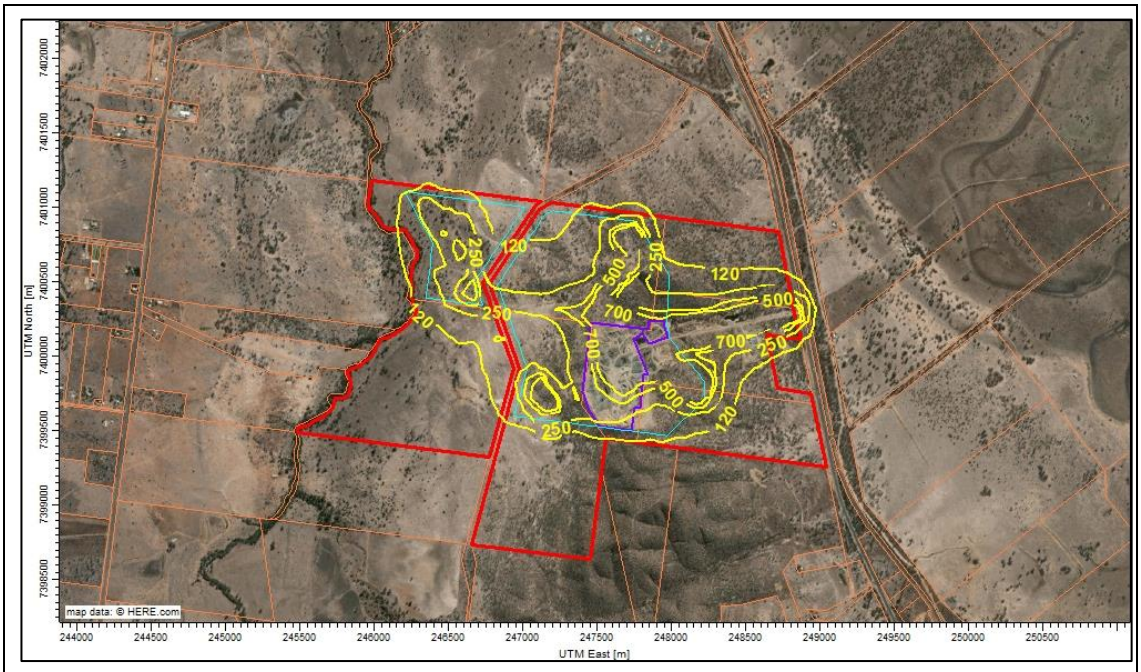
Background Concentrations: Included



Pollutant:	Period:	Percentile:	Criteria:
$PM_{2.5}$	1 Year	100th	8 µg/m³

Figure 21: Future $PM_{2.5}$ annual concentrations from quarry operations at 2,000,000 tpa as detailed in Table 23 and asphalt plant as detailed in Table 24

Background Concentrations: Included



Pollutant:	Period:	Percentile:	Criteria:
Deposited Dust	1 Month	100th	120 mg/m²/day

Figure 22: Future deposited dust from quarry operations at 2,000,000 tpa as detailed in Table 23 and asphalt plant as detailed in Table 24

Background Concentrations: Included

8.4 Additional Emissions Controls

The predicted ground level contours presented in Table 17 and Table 18 are based on level 2 watering of the haul roads A review of the results identified that the two main source contributions to the PM_{10} 24-hour concentrations are the main haul road and screening/crushing activities in the eastern part of Pit 2.

Table 19 presents the maximum predicted concentrations with background concentrations included at sensitive receptors with the following additional controls:

- paving the main haul road from Bruce Highway to the pit entrance; and
- watering during the screening and crushing activities in Pit 2 East.

Table 19: Summary of Maximum Predicted Ground Level Concentrations at Sensitive Receptors with Additional Emissions Controls Implemented

Pollutant	Averaging Period	Maximum Predicted GLC at Sensitive Receptors with Additional Control Measures (µg/m^3)	Criteria (µg/m^3)
TSP	Annual	29.2	90
PM_{10}	24 hours	49.1	50
	Annual	17.4	25
$PM_{2.5}$	24 hours	22.7	25
	Annual	6.1	8
Deposited Dust	Month	52.7	120 mg/m^2/day

It can be seen from Table 19 that all sensitive receptors are compliant with the respective criteria.

A review of the main haul road emissions has identified that paving the main haul road from Bruce Highway to the pit entrance should be completed whenever the following occurs first:

- when the quarry production reaches 1.2 Mtpa without the asphalt plant operating; or
- when the quarry production reaches 500,000 tpa with the asphalt plant operating at maximum daily capacity; or
- when the quarry production reaches 800,000 tpa and the asphalt plant is operating at 50% capacity.

Whilst it is recommended the entire haul road is paved eventually (based on production rates), it is acknowledged that paving the entire road at once may be financially disadvantageous. If this occurs, paving the first 200 m from Bruce Highway would be most beneficial to the closest sensitive receptors.

If a staged approach is taken, it is recommended that particulate monitoring, in accordance with the Site Based Management Plan and visual inspections are completed to ensure PM_{10} 24-hour criteria is not exceeded. If the monitoring data indicates an exceedence, the remainder of the haul road will need to be paved or site operations should be reviewed, such as location of processing plant.

9 MITIGATION MEASURES

The Environment Protection (Air) Policy management hierarchy gives priority to avoiding emissions where reasonable to do so. Where this is not possible, emissions reduction and management currently at the quarry are best practice.

The quarry aims to reduce emissions of dust and other pollutants by implementing the following control measures, which are consistent with the site-based management plan for the quarry. The management plan aims to reduce emissions from dust and other pollutants by implementing the following control measures listed in Table 20.

Table 20: Mitigation Controls by Activity

Activity	Mitigation Measure
Work Areas / Trafficable Area	▪ Limit high dust generating activities (e.g., removal of topsoil/overburden and blasting) to periods of favourable weather conditions. ▪ Dampen down (approx. rate of 2 litres/m²/hour) work areas, stockpiles, access roads and other hardstand areas by water spraying when visual surveillance indicates excessive dust generation. ▪ Restrict vehicle movements to designated routes to the extent practicable. ▪ Enforce speed limits on internal roads. ▪ Maintain road surfaces in good condition. ▪ Prevent and clean up any raw material / product spillages or dust accumulation on driveways or sealed roads. ▪ Use dust extraction systems on drill rigs where possible, or wet down drilling via water sprays
Processing Plant	▪ Use water sprays and/or dust collection systems at transfer points. ▪ Use shielding and/or windbreaks where possible. ▪ Maintain equipment in accordance with the original equipment manufacturers' specifications. ▪ Dampen materials prior to transport/handling.
Stockpiles	▪ Limit the height of any stockpiles to <6m, where practicable. ▪ Regularly water stockpiles to keep down dust emissions. ▪ Apply additional water sprays to stockpiles during high wind conditions.
Transport of Materials	▪ Ensure that incoming and outgoing truckloads of materials are covered during transport

10 CONCLUSIONS

Hopkins Brothers have been operating the Midgee Quarry on the Bruce Highway, Midgee, since the early 2000s. Historically, the site has been used to extract material since the 1960s. The quarry operation has evolved over the years to respond to market demand, resulting in various planning permits having been obtained from Rockhampton Regional Council (RRC).

Local demand for quarry resources is anticipated to increase in the next decade, driven by regional significant infrastructure projects and a general increase in development within the region. As such, Hopkins Brothers are seeking to secure access to the known resource.

An air quality impact assessment has been undertaken to demonstrate the increase in production and associated changes to infrastructure will not have adverse effects on surrounding receptors. The assessment has been conducted in accordance with Department of Environment & Science (DES) *Guideline - Application requirements for activities with impacts to air* (2019).

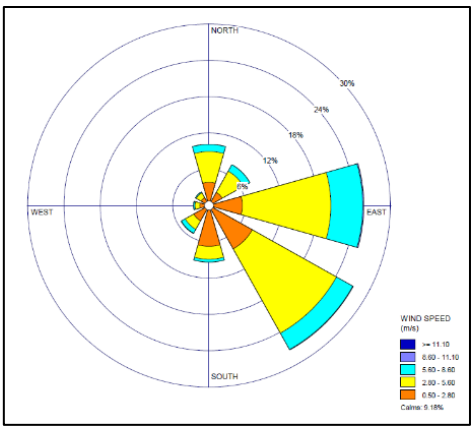
The results of the contemporaneous modelling for future operations (2 Mtpa with and without the asphalt plant) has identified an exceedence of the PM_{10} 24-hour criteria at two receptors. Paving the main haul road as detailed in Section 8.4 has determined compliance can be achieved at these receptors.

Overall, the proposed increase in production is not expected to adversely impact on the air environment of nearby sensitive uses if the haul road is paved at the required stages in Section 8.4.

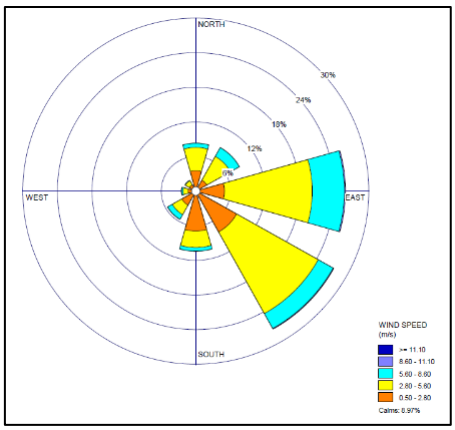
APPENDIX A: METEOROLOGICAL REVIEW

Section of Representative Year

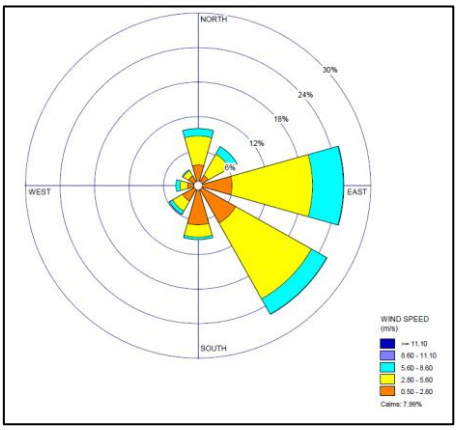
To determine the most representative meteorological year to utilise in the modelling, seven years (2012 - 2019) of meteorological observations from BOM Rockhampton Airport (station number 039083) were reviewed. The Figure below presents the wind roses for 2012 – 2019.



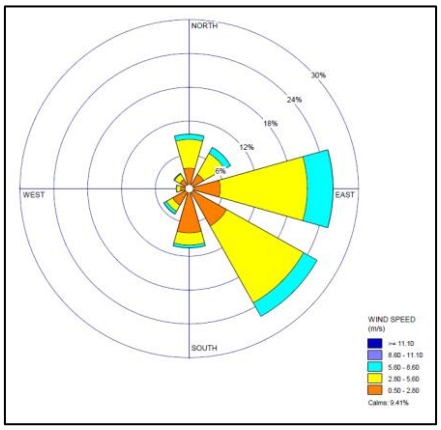
Annual 2012 - 2019



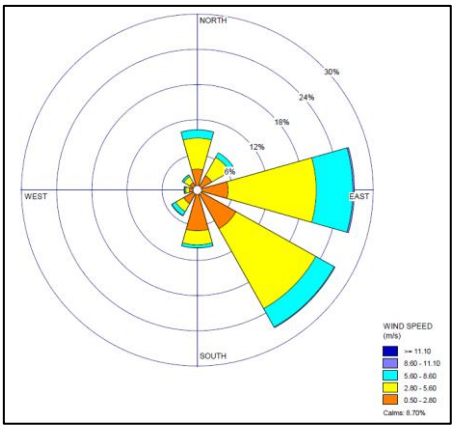
Annual 2015



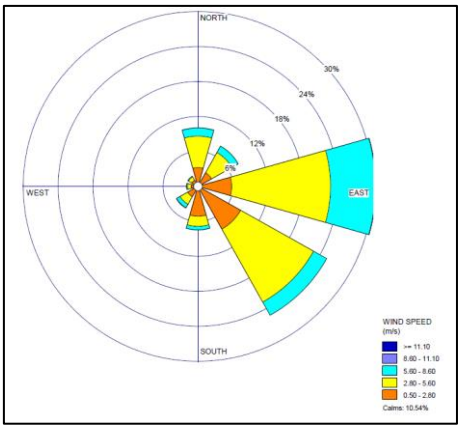
Annual 2016



Annual 2017



Annual 2018



Annual 2019

Long-term Wind Roses from BOM Rockhampton Airport (2012 - 2019)

Figure in this section present the observed annual and seasonal wind roses for BOM Rockhampton Airport. The following is noted:

- The annual wind roses for 2012 - 2019 show that the dominant wind directions are easterly and south easterly wind flows.
- The annual wind roses for 2016 and 2017 are the closest wind roses to the long-term average.

Based on the wind roses alone, 2016 and 2017 are considered the most representative years. Table 21 presents a yearly comparison of various meteorological parameters against the seven-year dataset. It can be seen form the Table that 2017 is the most conservative (highest occurrence of calms and lowest wind speeds) representative year based on the percentage of calm conditions and the strongest correlation for relative humidity, temperature, and wind speed by month.

Table 21: Data Analysis

Parameter		Year					
		2012 - 2019	2015	2016	2017	2018	2019
Wind Conditions	Data Availability	99.63	99.91	98.77	99.98	99.97	99.95
	Calm Conditions (%)	9.18	8.97	7.99	9.41	8.70	10.54
	Ave. Wind Speed (m/s)	3.26	5.24	5.33	3.16	3.39	3.30
Rainfall	Data Availability	99.65	99.91	98.77	99.98	99.97	99.95
	Rainfall (mm)	815	678	809	802	469	268
	Average Hourly Rainfall (mm/hour)	0.07	0.08	0.09	0.09	0.05	0.03
Correlations of Datasets by Month	RH (%)		0.40	0.58	0.83	0.68	0.32
	Temperature (°C)		0.98	0.98	0.97	0.99	0.61
	Wind Speed (m/s)		0.88	0.89	0.92	0.92	0.67

a) Based on long-term data from BOM website

As such, 2017 is considered the most representative year for locations close to Rockhampton.

Validation of Model Performance

An evaluation of the performance of the meteorological model is presented in this section. The evaluation compares the observed meteorological data from BOM Amberley with the output from CALMET, which included data assimilation in TAPM.

Figure 23 presents a comparison of the 9 am, 3 pm and annual 2017 predicted and observed wind roses at BOM Rockhampton Airport monitoring station which is located approximately 14 km to the NNW of the Subject Site. Comparison of the BOM site observed wind roses with predicted wind roses indicate that whilst the model has more wind flows from the east on an annual basis, the prediction model is accurately representing the wind flows for 9 am and 3 pm.

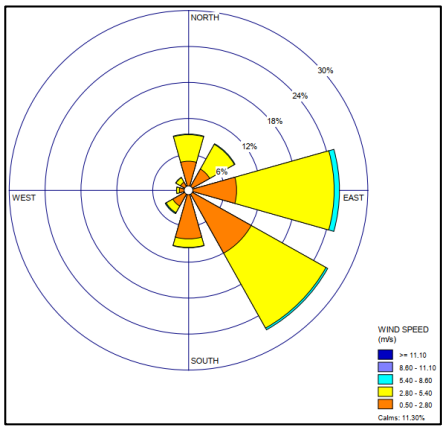
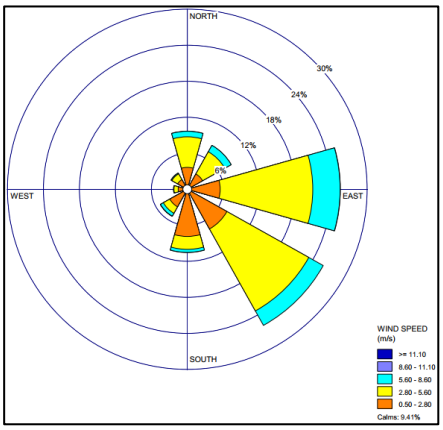
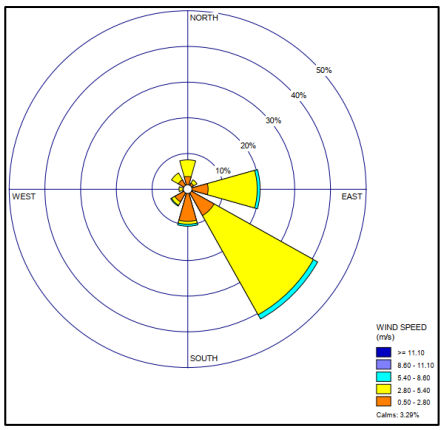
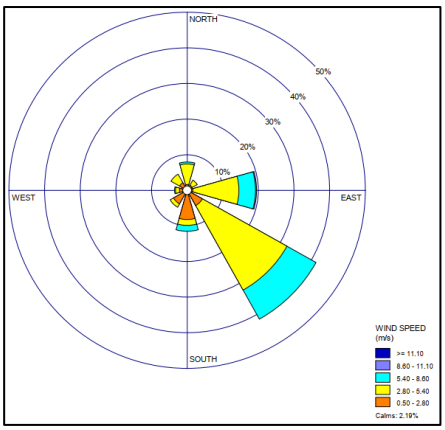
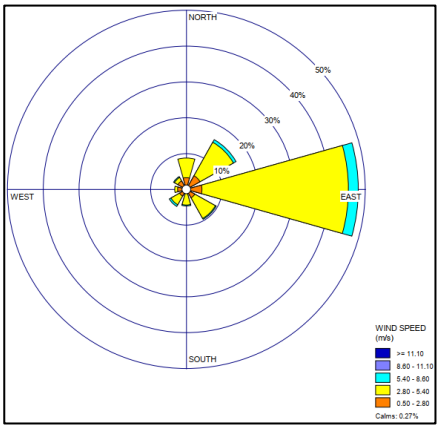
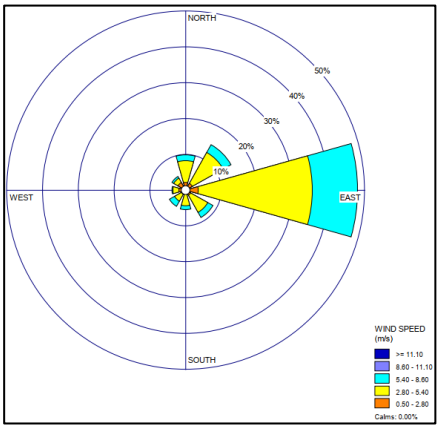
Period	BOM Rockhampton Predicted (2017)	BOM Rockhampton Observed (2017)
Annual		
0900		
1500		

Figure 23: Comparison of Predicted (2017) and BOM Observed Wind Roses (2017) at BOM Rockhampton

Figure 24 shows the probability density functions that graphically compare statistical distributions of individual meteorological parameters between TAPM/CALMET output and observational data, as extracted from the BOM Amberley location.

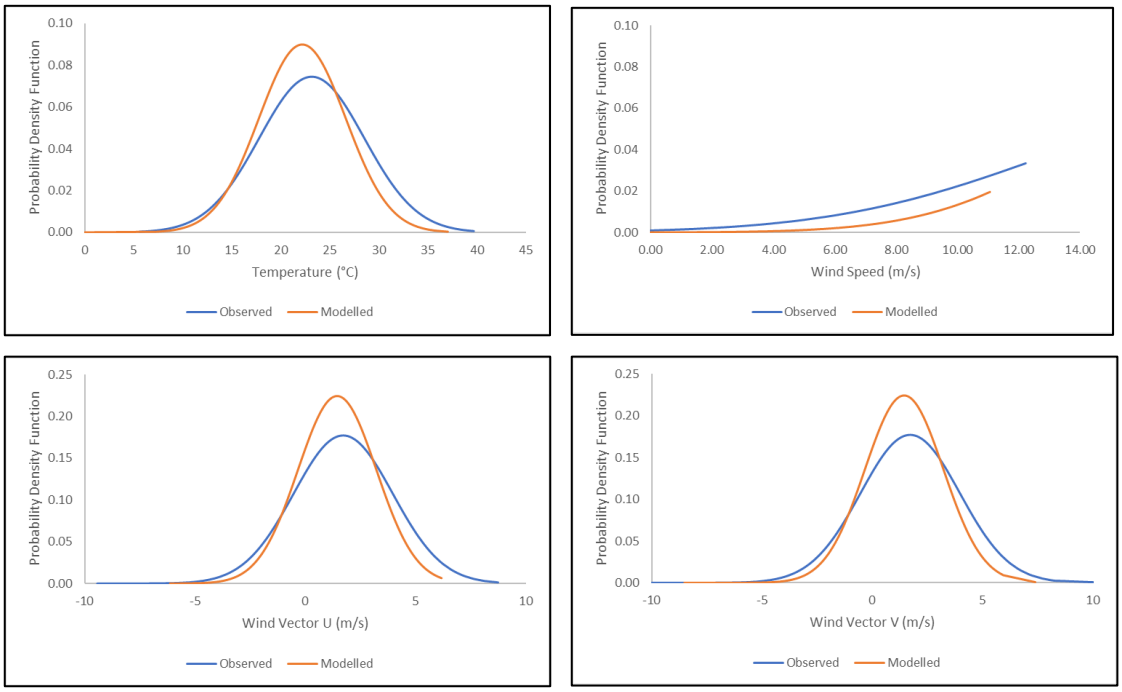


Figure 24: Probability Density Functions (pdf) Comparing Observational and Modelled Data at BOM Rockhampton

Review of the data has identified that the modelled and observed datasets are very similar, with the following noted:

- The modelled temperatures are more likely to be higher than those observed;
- The model has a cut of wind speed of 11 m/s;
- The wind vectors U (east/west component) and V (south/north component) are very similar.

On this basis, the prognostic dataset is considered suitable for the purposes of the assessment.

Prognostic Dataset Review at Subject Site

This section provides an analysis of the prognostic meteorological dataset extracted from the CALMET model for 2017 at the Subject Site.

Predicted Atmospheric Stability

The amount of turbulence in the ambient air has a major effect upon the rise and dispersion of emissions. In particular, the amount of turbulence in the atmosphere plays a key role in diffusion of an emitted plume in the air with stronger turbulence (increased instability) increasing the rate of diffusion. Where the atmosphere exhibits weak turbulence (increased stability), downwind contaminant concentrations can be expected to increase due to the limited diffusion.

Figure 25 presents the diurnal variability in atmospheric stability identified in the predicted meteorological dataset. As can be seen, atmospheric instability increased during the day where the influence of solar energy drives convection in the atmosphere. Conversely, increased stability can be seen during night periods where stable conditions are predicted for more than 90% of the time.

Monin-Obukhov Length

The Monin-Obukhov Length represents a parameter (with dimension of length) which provides a relationship between parameters characterising dynamic, thermal, and buoyant processes. The parameter, first described by Obukhov in 1946, is the characteristic height scale of the dynamic sub-layer of the atmosphere and is positive for stable stratifications and negative for unstable stratifications.

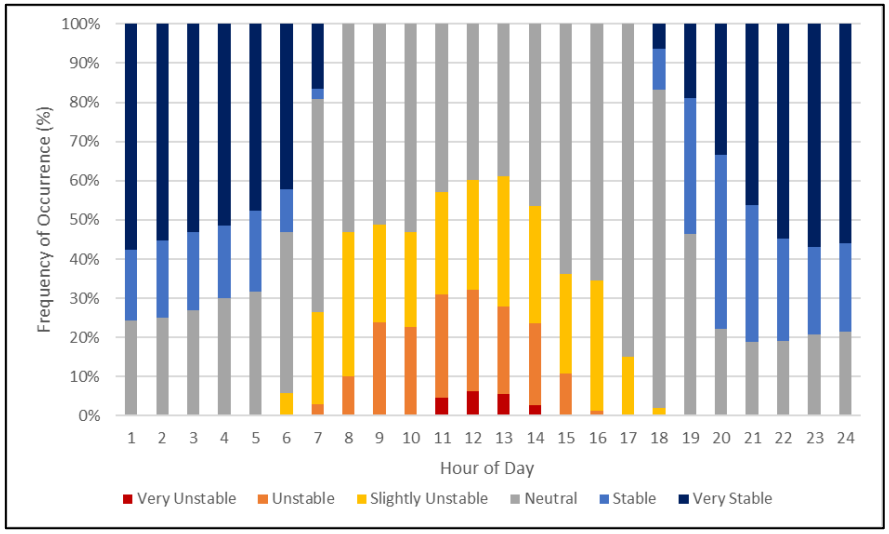
Figure 25 presents a graphical representation of the reciprocal of the Monin-Obukhov length (1/L) for the 2017 prognostic (CALMET) dataset. In this figure, neutral stability conditions have the 1/L value of zero (0), stable conditions have positive values of 1/L and unstable conditions have negative values of 1/L. The more positive 1/L value, the more stable the atmosphere is assumed to be by the model. Similarly, the more negative 1/L becomes, the more unstable the atmosphere is assumed to be by the model.

Predicted Atmospheric Mixing Height

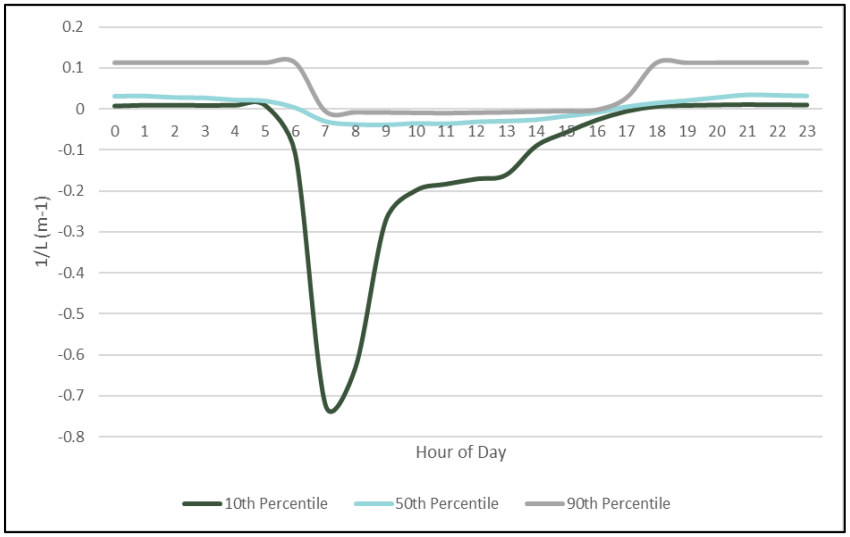
Figure 25 presents an illustration of diurnal variations in maximum and average mixing heights predicted by CALMET at the Subject Site across the 2017 prognostic meteorological dataset. As expected, an increase in mixing height during the morning is apparent, arising due to the onset of vertical mixing following sunrise. Maximum mixing heights generally occur in the mid to late afternoon, due to the dissipation of ground-based temperature inversions and growth of the convective mixing layer. The highest maximum mixing height for the Subject Site occurs during the late afternoon period.

Temperature

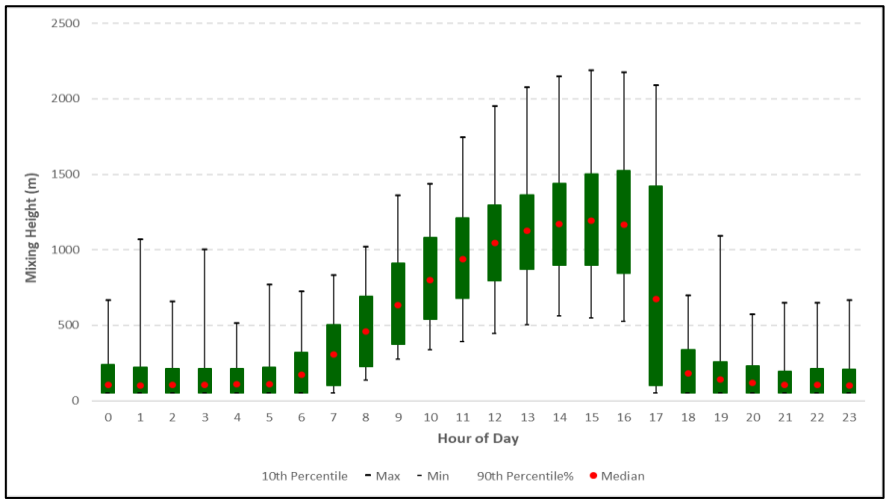
Figure 25 presents an illustration of diurnal variations in maximum and average temperatures predicted by CALMET at the Subject Site across the 2017 prognostic meteorological dataset.



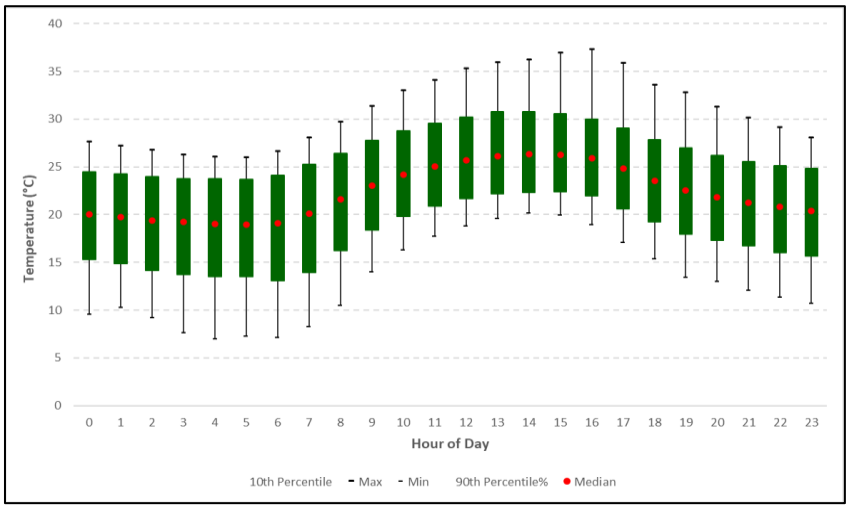
Annual Atmospheric Stability by Hour



Annual Variability of Monin-Obukhov Length by Hour



Atmospheric Mixing Height by Hour



Temperature by Hour

Figure 25: Meteorological Analysis at Subject Site

APPENDIX B: EMISSION ESTIMATION

Emission factors shown in Table 22 and operational information listed in Table 23 can be used to estimate emissions of TSP, PM_{10} and $PM_{2.5}$ to the air from various sources associated with the site.

Table 22: Emission Factor by Activity

Activity	Units	TSP Emission Factor	PM_{10} Emission Factor	$PM_{2.5}$ Emission Factor	Source
Wind Erosion for exposed areas	t/ha/hr	0.85 x (365-RD)/365	TSP x 0.5	PM_{10} x 0.075	NPI Mining
Wind Erosion from active stockpiles	kg/ha/hr	1.8 x U x (365-RD)/365	TSP x 0.5	PM_{10} x 0.075	NPI Mining
Loading / unloading trucks from stockpiles	kg/t	$0.74\ x\ 0.0016\ x\ \frac{(U/2.2)^{1.3}}{(M/2)^{1.4}}$	$0.35\ x\ 0.0016\ x\ \frac{(U/2.2)^{1.3}}{(M/2)^{1.4}}$	$0.053\ x\ 0.0016\ x\ \frac{(U/2.2)^{1.3}}{(M/2)^{1.4}}$	NPI Mining
Wheel generated particulates on paved roads	g/VKT	$3.23\ x\ \frac{S^{0.91}}{W^{1.02}}$	$0.62\ x\ \frac{S^{0.91}}{W^{1.02}}$	$0.15\ x\ \frac{S^{0.91}}{W^{1.02}}$	AP-42 13.2.1
Wheel generated particulates on unpaved roads (heavy vehicles)	kg/VKT	$\frac{0.4536}{1.6093}\ x\ 4.9\ x\ (S/12)^{0.7}\ x\ (W/3)^{0.45}$	$\frac{0.4536}{1.6093}\ x\ 1.5\ x\ (S/12)^{0.9}\ x\ (W/3)^{0.45}$	PM_{10} x 0.15	NPI Mining
Wheel generated particulates on unpaved roads (light vehicles)	kg/VKT	$1.69\ x\ \frac{(S/12)\ x\ (S/48)^{0.3}}{(M/0.5)^{0.3}}$ - 0.0013	$0.51\ x\ \frac{(S/12)\ x\ (S/48)^{0.5}}{(M/0.5)^{0.2}}$ - 0.0013	PM_{10} x 0.15	NPI Mining
Material transfer (misc)	kg/t per transfer point	$0.74\ x\ 0.0016\ x\ \frac{(U/2.2)^{1.3}}{(M/2)^{1.4}}$	$0.35\ x\ 0.0016\ x\ \frac{(U/2.2)^{1.3}}{(M/2)^{1.4}}$	$0.053\ x\ 0.0016\ x\ \frac{(U/2.2)^{1.3}}{(M/2)^{1.4}}$	NPI Mining
Tertiary Crushing - Controlled	kg/t	0.0027	0.0012	0.00022	NPI Mining
Screening - Controlled	kg/t	0.01250	0.00430	0.00029	NPI Mining
Conveyor Transfer Point	kg/t	0.00150	0.00055	0.00016	NPI Mining

Where:

- M = material moisture content (%)
- S = material silt content (or surface content in unpaved roads (%) or silt loading on paved roads (g/m^2))
- U = wind speed (m/s)
- RD = rainfall days >0.25 mm
- W = mean vehicle weight (tonnes)
- Area (m^2)

Table 23: List of Activity Data and Assumptions for Dust Emission Rates for Quarry

Parameter	Units	Existing	Future
Operating Times			
Operating hours	hrs per day	12	24
Operating days	day / year	312	365
Operating days	days	Mon to Sat	Mon to Sun
Volumes / Areas			
Annual Production	tonnes/yr	200,000	2,000,000
Exposed Areas (Quarry)	ha	8.8	48.1
Exposed Areas (Storage Area)	ha	2.8	2.8
Exposed stockpiles	ha	4.3	6.0
Rehabilitated Area	ha	-	-
Material Transfer			
Trucks Loading in Pit	tonnes/yr	200,000	2,000,000
Truck Unloading at Screening Plant	tonnes/yr	200,000	2,000,000
Screening (5 transfer points)	tonnes/yr	1,000,000	10,000,000
Crushing (3 transfer points)	tonnes/yr	600,000	6,000,000
Stockpile Loading	tonnes/yr	200,000	2,000,000
Trucks Loading from Stockpile	tonnes/yr	200,000	2,000,000
Trucks Unloading in Storage Area	tonnes/yr	200,000	2,000,000
FEL in Materials Storage Area	tonnes/yr	200,000	2,000,000
Vehicle Movements			
Product Truck Weight (unladen)	tonnes	32	32
Product Truck Weight (laden)	tonnes	61	61
Raw Materials Truck (unladen)	tonnes	47	47
Raw Materials Truck (laden)	tonnes	79	79
Access Road (Bruce Highway to Pit 2 Entrance)	km / VKT	1.1 / 13,225	1.1 / 117,556
Internal Haul Road (Existing Pit to Fixed Plant)	km / VKT	0.9 / 2,813	-
Internal Haul Road (Existing Pit to Mobile Plant)	km / VKT	1.0 / 3,188	-
Internal Haul Road (Mobile Plant to Access Road)	km / VKT	1.0 / 6,163	-
Internal Haul Road (Fixed Plant to Main Haul Road)	km / VKT	-	0.2 / 22,250
Internal Haul Road (Pit 1 to Main Haul Road)	km / VKT	-	2.0 / 36,806
Internal Haul Road (Pit 2 East to Main Haul Road)	km / VKT	-	0.5 / 12,900
Internal Haul Road (Pit 2 North to Main Haul Road)	km / VKT	-	0.6 / 24,338
Internal Haul Road (Pit 2 West to Fixed Plant)	km / VKT	-	0.9 / 11,075

Parameter	Units	Existing	Future
Internal Haul Road (Fixed Plant to Pite 1 Haul Road)	km / VKT	-	0.7 / 25,875
Drilling and Blasting			
Number of Holes	per blast	160	160
Area per Blast	m^2	1,960	1,960
Number of Blasts per Year	-	4	6
Weather			
Mean wind speed (Rockhampton Airport)	m/s	3.26	3.26
Rainfall >0.25 mm	Days per yr	62	62
Material Characteristics			
Raw material moisture content	%	2	2
Silt content of unpaved road	%	7.1	7.1
Emission Controls			
Material transfers (loading stockpiles)	%	0	0
Material transfers (processing)	%	0	0
Material transfers (loading trucks)	%	0	0
Unpaved roads (water truck)	%	75	75
Wind erosion of stockpile	%	0	0
In pit retention	%	TSP – 50% PM_{10} – 5%	N/A

Table 24: List of Activity Data and Assumptions for Dust Emission Rates for Asphalt Plant

Parameter	Units	Asphalt Plant
Operating Times		
Operating hours	hrs per day	12
Operating days	day / year	307
Operating days	days	Mon to Sat
Volumes / Areas		
Annual Production	tonnes/yr	100,000
Maximum Production	tonnes/day	2,500
Maximum Production (based on daily maximum production)	tonnes/yr	997,750
Exposed Areas	ha	1.8
Exposed stockpiles	ha	0.09
Material Transfer		
Truck unloading (raw materials)	tonnes/yr	767,500
Loading material to crusher	tonnes/yr	-
Rehandling of material / FEL	tonnes/yr	767,500
Rehandling of material / bin loading	tonnes/yr	767,500

Parameter	Units	Asphalt Plant
Truck loading	tonnes/yr	997,750
Asphalt Product Truck Weight (unladen)	tonnes	25
Asphalt Product Truck Weight (laden)	tonnes	61
Access Road (Bruce Highway to Asphalt Plant)	km / VKT	1.09 / 60,198
Raw Materials Truck (unladen)	tonnes	47
Raw Materials Truck (laden)	tonnes	79
Internal Haul Road (Quarry Stockpiles to Asphalt Plant)	km / VKT	0.13 / 6,284
Weather		
Mean wind speed (Rockhampton Airport)	m/s	3.26
Rainfall >0.25 mm	Days per yr	62
Material Characteristics		
Raw material moisture content	%	2
Silt content of unpaved road	%	7.1
Emission Controls		
Material transfers (loading stockpiles)	%	0
Material transfers (processing)	%	0
Material transfers (loading trucks)	%	25
Unpaved roads (water truck)	%	75
Wind erosion of stockpile	%	0

ASSESSMENT OF ECOLOGICAL MATTERS OF STATE AND LOCAL SIGNIFICANCE

MIDGEE QUARRY EXTENSION, ROCKHAMPTON

Prepared for
Groundwork Plus



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File Number: 0049-122

Project Manager/s: Jedd Appleton

Client: Groundwork Plus

Project Title: Assessment of Ecological Matters of State and Local Significance – Midgee Quarry, Rockhampton

Project Author/s: Shelley Trevaskis, Dr Colin Trainor, Jedd Appleton

Project Summary: Assessment of ecological matters of State and Local Significance to inform future development of Midgee Quarry.

Draft Preparation History:

Draft No.	Date draft completed	Reviewed by	Issued by
0049-122 Working Draft	15/12/2021	Megan Benham	Jedd Appleton

Revision/ Checking History Track:

Version	Date of Issue	Checked by	Issued by
0049-122 Version 0	04/02/2022	Jedd Appleton	Jedd Appleton

Document Distribution:

Destination	Revision					
	1	Date Dispatched	2	Date Dispatched	3	Date Dispatched
Client Copy 1 - digital	Working Draft	15/12/2021	0	04/02/2022		
Client Copy 1- hard copy						
PDF - server	Working Draft	15/12/2021	0	04/02/2022		
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Signed on behalf of Date: 04/02/2022

Biodiversity Assessment and Management Pty Ltd



Director

EXECUTIVE SUMMARY

INTRODUCTION

This report has been prepared for Groundwork Plus to document the results of an assessment of ecological matters of State and Local significance over land proposed for the future development of the existing Midgee Quarry, located adjacent to the Bruce Highway (Lot 2 RP888747, Lot 93 LIV42065, Lot 725 RP888747, Lot 1 SP747721, Lot 2 SP 747721; the 'Study Site').

METHODOLOGIES

The assessment combined a desktop review to broadly characterise the currently recognised ecological values of the Study Site, with a field survey to verify the presence or absence of Matters of State and/or Local Environment Significance identified as present or potentially present as part of the desktop review, including searching for the presence of any conservation significant species and their preferred habitats.

SUMMARY OF ECOLOGICAL CONSTRAINTS AND LEGISLATIVE OBLIGATIONS

Matters of State Environmental Significance (MSES)

Regulated Vegetation

The proposed development will impact upon prescribed MSES in the form of remnant vegetation within a defined distance from the defining banks of a relevant watercourse or relevant drainage feature (stream order 1). No other regulated vegetation representing prescribed MSES within the Study Site (i.e. remnant Of Concern regional ecosystems or Essential Habitat) will be impacted.

Where Category B regulated vegetation is to be removed under a development application (under the relevant purpose of extractive industry), the application must (subject to any exemptions) address State Code 16: Native vegetation clearing, with any acceptable significant residual impacts (SRIs) to prescribed MSES (including remnant vegetation within a defined distance from the defining banks of a relevant watercourse or relevant drainage feature) subject to offsets in accordance with the *Environmental Offsets Act 2014.* An assessment of the proposed development against the relevant performance outcomes of State Code 16 indicates the significance of residual impacts on remnant vegetation within the defined distance of a watercourse will need to be assessed (with respect to any mitigation measures proposed) to determine if offsets are required.

The proposed development will also be subject to assessment against State Code 22: Environmentally relevant activities, PO7 of which also requires any acceptable, SRIs to prescribed MSES to be offset in accordance with the *Environmental Offsets Act 2014*.

It is understood revegetation works will be undertaken to prevent or reduce overall environmental harm and degradation, and the likelihood of an SRI to MSES, including vegetation within a defined distance from the defining banks of a relevant watercourse or relevant drainage feature, in accordance with pre-lodgement advice from the State Assessment and Referral Agency (SARA) and in further consultation with the Department of Resources (DoR). It is expected this would involve the rehabilitation and legal security of an appropriately sized and located area of vegetation, under the guidance of an approved management plan, in conjunction with rehabilitation activities proposed to mitigate impacts on Category C/R vegetation and protected wildlife habitat, as necessary.

In terms of Category C and Category R regulated vegetation, Schedule 1, Part 2(i) of the *Planning Regulation 2017* indicates the clearing of regulated regrowth vegetation (other than in a category A area) for an extractive industry in a Key Resource Area (KRA) meets the definition of exempt clearing. If a KRA designation is not applicable, review of the proposed footprint against *Table 1 Clearing Requirements* of the Accepted Development Vegetation Clearing Code (ADVCC) for Extractive Industry indicates the proposed clearing of Category C and Category R regulated vegetation for the proposed quarry pits may trigger a requirement for an exchange area to be legally secured and managed until it achieves remnant status. Any necessary exchange area would be provided in conjunction with rehabilitation activities

proposed to mitigate impacts on remnant vegetation within a defined distance from the defining banks of a relevant watercourse / drainage feature.

Waterways for Waterway Barrier Works

The Study Site contains "low value" watercourses that are mapped as Waterways for Waterway Barrier Works by the Department of Agriculture and Fisheries (DAF). However, ground-truthing has determined that these drainage features do not provide for fish passage. Consequently, the proposed development will not impact upon Waterways for Waterway Barrier Works.

Protected Wildlife Habitat

MSES mapping indicates protected wildlife habitat for endangered /vulnerable species occurs within the Study Site. This mapping relates to records for Squatter Pigeon *Geophaps scripta scripta* (listed as Vulnerable under the Queensland *Nature Conservation Act 1992* [NC Act]) and wildlife habitat suitability modelling for Ornamental Snake *Denisonia maculata* (NC Act: Vulnerable), and corresponds with Essential Habitat mapping for these species.

Squatter Pigeon was confirmed to occur on the Study Site, such that protected wildlife habitat for this species is confirmed as occurring on the Study Site. Conversely, the apparent absence of seasonal wetlands and gilgai habitat with cracking clay indicates Ornamental Snake is unlikely to occur.

The proposed development will be subject to assessment against State Code 22: Environmentally relevant activities, PO7 of which requires any acceptable, significant residual impacts to prescribed MSES (including protected wildlife habitat) to be offset in accordance with the *Environmental Offsets Act 2014*.

It is noted that none of the protected wildlife habitat mapped by the State will be impacted, although Squatter Pigeon is known to utilise the proposed impact area.

Published information on habitat preferences for Squatter Pigeon is consistent with observations made during the current field survey, which recorded the species on or near lower-lying, alluvial substrates (land zone 3) and in close proximity to onsite dams. The birds were also recorded in or near areas of remnant vegetation on land zone 11 (hills and lowlands on metamorphic rocks), although this vegetation would typically be used more for shelter and dispersal rather than for foraging or breeding. In this case, the more fertile, lower lying areas on land zone 3 have been historically cleared for grazing and currently comprise mainly regrowth and non-remnant vegetation with sparser canopy cover, such that the areas of remnant vegetation on land zone 11 provide the best cover for sheltering purposes within the Study Site.

It is understood revegetation works will be undertaken to prevent or reduce overall environmental harm and degradation, and the likelihood of an SRI to MSES, including protected wildlife habitat for Squatter Pigeon. It is expected this would involve the rehabilitation and legal security of an appropriately sized and located area of vegetation, under the guidance of an approved management plan, in conjunction with rehabilitation activities proposed to mitigate impacts on remnant vegetation within a defined distance from the defining banks of a relevant watercourse / drainage feature and Category C/R vegetation, as necessary.

No other potentially occurring threatened species is expected to rely on the Study Site to such an extent that the removal of potential habitat will result in a significant impact.

NC Act Obligations

Protected Plants

The Study Site is not mapped as occurring within or containing a high risk area on the State's protected plants flora survey trigger map, and the field survey did not record any flora species listed as threatened or near threatened under the NC Act within the Study Site. Consequently, an NC Act protected plants clearing permit will not need to be obtained prior to the clearing of native vegetation from the Study Site.

Animal Breeding Places

No active animal breeding places were recorded during the field survey. However, there may be breeding places for threatened and non-threatened fauna species (present within the Study Site at certain times of the year).

Under the NC Act, any removal of vegetation that is required to tamper with a confirmed native animal breeding place in order to complete the scope of works must be undertaken in accordance with a Species Management Program (SMP) approved by the Queensland Department of Environment and Science (DES). It is recommended all wet areas and trees to be removed are inspected prior to removal to determine if any active animal breeding places are present and any necessary SMP is obtained prior to works, as advised by DES.

State Restricted Weeds

Restricted invasive weed species listed as Category 3 restricted invasive plants under the Queensland *Biosecurity Act 2014* were recorded and appropriate management of these species is required.

Matters of Local Environmental Significance (MLES)

The Rockhampton Regional Council has mapped MLES over the Study Site, with the Waterways, Biodiversity Corridor and MLES General overlays affecting the Study Site. These overlays trigger the application of the *Biodiversity Areas Overlay Code*.

Council mapped waterways appear to reflect those mapped as Waterways for Waterway Barrier Works by DAF, neither of which provide any notable ecological values in terms of fish passage or other aquatic or riparian habitat functions, such that the removal of these features is not considered to represent a significance impact upon MLES.

A Biodiversity Corridor is mapped through the eastern area of the Study Site, but will not be impacted by the proposed development.

MLES General reflects State-mapped, Least Concern remnant vegetation, which will be impacted by the proposed development. However, pre-lodgement advice from Rockhampton Regional Council states that, while an assessment of MLES is required, biodiversity offsets will not be triggered.

It is understood revegetation works will be undertaken to prevent or reduce overall environmental harm and degradation, and the likelihood of an SRI to MSES and MLES. It is expected this would involve the rehabilitation and legal security of an appropriately sized and located area of vegetation, under the guidance of an approved management plan, in conjunction with rehabilitation activities proposed to mitigate impacts on MSES, as necessary.

ASSESSMENT OF ECOLOGICAL MATTERS OF STATE AND LOCAL SIGNIFICANCE

MIDGEE QUARRY EXTENSION, ROCKHAMPTON

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Table of Terms and Abbreviations

ADVCC	Accepted Development Vegetation Clearing Code
BAAM	Biodiversity Assessment and Management Pty Ltd
DAF	Queensland Department of Agriculture and Fisheries
DES	Queensland Department of Environment and Science
EH	Essential Habitat
EVNT	Species listed as endangered, vulnerable or near threatened under the EPBC Act or NC Act
KRA	Key Resource Area
MLES	Matters of Local Environmental Significance
MSES	Matters of State Environmental Significance
NC Act	Queensland *Nature Conservation Act 1992*
RE	Regional Ecosystem
SARA	State Assessment and Referral Agency
SMP	Species Management Program
SRI	Significant Residual Impact

1.0 INTRODUCTION

1.1 BACKGROUND AND PURPOSE

This report has been prepared for Groundwork Plus to document the results of an assessment of ecological matters of State and Local significance over land proposed for the future development of the existing Midgee Quarry, at Midgee, Queensland; properly described as Lot 2 RP888747, Lot 93 LIV42065, Lot 725 RP888747, Lot 1 SP747721 and Lot 2 SP 747721 (the 'Study Site') (**Figure 1.1**).

It is understood future development will involve an expansion of the existing pit, the creation of a second pit to the west, and the creation of an internal access road between the two pits (**Figure 1.1**), while the existing access road to the Bruce Highway will continue to be utilised. The Study Site also included surrounding lot areas, as indicated in **Figure 1.1.**

Portions of the Study Site are mapped to contain Matters of State Environmental Significance (MSES) and Matters of Local Environmental Significance (MLES). As many MSES and MLES are associated with ecological values, an ecological assessment was required to verify the known or likely presence/absence of MSES and MLES and the accuracy of associated mapping.

The outcomes of this assessment will inform necessary approval applications under State and Local Government legislation.

1.2 STUDY SITE

Midgee Quarry is located on the Bruce Highway, 10km south of Rockhampton in central Queensland. An active quarry is located on Lot 2 RP888747.

The quarry is surrounded by native vegetation communities that are mapped as remnant and regrowth vegetation by the State. Non-remnant areas over the balance of the Study Site are typically mostly cleared and grazed.

Gavial Creek forms the western boundary of the Study Site. The Study Site also features stream order 1 and 2 waterways that include ephemeral watercourses, as well as retained water in dams.

2.0 METHODOLOGIES

2.1 DESKTOP REVIEW

An initial desktop review was undertaken, which comprised a search of the following information:

- The Wildlife Online database (**Appendix 1**) and Atlas of Living Australia database, to determine if any species listed as Endangered, Vulnerable or Near Threatened (EVNT) under the Queensland *Nature Conservation Act 1992* (NC Act) have been previously recorded in the vicinity.
- State Government mapping of MSES (**Appendix 2**) and local Council mapping of MLES (**Appendix 3**) currently recognised as occurring within the Study Site
- Reference material on the target flora/fauna species.

2.2 FIELD SURVEY

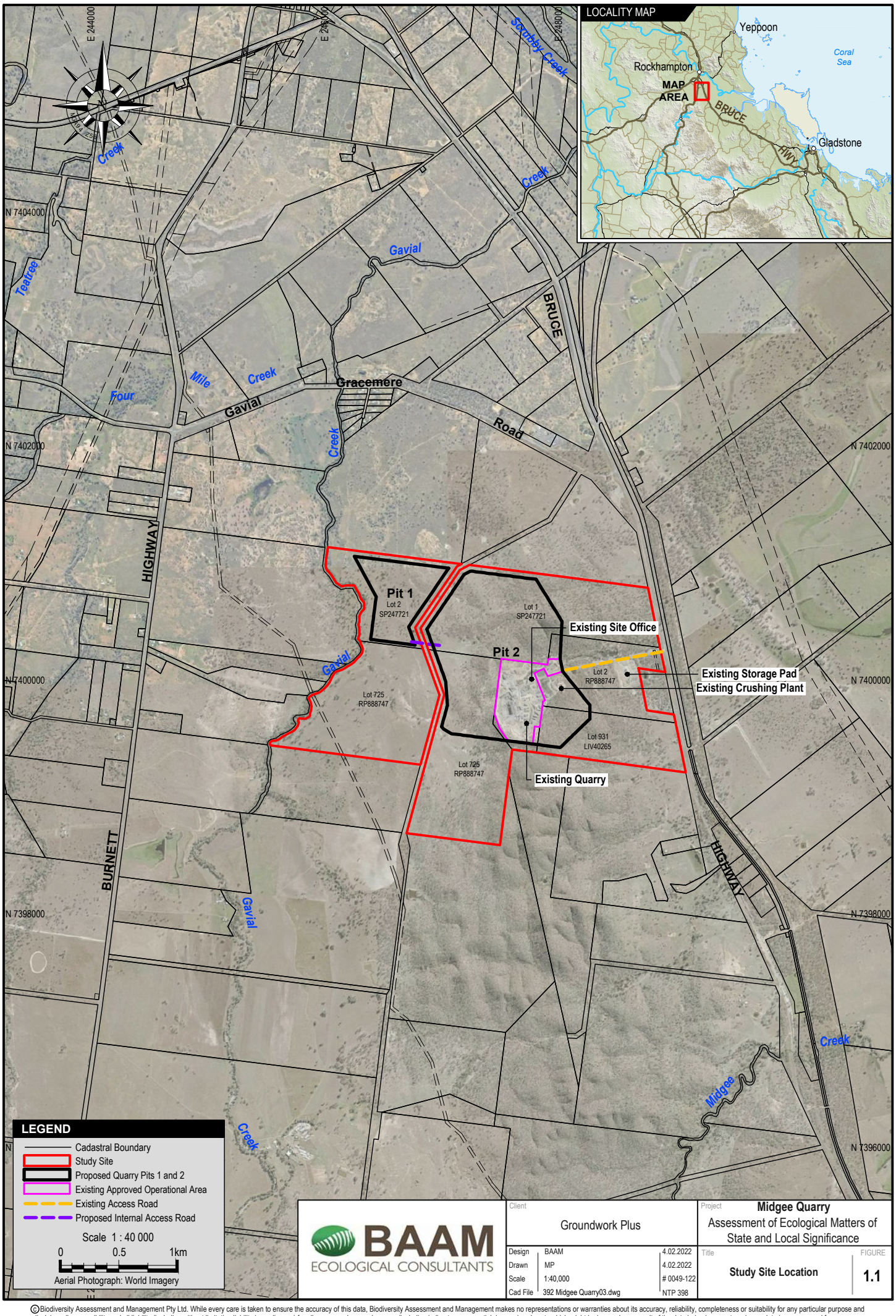
The ecological field survey involved a traverse of the Study Site undertaken by BAAM Senior Ecologists Dr Colin Trainor and Shelley Trevaskis and over two days and one night on 14-15 September during warm, dry conditions. All work was performed in accordance with BAAM's Scientific Purposes Permit and Animal Ethics Approval.

The focus of the field survey was to verify the known or likely presence or absence of MSES and MLES identified as present or potentially present as part of the desktop review, including searching for the presence of any conservation significant species and their preferred habitats.

To record the type and status of vegetation across the Study Site, Quaternary site data were recorded at representative locations (**Figure 2.1**) in accordance with the methodology prescribed in Neldner *et al.* (2019). Quaternary sites measure the height, canopy cover and dominant plant species present in each stratum of a vegetation community and inform the applicable remnant status and Regional Ecosystem (RE) type.

Diurnal flora and fauna searches were undertaken across the Study Site, targeting significant species identified by data searches as potentially present. A nocturnal spotlighting event was also completed in the eastern area of the Study Site (**Figure 2.1**).

The presence of wetlands and watercourses was also assessed to verify State and Local Government mapping of any such features.



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Client	Groundwork Plus		
Design	BAAM	4.02.2022	
Drawn	MP	4.02.2022	
Scale	1:40,000	# 0049-122	
Cad File	392 Midgee Quarry03.dwg	NTP 398	

Project: **Midgee Quarry**
Assessment of Ecological Matters of State and Local Significance

Title: **Study Site Location**

FIGURE **1.1**

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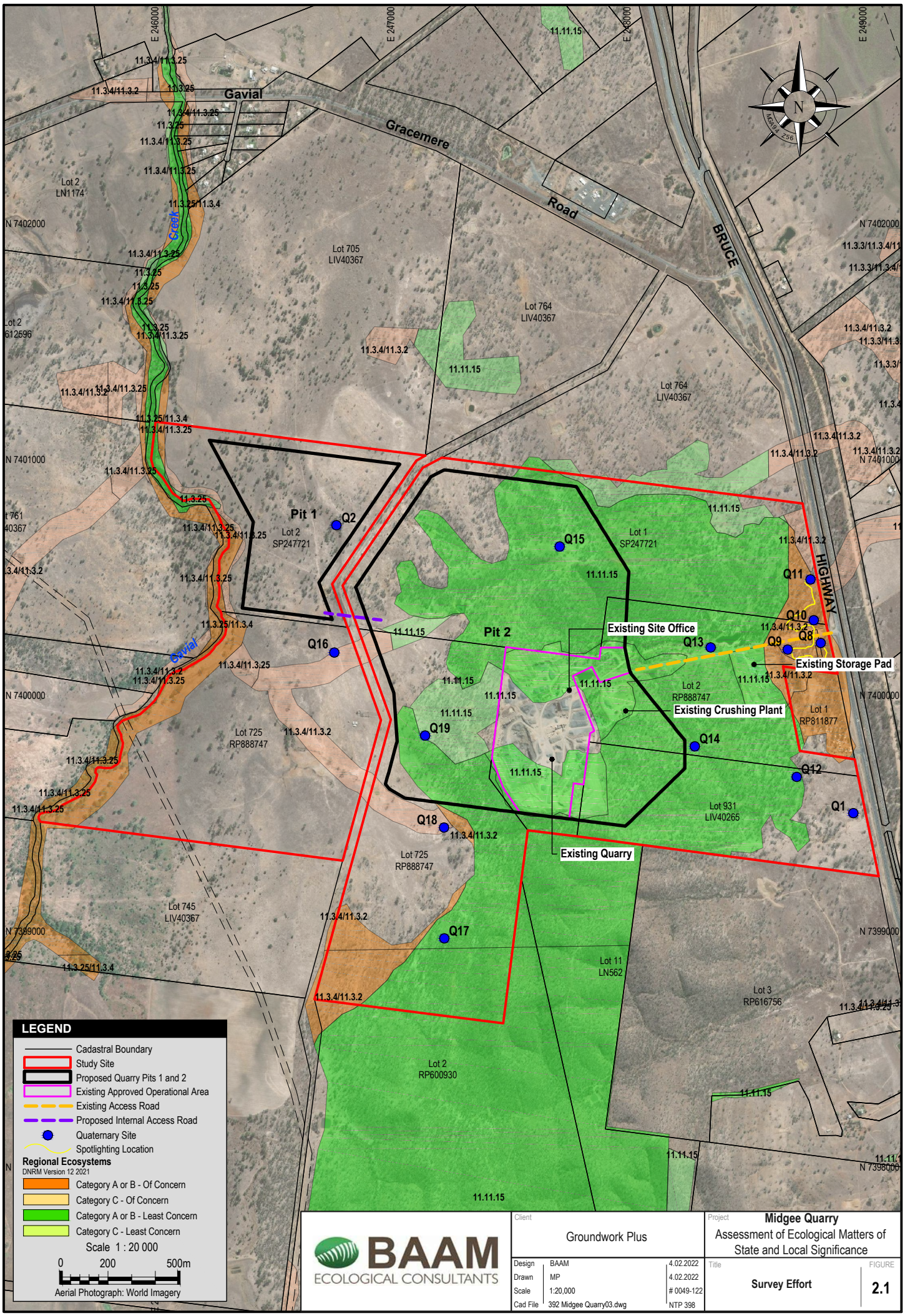

BAAM ECOLOGICAL CONSULTANTS

Client	Groundwork Plus		
Design	BAAM	4.02.2022	
Drawn	MP	4.02.2022	
Scale	1:20,000	# 0049-122	
Cad File	392 Midgee Quarry03.dwg	NTP 398	

Project: **Midgee Quarry**
Assessment of Ecological Matters of State and Local Significance

Title: **Survey Effort**

FIGURE **2.1**

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3.0 MATTERS OF STATE ENVIRONMENTAL SIGNIFICANCE (MSES)

3.1 REGULATED VEGETATION

State regulated vegetation mapping (**Appendix 2, Figure 3.1**) identifies the Study Site as supporting areas mapped as Category B (remnant), Category C (high value regrowth) and Category R (reef regrowth watercourse) regulated vegetation, as well as remnant vegetation within a defined distance from the defining banks of a relevant watercourse or relevant drainage feature (stream orders 1, 2) supporting the following REs:

- RE11.3.25 (Least Concern);
- RE11.3.2 (Of Concern);
- RE11.3.4 (Of Concern); and
- RE11.11.15 (Least Concern).

All of the above listed REs were recorded on site, mostly in accordance with the extents indicated in State mapping. **Appendix 4** provides a description of vegetation recorded at representative locations across the Study Site, as shown on **Figure 2.1**.

Portions of State-mapped remnant vegetation are also mapped as Essential Habitat for two species listed as threatened under the NC Act: Squatter Pigeon *Geophaps scripta scripta* (NC Act: Vulnerable) and Ornamental Snake *Denisonia maculata* (NC Act: Vulnerable) (**Figure 3.1**).

Squatter Pigeon was observed on several occasions during the survey, all within 1.5 km of waterbodies recorded on site including Gavial Creek, dams and cattle drinking toughs (**Figure 3.1**). The Study Site appears to provide suitable, regular habitat for this species, as evidenced by the number of records and by one record of a larger flock of 10 birds. Consequently, the State's mapping of Essential Habitat for this species is verified as correct.

Historically (i.e. during the 1970's), Ornamental Snake was recorded at several locations within 15 km of the Study Site (ALA, 2021); however, the apparent absence of seasonal wetlands and gilgai habitat with cracking clay indicates that the species is unlikely to occur. Nevertheless, Essential Habitat factors for the species are present.; therefore (aside from dead vegetation in the southern portion of Lot 725 RP888747), the State's mapping of Essential Habitat for this species is verified as correct.

As shown on **Figure 3.1,** expansion of the existing pit will impact upon Least Concern remnant and regrowth RE 11.11.15 (Least Concern) and regrowth RE 11.3.4/11.3.25 (Of Concern), some of which is mapped by the State as a prescribed MSES in the form of remnant vegetation within a defined distance from the defining banks of a relevant watercourse or relevant drainage feature (stream order 1). Specifically, remnant vegetation is mapped within the defined distance of mapped watercourses traversing the eastern and north-western portions of Pit 2 (**Figure 3.1**).

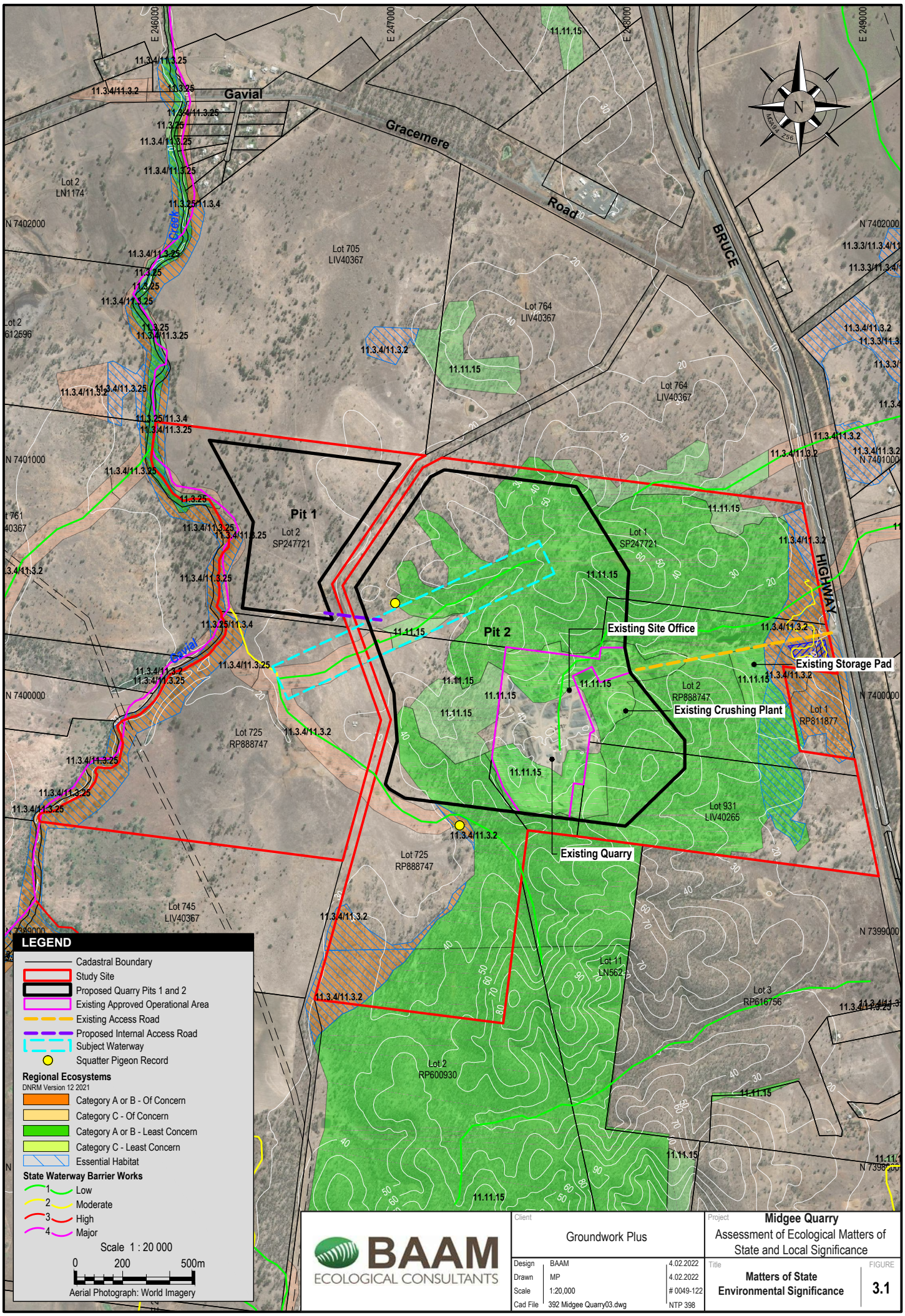
Analysis of aerial photography and recent site investigations have revealed that the previously approved, existing quarry footprint has already impacted the upstream portion of the eastern mapped watercourse in, and/or removed the remnant vegetation from within the defined distance of its defining banks, such that there will be no impact upon remnant vegetation within the defined distance from the defining banks of a watercourse or drainage feature at this location (refer **Image 1**). Consequently, impacts upon prescribed MSES will be restricted to 1 ha of remnant vegetation within the defined distance from the defining banks of the mapped watercourse / drainage feature (stream order 1) traversing the north-western portion of Pit 2.

No other regulated vegetation representing prescribed MSES within the Study Site (i.e. remnant Of Concern REs or Essential Habitat) will be impacted.

Legislative Implications

Pre-lodgement advice from the State Assessment and referral Agency (SARA) (REF: 2109-24772 SPL) for the clearing of regulated vegetation at Midgee Quarry states:

- *Clearing vegetation identified as category X on the regulated vegetation management map can be undertaken as exempt clearing work.*
- *Clearing vegetation identified as category C or R on the regulated vegetation management map can only be undertaken as exempt clearing or in accordance with an accepted development vegetation clearing code (ADVCC). If clearing is not exempt or in accordance with an ADVCC, then clearing is prohibited development* (i.e. for the purposes of the *Planning Act 2016*).



BAAM ECOLOGICAL CONSULTANTS

Client	Groundwork Plus		
Design	BAAM	4.02.2022	
Drawn	MP	4.02.2022	
Scale	1:20,000	# 0049-122	
Cad File	392 Midgee Quarry03.dwg	NTP 398	

Project: **Midgee Quarry**
Assessment of Ecological Matters of State and Local Significance

Title: **Matters of State Environmental Significance**

FIGURE **3.1**

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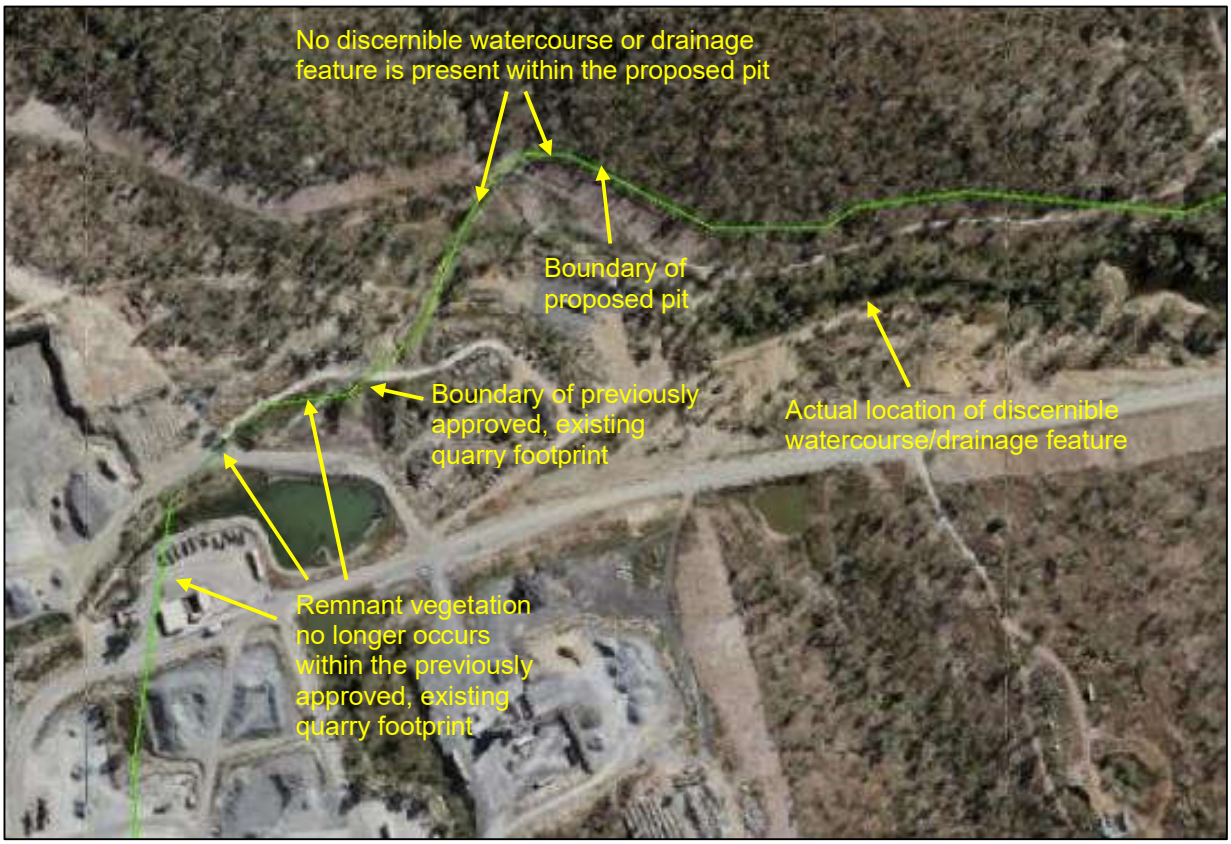

Image 1. State mapped watercourse in relation to existing quarry footprint and on-ground vegetation

- *Clearing vegetation identified as category B on the regulated vegetation management map will either be assessable development* (in which case it will be referred to the Department of Resources for assessment against State Code 16: Native vegetation clearing) *or accepted operational work under schedule 21.*
- *A Relevant Purpose Determination will be required under section 22A of the Vegetation Management Act 1999 for extractive activities. Prior to submitting the development application to clear native vegetation, written confirmation must be obtained from the Department of Resources that the proposed development is for a relevant purpose.*

Where Category B regulated vegetation is to be removed under a development application (under the relevant purpose of extractive industry), the application must (subject to any exemptions) address State Code 16: Native vegetation clearing, with any acceptable, significant residual impacts to relevant MSES (including regulated vegetation within a defined distance from the defining banks of a relevant watercourse or relevant drainage feature) subject to offsets in accordance with the *Environmental Offsets Act 2014*.

An assessment of the proposed development against the relevant performance outcomes of State Code 16: Native vegetation clearing is provided in **Appendix 5**. This indicates the significance of residual impacts on remnant vegetation within the defined distance of a watercourse will need to be assessed (with respect to any mitigation measures proposed) to determine if offsets are required.

The proposed development will also be subject to assessment against State Code 22: Environmentally relevant activities, PO7 of which also requires any acceptable, significant residual impacts to relevant MSES (including regulated vegetation within a defined distance from the defining banks of a relevant watercourse or relevant drainage feature) to be offset in accordance with the *Environmental Offsets Act 2014*.

Guidance for determining if the development will have a significant residual impact (SRI) on MSES is provided in the Significant Residual Impact Guideline, Department of State Development, Infrastructure and Planning, 2014. In this regard, it is noted the SARA pre-lodgement advice states:

- *The Significant Residual Impact Guideline identifies that 'rehabilitation works such as revegetation may help to prevent or reduce overall environmental harm and degradation, and the likelihood of a Significant Residual Impact (SRI)'. The likely and unlikely SRI criteria are provided as examples only, and the list is not exclusive. Should rehabilitation/revegetation be proposed for a development of this nature, the application would need to provide detailed information to confirm that the extent proposed is sufficient to maintain the current extent of vegetation.*
- *The revegetation/rehabilitation area should be of the same regional ecosystem description for which is proposed to be cleared or be capable of being mapped as such in the future on successful implementation of a management plan designed to achieve that performance outcome. The revegetation/rehabilitation areas would be legally secured through the voluntary declaration process and would be a condition of approval if the development application is supported.*

It is understood revegetation works will be undertaken to prevent or reduce overall environmental harm and degradation, and the likelihood of an SRI to MSES, including vegetation within a defined distance from the defining banks of a relevant watercourse or relevant drainage feature, in accordance with the above advice and in further consultation with DoR. It is expected this would involve the rehabilitation and legal security of an appropriately sized and located area of vegetation, under the guidance of an approved management plan, in conjunction with rehabilitation activities proposed to mitigate impacts on Category C/R vegetation (see below) and protected wildlife habitat (see **Section 3.3**), as necessary.

In terms of Category C and Category R regulated vegetation, Schedule 1, Part 2(i) of the *Planning Regulation 2017* indicates the clearing of regulated regrowth vegetation (other than in a category A area) for an extractive industry in a KRA meets the definition of exempt clearing.

It is understood the Study Site is not within a Key Resource Area (KRA) although the available resource would meet the KRA criteria. If a KRA designation is not applicable, review of the proposed footprint against *Table 1 Clearing Requirements* of the ADVCC for Extractive Industry indicates the proposed clearing of Category C and Category R regulated vegetation for the proposed quarry pits may exceed one or more specified area thresholds, such that an exchange area may need to be legally secured and managed until it achieves remnant status. Any necessary exchange area would be provided in conjunction with rehabilitation activities proposed to mitigate impacts on remnant vegetation within a defined distance from the defining banks of a relevant watercourse / drainage feature, as outlined above.

PO6 of State Code 22: Environmentally relevant activities also requires development to avoid impacts on category C areas of vegetation and category R areas of vegetation, or minimise impacts after demonstrating avoidance is not reasonably possible. In this case, it is noted that:

- extractive resources are both finite in extent and fixed in location as a result of fortuitous geological events, and the resource to be extracted at Midgee Quarry is associated with the steeper topography on site, which is an area that has likely avoided a high level of historical clearing due to its limitations for use as grazing land (steeper access and poorer soils comprising rocky outcrops). It is understood that areas of the site have been subject to historical disturbance and vegetation clearing, and these areas have been left to revegetate (i.e. Cat C area west of current extraction area)
- while disturbance of the area cannot be avoided by virtue of deposit location, an exchange area will be established pursuant to the ADVCC code, thereby minimising the impact of the clearing
- retained vegetation will be managed under the direction of the site Environmental Management Plan to mitigate impacts from adjacent quarrying activities.

3.2 WATERWAYS FOR WATERWAY BARRIER WORKS

As shown in **Figure 3.1,** the Study Site contains "low value" watercourses that are mapped as Waterways for Waterway Barrier Works by the Department of Agriculture and Fisheries (DAF).

Ground-truthing during the recent field survey has determined that the function of the mapped waterway traversing the north-western portion of proposed Pit 2 as a passage for fish is highly doubtful, as detailed in **Appendix 6**, and DAF have confirmed that this drainage feature does not provide for fish passage.

As outlined in **Section 3.1**, it is also apparent that the mapping of the fish passage waterway within the eastern portion of proposed Pit 2 is an error, given this feature no longer occurs in this part of the site (**Image 1**).

Consequently, the proposed development will not impact upon Waterways for Waterway Barrier Works.

3.3 PROTECTED WILDLIFE HABITAT

MSES mapping indicates protected wildlife habitat for endangered /vulnerable species occurs within the Study Site (refer **Appendix 2**). This mapping relates to records for Squatter Pigeon and wildlife habitat suitability modelling for Ornamental Snake, and corresponds with Essential Habitat mapping for these species to the east of the proposed footprint (**Figure 3.1**).

In terms of fauna, protected wildlife habitat for endangered /vulnerable species includes an area of land used by an endangered /vulnerable animal for foraging, roosting, nesting or breeding. As outlined in **Section 3.1**, Squatter Pigeon was confirmed to occur on the Study Site, such that protected wildlife habitat for this species is confirmed as occurring on the Study Site. Conversely, the apparent absence of seasonal wetlands and gilgai habitat with cracking clay indicates Ornamental Snake is unlikely to occur.

As indicated in the likelihood of occurrence assessment results in **Appendix 7**, other fauna species listed as threatened under the NC Act that have the potential to occur on the Study Site include White-throated Needletail (Vulnerable), Curlew Sandpiper *Calidris ferruginea* (Endangered), Australian Painted Snipe *Rostratula australis* (Vulnerable) and Koala (Vulnerable).

White-throated Needletail is an aerial migrant species that is unlikely to be impacted by terrestrial development.

Curlew Sandpiper and Australian Painted Snipe could occur as a rare visitors to man-made dams within the Study Site, although no natural wetland habitat for these species will be impacted.

No Koalas were recorded during diurnal surveys and nocturnal spotlighting, and no scats or tree scratches likened to this species were recorded. The majority of the proposed impact area does not contain preferred food tree species for Koala, and this species is considered unlikely to regularly utilise the proposed impact area.

Legislative Implications

The proposed development will be subject to assessment against State Code 22: Environmentally relevant activities, PO7 of which requires any acceptable, significant residual impacts to relevant MSES (including protected wildlife habitat) to be offset in accordance with the *Environmental Offsets Act 2014*.

The Significant Residual Impact Guideline, Department of State Development, Infrastructure and Planning, 2014 indicates an action is likely to have a significant impact on habitat for endangered and vulnerable wildlife if the action will:

- lead to a long-term decrease in the size of a local population; or
- reduce the extent of occurrence of the species; or
- fragment an existing population; or
- result in genetically distinct populations forming as a result of habitat isolation; or
- result in invasive species that are harmful to an endangered or vulnerable species becoming established in the endangered or vulnerable species' habitat; or
- introduce disease that may cause the population to decline, or
- interfere with the recovery of the species; or
- cause disruption to ecologically significant locations (breeding, feeding, nesting, migration or resting sites) of a species.

It is noted that none of the protected wildlife habitat mapped by the State will be impacted, although Squatter Pigeon is known to utilise the proposed impact area (refer **Figure 3.1**).

The southern subspecies of Squatter Pigeon occurs mainly in dry grassy eucalypt woodlands, open forests and scrub that are (Commonwealth of Australia 2021):

- open-forest to woodland communities mostly dominated in the overstorey by *Eucalyptus, Corymbia, Acacia* or *Callitris* species, with gravelly, sandy or loamy soils and patchy, relatively sparse (<33%) tussock-grassy understories,
- remnant, regrowth or partly modified vegetation communities, and

- within 3 km of a suitable, permanent or seasonal waterbody or watercourse, since the birds drink daily; birds breed within 1 km of a suitable water source.

Although foraging and breeding habitat is described as known to occur on well-draining, sandy or loamy soils on low, gently sloping, flat to undulating plains and foothills (i.e. Queensland Regional Ecosystem Land Zone 5), and lateritic (duplex) soils on low 'jump-ups' and escarpments (i.e. Land Zone 7) (Commonwealth of Australia 2021), analyses of high precision records show the species also likely forages in habitats on other land zones, particularly Land Zones 3 and 10, and the majority of nests were on land zone 3, with others on land zones 5, 8, 9 and 10 (BAAM 2019).

It is noted that the State's mapping of protected wildlife habitat (and essential habitat) for this species within the Study Site is largely restricted to vegetation on land zone 3.

Squatter Pigeons dust-bathe and are often encountered on dirt tracks and in areas of bare soil denuded of ground cover by livestock (Higgins and Davies 1996). However, the birds do not move far from woodland trees that provide protection from predatory birds, and do not typically forage further than 100 m from remnant trees or patches of wooded habitat (Commonwealth of Australia 2021).

This information is consistent with observations made during the current field survey, which recorded Squatter Pigeon on or near lower-lying, alluvial substrates (land zone 3) and in close proximity to onsite dams. The birds were also recorded in or near areas of remnant RE 11.11.15, although this vegetation would typically be used more for shelter and dispersal rather than for foraging or breeding. In this case, the more fertile, lower lying areas on land zone 3 have been historically cleared for grazing and currently comprise mainly regrowth and non-remnant vegetation with sparser canopy cover, such that the areas of remnant RE 11.11.15 provide the best cover for sheltering purposes within the Study Site.

It is understood revegetation works will be undertaken to prevent or reduce overall environmental harm and degradation, and the likelihood of an SRI to MSES, including protected wildlife habitat for Squatter Pigeon. It is expected this would involve the rehabilitation and legal security of an appropriately sized and located area of vegetation, under the guidance of an approved management plan, in conjunction with rehabilitation activities proposed to mitigate impacts on remnant vegetation within a defined distance from the defining banks of a relevant watercourse / drainage feature and Category C/R vegetation (see **Section 3.1**), as necessary.

No other potentially occurring threatened species is expected to rely on the Study Site to such an extent that the removal of potential habitat will result in a significant impact.

4.0 OTHER STATE ENVIRONMENTAL MATTERS

4.1 NATURE CONSERVATION ACT

4.1.1 Protected Plants

The Study Site is not mapped as occurring within or containing a high risk area on the State's protected plants flora survey trigger map (**Appendix 2**), and the field survey did not record any flora species listed as threatened or near threatened under the NC Act)within the Study Site. Consequently, an NC Act protected plants clearing permit will not need to be obtained prior to the clearing of native vegetation from the Study Site.

4.1.2 Animal Breeding Places

No active animal breeding places were recorded during the field survey. However, there may be breeding places for native fauna, including certain EVNT species (e.g. Tusked Frog *Adelotus brevis*, listed as Vulnerable under the NC Act), as well as Least Concern species such as common frog species, nesting birds and possums, present within the Study Site at certain times of the year.

Under the NC Act, any project activities that are required to tamper with a confirmed native animal breeding place in order to complete the scope of works must be undertaken in accordance with a Species Management Program (SMP) approved by DES.

DES provides two SMP templates, depending on the identified protected animals. The SMP "low risk of impacts" relates to protected animals classed as Least Concern under NC Act where the impacts are unlikely to affect broader population. The SMP "high risk of impacts" relates to protected animals identified as EVNT, Special Least Concern or Least Concern Colonial Breeder species, where the broader population is at a greater risk from impacts.

As breeding places for native fauna may be impacted, subject to the timing of works, it is recommended all wet areas and trees to be removed are inspected prior to removal to determine if any active animal breeding places are present and any necessary SMP is obtained prior to works, as advised by DES.

4.2 BIOSECURITY ACT 2014

4.2.1 State Restricted Weeds

Restricted invasive weed species listed as Category 3 restricted invasive plants under the Queensland *Biosecurity Act 2014* that were recorded on the Study Site include:

- Chinee Apple *Ziziphus mauritiana;*
- Lantana *Lantana camara*;
- Creeping Lantana *Lantana montevidensis;*
- Prickly Pear *Opuntia tomentosa;* and
- Prickly Acacia *Acacia nilotica.*

These Category 3 restricted invasive plants are species that are already established in Queensland and seriously threaten Queensland's primary industries, natural environment, livestock, human health and/or people's livelihoods. In accordance with the *Biosecurity Act 2014*, Category 3 restricted matters must not be distributed (i.e. released into the environment) unless the distribution or disposal is authorised in a regulation or under a permit. More generally, landowners are responsible for taking all reasonable and practical steps to minimise the risks associated with invasive plants under their control.

5.0 MATTERS OF LOCAL ENVIRONMENTAL SIGNIFICANCE (MLES)

The Rockhampton Regional Council has mapped MLES (**Appendix 3**) over the Study Site, which trigger the application of the *Biodiversity Areas Overlay Code*.

The purpose of this code is to protect, rehabilitate and manage areas of environmental significance and the ecological processes and biodiversity values of terrestrial and aquatic ecosystems, these being:

- land mapped as containing matters of state or local environmental significance;
- a biodiversity corridor or wildlife habitat; and
- a wetland or waterway and its buffer area.

Watercourses:

Council mapped waterways appear to reflect those mapped as Waterways for Waterway Barrier Works by DAF, as shown on **Figure 3.1**.

The Biodiversity Areas Overlay Code states that, for areas where environmental values have been mapped but are no longer present, a report certified by an appropriately qualified person that the development site does not contain the matter of environmental significance will be required.

As outlined in **Sections 3.1 and 3.2**, and **Appendix 6**, neither of the waterways mapped within the proposed footprint provide any notable ecological values in terms of fish passage or other aquatic or riparian habitat functions, such that the removal of these features is not considered to represent a significance impact upon MLES.

Biodiversity Corridor:

A Biodiversity Corridor is mapped through the eastern area of the Study Site, but will not be impacted by the proposed development.

MLES General:

MLES General reflects State-mapped, Least Concern remnant vegetation, which will be impacted by the proposed development.

Pre-lodgement advice from Rockhampton Regional Council states:

- *The site is affected by the Biodiversity Overlay. An assessment of these matters will be required. Biodiversity offsets will not be triggered.*

It is understood revegetation works will be undertaken to prevent or reduce overall environmental harm and degradation, and the likelihood of an SRI to MSES and MLES. It is expected this would involve the rehabilitation and legal security of an appropriately sized and located area of vegetation, under the guidance of an approved management plan, in conjunction with rehabilitation activities proposed to mitigate impacts on MSES (see **Sections 3.1 and 3.3**), as necessary.

6.0 REFERENCES

Atlas of Living Australia (ALA) (2021). Found at: https://www.ala.org.au/

BAAM (2019). Technical memorandum re EPBC 2004/1770 Poitrel Squatter Pigeon Offset Management Plan (OMP). Technical memorandum prepared by Biodiversity Assessment and Management Pty Ltd for BMC.

Commonwealth of Australia (2021). Species Profile and Threats Database, Department of the Environment, Canberra. Available from: http://www.environment.gov.au/sprat.

Higgins, P.J. and Davies, S.J.J.F. (eds.) (1996). *Handbook of Australian, New Zealand and Antarctic birds,* Vol. 3, *Snipe to pigeons.* Oxford University Press, Melbourne.

Neldner, V.J., Wilson, B.A., Dillewaard, H.A., Ryan, T.S., Butler, D.W., McDonald, W.J.F, Addicott, E.P. and Appelman, C.N. (2019). *Methodology for survey and mapping of regional ecosystems and vegetation communities in Queensland.* Version 5.0. Updated March 2019. Queensland Herbarium, Queensland Department of Environment and Science, Brisbane.

APPENDIX 1

Database Search Results

Queensland Government

WildNet species list

Search Criteria: Species List for a Specified Point
Species: All
Type: All
Queensland status: Rare and threatened species
Records: Confirmed
Date: Since 1980
Latitude: -23.4916
Longitude: 150.5290
Distance: 10
Email: shelley@baamecology.com
Date submitted: Wednesday 27 Oct 2021 14:08:52
Date extracted: Wednesday 27 Oct 2021 14:10:03

The number of records retrieved = 5

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Information about your Species lists request is logged for quality assurance, user support and product enhancement purposes only.
The information provided should be appropriately acknowledged as being derived from WildNet database when it is used. As the WildNet Program is still in a process of collating and vetting data, it is possible the information given is not complete. Go to the WildNet database webpage (https://www.qld.gov.au/environment/plants-animals/species-information/wildnet) to find out more about WildNet and where to access other WildNet information products approved for publication. Feedback about WildNet species lists should be emailed to wildlife.online@des.qld.gov.au.

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	birds	Columbidae	*Geophaps scripta scripta*	squatter pigeon (southern subspecies)		V	V	1
animals	birds	Rostratulidae	*Rostratula australis*	Australian painted snipe		E	E	2
animals	birds	Scolopacidae	*Calidris ferruginea*	curlew sandpiper		CR	CE	1
animals	reptiles	Elapidae	*Hemiaspis damelii*	grey snake		E		3
plants	land plants	Cycadaceae	*Cycas megacarpa*			E	E	2/2

CODES

I - Y indicates that the taxon is introduced to Queensland and has naturalised.

Q - Indicates the Queensland conservation status of each taxon under the *Nature Conservation Act 1992.*
The codes are Extinct (EX), Extinct in the Wild (PE), Critically Endangered (CR), Endangered (E), Vulnerable (V), Near Threatened (NT), Special Least Concern (SL) and Least Concern (C).

A - Indicates the Australian conservation status of each taxon under the *Environment Protection and Biodiversity Conservation Act 1999.*
The values of EPBC are Extinct (EX), Extinct in the Wild (XW), Critically Endangered (CE), Endangered (E), Vulnerable (V) and Conservation Dependent (CD).

Records - The first number indicates the total number of records of the taxon (wildlife records and species listings for selected areas).
This number is output as 99999 if it equals or exceeds this value. A second number located after a / indicates the number of specimen records for the taxon.
This number is output as 999 if it equals or exceeds this value.

APPENDIX 2

Matters of State Environmental Significance Mapping

Queensland Government

Department of Environment and Science

Environmental Reports

Matters of State Environmental Significance

For the selected area of interest

Environmental Reports - General Information

The Environmental Reports portal provides for the assessment of selected matters of interest relevant to a user specified location, or area of interest (AOI). All area and derivative figures are relevant to the extent of matters of interest contained within the AOI unless otherwise stated. Please note, if a user selects an AOI via the "central coordinates" option, the resulting assessment area encompasses an area extending for a 2km radius from the point of interest.

All area and area derived figures included in this report have been calculated via reprojecting relevant spatial features to Albers equal-area conic projection (central meridian = 146, datum Geocentric Datum of Australia 1994). As a result, area figures may differ slightly if calculated for the same features using a different co-ordinate system.

Figures in tables may be affected by rounding.

The matters of interest reported on in this document are based upon available state mapped datasets. Where the report indicates that a matter of interest is not present within the AOI (e.g. where area related calculations are equal to zero, or no values are listed), this may be due either to the fact that state mapping has not been undertaken for the AOI, that state mapping is incomplete for the AOI, or that no values have been identified within the site.

The information presented in this report should be considered as a guide only and field survey may be required to validate values on the ground.

Please direct queries about these reports to: Planning.Support@des.qld.gov.au

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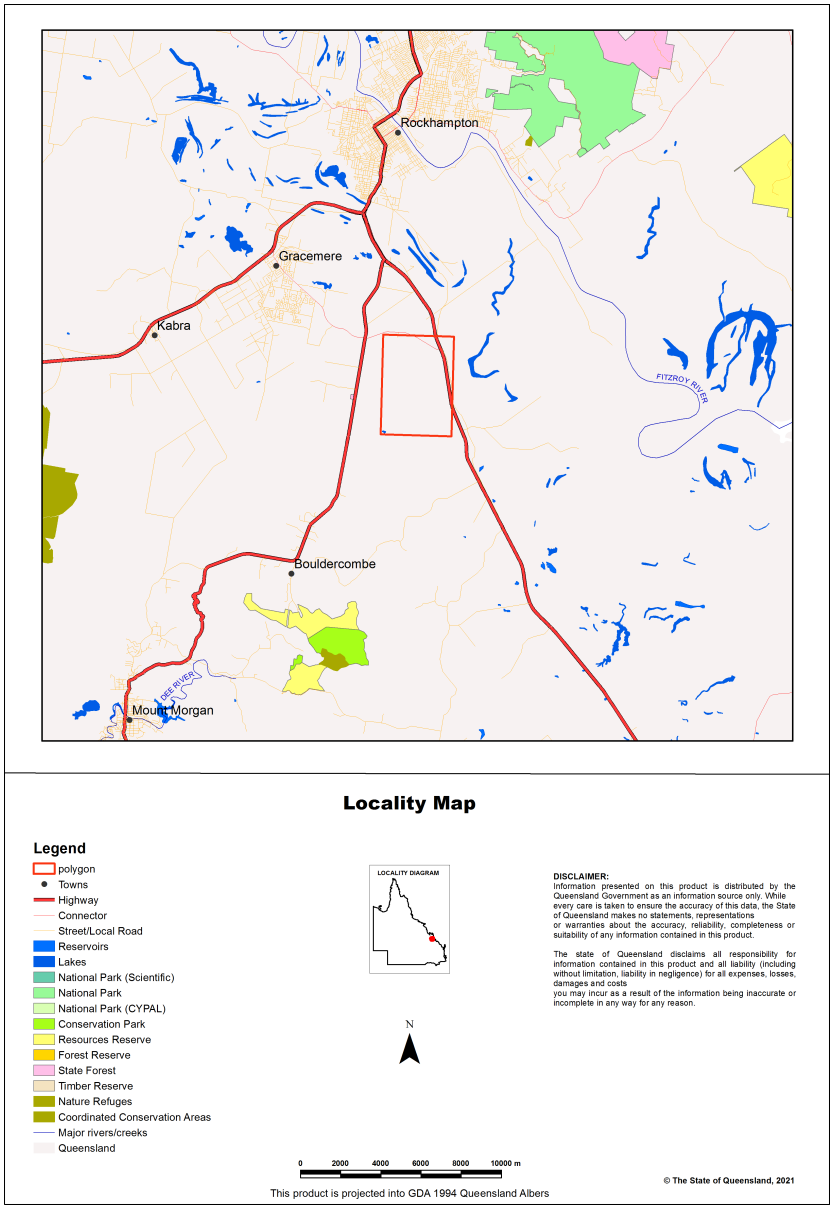
Assessment Area Details

The following table provides an overview of the area of interest (AOI) with respect to selected topographic and environmental values.

Table 1: Summary table, details for AOI

Size (ha)	1,750.87
Local Government(s)	Rockhampton Regional
Bioregion(s)	Brigalow Belt
Subregion(s)	Mount Morgan Ranges, Marlborough Plains
Catchment(s)	Fitzroy



Matters of State Environmental Significance (MSES)

MSES Categories

Queensland's State Planning Policy (SPP) includes a biodiversity State interest that states:

'The sustainable, long-term conservation of biodiversity is supported. Significant impacts on matters of national or state environmental significance are avoided, or where this cannot be reasonably achieved; impacts are minimised and residual impacts offset.'

The MSES mapping product is a guide to assist planning and development assessment decision-making. Its primary purpose is to support implementation of the SPP biodiversity policy. While it supports the SPP, the mapping does not replace the regulatory mapping or environmental values specifically called up under other laws or regulations. Similarly, the SPP biodiversity policy does not override or replace specific requirements of other Acts or regulations.

The SPP defines matters of state environmental significance as:

- Protected areas (including all classes of protected area except coordinated conservation areas) under the *Nature Conservation Act 1992* ;

- Marine parks and land within a 'marine national park', 'conservation park', 'scientific research', 'preservation' or 'buffer' zone under the *Marine Parks Act 2004* ;

- Areas within declared fish habitat areas that are management A areas or management B areas under the Fisheries Regulation 2008;

- Threatened wildlife under the *Nature Conservation Act 1992* and special least concern animals under the Nature Conservation (Wildlife) Regulation 2006;

- Regulated vegetation under the *Vegetation Management Act 1999* that is:

    • Category B areas on the regulated vegetation management map, that are 'endangered' or 'of concern' regional ecosystems;

    • Category C areas on the regulated vegetation management map that are 'endangered' or 'of concern' regional ecosystems;

    • Category R areas on the regulated vegetation management map;

    • Regional ecosystems that intersect with watercourses identified on the vegetation management watercourse and drainage feature map;

    • Regional ecosystems that intersect with wetlands identified on the vegetation management wetlands map;

- Strategic Environmental Areas under the *Regional Planning Interests Act 2014* ;

- Wetlands in a wetland protection area of wetlands of high ecological significance shown on the Map of Queensland Wetland Environmental Values under the Environment Protection Regulation 2019;

- Wetlands and watercourses in high ecological value waters defined in the Environmental Protection (Water) Policy 2009, schedule 2;

- Legally secured offset areas.

MSES Values Present

The MSES values that are present in the area of interest are summarised in the table below:

Table 2: Summary of MSES present within the AOI

1a Protected Areas- estates	0.0 ha	0.0 %
1b Protected Areas- nature refuges	0.0 ha	0.0 %
1c Protected Areas- special wildlife reserves	0.0 ha	0.0 %
2 State Marine Parks- highly protected zones	0.0 ha	0.0 %
3 Fish habitat areas (A and B areas)	0.0 ha	0.0 %
4 Strategic Environmental Areas (SEA)	0.0 ha	0.0 %
5 High Ecological Significance wetlands on the map of Referable Wetlands	1.62 ha	0.1%
6a High Ecological Value (HEV) wetlands	0.0 ha	0.0 %
6b High Ecological Value (HEV) waterways **	0.0 km	Not applicable
7a Threatened (endangered or vulnerable) wildlife	94.38 ha	5.4%
7b Special least concern animals	5.62 ha	0.3%
7c i Koala habitat area - core (SEQ)	0.0 ha	0.0 %
7c ii Koala habitat area - locally refined (SEQ)	0.0 ha	0.0 %
8a Regulated Vegetation - Endangered/Of concern in Category B (remnant)	59.14 ha	3.4%
8b Regulated Vegetation - Endangered/Of concern in Category C (regrowth)	21.26 ha	1.2%
8c Regulated Vegetation - Category R (GBR riverine regrowth)	44.89 ha	2.6%
8d Regulated Vegetation - Essential habitat	96.25 ha	5.5%
8e Regulated Vegetation - intersecting a watercourse **	18.4 km	Not applicable
8f Regulated Vegetation - within 100m of a Vegetation Management Wetland	5.63 ha	0.3%
9a Legally secured offset areas- offset register areas	0.0 ha	0.0 %
9b Legally secured offset areas- vegetation offsets through a Property Map of Assessable Vegetation	0.0 ha	0.0 %

Additional Information with Respect to MSES Values Present

MSES - State Conservation Areas

1a. Protected Areas - estates

(no results)

1b. Protected Areas - nature refuges

(no results)

1c. Protected Areas - special wildlife reserves

(no results)

2. State Marine Parks - highly protected zones

(no results)

3. Fish habitat areas (A and B areas)

(no results)

Refer to **Map 1 - MSES - State Conservation Areas** for an overview of the relevant MSES.

MSES - Wetlands and Waterways

4. Strategic Environmental Areas (SEA)

(no results)

5. High Ecological Significance wetlands on the Map of Queensland Wetland Environmental Values

Natural wetlands that are 'High Ecological Significance' (HES) on the Map of Queensland Wetland Environmental Values are present.

6a. Wetlands in High Ecological Value (HEV) waters

(no results)

6b. Waterways in High Ecological Value (HEV) waters

(no results)

Refer to **Map 2 - MSES - Wetlands and Waterways** for an overview of the relevant MSES.

MSES - Species

7a. Threatened (endangered or vulnerable) wildlife

Values are present

7b. Special least concern animals

Values are present

7c i. Koala habitat area - core (SEQ)

Not applicable

7c ii. Koala habitat area - locally refined (SEQ)

Not applicable

Threatened (endangered or vulnerable) wildlife habitat suitability models

Species	Common name	NCA status	Presence
Boronia keysii		V	None
Calyptorhynchus lathami	Glossy black cockatoo	V	None
Casuarius casuarius johnsonii	Sthn population cassowary	E	None
Crinia tinnula	Wallum froglet	V	None
Denisonia maculata	Ornamental snake	V	Core
Litoria freycineti	Wallum rocketfrog	V	None
Litoria olongburensis	Wallum sedgefrog	V	None
Melaleuca irbyana		E	None
Petaurus gracilis	Mahogany Glider	E	None
Petrogale persephone	Proserpine rock-wallaby	E	None
Phascolarctos cinereus	Koala - outside SEQ*	V	None
Pezoporus wallicus wallicus	Eastern ground parrot	V	None
Taudactylus pleione	Kroombit tinkerfrog	E	None
Xeromys myoides	Water Mouse	V	None

**For koala model, this includes areas outside SEQ. Check 7c SEQ koala habitat for presence/absence.*

Threatened (endangered or vulnerable) wildlife species records

Scientific name	Common name	NCA status	EPBC status	Migratory status
Geophaps scripta scripta	squatter pigeon (southern subspecies)	V	V	

Special least concern animal species records

Scientific name	Common name	Migratory status
Gallinago hardwickii	Latham's snipe	M-J/R/B/E

**Nature Conservation Act 1992 (NCA) Status- Endangered (E), Vulnerable (V) or Special Least Concern Animal (SL). Environment Protection and Biodiversity Conservation Act 1999 (EPBC) status: Critically Endangered (CE) Endangered (E), Vulnerable (V)*

Migratory status (M) - China and Australia Migratory Bird Agreement (C), Japan and Australia Migratory Bird Agreement (J), Republic of Korea and Australia Migratory Bird Agreement (R), Bonn Migratory Convention (B), Eastern Flyway (E)

To request a species list for an area, or search for a species profile, access Wildlife Online at:

https://www.qld.gov.au/environment/plants-animals/species-list/

Refer to **Map 3a - MSES - Species - Threatened (endangered or vulnerable) wildlife and special least concern animals** and **Map 3b - MSES - Species - Koala habitat area (SEQ)** for an overview of the relevant MSES.

MSES - Regulated Vegetation

For further information relating to regional ecosystems in general, go to:
https://www.qld.gov.au/environment/plants-animals/plants/ecosystems/
For a more detailed description of a particular regional ecosystem, access the regional ecosystem search page at:
https://environment.ehp.qld.gov.au/regional-ecosystems/

8a. Regulated Vegetation - Endangered/Of concern in Category B (remnant)

Regional ecosystem	Vegetation management polygon	Vegetation management status
11.3.25/11.3.4	O-subdom	rem_oc
11.3.4/11.3.2	O-dom	rem_oc
11.3.4/11.3.25	O-dom	rem_oc

8b. Regulated Vegetation - Endangered/Of concern in Category C (regrowth)

Regional ecosystem	Vegetation management polygon	Vegetation management status
11.3.4/11.3.2	O-dom	hvr_oc
11.3.4/11.3.25	O-dom	hvr_oc
11.3.3/11.3.4/11.3.2/11.3.3c/11.3.27x1b	O-dom	hvr_oc

8c. Regulated Vegetation - Category R (GBR riverine regrowth)

Regulated vegetation map category	Map number	RVM rule
R	9051	4
R	9050	4

8d. Regulated Vegetation - Essential habitat

Values are present

8e. Regulated Vegetation - intersecting a watercourse**

A vegetation management watercourse is mapped as present

8f. Regulated Vegetation - within 100m of a Vegetation Management wetland

Regulated vegetation map category	Map number	RVM rule
C	9051	3

Refer to **Map 4 - MSES - Regulated Vegetation** for an overview of the relevant MSES.

MSES - Offsets

9a. Legally secured offset areas - offset register areas

(no results)

9b. Legally secured offset areas - vegetation offsets through a Property Map of Assessable Vegetation

(no results)

Refer to **Map 5 - MSES - Offset Areas** for an overview of the relevant MSES.

Map 1 - MSES - State Conservation Areas

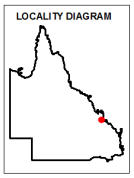


MSES - State Conservation Areas

Area of Interest

- polygon
- Towns
- Freeways/Highways
- Secondary roads
- Major rivers/creeks
- Protected area (estates, nature refuges, special wildlife reserves)
- Declared fish habitat area (A and B areas)
- Marine park (highly protected)

LOCALITY DIAGRAM



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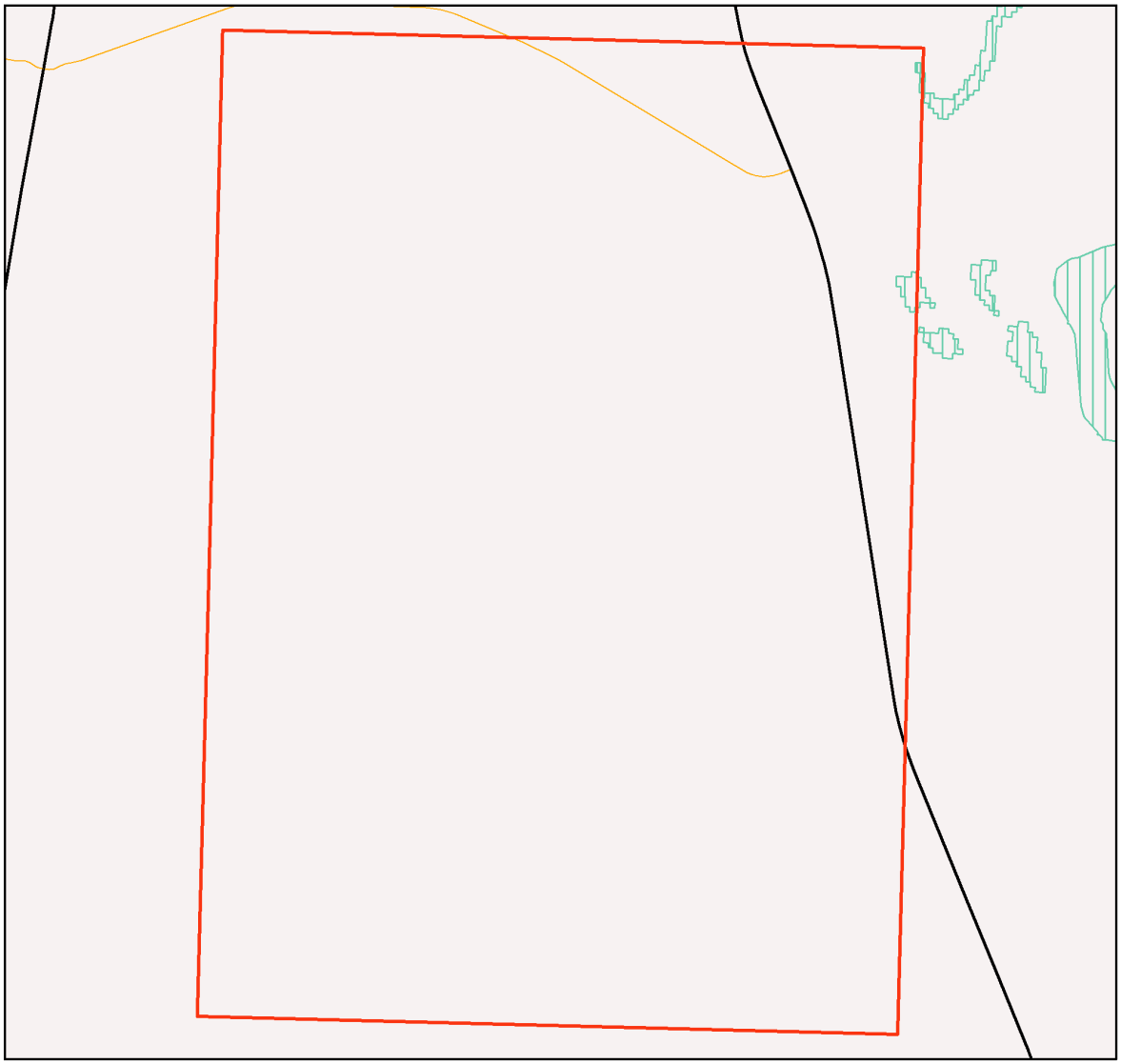
Map 2 - MSES - Wetlands and Waterways

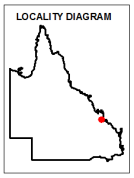


MSES - Wetlands and Waterways

Area of Interest

- polygon
- Towns
- Freeways/Highways
- Secondary roads
- Major rivers/creeks
- Declared high ecological value waters (watercourse)
- Strategic environmental area (designated precinct)
- Declared high ecological value waters (wetland)
- High ecological significance wetlands

LOCALITY DIAGRAM



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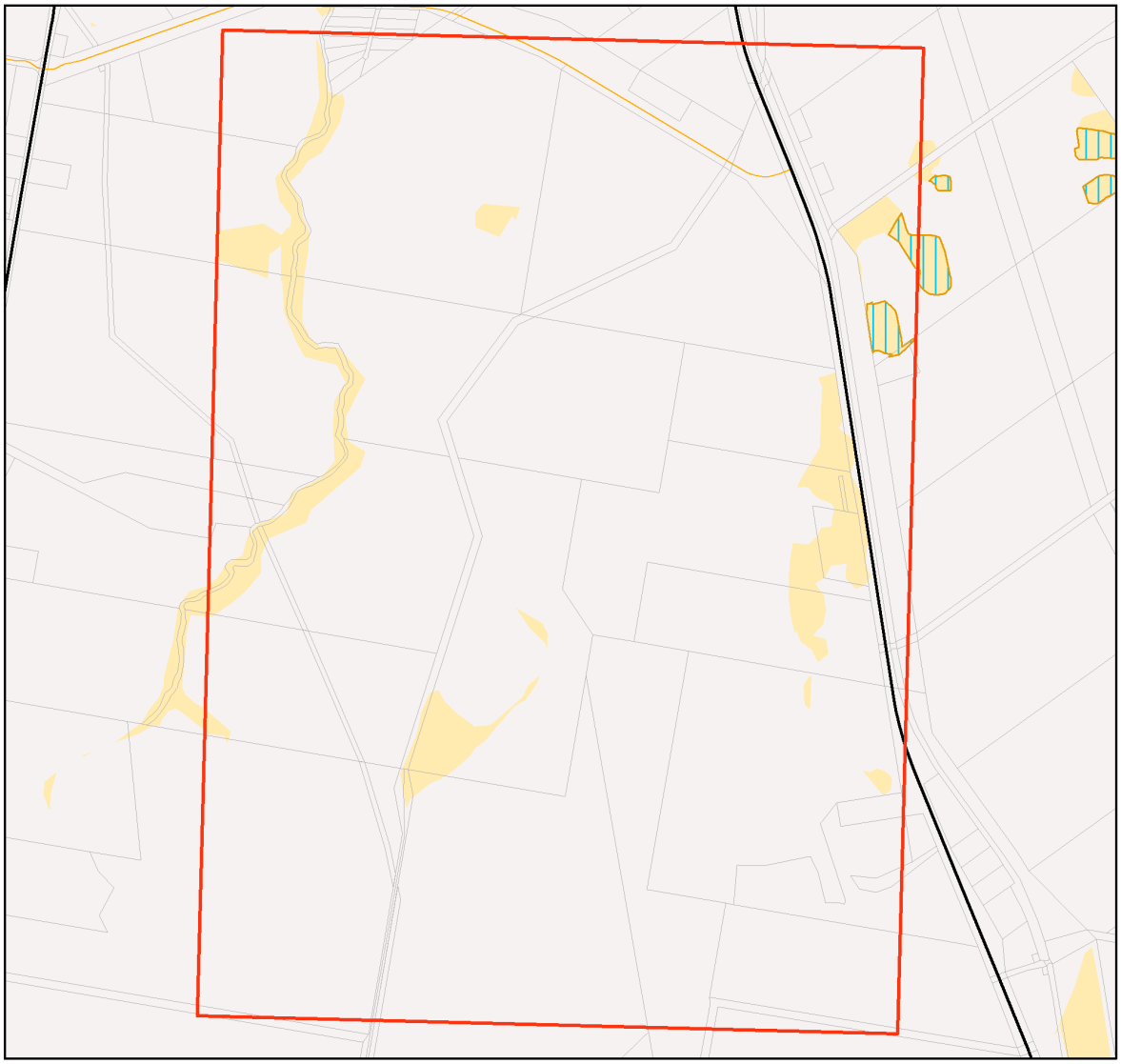
Map 3a - MSES - Species - Threatened (endangered or vulnerable) wildlife and special least concern animals

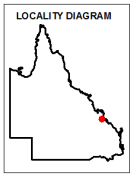


MSES - Species
Threatened (endangered or vulnerable) wildlife and special least concern animals

Area of Interest

- polygon
- Towns
- Freeways/Highways
- Secondary roads
- Major rivers/creeks
- Wildlife habitat (special least concern)
- Wildlife habitat (endangered or vulnerable)

LOCALITY DIAGRAM



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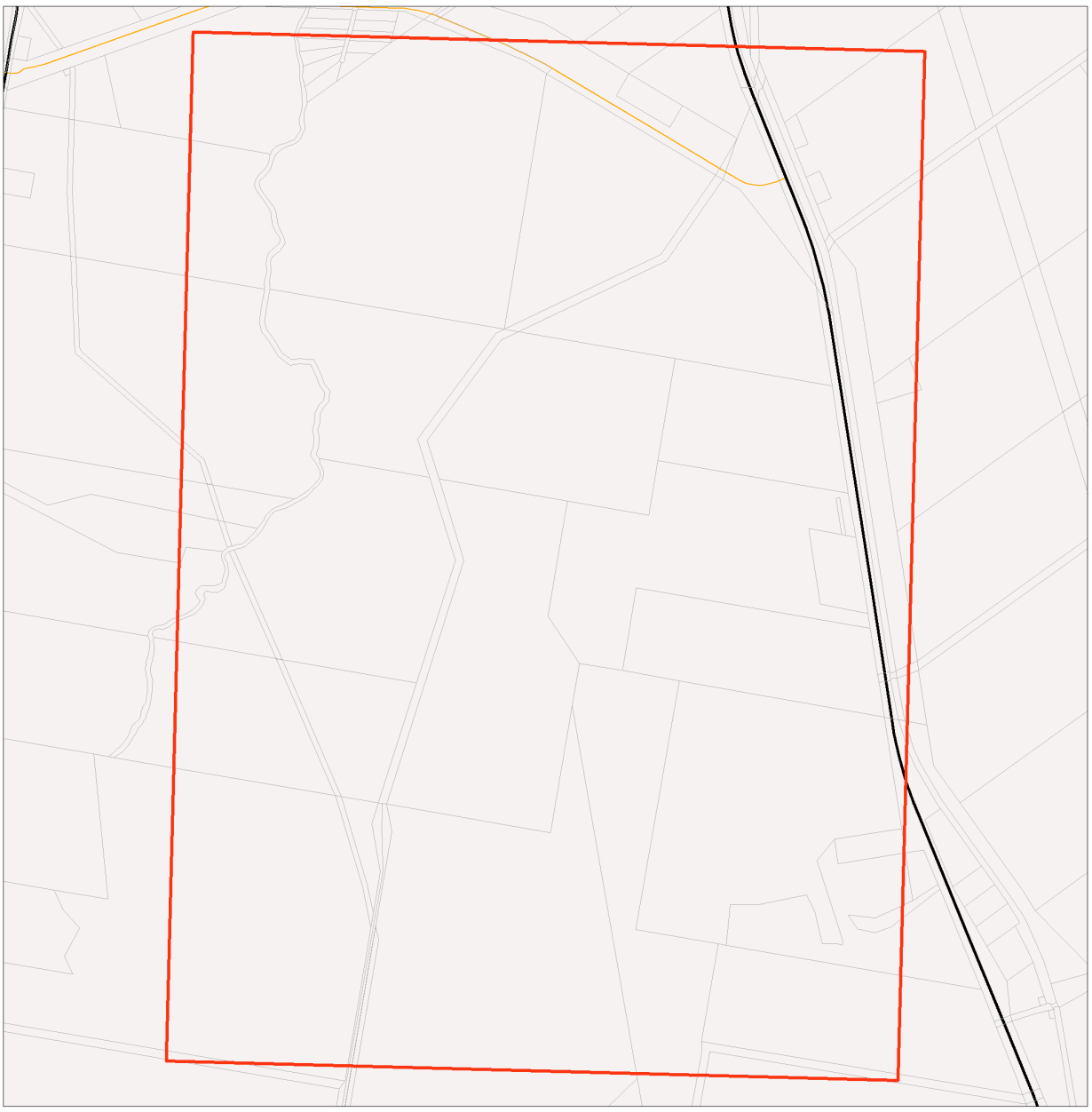
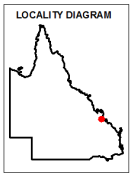
Map 3b - MSES - Species - Koala habitat area (SEQ)



MSES - Species
Koala habitat area (SEQ)

Area of Interest
- polygon
- Towns
- Freeways/Highways
- Secondary roads
- Major rivers/creeks
- Koala habitat area (core)
- Koala habitat area (locally refined)

LOCALITY DIAGRAM



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The represented layers for SEQ 'koala habitat area-core' and 'koala habitat area- locally refined' in MSES are sourced directly from the regulatory mapping under the Nature Conservation (Koala) Conservation Plan 2017. Whilst every effort is made to ensure the information remains current, there may be delays between updating versions. Please refer to the original mapping for the most recent version. See https://environment.des.qld.gov.au/wildlife/animals/living-with/koalas/mapping

The koala habitat mapping within South East Queensland uses regional ecosystem linework compiled at a scale varying from 1:25,000 to 1:100,000. Linework should be used as a guide only. The positional accuracy of regional ecosystem data mapped at a scale of 1:100,000 is +/- 100 metres.

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0 270 540 810 1,080 1,350 m

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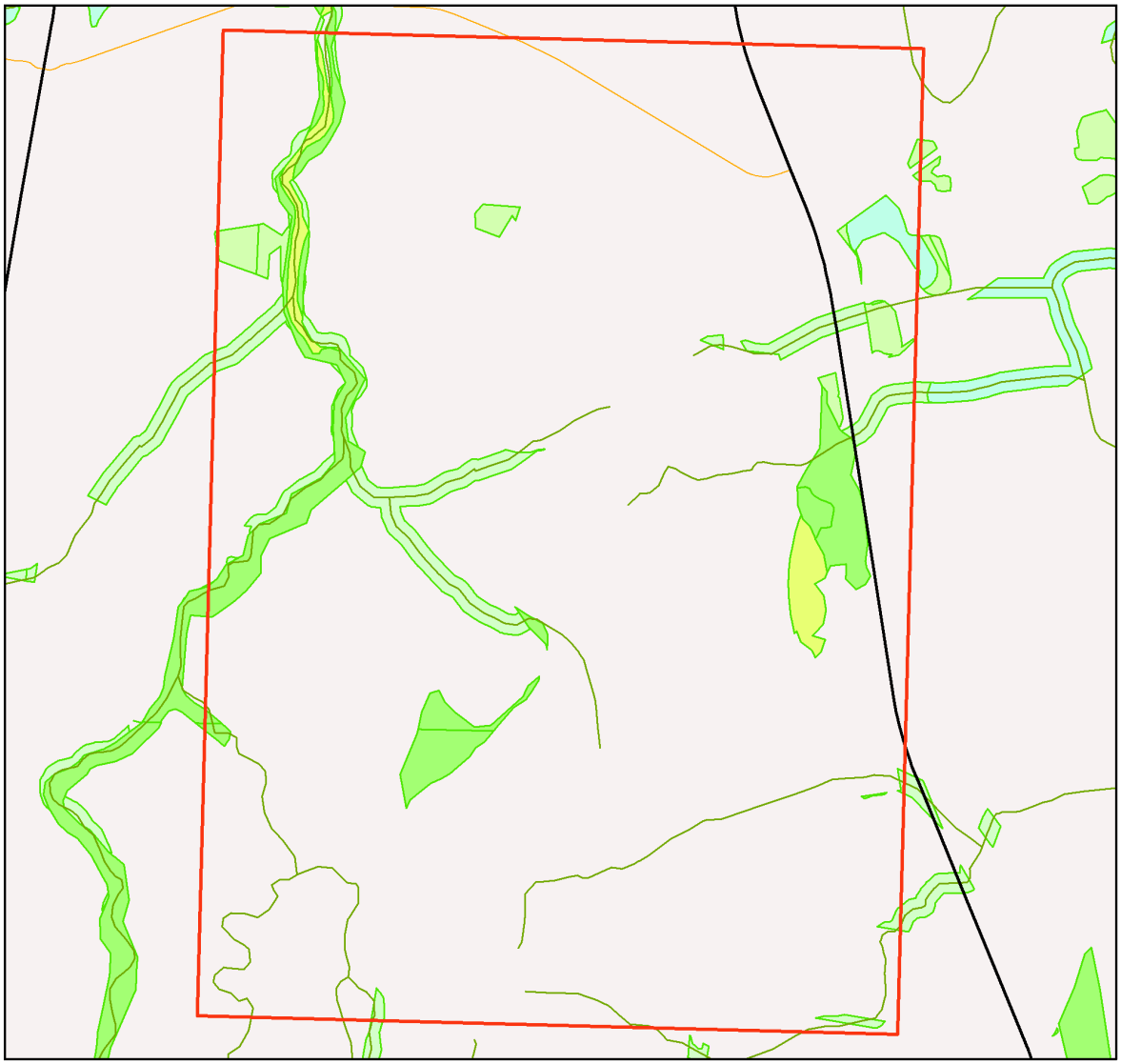
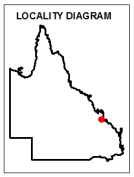
Map 4 - MSES - Regulated Vegetation



MSES - Regulated Vegetation

Area of Interest
- polygon
- Towns
- Freeways/Highways
- Secondary roads
- Major rivers/creeks
- Regulated vegetation (intersecting a watercourse)
- Regulated vegetation (100m from wetland)
- Regulated vegetation (category B - endangered or of concern)
- Regulated vegetation (category C - endangered or of concern)
- Regulated vegetation (category R - GBR riverine)
- Regulated vegetation (essential habitat)



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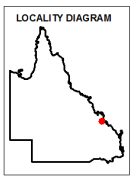
Map 5 - MSES - Offset Areas



MSES - Offsets

Area of Interest

- polygon
- Towns
- Freeways/Highways
- Secondary roads
- Major rivers/creeks
- Legally secured offset area (offset register)
- Legally secured offset area (vegetation offsets)



N

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Appendices

Appendix 1 - Matters of State Environmental Significance (MSES) methodology

MSES mapping is a regional-scale representation of the definition for MSES under the State Planning Policy (SPP). The compiled MSES mapping product is a guide to assist planning and development assessment decision-making. Its primary purpose is to support implementation of the SPP biodiversity policy. While it supports the SPP, the mapping does not replace the regulatory mapping or environmental values specifically called up under other laws or regulations. Similarly, the SPP biodiversity policy does not override or replace specific requirements of other Acts or regulations.

The Queensland Government's "Method for mapping - matters of state environmental significance for use in land use planning and development assessment" can be downloaded from:

http://www.ehp.qld.gov.au/land/natural-resource/method-mapping-mses.html .

Appendix 2 - Source Data

The datasets listed below are available on request from:

http://qldspatial.information.qld.gov.au/catalogue/custom/index.page

- Matters of State environmental significance

Note: MSES mapping is not based on new or unique data. The primary mapping product draws data from a number of underlying environment databases and geo-referenced information sources. MSES mapping is a versioned product that is updated generally on a twice-yearly basis to incorporate the changes to underlying data sources. Several components of MSES mapping made for the current version may differ from the current underlying data sources. To ensure accuracy, or proper representation of MSES values, it is strongly recommended that users refer to the underlying data sources and review the current definition of MSES in the State Planning Policy, before applying the MSES mapping.

Individual MSES layers can be attributed to the following source data available at QSpatial:

MSES layers	**current QSpatial data (http://qspatial.information.qld.gov.au)**
Protected Areas-Estates, Nature Refuges, Special Wildlife Reserves	- Protected areas of Queensland - Nature Refuges - Queensland - Special Wildlife Reserves- Queensland
Marine Park-Highly Protected Zones	Moreton Bay marine park zoning 2008
Fish Habitat Areas	Queensland fish habitat areas
Strategic Environmental Areas-designated	Regional Planning Interests Act - Strategic Environmental Areas
HES wetlands	Map of Queensland Wetland Environmental Values
Wetlands in HEV waters	HEV waters: - EPP Water intent for waters Source Wetlands: - Queensland Wetland Mapping (Current version 5) Source Watercourses: - Vegetation management watercourse and drainage feature map (1:100000 and 1:250000)
Wildlife habitat (threatened and special least concern)	-WildNet database species records - habitat suitability models (various) - SEQ koala habitat areas under the Koala Conservation Plan 2019
VMA regulated regional ecosystems	Vegetation management regional ecosystem and remnant map
VMA Essential Habitat	Vegetation management - essential habitat map
VMA Wetlands	Vegetation management wetlands map
Legally secured offsets	Vegetation Management Act property maps of assessable vegetation. For offset register data-contact DES
Regulated Vegetation Map	Vegetation management - regulated vegetation management map

Appendix 3 - Acronyms and Abbreviations

AOI	- Area of Interest
DES	- Department of Environment and Science
EP Act	- *Environmental Protection Act 1994*
EPP	- Environmental Protection Policy
GDA94	- Geocentric Datum of Australia 1994
GEM	- General Environmental Matters
GIS	- Geographic Information System
MSES	- Matters of State Environmental Significance
NCA	- *Nature Conservation Act 1992*
RE	- Regional Ecosystem
SPP	- State Planning Policy
VMA	- *Vegetation Management Act 1999*

APPENDIX 3

Matters of Local Environmental Significance Mapping

RichTextBox1

Spatial reference

GDA2020_MGA_Zone_56

A4 Page scale at 1: 35,493.00

Printed from RRPS on 08/09/21



Legend

- RRC Mask
- RRC Mask
- Biodiversity Corridors
- MSES - Wildlife Habitat
- Roads3
  - Main roads
  - Major council roads
  - Standard council roads
  - Access roads
  - Private roads
- Property Parcels
- Ocean
- CQ LGA Boundaries

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GDA 2020

Rockhampton Regional Council

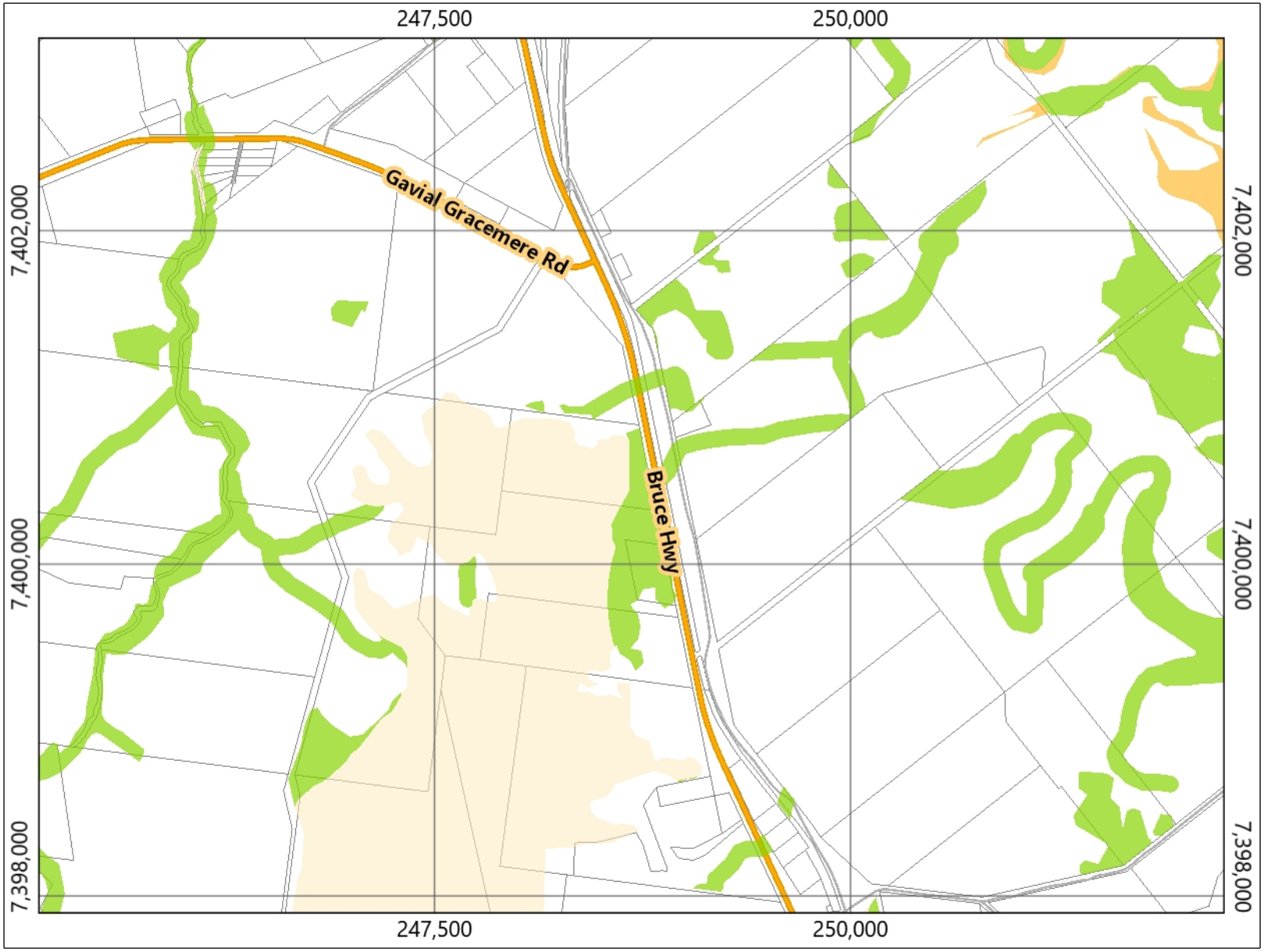
RichTextBox1

Spatial reference

GDA2020_MGA_Zone_56

A4 Page scale at 1: 35,493.00

Printed from RRPS on 08/09/21



Legend

- RRC Mask
- RRC Mask
- MSES
- MLES - High
- MLES - General
- Roads3
  - Main roads
  - Major council roads
  - Standard council roads
  - Access roads
  - Private roads
- Property Parcels
- Ocean
- CQ LGA Boundaries

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GDA 2020

Rockhampton Regional Council

RichTextBox1

Spatial reference

GDA2020_MGA_Zone_56

A4 Page scale at 1: 35,492.51

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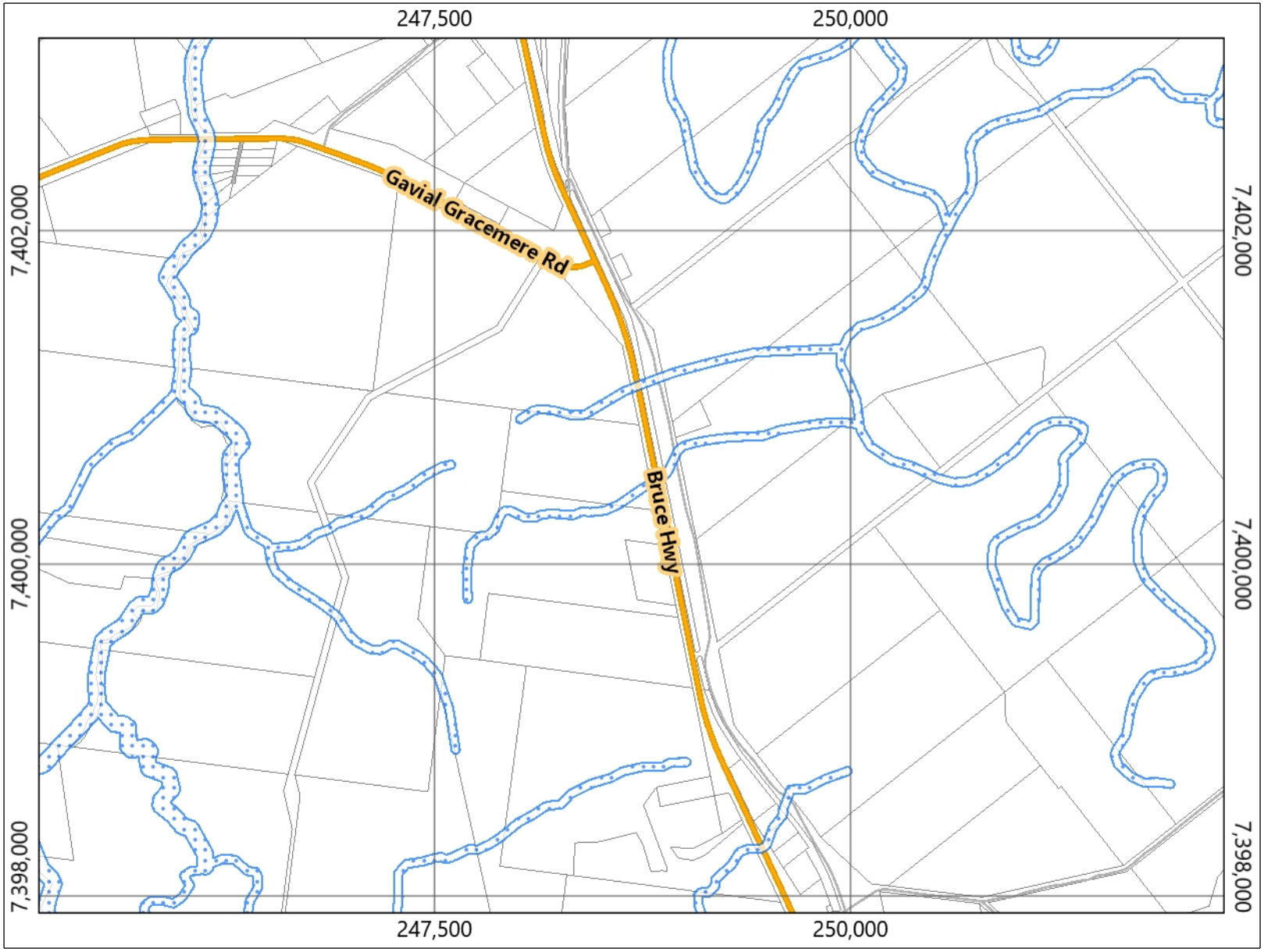

Legend

- RRC Mask
- RRC Mask
- MSES - Waterways
- Waterways
- Roads3
  - Main roads
  - Major council roads
  - Standard council roads
  - Access roads
  - Private roads
- Property Parcels
- Ocean
- CQ LGA Boundaries

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GDA 2020

Rockhampton Regional Council

APPENDIX 4

Flora Survey Data

Site	Habitat description	Representative photo
Q1	**Brief description:** non-remnant. **Canopy (T1):** Very sparse. Height range 7-12m; median height 9m. *Eucalyptus crebra, E.populnea.* **Shrub (S1):** Very sparse. Height range 1-2m; median height 1m. *Ziziphus mauritiana*, Acacia salicina.* **Groundcover:** Dense. Height range 0.1-0.4m; median height 0.1m. *Sida subspicata, Melinis repens*, Salsola kali, Stachytarpheta spp.*, Chloris gayana*, Opuntia tomentosa*. .*	
Q2	**Brief description:** non-remnant. **Canopy (T1):** Very sparse. Height range 7-15m; median height 15m. *Eucalyptus tereticornis, E.populnea, Corymbia tessellaris, C.intermedia* **Sub-canopy (T2):** Very sparse. Height range 3-6m; median height 4m: *Melaleuca viridiflora, Acacia salicina, Santalum lanceolatum.* **Groundcover:** Dense. Height range 1-1.5m; median height 1m. *Sida cordifolia, Melinis repens*, Salsola kali, Stachytarpheta spp.*, Chloris virgata*, Chloris inflata*, Dianella spp., Heteropogon contortus.*	
Q8	**Brief description:** RE11.3.2/11.3.4 (groundtruthed as RE11.3.2) **Canopy (T1):** Mid-dense. Height range 13-17m; median height 15m. *Eucalyptus populnea, E.crebra, E.tereticornis, C.tesselaris,* **Sub-canopy (T2):** Very sparse. Height range 7-9m; median height 8m: *Santalum lanceolatum, E.crebra, Maclura cochinchinensis, Acacia salicina, Acacia spp. .* **Shrub (S1):** Very sparse. Height range 0.5-1m; median height 0.5m. *Coelospermum reticulatum, Alphitonia excelsa, Opuntia tomentosa*, Capparis lasianthos, Lantana camara*, Sida cordifolia, E.populnea, Santalum lanceolatum, Breynia oblongifolia, Grewia latifolia.* *Senna pendula*, Maclura cochinchinensis.* **Groundcover:** Mid-Dense. Height range 0.5-1m; median height 0.3m. *Stachytarpheta spp.*, Lantana montevidensis*, Aristida spp., Glycine spp., Cyperus spp., Cyperus exaltatus, Dianella spp., Heteropogon contortus, Sida cordifolia, Eremophila debilis, Megathyrsus maximus*, Chloris virgata*, Argemone ochroleuca*.* **Potential to be classed as a TEC if below canopy native species diversity meets criteria following a wet season survey**	

Site	Habitat description	Representative photo
Q9	**Brief description:** RE11.3.2/11.3.4 (ground truthed RE11.3.4). **Canopy (T1):** Very sparse to Mid-dense (patchy). Height range 8-14m; median height 14m. *Corymbia tessellaris, E.crebra* **Sub-canopy (T2):** Very sparse. Height range 2-5m; median height 2m: *C.tessellaris, E.crebra, E.populnea.* **Shrub (S1):** Mid-dense. Height range 0.5-1m; median height 0.5m. *Sida subspicata. .* **Groundcover:** Mid-dense. Height range 0.1-0.4m; median height 0.3m. *Stachytarpheta spp.*, Chloris virgata*, Heteropogon contortus, Aristida spp., Megathyrsus maximus*.*	
Q10	**Brief description:** RE11.3.2/11.3.4 (groundtruthed as RE11.3.4) **Canopy (T1):** Mid-dense. Height range 10-16m; median height 15m. *Eucalyptus crebra, E.populnea, C.intermedia, E.tereticornis, C.tesselaris,* **Sub-canopy (T2):** Very sparse. Height range 7-9m; median height 8m: *Acacia salicina, Santalum lanceolatum, E.crebra, E.populnea, Grevillea striata.* **Shrub (S1):** Very sparse. Height range 0.5-1m; median height 0.5m. *Coelospermum reticulatum, Lantana camara*.* **Groundcover:** Mid-dense. Height range 0.1-0.4m; median height 0.3m. *Stachytarpheta spp.*, Chloris virgata*, Heteropogon contortus, Aristida spp., Megathyrsus maximus*.*	
Q11	**Brief description:** Remnant RE11.3.2/11.3.4 (ground truthed as remnant RE11.11.15). **Canopy (T1):** Mid-dense/Sparse. Height range 10-15m; median height 13m. *E.crebra* **Sub-canopy (T2):** Very sparse. Height range 3-6m; median height 4m: *Santalum lanceolatum, E.crebra, Alphitonia excelsa.* **Shrub (S1):** sparse. Height range 0.5-1m; median height 0.5m. *Coelospermum reticulatum, E.crebra, Alphitonia excelsa, Lantana camara*, Sida cordifolia.* **Groundcover:** Mid-dense. Height range 0.1-0.3m; median height 0.3m. *Heteropogon contortus, Stachytarpheta spp.*,*	

Site	Habitat description	Representative photo
Q12	**Brief description:** Remnant RE11.11.15. **Canopy (T1):** Mid-dense/Sparse. Height range 8-14m; median height 13m. *E.crebra* **Sub-canopy (T2):** Very sparse. Height range 4-6m; median height 5m: *Santalum lanceolatum, E.crebra,* **Shrub (S1):** Mid-dense. Height range 0.5-1m; median height 0.5m. *Sida subspicata, E.crebra, Alphitonia excelsa.* **Groundcover:** Mid-dense. Height range 0.1-0.3m; median height 0.3m. *Heteropogon contortus, Stachytarpheta spp.*,*	
Q13	**Brief description:** Remnant RE11.11.15. **Canopy (T1):** Mid-dense/Sparse.median height 20m. *E.crebra* **Sub-canopy (T2):** Very sparse. median height 10m: *E.tereticornis, C.tessellaris, Melaleuca fluviatilis.* **Shrub (S1):** Mid-dense. median height 2m. *Sida subspicata.* **Groundcover:** Mid-dense. median height 1m. *Heteropogon contortus, Melinis repens*, Chloris virgata*, Megathyrsus maximus*.*	
Q14	**Brief description:** Remnant RE11.11.15. **Canopy (T1):** Sparse. Height range 8-14m; median height 12m. *E.crebra, Corymbia erythrophloia* **Sub-canopy (T2):** Very sparse. Height range 4-6m; median height 6m: *Alphitonia excelsa, Acacia disparrima, Coelospermum reticulatum* **Shrub (S1):** Very sparse. Height range 1-2m; median height 1m. *Alphitonia excelsa, Sida subspicata, E.crebra, Lantana camara*, Coelospermum reticulatum, Pandorana pandorana* **Groundcover:** Mid-dense. Height range 0.1-0.3m; median height 0.3m. *Heteropogon contortus, Stachytarpheta spp.*,*	

Site	Habitat description	Representative photo
Q15	**Brief description:** Remnant RE11.11.15. **Canopy (T1):** Sparse. Height range 9-14m; median height 12m. *E.crebra, Corymbia erythrophloia, C.tessellaris.* **Sub-canopy (T2):** Very sparse. Height range 6-8m; median height 7m: *Santalum lanceolatum, E.crebra.* **Shrub (S1):** Very sparse. Height range 1-2m; median height 1m. *E.crebra.* **Groundcover:** Mid-dense. Height range 0.1-0.4m; median height 0.4m. *Heteropogon contortus, Stachytarpheta spp.*,Sida subspicata, Aristida spp., Chloris virgata*, Opuntia tomentosa*.*	
Q16	**Brief description:** Remnant 11.3.2/11.3.4. Dead vegetation, possibly ringbarked. Unlikely to be a natural cause of death. State mapping (RE11.3.2/11.3.4) was incorrect – this area would once have been RE11.11.15 (based on observations of remaining vegetation and vegetation in adjacent land).	
Q17	**Brief description:** Remnant RE11.11.15. **Canopy (T1):** Mid-dense. Height range 16-20m; median height 20m. *E.crebra..* **Sub-canopy (T2):** Very sparse. Height range 6-10m; median height 8m: *Santalum lanceolatum, E.crebra, Acacia decora. .* **Shrub (S1):** Very sparse. Height range 0.5-1m; median height 1m. *E.crebra.* **Groundcover:** Sparse. Height range 0.1-0.2m; median height 0.2m. *Heteropogon contortus, Stachytarpheta spp.*,Sida subspicata, Aristida spp.*	

Site	Habitat description	Representative photo
Q18	**Brief description:** RE11.3.2/11.3.4 (groundtruthed as RE11.3.4) **Canopy (T1):** Sparse. Height range 18-20m; median height 18m. *E.tereticornis,,* **Sub-canopy (T2):** Mid-dense. Height range 8-11m; median height 11m: *E.crebra, E.populnea, C.tessellaris, Melaleuca leucadendron.* **Shrub (S1):** Very sparse. Height range 1-2m; median height 1.5m. *Maclura cochinchinensis, E.tereticornis, E.populnea, E.crebra.* **Groundcover:** Mid-dense. Height range 0.1-0.4m; median height 0.3m. *Stachytarpheta spp.*, Heteropogon contortus, Aristida spp., Sida subspicata.*	
Q19	**Brief description:** Regrowth RE11.11.15. **Canopy (T1):** Very sparse. Height range 9-16m; median height 9m. *E.crebra..* **Sub-canopy (T2):** Very sparse. Height range 2-5m; median height 3m: *Santalum lanceolatum, E.crebra, Acacia decora. .* **Shrub (S1):** Very sparse. Height range 0.5-1m; median height 1m. *E.crebra, Coelospermum reticulatum,* **Groundcover:** Sparse. Height range 0.1-0.4m; median height 0.3m. *Heteropogon contortus, Stachytarpheta spp.*,Sida subspicata, Aristida spp.*	

* exotic species.

APPENDIX 5

State Code 16 Assessment

State Code 16: Native Vegetation Clearing: Extractive Industry Tables: 16.2.2 and 16.2.3

Table 16.2.2: POs 1-4

Performance Outcome	Acceptable Outcome	Response
Clearing avoids or minimises impacts		
PO1 Clearing and adverse impacts of clearing do not occur unless the application has demonstrated that the clearing and the adverse impacts of clearing have been: 1. reasonably avoided; or 2. reasonably minimised where it cannot be reasonably avoided.	No acceptable outcome is prescribed.	Extractive resources are both finite in extent and fixed in location as a result of fortuitous geological events. The resource in this instance is associated with the steeper topography on site, which is an area that has likely avoided a high level of historical clearing due to its limitations for use as grazing land (steeper access and poorer soils comprising rocky outcrops). Areas which have been previously cleared for agricultural activities, and are not mapped as possessing remnant vegetation, do not provide suitable resource. While disturbance of the area cannot be avoided by virtue of deposit location, the clearing can be minimised. Permanent site infrastructure and access road for the quarry exist on site and are proposed to remain unchanged as a result of the extension to the quarry footprint. The extension to the quarry footprint is necessary to extract the suitable quarry rock material. Retained vegetation will be managed under the direction of the site Environmental Management Plan to mitigate impacts from adjacent quarrying activities. Stormwater and sediment controls will limit impacts outside of the quarry footprint, in particular in the context of the ongoing agricultural activities. Revegetation works will be undertaken to prevent or reduce overall environmental harm and degradation, and the likelihood of an SRI to MSES, in accordance with pre-lodgement advice from SARA and in further consultation with DoR. This would involve the rehabilitation and legal security of an appropriately sized and located area of vegetation, under the guidance of an approved management plan.
Clearing on land in particular circumstances		
PO2 Clearing is consistent with any notice requiring compliance on the land subject to the development application, unless a better environmental outcome can be achieved. Note: The discharge of the vegetation management requirements under the notice requiring compliance can only	No acceptable outcome is prescribed.	**Not applicable.** The site is not subject to a notice requiring compliance.

Performance Outcome	Acceptable Outcome	Response
occur in conjunction with the better environmental outcome being legally secured.		
PO3 Clearing is consistent with vegetation management requirements for particular regulated areas unless a better environmental outcome can be achieved. Note: The discharge of the vegetation management requirements under the notice requiring compliance can only occur in conjunction with the better environmental outcome being legally secured.	No acceptable outcome is prescribed.	**Not applicable.** The site is not subject to a notice requiring compliance.
PO4 Clearing of a legally secured offset area: 1. is consistent with the offset delivery plan; or agreement for the offset area on the land subject to the development application; or 2. only occurs if an additional offset is provided. Note: Reference to 'agreement' above includes the 'agreed delivery arrangement' for the offset area as well as instruments associated with the legally secured offset area. Clearing should be consistent with any agreement however described.	No acceptable outcome is prescribed.	**Not applicable.** The site does not contain a legally secured offset area.

Table 16.2.3: POs 7, 11, 16, 22-24 and 27-28

Performance Outcome	Acceptable Outcome	Response
Clearing associated with wetlands (public safety and infrastructure, a coordinated project, extractive industry, high value agriculture clearing, and irrigated high value agriculture clearing)		
PO7 Clearing maintains the current extent of vegetation associated with any natural wetland to protect: 1. bank stability by protecting against bank erosion 2. water quality by filtering sediments, nutrients and other pollutants 3. aquatic habitat; and 4. terrestrial habitat	AO7.1 Clearing does not occur in a natural wetland or within 100 metres of the defining bank of any natural wetland. OR	**Complies.** Clearing will not occur in a natural wetland or within 100 metres of the defining bank of any natural wetland.
	AO7.2 Clearing within 100 metres of the defining bank of any natural wetland: **1.** does not occur within 50 metres of the defining bank of any natural wetland; and **2.** does not exceed widths in table 16.3.1 in this code. OR	
	AO7.3 Where clearing cannot be reasonably avoided, and clearing has been reasonably minimised, an offset is provided for any acceptable significant residual impact from clearing of vegetation associated with a natural wetland (matter of state environmental significance).	
Clearing associated with watercourses and drainage features (public safety and relevant infrastructure activities, coordinated project, extractive industry, high value agriculture clearing, irrigated high value agriculture clearing)		

Performance Outcome	Acceptable Outcome	Response
PO11 Clearing maintains the current extent of vegetation associated with any watercourse or drainage feature to protect: 1. bank stability by protecting against bank erosion 2. water quality by filtering sediments, nutrients and other pollutants 3. aquatic habitat; and 4. terrestrial habitat.	AO11.1 Clearing does not occur in any of the following areas: **1.** inside the defining bank of a watercourse or drainage feature; and **2.** within the relevant distance of the defining bank of any watercourse or drainage feature in table 16.3.2 of this code. OR AO11.2 Clearing within any watercourse or drainage feature, or within the relevant distance of the defining bank of any watercourse or drainage feature in table 16.3.2 of this code: 1. does not exceed the widths in table 16.3.1 of this code; and 2. does not occur within five metres of the defining bank, unless clearing is required into or across the watercourse or drainage feature. OR **AO11.3** Where clearing cannot be reasonably avoided, and clearing has been reasonably minimised, an offset is provided for any acceptable significant residual impact from clearing of vegetation associated with any watercourse or drainage feature (a matter of state environmental significance).	The proposed clearing will occur within mapped watercourses, and within the relevant distance of the defining bank of mapped watercourses, and will exceed the width prescribed in table 16.3.1 relating to RE 11.11.15 (sparse) – i.e. the proposed clearing will exceed 20 m in width. The *Significant Residual Impact Guideline, Department of State Development, Infrastructure and Planning, 2014* states an action is **LIKELY** to have a significant residual impact (SRI) on remnant vegetation within the defined distance of a watercourse if the action will result in: (a) permanent removal of vegetation within the defined distance of a stream order 2 or higher where no rehabilitation is proposed; (b) building of an online detention basin greater than 1ha in size or other similar works that result in the clearing of vegetation which fragments up and downstream remnant areas on any stream order; OR (c) permanent clearing of more than 0.5ha of an endangered or of concern RE, within the defined distance of a watercourse. The proposed clearing will not result in any of the above, such that an SRI should not be considered likely without further consideration of the guidelines and proposed mitigation measures. Notwithstanding the above, the *Significant Residual Impact Guideline, Department of State Development, Infrastructure and Planning, 2014* states an action is **UNLIKELY** to have a SRI on an 'endangered' or 'of concern' RE if the action will result in: (a) lineal clearing of vegetation (that is for a purpose under section 22A of the VMA) less than 25m in width on a stream order 1 or 2 mapped watercourse, where the works include: i. revegetation of exposed embankment areas (e.g. from a new road crossing and culvert installation) in accordance with a vegetation management or rehabilitation plan, ii. temporary erosion and sediment control until construction is completed or stream banks have been stabilised, AND iii. a crossing design which can be demonstrated (through a site specific study or similar) not to interfere with existing aquatic and terrestrial habitat of the watercourse; (b) temporary clearing of 'least concern' RE of up to 1 ha on a stream order 1 or 2 where erosion and sediment measures are in place and the area is to be rehabilitated on the subject site;

Performance Outcome	Acceptable Outcome	Response
		(c) removal of vegetation from a partially vegetated / degraded stream order 1 or 2 where revegetation greater than the area removed occurs on other stream order areas within or adjoining the site; (d) clearing of 'least concern' RE not containing Essential Habitat up to 1ha for lineal infrastructure (e.g. roads and rail); OR (e) removal of understorey vegetation of up to 3ha within a remnant area (excluding clearing within the high bank of the watercourse) for the purposes of open space or safety where not removing any trees with a trunk Diameter at Breast Height (DBH) greater than 150mm in diameter. The proposed clearing will result in the permanent removal of 1 ha of remnant RE 11.11.15 within the relevant distance (10m) of stream order 1 watercourses for the expansion of an existing quarry pit. Revegetation works will be undertaken to prevent or reduce overall environmental harm and degradation, and the likelihood of an SRI to MSES, including vegetation within a defined distance from the defining banks of a relevant watercourse or relevant drainage feature, in accordance with pre-lodgement advice from SARA and in further consultation with DoR. This would involve the rehabilitation and legal security of an appropriately sized and located area of vegetation, under the guidance of an approved management plan.
Maintaining connectivity (public safety and relevant infrastructure activities, extractive industry, high value agriculture clearing, irrigated high value agriculture clearing)		
PO16 In consideration of vegetation on the land subject to the development application and on adjacent land, sufficient vegetation is retained to maintain ecological processes and remains in the landscape despite threatening processes.	AO16.1 Clearing occurs in accordance with table 16.3.3 in this code.	The proposed clearing is in a coastal bioregion, and will not: • occur in areas of vegetation that are less than 10 hectares. • occur where the extent of vegetation on the subject lot(s) is reduced to, or less than, 30 percent of the total area of the lot(s). • reduce the extent of vegetation to less than 10 hectares; • occur in areas of vegetation less than 100 metres wide. The width of Category B vegetation to the north of the proposed footprint for Pit 2 will be reduced to less than 100 metres, although sufficient remnant vegetation will retained within the subject lots (i.e. 175ha), along with adjacent high value regrowth, to maintain ecological processes and remain in the landscape despite threatening processes.

Performance Outcome	Acceptable Outcome	Response
		Revegetation works will be undertaken to prevent or reduce overall environmental harm and degradation, including any reduction in connectivity. This would involve the rehabilitation and legal security of an appropriately sized and located area of vegetation, under the guidance of an approved management plan.
Salinity (public safety and relevant infrastructure activities, coordinated project, extractive industry, high value agriculture clearing, irrigated high value agriculture clearing, necessary environmental clearing, fodder harvesting)		
PO22 Clearing does not contribute to or accelerate land degradation through waterlogging, or through the salinisation of groundwater, surface water or soil.	AO22.1 Clearing does not occur within 100 metres of a salinity expression area.	No vegetation within a 'salinity expression area' (as defined in State Code 16) or within 100m of such an area, is proposed to be cleared. The regional ecosystems proposed to be cleared and those within 100m are primarily eucalypt communities on volcanics. Groundwater bore data indicates the site would not be in an area of shallow groundwater (i.e. <5m). A search of Queensland Globe (2021) for 'Potential Groundwater Dependant Ecosystem' (GDE) did not identify any confirmed GDEs either within the site or close proximity.
Conserving endangered and of concern regional ecosystems (public safety and relevant infrastructure activities, coordinated project, extractive industry, high value agriculture clearing, irrigated high value agriculture clearing)		
PO23 Clearing maintains the current extent of endangered regional ecosystems and of concern regional ecosystems.	AO23.1 Clearing does not occur in an endangered regional ecosystem or an of concern regional ecosystem. OR	**Complies.** Clearing will not occur in an endangered regional ecosystem or an of concern regional ecosystem (Category B). The avoidance and minimisation of the clearing of mapped remnant vegetation is addressed in the response to **PO1**.
	AO23.2 Total clearing of endangered regional ecosystems and of concern regional ecosystems combined does not exceed the widths prescribed in table 16.3.1 of this code. OR	
	AO23.3 Total clearing of endangered regional ecosystems and of concern regional ecosystems combined does not exceed areas prescribed in table 16.3.1 of this code. OR	
	AO23.4 Where clearing cannot be reasonably avoided, and clearing has been reasonably minimised, an offset is provided for any acceptable significant residual impact from clearing of	

Performance Outcome	Acceptable Outcome	Response
	endangered regional ecosystems and of concern regional ecosystems (a matter of state environmental significance).	
Essential habitat (public safety and relevant infrastructure activities, coordinated project, extractive industry, high value agriculture clearing and irrigated high value agriculture clearing, fodder harvesting)		
PO24 Clearing maintains the current extent of essential habitat.	AO24.1 Clearing does not occur in essential habitat. OR	**Complies.** Clearing will not occur in essential habitat.
	AO24.2 Clearing in essential habitat does not exceed the widths prescribed in table 16.3.1 of this code. OR	
	AO24.3 Clearing in essential habitat does not exceed the areas prescribed in table 16.3.1 of this code. OR	
	AO24.4 Where clearing cannot be reasonably avoided, and clearing has been reasonably minimised, an offset is provided for any acceptable significant residual impact from clearing of essential habitat (a matter of state environmental significance).	
Acid sulfate soils (public safety and relevant infrastructure activities, coordinated project, extractive industry, high value agriculture clearing, irrigated high value agriculture clearing, necessary environmental clearing, necessary to control non-native plants or declared pests, thinning, encroachment)		
PO27 Clearing does not result in, or accelerate, disturbance of acid sulfate soils or changes to the hydrology of the location that will result in either of the following: 1. aeration of horizons containing iron sulphides; or	AO27.1 Clearing does not occur in land zone 1, land zone 2 or land zone 3. OR	**Complies.** The local government is the assessment manager for the development application.
	AO27.2 Clearing in land zone 1, land zone 2 or land zone 3 in areas below the five metre Australian Height Datum only occurs where: 1. mechanical clearing does not disturb the soil to a depth greater than 30 centimetres; and	

Performance Outcome	Acceptable Outcome	Response
2. mobilisation of acid or metals.	2. acid sulfate soils are managed consistent with the State Planning Policy, Department of Infrastructure, Local Government and Planning, July 2017, and with the soil management guidelines in the Queensland Acid Sulfate Soil Technical Manual, Department of Science Information Technology Innovation and the Arts, 2014. OR **AO27.3** The local government is the assessment manager for the development application.	
Clearing is staged (extractive industry)		
PO28 Clearing: 1. is staged in line with operational needs that restrict clearing to the current operational area 2. only occurs in the area from which material will be extracted, and any reasonably associated infrastructure, within the term of the development approval; and 3. does not occur without required permits.	No acceptable outcome is prescribed.	**Complies.** Clearing will occur progressively, in line with operational needs. Extractive industry progresses horizontally and vertically in a slow and 'step like' manner and, hence, clearing on site will be required to be carried out in a progressive and sequential manner. As a result of the long time periods associated with extractive industry development, it is common (and best) practice to clear just ahead of extraction to ensure that other matters such as visual amenity and erosion and sediment control are managed in line with quarry development and in order to ensure ongoing compliance with the site Environmental Authority.

APPENDIX 6

Assessment of Waterway for Waterway Barrier Works

BAAM
ECOLOGICAL CONSULTANTS

specialised ecological knowledge
that reduces your risk

8 December 2021

Megan Benham
mbenham@groundwork.com.au

Dear Megan,

RE: Assessment of Waterway for Waterway Barrier Works, Midgee Quarry

Biodiversity Assessment and Management Pty Ltd (BAAM) was commissioned to groundtruth a drainage feature traversing land adjacent to the existing Midgee Quarry that is mapped as a Waterway for Waterway Barrier Works (WWBW). The purpose of the assessment was to determine if on-ground features of the drainage feature would or would not support fish passage, and if a WWBW mapping change was warranted.

The Subject Site was visited by BAAM Senior Ecologists Dr Colin Trainor and Shelley Trevaskis over two days on 14-15 September 2021, during warm, dry conditions.

We trust the following information meets your requirements.

Yours sincerely



Shelley Trevaskis
Senior Ecologist, CEnvP
Biodiversity Assessment and Management Pty Ltd

File No	Author	Reviewer
0049-122 WWBW Version 0		

BACKGROUND

As shown in **Figure 1,** the land around Midgee Quarry supports waterways that are mapped as Waterways for Waterway Barrier Works (WWBW) by the Department of Agriculture and Fisheries (DAF).

One waterway (indicated on **Figure 1**), classed 'Low', that traverses Lot 1 SP247721 and Lot 725 RP888747 and drains toward Gavial Creek, is the subject of this technical note.

FIELD RESULTS

The source of the waterway that is the subject of this assessment is a shallow gully that likely carries overland flow for a brief period in rain events (**Photo 1**). Flow from this gully is then collected in a dam located along this waterway (**Photo 2**). South-west of the dam, there is no discernible feature in the landscape to indicate that a waterway or overland flow path is present (**Photo 3**). Whilst the dam did support aquatic vegetation, no other section of the waterway supported vegetation representative of an aquatic environment.

The dam was not specifically surveyed to determine if it supports fish; however, the ephemeral flow paths that flow into and out of the dam are not considered likely to transport fish at any stage.



Photo 1: View of the source of the drainage feature, north-west (upstream) of dam



Photo 2: View of the dam located on the waterway

	**Photo 3: View of the land located south-east (downstream) of the dam. This land is a dry, flat plain with no discernible feature to indicate a waterway channel.**

ASSESSMENT AGAINST WATERWAY ATTRIBUTES

The definition of a waterway under the *Fisheries Act 1994* includes a river, creek, stream, watercourse or inlet of the sea. This definition includes permanent and ephemeral waterways, and drainage features. It also includes channels along which fish are expected to move if they connect isolated water bodies to defined waterways during times of flow. However, it does not include isolated waterbodies where no connectivity is available (DAF, 2017).

Although the watercourse may technically meet the definition of a waterway (as the upstream gully could be classed as an ephemeral waterway [DAF, 2017]), it's function as a passage for fish is highly doubtful.

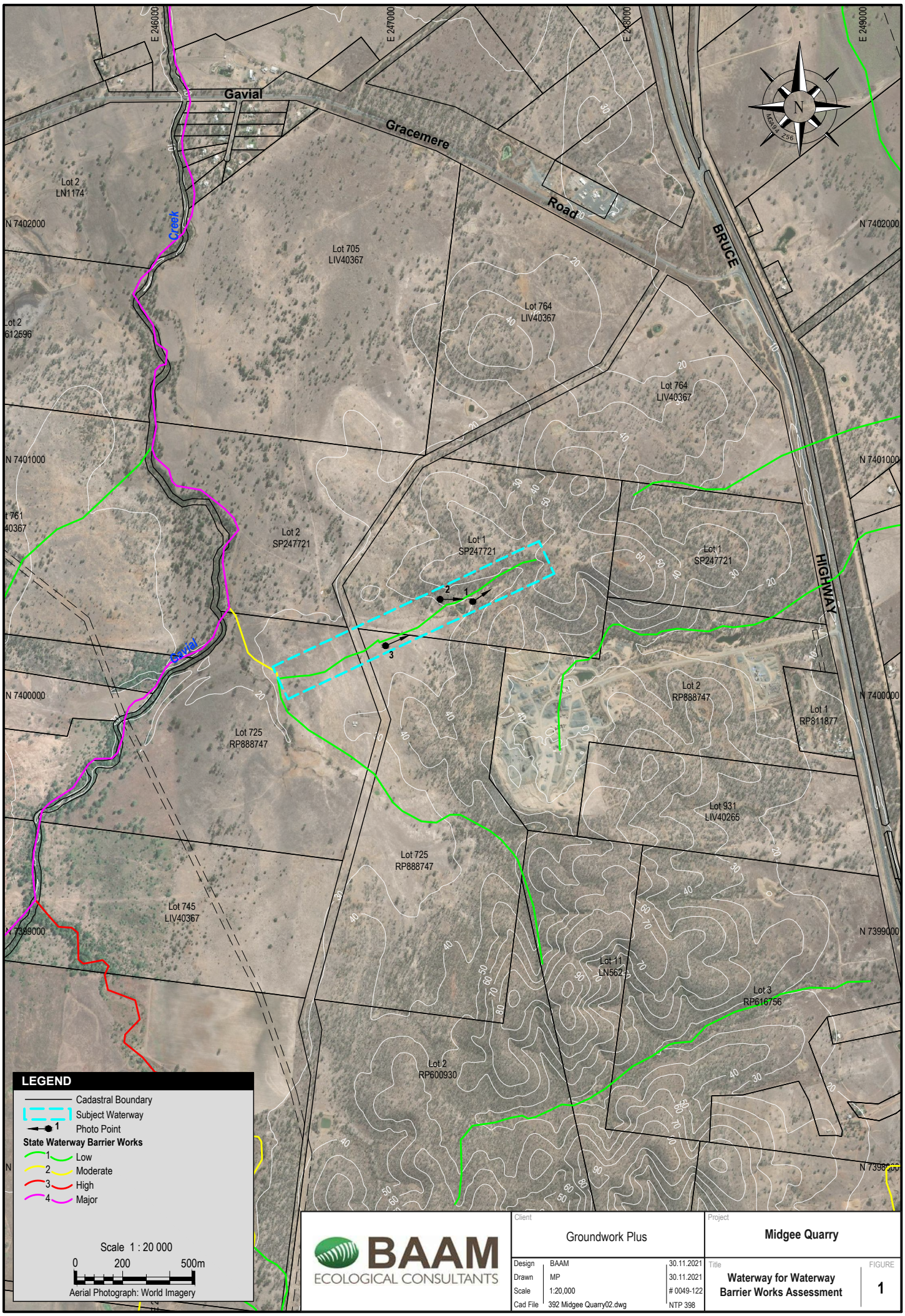
DAF (2017) identifies physical and hydrological attributes of a waterway that can be assessed in order to determine if a waterway can support fish passage. These attributes, together with site findings, are presented in **Table 1**.

Table 1: DAF attributes that define a waterway and site findings

DAF (2017) attribute criteria	Site findings
1. Defined bed and bank: The bed and banks need to be continuous upstream and downstream of the site rather than isolated and broken sections of a depression.	The dam was the only feature along the low value waterway that held water and displayed banks. There were no defined bed and banks along the balance of the mapped waterway.
2. An extended, if non-permanent, period of flow: Flow must continue beyond the duration of a rain event and have some reliability attached to rainfall. There is a need to distinguish between channels that funnel immediate localised rainfall, and waterways where flow has arisen from an upstream catchment.	The field assessment was undertaken during the dry season (October). At the time of the assessment, the dam was the only feature along the waterway that held water (**Photo 2**). It is expected that the gully upstream of the dam (**Photo 1**) collects flow only in rain events, which is then carried and held in the dam. The gully is a shallow depression in the landscape that does not feature any bed or banks that might indicate it holds water/flow beyond the duration of a rain event.

DAF (2017) attribute criteria	Site findings
	Downstream of the dam, no channel that may carry flow was present (**Photo 3**).
3. Flow adequacy: The flow needs to be sufficient to sustain basic ecological processes and habitats, and to maintain biodiversity within or across the feature. The adequacy of the flow depends on the ecological function of the channel, e.g. waterways that connect to fish habitat like a wetland or waterhole may only need infrequent and short-duration flows to provide connectivity for fish.	As discussed above, the only feature along the waterway that displayed features that may support sustained aquatic processes and habitats was the dam. The gully upstream of the dam will never support fish passage, as it is the head of the watercourse and emanates from dry eucalypt forest. Hence, it is not expected that the dam would ever support fish life (as no fish can enter from upstream) and, as a consequence, would never convey fish life downstream. Aside from the dam, no other point along the waterway featured bed or banks, aquatic vegetation, or evidence that the waterway maintains flow, or holds water for a long enough duration to sustain habitat that would support fish life.
4. Fish habitat at, or upstream of, the site: Most instream features provide habitat for fish under adequate flow conditions or, in the case of pools, during dry periods. Therefore, it is important to have some knowledge of the fish species for the site and their habitat use, particularly in headwater streams. Periodic connectivity to upstream and off stream fish habitat are also considered fish habitat.	As relayed above, the only feature along the waterway that displayed features that may support sustained aquatic processes and habitats was the dam. The gully upstream of the dam will never support fish passage, as it is the head of the waterway and emanates from dry eucalypt forest. Hence, it is not expected that the dam would ever support fish life (as no fish can enter from upstream), and as a consequence would never convey fish life downstream.

Based on the above assessment of attributes, there is evidence to demonstrate that the waterway that is the subject of this assessment does not support fish passage, and the WWBW designation is contestable.



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REFERENCES

Department of Agriculture and Fisheries (DAF) (2017) What is a Waterway? Found at: https://www.daf.qld.gov.au/business-priorities/fisheries/habitats/policies-guidelines/factsheets/what-is-a-waterway

APPENDIX 7

EVNT Species Likelihood of Occurrence Assessment

Criteria and categories used to assign likelihood of occurrence of species in the Study Site.

Category	Explanation
Known	The species is known from the current and/or past surveys and is not now considered locally extinct.
Likely	A medium to high probability that the species occurs in or visits the Study Site because suitable habitat occurs, the Study Site is within the known distribution of the species, there are records of the species in the vicinity (i.e. within 40km of the Study Site), the species is not now considered locally extinct and there is sufficient information on the occurrence of the species to categorise the species as likely.
Potential	Either: (a) suitable habitat occurs and there is insufficient information on the distribution/occurrence of the species (e.g. it is naturally rare and difficult to detect, or there has been insufficient survey effort) to categorise the species as likely or unlikely to occur; or (b) there are records of the species in the vicinity but habitat in the Study Site is marginal or spatially limited meaning that the species' presence in the Study Site would be transitory at best.
Unlikely	A low probability that the species occurs in the Study Site because suitable habitat does not occur, the Study Site is outside the known distribution of the species, there are no records of the species in the local region despite adequate survey effort, the species is considered locally extinct, or the species has not been observed despite sufficient spatial and temporal survey effort for detecting the species.

Assessment of the likelihood of occurrence in the Study Site of threatened and near-threatened fauna species identified from database searches.

Species	Common name	NC Act Status[1]	Source[2]		Preferred habitat characteristics	Likelihood of occurrence
			PM	WO		
Flora						
Cupaniopsis shirleyana	Wedge-leaf Tuckeroo	V	X		Variety of dry rainforest vegetation types, including vine thicket communities on hillsides, stream beds and along riverbanks	**Unlikely** – preferred habitat not recorded.
Cycas megacarpa		E	X	X	Woodland, open woodland and open forests, often in conjunction with a grassy understory. Found in habitat dominated by *Eucalyptus crebra* and *Corymbia citriodora* as well as *Corymbia erythrophloia*, *Eucalyptus melanophloia* and *Lophostemon confertus.*	**Unlikely** – preferred habitat is present, however the species was not recorded despite targeted searches across the Study Site. .
Cycas ophiolitica		E	X		Hills and slopes in sparse, grassy open forest at altitude ranges from 80–400 m above sea level. Frequently found on shallow, stony, infertile soils, which are developed on sandstone and serpentinite, and is associated with species such as *Corymbia dallachiana, C. erythrophloia, C. xanthope* and *Eucalyptus fibrosa*. Also been found on mudstone in association with *Corymbia dallachiana, C. erythrophloia* and *Eucalyptus crebra*, and on alluvial loams with *Corymbia intermedia, Eucalyptus drepanophylla and E. tereticornis*	**Unlikely** – preferred habitat above 80m is not present (site elevation is 60m ASL). .

Species	Common name	NC Act Status[1]	Source[2]		Preferred habitat characteristics	Likelihood of occurrence
			PM	WO		
Dichanthium setosum	Bluegrass	V	X		Typically associated with heavy basaltic black soils and red-brown loams with clay subsoil. Often found in moderately disturbed areas such as cleared woodland, grassy roadside remnants and highly disturbed pasture. It is often collected from disturbed open grassy woodlands on the northern tablelands, where the habitat has been variously grazed, nutrient-enriched and water-enriched.	**Potential –** potential habitat is present within the study area; however, there are no previous records in the Rockhampton area and there is no preferred habitat within the proposed impact area (ALA, 2021).
Marsdenia brevifolia		V	X		North of Rockhampton, grows on serpentine rock outcrops or crumbly black soils derived from serpentine in eucalypt woodland, often with *Eucalyptus fibrosa* and *Corymbia xanthope*.	**Unlikely -** suitable habitat does not occur and the Study Site is outside the known distribution of the species.
Phaius australis	Lesser Swamp Orchid	V	X		Commonly associated with coastal wet heath/sedgeland wetlands, swampy grassland or swampy forest and often where Broad-leaved Paperbark or Swamp Mahogany are found.	**Unlikely -** suitable habitat does not occur and no records are known from the Rockhampton area (ALA, 2021).
Samadera bidwillii	Quassia	V	X		Lowland rainforest or on rainforest margins, but it can also be found in other forest types, such as open forest and woodland. Commonly found in areas adjacent to both temporary and permanent watercourses.	**Potential –** marginal preferred habitat is present along Gavial Creek, but unlikely to occur within the proposed impact area.
Fauna						
Birds						
Botaurus poiciloptilus	Australasian Bittern	E	X		Shallow, permanent freshwater and brackish swamps or lagoons that are densely vegetated (e.g. tall reeds, sedges, lignum). They also inhabit bore drains with tussocky vegetation and occasionally saltmarsh.	**Unlikely** to occur through lack of suitable sedge or reed dominated wetlands
Calidris ferruginea	Curlew Sandpiper	E	X	X	Intertidal mudflats, also non-tidal swamps, lakes and lagoons near the coast, ponds in saltworks and sewage farms, and occasionally inland at ephemeral and permanent lakes, dams, waterholes and bore drains, usually with bare edges of mud or sand.	**Potential** to occur. Several records within 40km at inland dams and lagoons, though little suitable habitat is present in the Study Site.
Epthianura crocea macgregori	Yellow Chat (Dawson)	E	X		Marine plain wetlands that are subject to extensive seasonal inundation and varying degrees of both fresh and saltwater (tidal) influence	**Unlikely** to occur through lack of suitable habitat
Erythrotriorchis radiatus	Red Goshawk	E	X		Inhabits woodlands and forests, particularly riverine forests in coastal and sub-coastal areas of north-western, northern and eastern Australia, requiring large areas of forested habitat to support home ranges of 210-200 km2.	**Unlikely** to occur. One 1955 record from within 40km of the Study Site, but extensive habitat is absent from Study Site (and beyond).

Species	Common name	NC Act Status[1]	Source[2]		Preferred habitat characteristics	Likelihood of occurrence
			PM	WO		
Falco hypoleucos	Grey Falcon	V	X		Frequents timbered lowland plains, particularly acacia shrublands that are crossed by tree-lined water courses, and has been observed hunting in treeless areas and frequents tussock grassland and open woodland, especially in winter. Nests are usually in the tallest trees along watercourses, particularly River Red Gum (*Eucalyptus camaldulensis*) and Coolibah (*E. coolabah*).	**Unlikely** to occur. A single undated historical record from within c. 40km (location imprecise) of the Study Site, and a second 1908 record from about 100 km away.
Geophaps scripta scripta	Squatter Pigeon (Southern Subspecies)	V	X	X	Dry, grassy, eucalypt woodlands, open forests and scrub. The ground vegetation layer in foraging and breeding habitat is typically considerably patchy consisting of native, perennial tussock grasses or a mix of perennial tussock grasses and low shrubs or forbs. Ground vegetation cover rarely exceeds 33% with the remaining ground surface consisting of bare ground, leaf litter and coarse, woody debris.	**Known** to occur. Numerous previous records within 40km of Study Site and recorded during current survey.
Hirundapus caudacutus	White-throated Needletail	V	X		Almost exclusively aerial, therefore conventional habitat descriptions do not apply. Although they occur over most types of habitat, they are probably recorded most often above wooded areas	**Likely** to occur; however, this is an aerial migrant species that is unlikely to be impacted by terrestrial development
Neochmia ruficauda ruficauda	Star Finch (Eastern Subspecies)	E	X		Dense, damp grasslands bordering wetlands and watercourses; also, in open grassy woodlands that are near permanent water or are subject to regular inundation.	**Unlikely** to occur. One undated and spatially imprecise record from "Rockhampton" but out of range.
Numenius madagascariensis	Eastern Curlew	E	X		Most commonly associated with sheltered coasts, especially estuaries, bays, harbours, inlets and coastal lagoons, with large intertidal mudflats or sandflats, often with beds of seagrass. Occasionally occurs on ocean beaches (often near estuaries), and coral reefs, rock platforms, or rocky islets. The birds are often recorded among saltmarsh and on mudflats fringed by mangroves, and sometimes within the mangroves.	**Unlikely** to occur through lack of suitable coastal habitat
Poephila cincta cincta	Black-throated Finch (southern subspecies)	E	X		Dry open grassy woodlands and forests with seeding native grasses and free-standing water.	**Unlikely** to occur. A single undated and likely spatially imprecise specimen collected from Rockhampton, but otherwise out of range.
Rostratula australis	Australian Painted Snipe	V	X	X	Shallow terrestrial wetlands, ephemeral and permanent, usually freshwater but occasionally brackish. They also use inundated grasslands, saltmarsh, dams, rice crops, sewage farms and bore drains.	**Potential** to occur. Several records within 20km (Rockhampton) of the Study Site and could occur as a rare visitor to man-made dams within the Study Site.
Mammals						

Species	Common name	NC Act Status[1]	Source[2]		Preferred habitat characteristics	Likelihood of occurrence
			PM	WO		
Chalinolobus dwyeri	Large-eared Pied Bat	V	X		Sandstone cliffs and fertile woodland valley habitat within close proximity of each are important habitat; also, rainforest and moist eucalypt forest habitats on other geological substrates (rhyolite, trachyte and basalt) at high elevation in south-east Queensland. Almost all records have been found within several kilometres of cliff lines or rocky terrain. It has been found roosting in disused mine shafts, caves, overhangs and disused Fairy Martin *Petrochelidon ariel* nests. It also possibly roosts in the hollows of trees.	**Unlikely** to occur. No records within c. 100km, and the Study Site lacks rock escarpment habitats.
Macroderma gigas	Ghost Bat	E	X		Inhabits a broad range of habitats from arid spinifex hillsides to tropical rainforest but depends critically on deep caves, abandoned mines or deep rock fissures for roosting or breeding.	**Unlikely** to occur. A few records from within 40km including Rockhampton in 1966, but there are no known roosting sites for this species within 40km.
Nyctophilus corbeni	Eastern Long-eared Bat	V	X		Dry forests dominated by various *Eucalyptus* and bloodwoods (*Corymbia* spp.), most abundant in vegetation with a distinct canopy and a dense cluttered shrub layer.	**Unlikely** to occur. No records within c. 200km, and Study Site is out of range.
Petauroides volans	Greater Glider	V	X		Eucalypt forests and woodlands, favouring forests with a diversity of eucalypt species, and found in highest abundance in taller, montane, moist eucalypt forests with relatively old trees and abundant hollows.	**Unlikely** to occur. Numerous records within 40km (most proximate record was in 1929) but unlikely to occur in Study Site through lack of suitable large hollow bearing trees in extensive and well-connected forest.
Phascolarctos cinereus	Koala	V	X		Forests and woodlands with eucalypt trees, particularly *Eucalyptus* species.	**Potential** to occur. Recorded in urban Rockhampton and especially forests to the north. However, no evidence of the species was recorded during the current survey, and the majority of the proposed impact area does not comprise preferred food tree species.
Reptiles						
Delma torquata	Collared Delma	V	X		Open eucalypt forest with a shrub and tussock grass understorey. Soil type is usually shallow and deep-cracking or stony. Regional ecosystems include REs 11.3.2, 11.9.10, 11.10.1 and 11.10.4.	**Unlikely** to occur. A single 1974 record from within 40km (though location was imprecise) and habitat is likely unsuitable.

Species	Common name	NC Act Status[1]	Source[2]		Preferred habitat characteristics	Likelihood of occurrence
			PM	WO		
Denisonia maculata	Ornamental Snake	V	X		Woodlands and open forests associated with moist areas, particularly gilgai (melon-hole) mounds and depressions in Queensland Regional Ecosystem (RE) Land Zone 4, but also lake margins and wetlands; habitat includes REs 11.4.3, 11.4.6, 11.4.8, 11.4.9, 11.3.3 and 11.5.16. Can occur abundantly in non-remnant, cleared landscapes on cracking-clay soils where Brigalow (*Acacia harpophylla*) once grew.	**Unlikely** to occur. A small number of records within 40km of Study Site but the lack of suitable habitat in Study Site (soil cracks and gilgais) suggest that this snake is unlikely to occur. Not detected in current survey during limited spotlight survey and searches under c. 60 logs.
Egernia rugosa	Yakka Skink	V	X		Variety of drier forests and woodlands (usually on well drained, coarse gritty soils) including Poplar Box on alluvial soils, low ridges, Callitris on sands, Belah.	**Unlikely** to occur. There are no records within 40km, and habitat is unsuitable in the Study Site.
Furina dunmalli	Dunmall's Snake	V	X		Poorly known but most records appear in open forests and woodlands, particularly Brigalow and woodlands growing on cracking black clay and clay loams. Also recorded from dry eucalypt forests on sandstone derived soils and may occur in vine thickets.	**Unlikely** to occur. A few mostly historical records within 40km, although no preferred habitat within or near the Study Site.
Hemiaspis damelii	Grey Snake	E		X	Favours woodlands (typically Brigalow *Acacia harpophylla* and Belah *Casuarina cristata*), usually on heavier, cracking clay soils, particularly in association with water bodies or in areas with small gullies and ditches (gilgais)	**Unlikely** to occur as preferred habitat not present, although a series of specimens collected from Rockhampton, mostly in 1970s.
Rheodytes leukops	Fitzroy River Turtle	V	X		Rivers in the Fitzroy River catchment of central Queensland with large deep pools and rocky, gravelly or sandy substrates, connected by shallow riffles.	**Unlikely** to occur. No suitable riverine habitat and no records within 15km (in Fitzroy River).

[1]Status under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC) or *Nature Conservation Act 1992* (NC): E = endangered; V = vulnerable.

[2]Source: Protected Matters Search Tool (PM), Wildlife Online (WO), X = species recorded in search result.

GROUNDWORK plus

Midgee Quarry

Environmental Assessment Report

Prepared for: HOPKINS BROTHERS

Date: 17 February 2022

File Reference: 2607_620_001

DOCUMENT CONTROL

PROJECT / DETAILS REPORT

Document Title:	Midgee Quarry Environmental Assessment Report
Principal Author:	D. Doolan
Client:	Hopkins Brothers
Reference Number:	2607_620_001

DOCUMENT STATUS

Issue	Description	Date	Author	Reviewer
0	Lodgement	17 February 2022	D. Doolan	M. Benham Y. Dowling J. Taylor

DISTRIBUTION RECORD

Recipient	
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Department of Environment and Science	Electronic x 1

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1 Introduction

1.1 Background

Groundwork Plus Pty Ltd has been engaged by Hopkins Brothers to prepare and submit a Development Application ('DA') to the Rockhampton Regional Council ('Council') to extend the existing Midgee Quarry, which is located at 59793 Bruce Highway, Midgee, QLD 4702, properly described as Lot 2 RP888747. The proposal includes extending the quarry footprint over four (4) adjacent parcels being 1 and 931 Bruce Highway, Midgee QLD 4702, Lot 725 Bruce Highway, Bouldercombe QLD 4702, and 33 Gavial-Gracemere Road Bouldercombe QLD 4702, properly described as Lot 1 SP247721, Lot 931 LIV40265, Lot 725 RP888747 and Lot 2 SP247721. It is also proposed to increase the extraction volume to up to 2 million tonnes per annum and to extend the hours of operation.

The quarry activity will consist of two (2) pits (Pit 1 and Pit 2) (refer to the **Site Layout Plan Drawing (Drawing No. 2607.DRG.013)**), and once approved, will comprise of the following Prescribed Environmentally Relevant Activities ('ERAs') under the *Environmental Protection Regulation 2019* ('EP Reg'):

- ERA 16 Threshold (2)(c) Extracting, other than by dredging, in a year, more than 1,000,000 tonnes of material; and
- ERA 16 Threshold (3)(c) Screening, in a year, more than 1,000,000 tonnes of material.

The DA comprises the following components:

- Material Change of Use – Development Permit for Extractive Industry.
- Material Change of Use – Concurrence ERAs.
- Environmental Authority ('EA') for the above-mentioned Prescribed ERAs.

The purpose of this Environmental Assessment Report ('EAR') is to support the EA application, by providing the information necessary to assist the Department of Environment and Science ('DES') in the assessment process for the EA.

It is noted that Council have approved a proposal to establish an asphalt plant on the site via a DA and devolved ERA. The approval asphalt plant is not yet operational on site. However, where relevant, potential cumulative impacts of a fully operational asphalt plant have been included within the EAR.

1.2 Purpose of the EAR

The application requirements for Site-specific EA applications for Prescribed ERAs are outlined in Section 125 (l)(i) of the *Environmental Protection Act 1994* ('EP Act') and must include:

- An assessment of the likely impact of the proposed activity on the Environmental Values ('EVs'), including:
  - a description of the EVs likely to be affected by the activity.
  - details of any emissions or releases likely to be generated by the activity.
  - a description of the risk and likely magnitude of impacts on the EVs.
  - details of the management practices proposed to be implemented to prevent or minimise adverse impacts.
  - details of how the land the subject of the application will be rehabilitated after each relevant activity ceases.
- A description of the proposed measures for minimising and managing waste generated by each relevant activity.
- Details of any site management plan that relates to the land the subject of the application or any other document relating to the application prescribed under a regulation.

1.3 Eligibility Criteria and Standard Conditions

There are eligibilty criteria and standard conditions published for ERA 16 Threshold (3) (c); however, ERA 16 Threshold (2)(c) is not an activity to which an ERA standard applies. Therefore, the eligibility criteria and standard conditions do not apply to the proposed activity and no further assessment of the eligibility criteria or standard conditions has been included in the application material.

1.4 Site Description

The location details for the proposed activities are summarised in **Table 1 – Summary of Subject Land**.

Table 1 – Summary of Subject Land

Address	59793 Bruce Highway Midgee, 1 and 931 Bruce Highway, Midgee, Lot 725 Bruce Highway, Bouldercombe, and 33 Gavial-Gracemere Road Bouldercombe
Real Property Description	Lot 2 RP888747, Lot 931 LIV42065, Lot 725 RP888747, Lot 1 SP247721, Lot 2 SP247721
Local Authority	Rockhampton Regional Council

1.5 Description of Activities

Included as **Diagram 1 - Conceptual On-Site Extractive Operations** are illustrations of the quarry development. The existing quarry operations comprise the following basic elements:

- Clearing of vegetation and stripping of topsoil and overburden via mechanical means (i.e., bulldozer or excavator).
- Stockpiling topsoil and overburden for future use as saleable general fill, incorporation into onsite rehabilitation works where required, or use in construction of stormwater controls (e.g., perimeter banks / bunds).
- Drilling and blasting the exposed underlying rock to manageable size from the developed quarry benches to the quarry pit or bench below.
- Transferring raw material to the crushing and screening plant/stockpile area using off-road haul truck(s) loaded by an excavator or front-end loader.
- Crushing and screening raw material using a mobile crushing and screening plant.
- Stockpiling the final products using a front-end loader and/or off-road haul truck before the material is sold and loaded into trucks for transportation off-site for use.
- Rehabilitating disturbed areas progressively once the terminal quarry benches have been established.

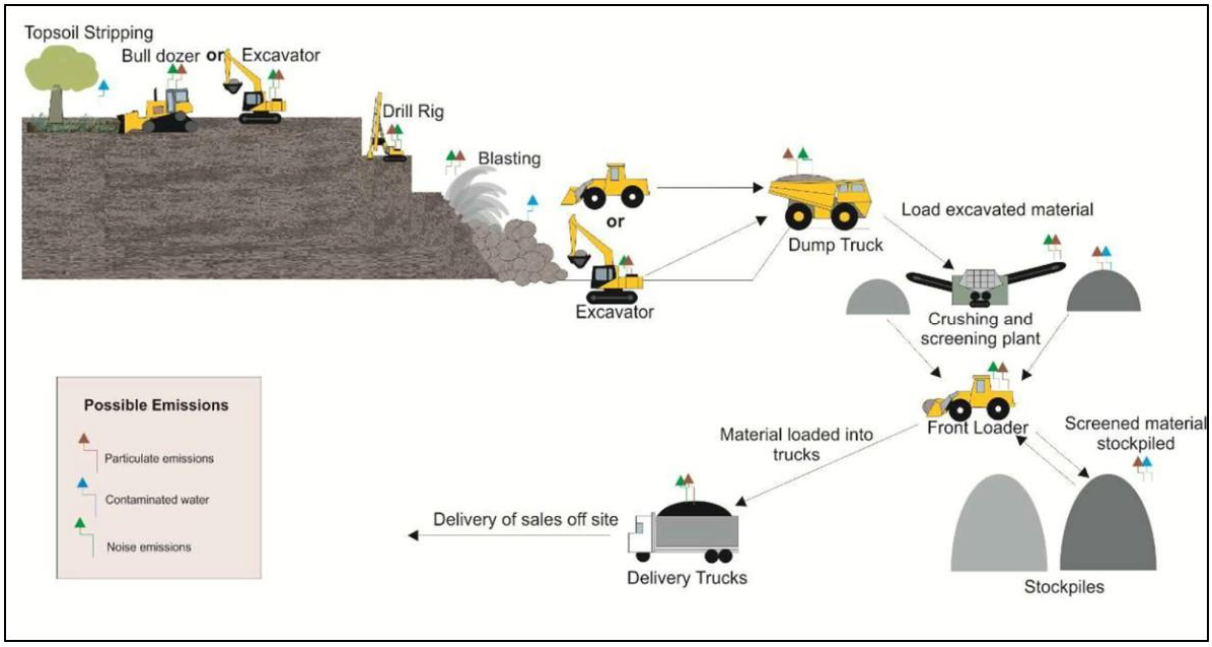

Diagram 1 – Conceptual On-Site Extractive Operations

Operations will be supported by an existing range of ancillary building and structures including, site office and amenities block, visitor car park, staff car park and truck parking area(s), weighbridge and workshop and internal haul and access roads.

1.6 Plant and Equipment

The number of plant and equipment deployed on-site varies from time-to-time to service the site demands. Types of major plant and equipment include, but is not limited to:

- Bulldozer.
- Grader.
- Drill Rig.
- Excavator.
- Off-highway haul trucks.
- Front-end loader.
- Mobile crushing and screening plant.
- Haul road trucks.
- Highway haul trucks.

Machinery repairs and maintenance is carried out on-site where practicable within a designated workshop area. Stationary equipment is generally be serviced in the field unless it is practical for the parts to be dismantled and transported to the workshop. Consumables (e.g., tyres, oils and greases) are supplied by contractors and removed (including associated packaging) for disposal off-site in accordance with the requirements of the prevailing legislation and the local authority on a regular basis.

1.7 Hours of Operation

It is proposed, through the Development Application, to operate the quarry 24 hours, 7 days a week. Blasting will be limited to 9am to 3pm, Monday to Saturday. No blasting will occur on Sundays or public holidays.

2 Description of Environmental Values

2.1 Regional Context

2.1.1 Land Use

The surrounding land uses are primarily cattle grazing, with the exception of the adjacent Kangaroo Country Caravan Park ('KCCP') which is situated on Lot 1 RP811877. The entrance to the Midgee Quarry and the KCCP is situated on the Bruce Highway. The North Coast Rail Line also passes directly opposite the Midgee Quarry entrance and KCCP. The North Coast Line is also the major freight corridor from Brisbane to Cairns, with connecting services travelling as far west as Longreach and Mount Isa. The North Coast Line also connects to the central line which is the main coal freight corridor which services the Central Highlands Coal Fields.

2.1.2 Nearest Sensitive Receptors

Sensitive receptors, as defined under Schedule 1 of the *Environmental Protection Policy (Noise) 2019*, are outlined in **Table 2 – Nearby Sensitive Receptors**. A discussion on whether any of these sensitive receptors are in close proximity to the site is provided herein.

Table 2 - Nearby Sensitive Receptors

Sensitive Receptor	Description and Location
Residence	The nearest residence is the Kangaroo Country Caravan Park, which is situated south of the access road, to the east of the existing quarry operation, shown as 'R85' in **Figure 1 – Nearest Residence**.
Library and educational institution (including a schools, playgrounds, college and university)	The Gracemere State School and Waraburra State School are situated approximately 7 km northwest of the site.
Childcare centre or kindergarten	The nearest childcare centre is situated in Gracemere, approximately 7 km from the site.
School or playground	The Gracemere State School and Waraburra State School are situated approximately 7 km northwest of the site.
Hospital, surgery or other medical institution	The nearest medical centre (Gracemere Medical Centre) is situated approximately 7 km northwest of the site.
Commercial and retail activity	For the purpose of this report, the Kangaroo Country Caravan Park, which is situated adjacent to the access road, serves both as a residence and commercial activity.
Protected area or critical area	The Bouldercombe State Forest is situated 3.0 km west of the site boundary. Refer to **Figure 2 – Protected Areas and Forests** for an illustration.

Marine park	The Great Barrier Reef Coast Marine Park is situated over 30 km east of the site.
Park or garden that is open to the public (whether or not on payment of an amount) for use other than for sport or organised entertainment	Parks and gardens are situated within Gracemere approximately 7 km from of the site boundary.

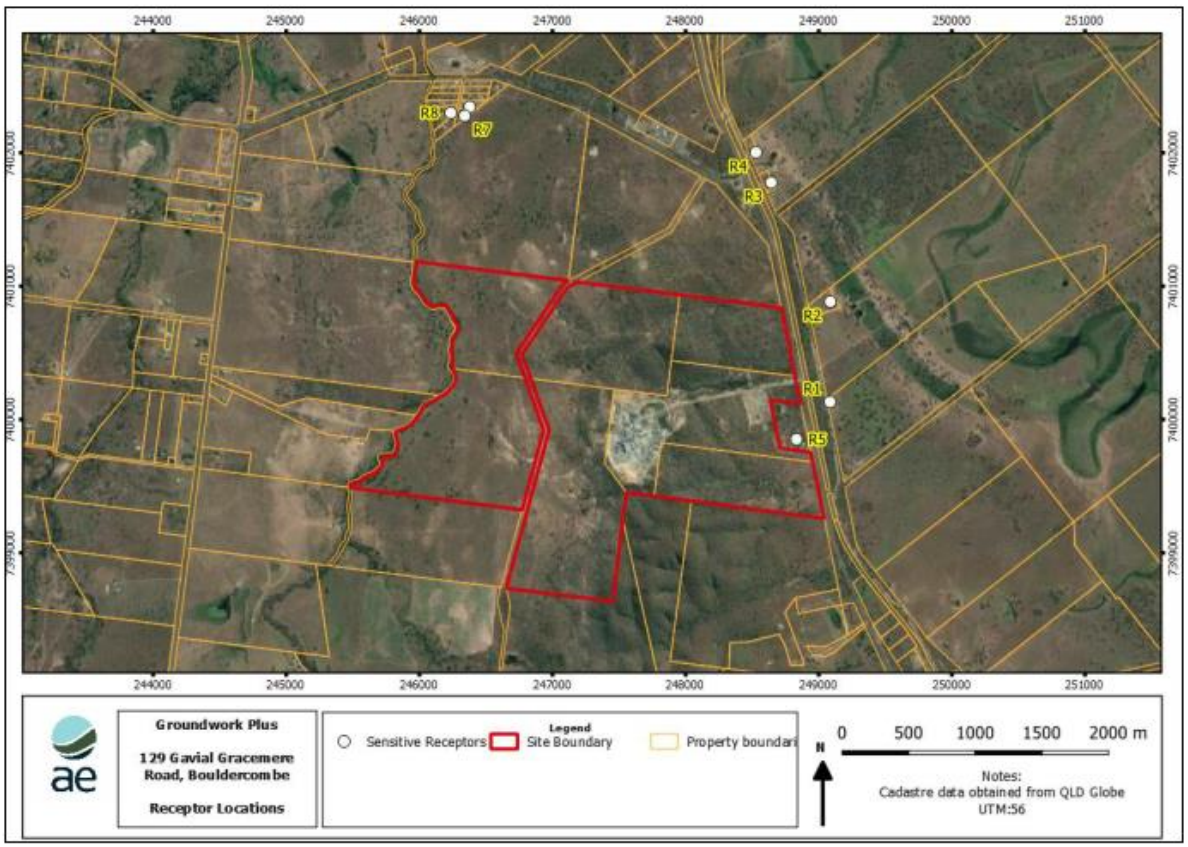

Figure 1 - Nearest Residence
(Figure reprinted from AE – Air Quality Assessment 2022)

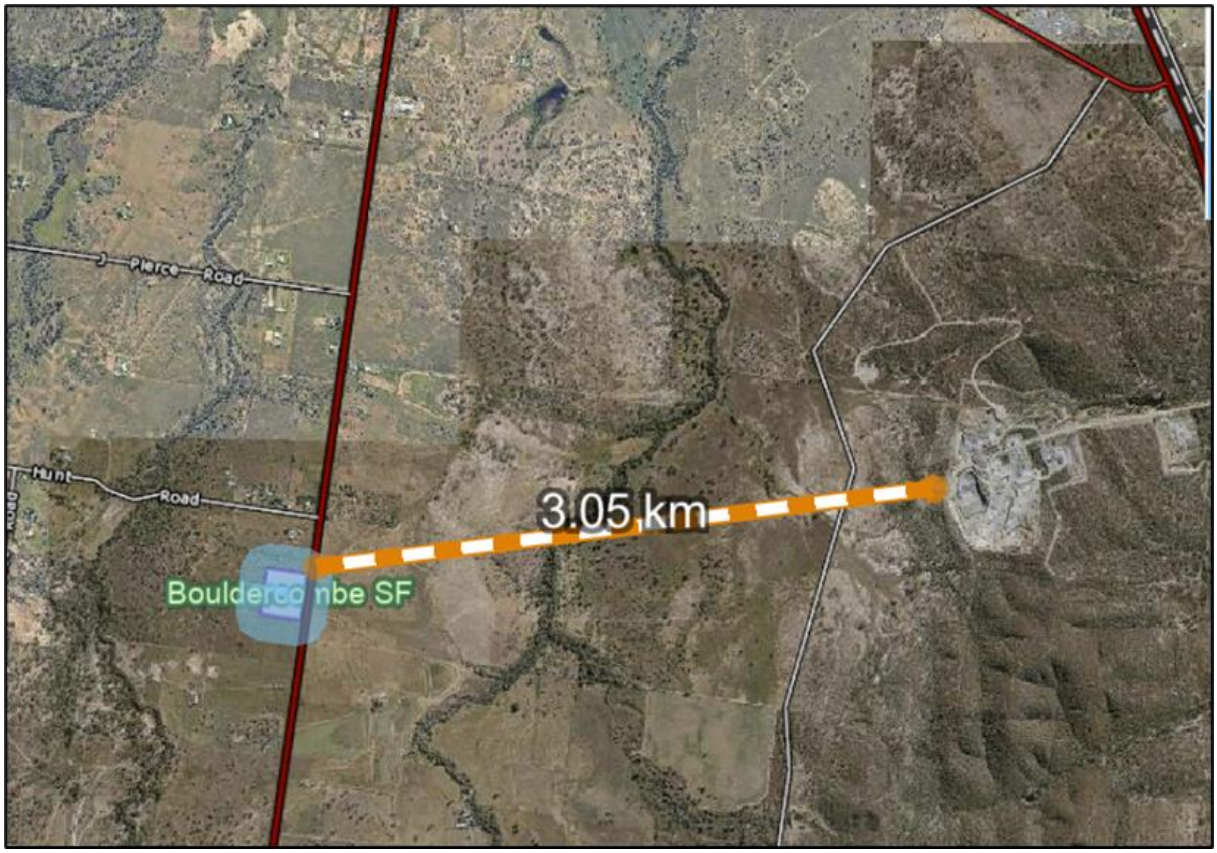

Figure 2 - Protected Areas and Forests
(Figure reprinted from Queensland Globe (2022))

2.1.3 Regional Climate

A summary of the regional climate data sourced from the Bureau of Meteorology ('BoM') is provided in **Table 3 – Regional Climatic Statistics**.

Table 3 - Regional Climatic Statistics

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Rainfall (mm)													
Mean	128.8	144.0	104.8	42.7	44.6	37.6	32.0	27.2	23.9	49.7	67.5	102.8	815.1
Days >25 mm rainfall	1.4	1.7	1.2	0.4	0.5	0.4	0.3	0.3	0.2	0.5	0.8	1.0	8.7
Temperature (°C)													
Mean min.	22.2	22.2	20.9	18.0	14.3	11.1	9.7	10.8	13.8	17.2	19.6	21.3	16.8
Mean max.	32.0	31.4	30.6	28.8	26.1	23.6	23.3	24.9	27.5	29.7	31.3	32.2	28.5
Wind Speed (km/h)													
Mean 9am wind speed	13.2	1.5	14.2	12.9	10.3	8.4	7.8	9.6	11.8	12.7	12.2	12.1	11.6
Mean 3pm wind speed	16.5	16.1	16.2	14.9	13.5	13.0	12.7	13.6	15.3	16.4	16.4	16.0	15.0

Source: Rockhampton Aero Station No.: 039083

As shown in **Table 3**, the annual mean rainfall for this locality is 815.1 mm and majority of rain falls between December and March. Review of the annual 9am and 3pm wind direction versus wind speed shows that the morning winds are generally from the southeast and predominantly between >= 10 and < 20 km/hr.

In the afternoon, winds are generally from the west and predominantly between >= 0 and < 10 km/hr. Refer to **Figure 3 – Wind Roses of Annual Speed and Direction 9am vs 3pm Rockhampton Aero Station No.: 039083** for graphic representations of the annual wind observations.

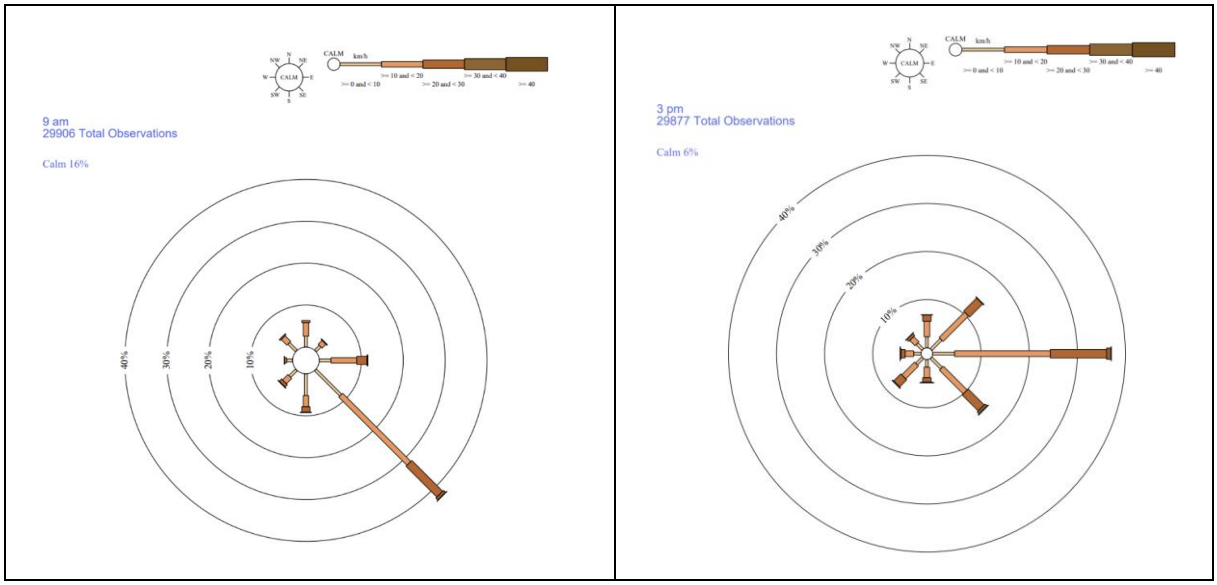

Figure 3 - Wind Roses of Annual Speed and Direction 9am vs 3pmRockhampton Aero Station No.:039083

(Figures reprinted from *Rose of Wind direction versus Wind speed in km/h (Jan 1939 to Jan 2022)* prepared by the Bureau of Meteorology (2021))

2.2 Land

BAAM Ecology ('BAAM')has provided a detailed appraisal of existing environmental values relating to vegetation and ecological matters, this is documented in *BAAM 2022, Assessment of Ecological Matters of State and Local Significance – Midgee Quarry, Rockhampton* (**Attachment 2 – Ecological Assessment**).

A summary of the main findings from this report are provided below.

2.2.1 Remnant Vegetation

State regulated vegetation mapping identifies the site as supporting areas mapped as Category B (remnant), Category C (high value regrowth) and Category R (reef regrowth watercourse) regulated vegetation, as well as regulated vegetation within a defined distance from the defining banks of a relevant watercourse or relevant drainage feature (stream orders 1, 2) supporting the following Regional Ecosystems ('REs'):

- RE11.3.25 (Least Concern);
- RE11.3.2 (Of Concern);
- RE11.3.4 (Of Concern); and
- RE11.11.15 (Least Concern).

BAAM confirmed through their assessment, that all of the above listed REs were recorded on site, mostly in accordance with the extents indicated in State mapping.

Portions of State-mapped remnant vegetation are also mapped as Essential Habitat for two species listed as threatened under the Nature Conservation Act 1992 ('NC Act'): Squatter Pigeon *Geophaps scripta scripta* (NC Act: Vulnerable) and Ornamental Snake *Denisonia maculata* (NC Act: Vulnerable).

BAAM confirmed through their assessment that the Squatter Pigeon was observed on several occasions during the survey, all within 1.5 km of waterbodies recorded on site including Gavial Creek, dams and cattle drinking toughs. The site appears to provide suitable, regular habitat for this species, as evidenced by the number of records and by one record of a larger flock of ten (10) birds. Consequently, the State's mapping of Essential Habitat for this species is verified as correct.

Historically (i.e. during the 1970's), Ornamental Snake was recorded at several locations within 15 km of the site; however, the apparent absence of seasonal wetlands and gilgai habitat with cracking clay indicates that the species is unlikely to occur. Nevertheless, Essential Habitat factors for the species are present.; therefore (aside from dead vegetation in the southern portion of Lot 725 RP888747), the State's mapping of Essential Habitat for this species is verified as correct.

Expansion of the existing pit will impact upon Least Concern remnant and regrowth RE 11.11.15 (Least Concern) and regrowth RE 11.3.4/11.3.25 (Of Concern), some of which represents a prescribed Matters of State Environmental significance ('MSES') in the form of regulated vegetation within a defined distance from the defining banks of a relevant watercourse or relevant drainage feature (stream order 1). No other regulated vegetation representing prescribed MSES within the Study Site (i.e. remnant Of Concern REs or Essential Habitat) will be impacted.

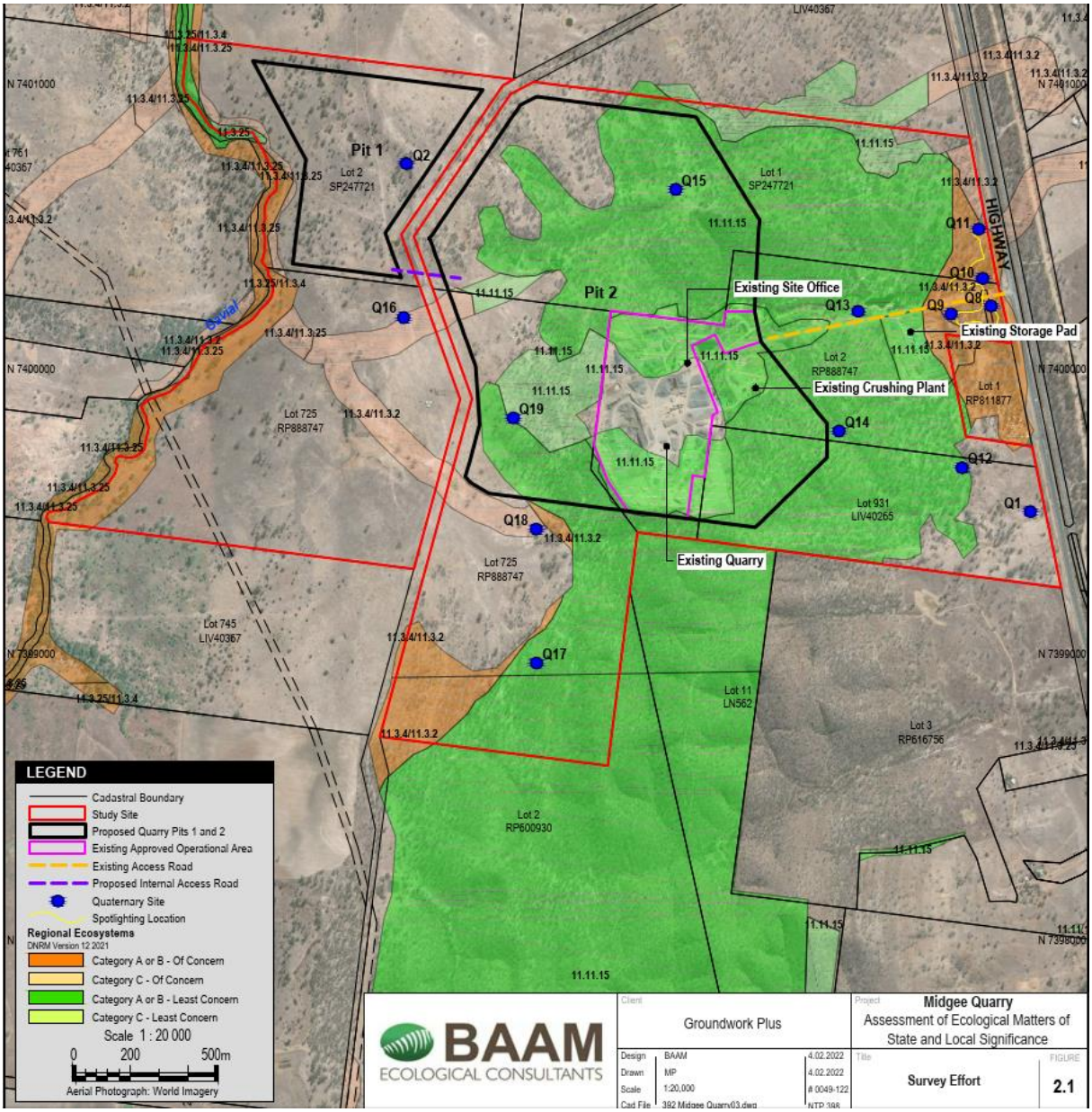

Figure 4 - Remnant Vegetation Mapping
(Figure reprinted from BAAM 2022)

2.2.2 Flora Survey Trigger Mapping

The site is not mapped as occurring within or containing a high risk area on the State's protected plants flora survey trigger map and the field survey did not record any flora species listed as threatened or near threatened (under the NC Act) within the site. Consequently, an NC Act protected plants clearing permit will not need to be obtained prior to the clearing of native vegetation from the site.

2.2.3 Animal Breeding Places

BAAM advises that no active animal breeding places were recorded during the field survey. However, BAAM noted that there may be breeding places for native fauna, including certain Endangered, Vulnerable and Near Threatened ('EVNT') species (e.g. Tusked Frog *Adelotus brevis*, listed as Vulnerable under the NC Act), as well as Least Concern species such as common frog species, nesting birds and possums, present within the site at certain times of the year.

2.2.4 State Restricted Weeds

Restricted invasive weed species listed as Category 3 restricted invasive plants under the Queensland *Biosecurity Act 2014* that were recorded at the site include:

- Chinee Apple *Ziziphus mauritiana*.
- Lantana *Lantana camara*.
- Creeping Lantana *Lantana montevidensis*.
- Prickly Pear *Opuntia tomentosa*.
- Prickly Acacia *Acacia nilotica*.

These Category 3 restricted invasive plants are species that are already established in Queensland and seriously threaten Queensland's primary industries, natural environment, livestock, human health and/or people's livelihoods. In accordance with the *Biosecurity Act 2014*, Category 3 restricted matters must not be distributed (i.e. released into the environment) unless the distribution or disposal is authorised in a regulation or under a permit. More generally, landowners are responsible for taking all reasonable and practical steps to minimise the risks associated with invasive plants under their control.

2.2.5 Topography

Pit 1 is low lying in an area typically below 20 m AHD. Pit 2, which includes the existing quarry disturbance, ranges from 50 mAHD to 20 m AHD. The site drains in an eastern direction (Pit 2), and westerly direction (Pit 1).



Figure 5 - Contour Mapping
(Figure reprinted from Queensland Globe (2022))

2.2.6 Geology

Pit 1 is located within Quaternary alluvium, described as clay, silt, sand and gravel; flood-plain alluvium. Pit 2 is located within the Rockhampton Group, early carboniferous aged sedimentary rock. The geology is described as, dark grey mudstone, siltstone, felsic volcaniclastic sandstone, polymictic conglomerate, ooid-bearing sandstone and conglomerate with mudstone rip-up clasts; oolitic and pisolitic limestone and minor skeletal limestone; rare rhyolitic ignimbrite.

2.2.7 Contaminated Land

A review of search results of the Environmental Management Register ('EMR') and Contaminated Land Register ('CLR') has confirmed that the site is not currently listed on either the EMR or CLR. A copy of the search results is included as **Attachment 1 – EMR / CLR Search Results**.

2.2.8 Acid Sulphate Soil

Review of the Acid Sulfate Soils ('ASS') mapping (Queensland Globe 2021) has confirmed that the site is not located within, or near, an area where ASS have previously been identified, or within a prospective land zone containing ASS. Whilst Pit 1 is located at less than 20 mAHD, ASS is not confirmed to be known at this location.

2.2.9 Soils

Soil mapping information available from QLD Globe is provided below as **Figure 6 – Soils Mapping**. This soils mapping is informed by the *Department of Natural Resource, 2004, Soil and land suitability survey of the Gavial-Gracemere area, Central Queensland*. This survey and resultant dataset are at a 1:50,000 scale, which provides for a reasonable level of confidence on soil types and their distribution. For the subject site, three soils have been mapped as being present. These are briefly described in **Table 4 – Soil Types and Characteristics**.

Table 4 - Soil Types and Characteristics

Soil Type	Description	Land Suitability
Malchi ('Mc')	Distinguishing soil feature being thin loamy surface over strongly alkaline dark clay subsoil. Under the Australian Soil Classification the soil is described as **Black Sodosol.** Malchi are very deep, texture contrast soils occurring on broad alluvial plains. Malchi soils have a thin (5 to 15 cm) loamy surface horizon. The subsoil of Malchi is generally dark, with the upper subsoil being strongly sodic (average Exchangeable Sodium Percentage of 18.3). Malchi has high salinity generally at 60 cm in the soil profile (E.C. >1.0 dSm-1). The native vegetation on Malchi comprises an open woodland of Moreton Bay ash and poplar box, with occasional narrow-leaved ironbark.	Class 4 land with severe limitations

Dart ('Dt')	Distinguishing soil feature being shallow, gravelly loam directly over rock, abundant surface cobble. Under the Australian Soil Classification the soil is described as **Leptic Tenosol.** Darts has low available soil water due to their shallow depth to hard rock, and extreme rockiness and water erosion limitations.. The low soil water availability of these soils will pose an extreme limitation to irrigation of vegetable crops.	Class 5 land unsuitable
Fourmile ('Fm')	Distinguishing soil feature being dark brown to red clay loamy surface grading to neutral red to brown clay loam to light clay subsoil. Under the Australian Soil Classification, the soil is described as **Brown Dermosol.** Fourmile occur on levees and are very deep soils. Fourmile is a red or brown uniform or gradational soil with a thick, clay loamy surface horizon. Fourmile has neutral reaction trends, and are non-sodic and non-saline throughout the soil profile. Native vegetation comprises open forest to woodland of mixed eucalypts, including blue gum, Moreton Bay ash and narrow leaved ironbark with Teatree.	Class 3 land with moderate limitations



Figure 6 - Soils Mapping
(Figure reprinted from Queensland Globe (2022))

2.3 Water

2.3.1 Watercourses

Pit 1 is not mapped as containing any watercourses or ephemeral gullies under either the *Vegetation Management Act 1999* ('VMA'), *Fisheries Act 1994* ('Fisheries Act') the *Water Act 2000* ('Water Act'), refer to **Figure 7 – VMA and Water Act Mapping** and **Figure 8 – Waterway Barrier Works Mapping**.

Pit 2 is mapped as containing two drainage features, one draining to the east and one draining to the west. The eastern feature is mapped as a stream order 1 watercourse (VMA), low value waterway for waterway barrier works (Fisheries Act) and an unmapped feature (Water Act) refer to **Figure 7 – VMA and Water Act Mapping**. The eastern feature has been confirmed to be a drainage feature for the purposes of the Water Act. The existing approved quarry pit includes these mapped features. As the quarry footprint does not extend any further to the east, no additional impact is proposed along the western feature, refer **Figure 8 – Waterway Barrier Works Mapping**.

The western feature is mapped as a stream order 1 watercourse (VMA), low value waterway for waterway barrier works (Fisheries Act) and an unmapped feature (Water Act) refer to **Figure 7 – VMA and Water Act Mapping**. The western feature has been confirmed to be a drainage feature for the purposes of the Water Act. It has also been confirmed by the Department of Agriculture and Fisheries that the feature does not provide sufficient bed and bank to provide for fish passage.

Pit 1 and the western portion of Pit 2 drain to Gavial Creek, which in turn drains into the Fitzroy River. Waters from the eastern area of Pit 2 drain towards Serpentine Creek to the east, which connects with the Fitzroy River.



Figure 7 - VMA and Water Act Mapping
(Figure reprinted from Queensland Globe (2022))

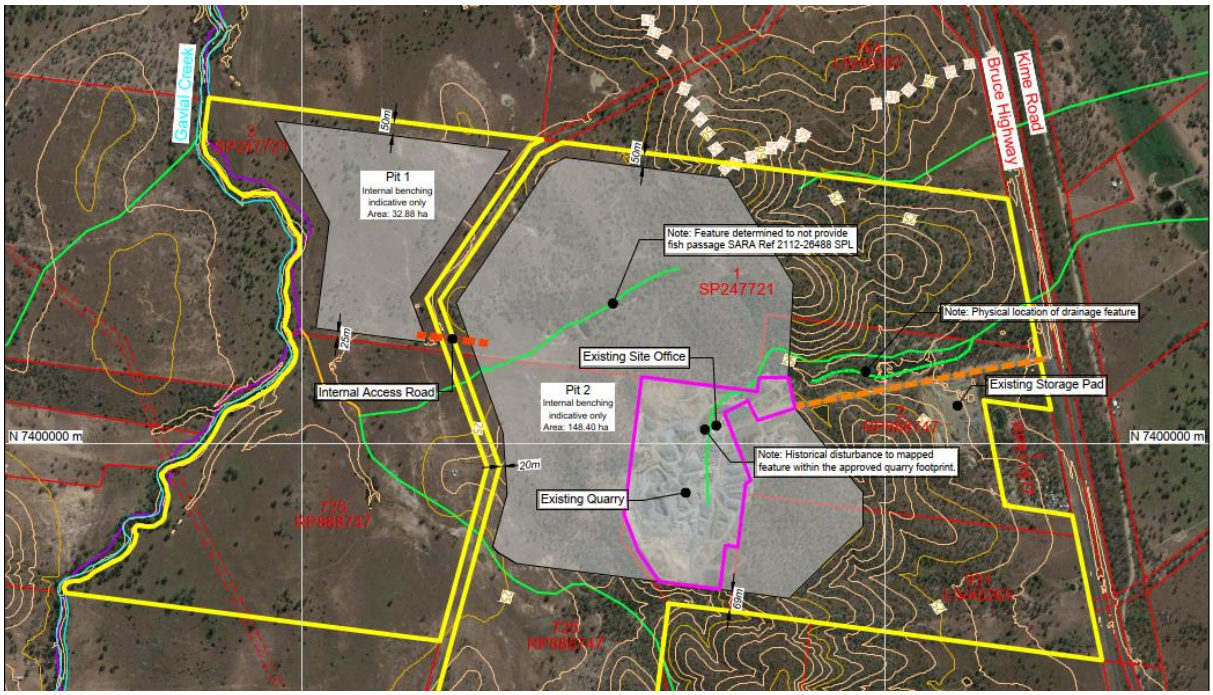

Figure 8 - Waterways Barrier Works Mapping
(Figure prepared by Groundwork Plus)

2.3.2 Water Quality Objectives and Environmental Values

The site is within the Fitzroy south / central tributaries of the Fitzroy River Sub-Basin (Part of basin 130). The receiving environments for the site include the waters of Gavial Creek and Serpentine Creek, and subsequently the Fitzroy River.

The Water Quality Objectives ('WQOs') for the Fitzroy south / central tributaries waters, prescribed under the *Environmental Protection (Water) Policy 2009 Fitzroy River Sub-basin Environmental Values and Water Quality Objectives Basin No. 130 (part), including all waters of the Fitzroy River Sub-basin* (September 2011), are summarised in **Table 5 – Water Quality Objectives**.

Table 5 – Water Quality Objectives

Quality Characteristic	WQO*
Ammonia N	< 20 µg/L
Oxidised N	< 60 µg/L
Total Nitrogen	< 500 µg/L
Filterable Reactive Phosphorous	< 20 µg/L
Total Phosphorus	< 50 µg/L
Dissolved Oxygen	85-110% Saturation
Turbidity	< 50 NTU
Suspended Solids	< 85 mg/L
pH	6.5 -8.5
Conductivity (base flow / high flow)	445 µS/cm / 250 µS/cm
Sulfate	< 15 mg/L

Table notes: *Low flow parameters unless otherwise stated.

The sites existing Environmental Authority EPPR00233813 prescribes the following water quality criteria:

- Total Suspended Solids – 50 mg/L
- pH – 6.0 to 8.5

Given these site-specific release limits have been developed for the existing operation already, these limits will likely continue to apply as the relevant water quality objectives for the quarry operation.

2.3.3 Flooding

The site is mapped as being subject to 1% AEP flooding in accordance with State mapping, refer to **Figure 9 – 1% AEP Flood Mapping**. Flood Hazard Overlay mapping provided by Rockhampton Regional Council does not identify the site as being subject to flooding, refer to **Figure 10 – RRC Flood Hazard Overlay Mapping**.

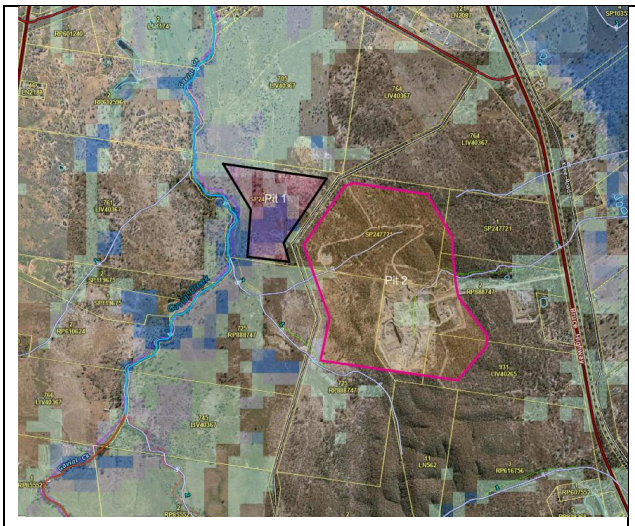

Figure 9 – 1% AEP Flood Mapping

(Source: QLD Globe 2022)

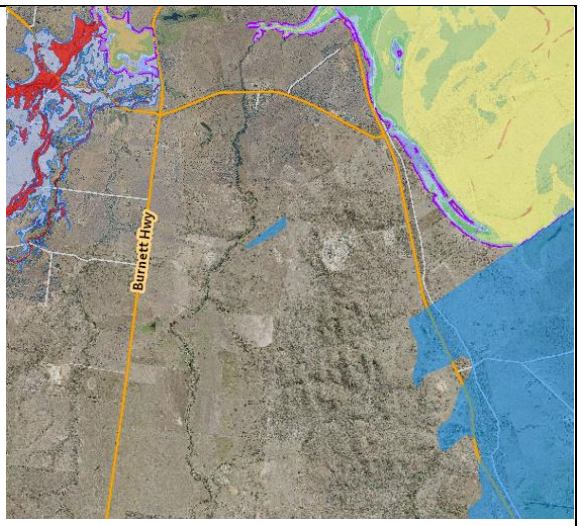

Figure 10 – RRC Flood Hazard Overlay Mapping

(Source: RRC Planning Scheme)

2.3.4 Great Barrer Reef

The site is located within the Fitzroy River Catchment which is within the broader Great Barrier Reef Catchment Area. The site is situated within an area subject to the Great Barrier Reef catchment waters mapping, which requires consideration in relation to Section 41AA of the EP Reg and the associated reef discharge standards. However, as noted in the Department's Guideline: Reef discharge standards for industrial activities, triggers for assessment under section 41AA do not include diffuse sources of contaminated stormwater that contains sediment only, which allows for an exclusion for stormwater proposed to be managed through erosion and sediment control measures.

As the site will capture and treat all stormwater in accordance with ESC measures, the site is exempt from consideration of Section 41AA and reef discharge standards have not been considered further.

2.4 Wetlands

There are no mapped wetlands inclusive of; VMA wetlands, MSES declared high ecological value waters (wetland), MSES high ecological significance wetlands or wetlands of high ecological significance within the site.

2.5 Groundwater

Local groundwater information sourced from Queensland Globe (2022) shows that there are a number of registered sub-artesian bores located close to the site. The details for these bore locations are summarised in **Table 6 – Registered Bore Groundwater Data Summary**. An illustration of the location of the bores is provided in **Figure 11 – Local Groundwater Bore Locations**.

The registered bore no RN97470 located near Pit 1, shows shallow groundwater levels within this area, slightly brackish with alkaline pH. Bores nearest to Pit 2, and within similar geological units showed deeper groundwater levels with similarly brackish water quality.

Table 6 – Registered Bore Groundwater Data Summary

Reg No.	Lat / Long	Quality	Geology	Date and Depth
97470	-23.482, 150.516	EC = 2,620 µS/cm pH = 7.4 Calcum = 107.5 mg/L Sodim = 333.3 mg/L Alkalinity = 512 m/L Sodium Absorption Ratio = 5.7	Bouldercombe Igneous Complex	2 October 1997 6.7 mBGL
187225	-23.482, 150.538	EC = 3,100 µS/cm	Rockhampton Group	18 June 2019 22.75 mAHD
187224	-23.480, 150.525	EC = 4,100 µS/cm	Rockhampton Group	15 June 2019 15.20 mAHD

The existing quarrying activities have not encountered groundwater to date through extraction activities.



Figure 11 – Local Groundwater Bore Locations
(Figure reprinted from Queensland Globe (2022))

A search of Queensland Globe (2022) for 'Potential Groundwater Dependant Ecosystem' ('GDE') did not identify any confirmed GDEs either within the site or close proximity.

2.6 Noise

Assured Environmental ('AE') was engaged to prepare an assessment of potential noise impacts, with the findings presented in the report titled *Midgee Quarry Noise Impact Assessment* (Assured Environmental 2022) (**Attachment 3 – Noise Impact Assessment**). AE described the existing acoustic noise environment in the area as being influenced by traffic on the Bruce Highway and train pass-bys. Additional noise sources include birds and wind through vegetation at receptors.

Three modelling scenarios were assessed:

- Existing quarry operations.;
- Future quarry operations.
- Future quarry operations with asphalt plant.

For the purpose of their assessment, AE relied on the Acoustic Quality Objectives prescribed under the EPP (Noise), replicated as **Plate 1 – EPP (Noise) Schedule 1 Acoustic Quality Objectives**.

Sensitive receptor	Time of day	Acoustic quality objectives (measured at the receptor) *dB(A)*			Environmental value
		$L_{Aeq,adj,1hr}$	$L_{A10,adj,1hr}$	$L_{A1,adj,1hr}$	
Residence (for outdoors)	daytime and evening	50	55	65	health and wellbeing
Residence (for indoors)	daytime and evening	35	40	45	health and wellbeing
	night-time	30 (45)	35 (50)	40 (55)	health and wellbeing (ability to sleep)
Commercial and retail activity (for indoors)	When the activity is open for business	45 (60)	-	-	health and wellbeing (ability to converse)
Protected area or critical area	-	the level of noise that preserves the amenity of the existing area or place			-

Note: Brackets ( ) denote the external noise criteria assuming a 15 dB(A) façade transmission loss.

Plate 1 – EPP (Noise) Schedule 1 Acoustic Quality Objectives

The adopted project noise level criteria based on the EPP Noise 2019 replicated below as **Plate 2 – Project Noise Level Criteria (Outdoors)**.

Receiver Type	Receptors	$L_{Aeq,adj,1\ hr}$ dB(A)			$L_{A1,\ adj,\ 1\ hr}$ dB(A)
		Day	Evening	Night	Night
Residential Dwellings	R01-R08	50	50	45	55

Note: Assuming 15 dB(A) façade transmission loss is accounted for

Plate 2 – Project Noise Level Criteria (Outdoors)

For the purposes of predicting impacts associated with noise emissions from the site on nearby sensitive receptors, noise modelling of the sources was completed using the proprietary software CadnaA (version 2021 build 181.5100) developed by DataKustik. CadnaA incorporates the influence of meteorology, terrain, ground type and air absorption in addition to source characteristics to predict noise impacts at receptor locations. All predictions have been undertaken in accordance with the CONCAWE calculation method.

The projected noise levels for the existing quarry activities are summarised in **Plate 3 – Maximum Predicted Noise Levels – Existing Quarry.**

Receptor	Predicted Operational Noise Levels, L_{Aeq}				Criteria Levels, L_{Aeq}				Complies
	Day	Eve	Night	$L_{A1,1max}$	Day	Eve	Night	$L_{A1,1max}$	
R01	34	34	34	50	45	43	40	55	Y
R02	37	37	37	45	45	43	40	55	Y
R03	5	5	5	25	45	43	40	55	Y
R04	1	1	1	23	45	43	40	55	Y
R05	33	33	33	46	45	43	40	55	Y
R06	<10	<10	<10	<10	45	43	40	55	Y
R07	<10	<10	<10	<10	45	43	40	55	Y
R08	<10	<10	<10	<10	45	43	40	55	Y

Plate 3 – Maximum Predicted Noise Levels – Existing Quarry

The projected noise levels for the future quarry activities are summarised in **Plate 4 –Maximum Predicted Noise Levels – Future Quarry**.

Receptor	Predicted Operational Noise Levels, L_{Aeq}				Criteria Levels, L_{Aeq}				Complies
	Day	Eve	Night	$L_{A1,1max}$	Day	Eve	Night	$L_{A1,1max}$	
R01	38	38	38	50	45	43	40	55	Y
R02	37	37	37	45	45	43	40	55	Y
R03	19	19	19	28	45	43	40	55	Y
R04	18	18	18	26	45	43	40	55	Y
R05	40	40	40	49	45	43	40	55	Y
R06	33	33	33	42	45	43	40	55	Y
R07	34	34	34	43	45	43	40	55	Y
R08	34	34	34	43	45	43	40	55	Y

Plate 4 – Maximum Predicted Noise Levels – Future Quarry

2.7 Vibration

An assessment of the potential for vibration impacts was also undertaken by AE, to determine potential impacts as a result of vibration generated by blasting, plant and equipment during quarry operation. In particular, the assessment has considered the potential for impacts on both human comfort and structural damage for the nearest residence to the quarry expansion.

The predicted vibration levels presented indicate compliance with the continuous preferred vibration nuisance criteria for locations. Compliance with the building damage criteria is predicted at 10 metres from operations for each source.

For intermittent vibration associated with haul vehicles, it was reportedly difficult to provide an appropriate comparison with the relevant criteria (which is presented as a Vibration Dose Value ('VDV') in m/s1.75). The calculation of a VDV requires both the overall weighted RMS (root mean square), and

acceleration (m/s2), typically obtained from on-site measurements and the estimated time period for vibration events.

It is noted however, that haul truck movements (on rough surfaces) at distances of >50 m is predicted to comply within the maximum continuous criteria of 0.56 mm/s. This comparison with the continuous criteria (as a conservative approach) indicates that vibration levels associated with operation of the quarry are not considered to be significant (which is expected given the significant separation distances).

With regard to blasting, through AE's assessment, it was determined that compliance with the nominated blasting criteria can be achieved.

2.8 Air

AE was engaged to prepare an assessment of potential air impacts, with the findings presented in the report titled *Midgee Quarry Air Impact Assessment* (Assured Environmental 2022) (**Attachment 3 – Air Impact Assessment**). AE based the dust modelling on the relevant Air Quality Objectives of the *Environmental Protection (Air) Policy 2019* as outlined in **Table 7**.

Table 7 – Applicable Particulate Objectives

Pollutant	Averaging Time	Ambient	Source
PM_{10}	24 Hour Average	50 µg/m^3	EPP (Air) 2019
	Annual Average	25 µg/m^3	EPP (Air) 2019
$PM_{2.5}$	24 Hour Average	25 µg/m^3	EPP (Air) 2019
	Annual Average	8 µg/m^3	EPP (Air) 2019
TSP	Annual Average	90 µg/m^3	EPP (Air) 2019
Deposition	Monthly Average	120 mg/m^2/day	Common ERA Condition

To assess cumulative impacts, ambient monitoring data has been obtained from the Department of Environment and Science ('DES') for 2017, as this is the same year as the meteorological dataset utilised in this assessment. There are no ambient air monitoring stations in Rockhampton; the nearest National Environmental Protection Measure reportable monitoring station is located at South Gladstone, approximately 89 km Southeast from the Project.

Pollutants monitored at this site, which are relevant to this assessment are PM_{10} and $PM_{2.5}$. The Queensland Air Monitoring 2017 (National Environment Protection (Ambient Air Quality) Measure Report (DES, 2018) confirms that there was one exceedance of the $PM_{2.5}$ 24-hour objective as a result of bushfire smoke. This exceedance occurred on 29 September 2017 and was removed from the data analysis.

The nearest station that records total suspended particles ('TSP') is located at Townsville. In lieu of this, research indicates that in rural areas, PM_{10} typically represents 49% of total TSP, therefore, TSP concentrations have been estimated based on the application of this ratio. **Plate 5 – Background Concentrations 2017** provides the background concentrations for particulates for 2017.

Compound	Time Period	24-hour Concentration (µg/m³)			Annual Average (µg/m³)	DES Station
		Max	90th Percentile	70th Percentile		
TSP	Annual	82.1	39.9	31.8	28.2	Calculated from PM_{10}
PM_{10}	24-hour	40.2	19.5	15.6	13.8	South Gladstone
$PM_{2.5}$	24-hour	22.7	8.6	6.2	5.6	

Plate 5 – Background Concentrations 2017

Atmospheric dispersion modelling involves the mathematical simulation of the dispersion of air contaminants in the environment. The modelling utilises a range of information to estimate the dispersion of pollutants released from a source, including:

- Meteorological data for surface and upper air winds, temperature, and pressure profiles, as well as humidity, rainfall, cloud cover and ceiling height information.
- Emissions parameters including source, location, and height, source dimensions and physical parameters (e.g. exit velocity and temperature) along with pollutant mass emission rates.
- Terrain elevations and land use both at the source and throughout the surrounding region.
- The location, height, and width of any obstructions (such as buildings or other structures) that could significantly impact on the dispersion of the plume.

Results from the monitoring are provided below in **Plate 6 - Summary of Maximum Predicted Ground Level Concentrations at Sensitive Receptors.**

Pollutant	Averaging Period	Maximum Predicted GLC (including Background Concentrations) at Sensitive Receptors (µg/m³)			Criteria (µg/m³)
		Existing Operations	Future Operations	Future Operations with Asphalt Plant	
TSP	Annual	28.4	29.7	30.2	90
PM_{10}	24 hours	41.8	65.8	81.4	50
	Annual	14.1	19.8	20.7	25
$PM_{2.5}$	24 hours	21.7	22.6	23.4	25
	Annual	5.6	6.4	6.6	8
Deposited Dust	Month	42.5	61.6	67.7	120 mg/m²/day

Plate 6 – Summary of Maximum Predicted Ground Level Concentrations at Sensitive Receptors

This modelling identifies that, with recommended dust control measures (further detailed in **Section 3**), the site activities will comply with the air quality objectives of the EPP (Air) at all surrounding residences.

3 Potential Environmental Impacts and Risks

3.1 Purpose of Assessment

The purpose of this assessment is to determine the extent to which the proposed site activities will achieve the environmental objective and performance outcomes nominated in Schedule 8, Part 3, Division 1 of the EP Reg. A risk-based approach has been utilised, with the source activities and potential impacts to environmental values utilised to determine the management strategies, if required, to mitigate these impacts to ensure the performance outcomes can be achieved.

3.2 Risk Assessment Methodology

This risk assessment methodology has been adopted from the process for risk management as set out in Clause 6 of the *AS ISO 31000:2018 Risk management - Guidelines* (Standards Australia Limited 2018). The risk assessment follows the following process:

- Risk Identification (source activity and potential impact).
- Risk Analysis (risk level = likelihood x consequence).
- Risk Evaluation (commentary on risk).

The risk treatment outlines the controls / management measures that can be implemented to reduce the level of risk to as low as reasonably possible.

The risk analysis qualitatively estimates the level of risk based on the likelihood of an environmental impact or event occurring (**Table 8 – Definitions of Likelihood**), and the consequences of the occurrence (**Table 9 – Definitions of Consequence**).

Table 8 – Definitions of Likelihood

Rating	Descriptor	Score
Rare	May occur only in exceptional circumstances	1
Unlikely	Could occur but doubtful	2
Possible	Might occur at some time in the future	3
Likely	Will probably occur	4
Almost Certain	Is expected to occur in most circumstances	5

Table 9 – Definitions of Consequence

Rating	Descriptor	Score
Negligible	Impacts not requiring any treatment or management action	1
Minor	Nuisance or insignificant environmental harm requiring minor management action	2
Moderate	Serious environmental impacts, readily manageable at low cost	3
Major	Substantial environmental impacts, manageable but at considerable cost and some disruption	4
Severe	Severe environmental impacts with major consequent disruption and heavy cost	5

The consequence and likelihood scores are plotted on the risk vs consequence matrix (**Table 10 – Risk Assessment Matrix**) and the final risk level assigned is a product of the likelihood and consequence scores, which equals the magnitude of the impacts. The higher the risk score, the higher the priority is for management.

Table 10 – Risk Assessment Matrix

Likelihood		Consequence				
		Negligible	**Minor**	**Moderate**	**Major**	**Severe**
		1	**2**	**3**	**4**	**5**
Almost Certain	**5**	5 Medium	10 High	15 High	20 Very High	25 Very High
Likely	**4**	4 Low	8 Medium	12 High	16 High	20 Very High
Possible	**3**	3 Low	6 Medium	9 Medium	12 High	15 High
Unlikely	**2**	2 Low	4 Low	6 Medium	8 Medium	10 High
Rare	**1**	1 Low	2 Low	3 Low	4 Low	5 Medium

Table 11 – Indicative Management Option for Each Risk Assessment Rating describes the possible actions required for each risk assessment rating.

Table 11 – Indicative Management Option for Each Risk Assessment Rating

Risk Rating	Risk Rating Scores	Indicative Management Option
Very High	**17 – 25**	Manage by implementing site management and emergency procedures, plant design controls and regular monitoring.
High	**10 – 16**	Manage by implementing site management procedures, specific monitoring and may require some operation/plant design controls.
Medium	**5 – 9**	Manage by implementing specific monitoring or response procedures.
Low	**1 – 4**	Manage by routine procedures, unlikely to need specific application of resources.

3.3 Inherent and Residual Environmental Risk Assessment

Activities associated with the activity which have the potential to cause environmental harm and/or nuisance and the potential impacts have been identified and tabulated in **Table 12 – Assessment of Environmental Risk**. **Table 12** also includes the inherent risk of the impacts occurring, and the residual risk following implementation of management strategies.

A Site Based Management Plan ('SBMP') (Doc ref. 2607.610.001) has been developed for the site to manage potential environmental impacts, and these documents are referenced where relevant in the risk assessment provided in **Table 12**.

Table 12 – Operational Assessment of Environmental Risk

Environmental Aspect	**Environmental Objective** [1]	**Performance Outcome**	**Source Activity**	**Potential Impact**	**Inherent Risk Rating** [2]	**Control / Management Measures**	**Residual Risk Rating** [3]
Air	The activity will be operated in a way that protects the EVs of air.	• Fugitive emissions of contaminants from storage, handling and processing of materials and transporting materials within the site are prevented or minimised. • Contingency measures will prevent or minimise adverse effects on the environment from unplanned emissions and shut down and start up emissions of contaminants to air. • Releases of contaminants to the atmosphere for dispersion will be managed to prevent or minimise adverse effects on environmental values.	• Clearing of vegetation and topsoil / overburden ahead of the extraction activity. • Stockpiling of topsoil and overburden. • Extraction and handling of raw materials (e.g., transfer of materials, processing, blending, stockpiling, transportation). • Vehicle movements on unsealed roads and access tracks. • Cumulative impacts should an asphalt plant be established on the site.	Emission of dust to air impacting nearby sensitive receptors.	4 x 3 = 12 (**High**)	In the absence of control measures, potential incidents associated with air emissions impacting nearby sensitive receptors is scored high due to the proximity of sensitive receptors to the site, particular the haul road / access. AE noted that the two (2) main source contributions are the main site haul road and the screening / crushing activities in the eastern part of Pit 2. Controls will be required to address these specific contributing sources, which may include: • Paving the haul road from the Bruce Highway to the Pit Entrance • Watering during the screening and crushing activities in Pit 2 east. Other general quarry controls will include: • Watering of haul road, access road and stockpile area at a rate of up to 2 litres/m^2/hour as required to manage emissions from unsealed roads and the stockpile area; • Water sprays to processing plant at transfer points, at a minimum; • Rock drill to have an appropriate dust extraction system with collector fitted to rig and/or wet drilling via water sprays; and • Management of dust emissions from stockpiles during high wind speed conditions through appropriate use of sprinklers and/or suitable water truck as required. Assured Environment ('AE') confirmed that the site activities will achieve compliance with the Air Quality Objectives prescribed in the EPP (Air) provided the following control measures are implemented: Section 4.1 - Air Quality Management Plan of the site's SBMP contains the above measures in addition to additional controls to minimise potential for air quality impacts. Provided that Midgee Quarry implement the management measures outlined in the SBMP, and observe the EA requirements, the environmental objective for 'Air' is likely to be achieved. Residual risk is scored low as the likelihood of an incident occurring, and its consequences, are reduced through the implementation of control measures.	2 x 2 = 4 (**Low**)

Environmental Aspect	Environmental Objective [1]	Performance Outcome	Source Activity	Potential Impact	Inherent Risk Rating [2]	Control / Management Measures	Residual Risk Rating [3]
Water	The activity will be operated in a way that protects the EVs of water.	• The storage and handling of contaminants will include effective means of secondary containment to prevent or minimise releases to the environment from spillage or leaks. • Contingency measures will prevent or minimise adverse effects on the environment due to unplanned releases or discharges of contaminants to water. • The activity will be managed so that stormwater contaminated by the activity that may cause an adverse effect on an environmental value will not leave the site without prior treatment. • The disturbance of any acid sulfate soil, or potential acid sulfate soil, will be managed to prevent or minimise adverse effects on environmental values. • Any discharge to water or a watercourse or wetland will be managed so that there will be no adverse effects due to the altering of existing flow regimes for water or a watercourse or wetland. • The activity will be managed so that adverse effects on environmental values are prevented or minimised.	• Clearing of vegetation and topsoil. • Stockpiling of topsoil and overburden. • Extraction and handling of raw materials (e.g., transfer of materials, processing, blending, stockpiling, transportation).	Release of contaminated water to the receiving environment.	4 x 3 = 12 (**High**)	Stormwater runoff will interact with disturbed areas created through the development of the extraction areas. Inherent risks to off-site waters are conservatively scored high in the absence of any environmental controls to mitigate these risks. To manage potential impacts to waters from the proposed extraction area, the *Midgee Quarry: Stormwater Management Plan (Doc ref. 2610.800.001) ('SMP')* has been prepared for the site. The site is situated within an area subject to the Great Barrier Reef catchment waters mapping, which requires consideration in relation to Section 41AA of the EP Reg and the associated reef discharge standards. However, as noted in the Department's Guideline: Reef discharge standards for industrial activities, triggers for assessment under section 41AA do not include diffuse sources of contaminated stormwater that contains sediment only, which allows for an exclusion for stormwater proposed to be managed through erosion and sediment control measures. As the site will capture and treat all stormwater in accordance with ESC measures, the site is exempt from consideration of Section 41AA and reef discharge standards have not been considered further. Provided that the management measures outlined in the SMP and SBMP (where relevant) are implemented, and the EA conditions complied with, the environmental objective for 'Water' is likely to be achieved. The residual risk score is reduced to medium based on a possible likelihood and a moderate consequence which can be management in accordance with the measures in the SBMP and SMP. Pit 1 is located on land that is <20 mAHD, and thus has the potential to contain ASS. Soil and geological mapping for the area has not identified or confirmed the presence of ASS. An ASS Management Plan has been included within the SBMP to manage ASS in the event they are exposed / disturbance through site operations.	2 x 3 = 6 (**Medium**)
Wetlands	The activity will be operated in a way that protects the environmental values of wetlands.	The activity will be managed in a way that prevents or minimises adverse effects on wetlands.	• Clearing of vegetation and topsoil. • Excavation activities within the quarry footprint. • Storage and handling of materials within the quarry footprint.	Release of contaminants to, or physical damage of, nearby wetlands.	2 x 2 = 4 (**Low**)	The site is not mapped as containing any wetlands; therefore, direct impacts to wetlands are unlikely. As a result, the inherent risk of impacts to wetlands is scored low. Low inherent risks are able to be managed by routine procedures and are unlikely to need specific application of resources. The residual risk is unchanged and remains low.	2 x 2 = 4 (**Low**)

Environmental Aspect	Environmental Objective [1]	Performance Outcome	Source Activity	Potential Impact	Inherent Risk Rating [2]	Control / Management Measures	Residual Risk Rating [3]
Groundwater	The activity will be operated in a way that protects the environmental values of groundwater and any associated surface ecological systems.	The activity will be managed to prevent or minimise adverse effects on groundwater or any associated surface ecological systems.	• Clearing of vegetation and topsoil. • Excavation activities within the quarry footprint. • Storage and handling of materials within the quarry footprint. • Excavation within Pit 1.	Release of contaminants to groundwater.	3 x 3 = 9 (**Medium**)	No groundwater has been intercepted within the hard rock extraction areas (Pit 2) at the site. Pit 1, located adjacent to Gavial Creek will likely have shallow groundwater, as shown by the groundwater records for this area. It is not proposed to operate a wet extraction activity, and avoidance of groundwater interaction is the preferred approach by Midgee Quarry. Unmitigated, the potential for indirect impacts through release of contaminants which have the potential to be transported to groundwaters is scored medium, based on a possible likelihood and a moderate consequence. The Water Quality Management Plan (Section 4.2 of the SBMP) and SMP include measures for capture and treatment of surface waters that may interact with potential contaminants at the site that could impact groundwater. The SBMP also includes a Hydrocarbon and Chemical Management Plan that provides measures for management of other potential groundwater contaminants, refer to Section 4.3 of the SBMP. In addition, it is understood that extraction will be undertaken so as to not intercept groundwater within the extraction areas. Indirect impacts to groundwater from the site activities could readily be managed through controls put in place for management of stormwater (see 'Water') and hydrocarbon and chemical handling (see 'Land'). Provided Midgee Quarry implement the SBMP and SMP, potential for indirect impacts to groundwater will be reduced, and the residual risk is reduced to a lower score based on a decreased likelihood of an event occurring. The risk is reduced to a lower score however remains medium, which will require ongoing management through the implementation of the SBMP.	2 x 3 = 6 (**Medium**)
				Impacts to GDEs.	2 x 2 = 4 (**Low**)	The site is not mapped as containing any GDEs; therefore, direct impacts to GDEs are unlikely. As a result, the inherent risk of impacts to GDEs is scored low. With that said, Pit 1, is situated within sandy alluvial materials. It is not anticipated that the extraction of resource will alter the permeability of the underlying geology, enabling infiltration of waters to continue as a source of aquifer replenishment for adjacent regional ecosystems. Inherent risk is scored low as a result, which requires no application of specific management measures.	2 x 2 = 4 (**Low**)

Environmental Aspect	Environmental Objective [1]	Performance Outcome	Source Activity	Potential Impact	Inherent Risk Rating [2]	Control / Management Measures	Residual Risk Rating [3]
Noise	The activity will be operated in a way that protects the EVs of the acoustic environment.	The release of sound to the environment from the activity is managed so that adverse effects on EVs including health and wellbeing and sensitive ecosystems are prevented or minimised.	• Clearing of vegetation and topsoil / overburden ahead of the extraction activity. • Stripping and stockpiling of topsoil, subsoils and overburden. • Extraction and handling of materials (e.g., transfer of materials, stockpiling, transportation). • Screening and processing of the materials. • Vehicle movements on unsealed roads and access tracks. • Plant and equipment use, including reverse beepers. • Radio / UHF use. • Alarms.	Noise nuisance for nearby noise sensitive receptors.	4 x 3 = 12 (**High**)	In the absence of any noise management measures, the site activities have the potential to influence the noise EVs of the locality. Due to the presence of nearby sensitive receptors the inherent risk is scored high due to the proximity of sensitive receptors to the site, particular the haul road / access. Section 4.4 - Noise Management Plan of the site's SBMP contains the above measures as well as additional controls to minimise noise emissions from the site activities. An assessment of the potential noise impacts was undertaken by AE, who confirmed that no additional mitigation measures were required to mitigate potential noise impacts to nearby sensitive receptors. Provided that Midgee Quarry implement control measures for potential noise impacts as outlined in the SBMP, and observe the EA requirements, the environmental objective for 'Noise' is likely to be achieved. Residual risk is reduced to medium as the likelihood and consequence of an incident involving noise nuisance is reduced through the implementation of the above measures.	2 x 3 = 6 (**Medium**)
Noise	The activity will be operated in a way that protects the EVs of the acoustic environment.	The release of sound to the environment from the activity is managed so that adverse effects on EVs including health and wellbeing and sensitive ecosystems are prevented or minimised.	Blasting activities.	Air blast overpressure and vibration nuisance for nearby sensitive receptors.	3 x 4 = 12 (**High**)	Blasting activities at the site inherently have the potential to cause air-blast overpressure and vibration impacts for sensitive receptors. The Blasting Management Plan (Section 4.5 of the SBMP) includes measures for management of blasting activities at the site. A key measure is that only suitably experienced and qualified blasting personnel shall be employed or contracted to provide blasting services. An assessment of the potential vibration nuisance was undertaken by AE, who confirmed that no additional mitigation measures were required to potential vibration nuisance to nearby sensitive receptors. Provided that the Blasting Management Plan is implemented, and only suitably qualified persons are engaged to undertake blasting activities at the site, the residual risk is reduced to a lower level as the likelihood of an incident occurring is reduced.	2 x 3 = 6 (**Medium**)

Environmental Aspect	Environmental Objective [1]	Performance Outcome	Source Activity	Potential Impact	Inherent Risk Rating [2]	Control / Management Measures	Residual Risk Rating [3]
						The residual risk rating is scored medium, which will require ongoing management measure to be applied as outlined in the SBMP.	
Waste	Any waste generated, transported, or received as part of carrying out the activity is managed in a way that protects all environmental values.	• Waste generated, transported or received is managed in accordance with the waste and resource management hierarchy in the *Waste Reduction and Recycling Act 2011*. • If waste is disposed of, it is disposed of in a way that prevents or minimises adverse effects on environmental values.	• Vegetation clearing. • Storage and disposal of residual waste (i.e., general, and regulated waste).	Improper disposal of wastes.	3 x 4 = 12 (**High**)	Types of waste that may be generated at the quarry include, but are not necessarily limited to, the following: • Regulated wastes (e.g., batteries, oil filters, waste oil/hydrocarbons and containers, oil/water emulsions and tyres). • Scrap metal and used or faulty parts and equipment. • General waste such as food waste, packaging, and consumables. • Green waste. In the absence of control measures, potential for impacts associated with improper disposal of wastes is inherently scored high. The Waste Management Plan included as Section 4.6 of the SBMP details measures for management of waste at the site, with reference to the requirements of the *Waste Reduction and Recycling Act 2011* (WRR Act). Provided Midgee Quarry implement the measures outlined in the SBMP, and comply with the requirements of the EA, the residual risk of a potential incident involving waste is reduced, and the environmental objective for 'Waste' is likely to be achieved.	2 x 2 = 4 (**Low**)

Land	The activity is operated in a way that protects the environmental values of land including soils, subsoils, landforms and associated flora and fauna.	• Activities that disturb land, soils, subsoils, landforms and associated flora and fauna will be managed in a way that prevents or minimises adverse effects on the EVs of land.
		• Areas disturbed will be rehabilitated or restored to achieve sites that are—
		  ○ safe to humans and wildlife; and
		  ○ non-polluting; and
		  ○ stable; and
		  ○ able to sustain an appropriate land use after rehabilitation or restoration.
		• The activity will be managed to prevent or minimise adverse effects on the environmental values of land due to unplanned releases or discharges, including spills and leaks of contaminants.
		• The application of water or waste to the land is sustainable and is managed to prevent or minimise adverse effects on the composition or structure of soils and subsoils.
			Handling of chemicals and fuels on-site.	Release of hydrocarbons and fuels to land.	3 x 4 = 12 (**High**)	In the absence of controls the inherent risk of handling fuels and chemicals is high due to an increased likelihood of potential release if handling and storage activities are unmanaged.
						
						A Hydrocarbon and Chemical Management Plan has been incorporated into the SBMP (refer to Section 4.3) which provides management measures for handling and storage of hydrocarbons and chemicals to reduce the potential impacts to land associated with spills and/or leaks.
						
						Provided Midgee Quarry implements the measures outlined in the SBMP, the residual risk is reduced to a lower level as the likelihood and consequence of an incident occurring is reduced through the implementation of the management measures outlined in the SBMP.
						
						The residual risk is scored medium, and ongoing management in accordance with the SBMP will be required to ensure risk is as low as reasonably possible.
							2 x 3 = 6 (**Medium**)

Environmental Aspect	Environmental Objective [1]	Performance Outcome	Source Activity	Potential Impact	Inherent Risk Rating [2]	Control / Management Measures	Residual Risk Rating [3]
			Clearing of vegetation ahead of extraction.	Unauthorised impacts to protected species as a result of site activities.	2 x 2 = 4 (**Low**)	There are areas of mapped regulated vegetation within the site and proposed development areas. To mitigate potential impacts to mapped features at the site, the footprint of the has been designed so as to reduce the level of impact. Under the NC Act, any project activities that are required to tamper with a confirmed native animal breeding place in order to complete the scope of works must be undertaken in accordance with a Species Management Program, approved by DES. DES provides two Species Management Program templates, depending on the identified protected animals. The "low risk of impacts" relates to protected animals classed as Least Concern under NC Act where the impacts are unlikely to affect broader population. The "high risk of impacts" relates to protected animals identified as EVNT, Special Least Concern or Least Concern Colonial Breeder species, where the broader population is at a greater risk from impacts. As breeding places for native fauna may be impacted, subject to the timing of works, it is recommended all wet areas and trees to be removed are inspected prior to removal to determine if any active animal breeding places are present and any necessary Species Management Program is obtained prior to works, as advised by DES. Inherent risks of impacts to protected species are scored low due to the proposed location of the activities in low value vegetation. To mitigate potential impacts to adjacent areas of mapped remnant vegetation, the extraction areas are to be demarcated prior to clearing. To assist with further mitigating risks to flora and fauna, **Section 4.8 - Flora and Fauna Management Plan** has been prepared with additional control measures. Provided that all clearing occurs within the designated extraction limits, direct impacts to adjacent areas of remnant vegetation will be avoided.	2 x 2 = 4 (**Low**)
Land	The activity is operated in a way that protects the environmental values of land including soils, subsoils, landforms and associated flora and fauna.	• Activities that disturb land, soils, subsoils, landforms and associated flora and fauna will be managed in a way that prevents or minimises adverse effects on the EVs of land. • Areas disturbed will be rehabilitated or restored to achieve sites that are— o safe to humans and wildlife; and o non-polluting; and o stable; and o able to sustain an appropriate land use after rehabilitation or restoration.	Post-closure implementation and management of the site rehabilitation.	Failure to achieve rehabilitation milestones in disturbance areas at the cessation of the activities.	3 x 4 = 12 (**High**)	In the absence of management measures to assist in site rehabilitation, landforms created through the extraction activities have the potential to impact upon environmental values of the surrounding areas. The SBMP includes a Rehabilitation Management Plan (refer to Section 4.7 of the SBMP). Provided that Midgee Quarry implement the SBMP, and observe the EA requirements, the environmental objectives for 'Land' are likely to be achieved. Residual risk is reduced to a lower level as the likelihood	2 x 3 = 6 (**Medium**)

Environmental Aspect	Environmental Objective [1]	Performance Outcome	Source Activity	Potential Impact	Inherent Risk Rating [2]	Control / Management Measures	Residual Risk Rating [3]
		• The activity will be managed to prevent or minimise adverse effects on the environmental values of land due to unplanned releases or discharges, including spills and leaks of contaminants. • The application of water or waste to the land is sustainable and is managed to prevent or minimise adverse effects on the composition or structure of soils and subsoils.				of failure of final rehabilitated landforms is reduced through the implementation of these measures. With future planning and implementation of successful rehabilitation, the likelihood of failure is reduced; however, the consequence remains the same, which result in a residual risk rating of medium.	

Notes:

1. Environmental Objectives and Performance Outcomes have been reprinted from Schedule 8, Part 3, Division 1 of the EP Reg
2. "Inherent risk" is the level of risk that exists if the impacts go unmitigated.
3. "Residual risk" is the risk that remains after implementation of the proposed control / management measures.

4 Concluding Risk

The EAR has been prepared to address the EA application requirements as outlined in Section 125 of the EP Act.

The highest level of residual risk has been calculated as medium. Ongoing management of the site will be required in accordance with the management measures provided in the site's SBMP and SMP, and through compliance with the EA conditions, to ensure that the potential risk associated with environmental impacts identified is reduced to as low as reasonably possible.

The SBMP and SMP have been developed to provide written procedures regarding the measures for the management of potential environmental impacts from the site activities, with reference to the risk assessment provided in **Table 12**.

Reference

Assured Environmental, (2022). Noise Impact Assessment

Assured Environmental, (2022). Air Quality Assessment

BAAM (Biodiversity Assessment and Management) (2022), *Assessment of Ecological Matters of State and Local Significance – Midgee Quarry, Rockhampton*

Bureau of Meteorology (2022). Climate Data Online. Accessed January 17, 2022 via http://www.bom.gov.au/climate/data/

DES (Department of Environment and Science). (2011). *Environmental Protection (Water) Policy 2009 Fitzroy River Sub basin Environmental Values and Water Quality Objectives Basin No. 130 (part), including all waters of the Fitzroy River Sub-basin.* Via https://environment.des.qld.gov.au/__data/assets/pdf_file/0037/88795/fitzroy_fitzroy_river_wqo_290911.pdf

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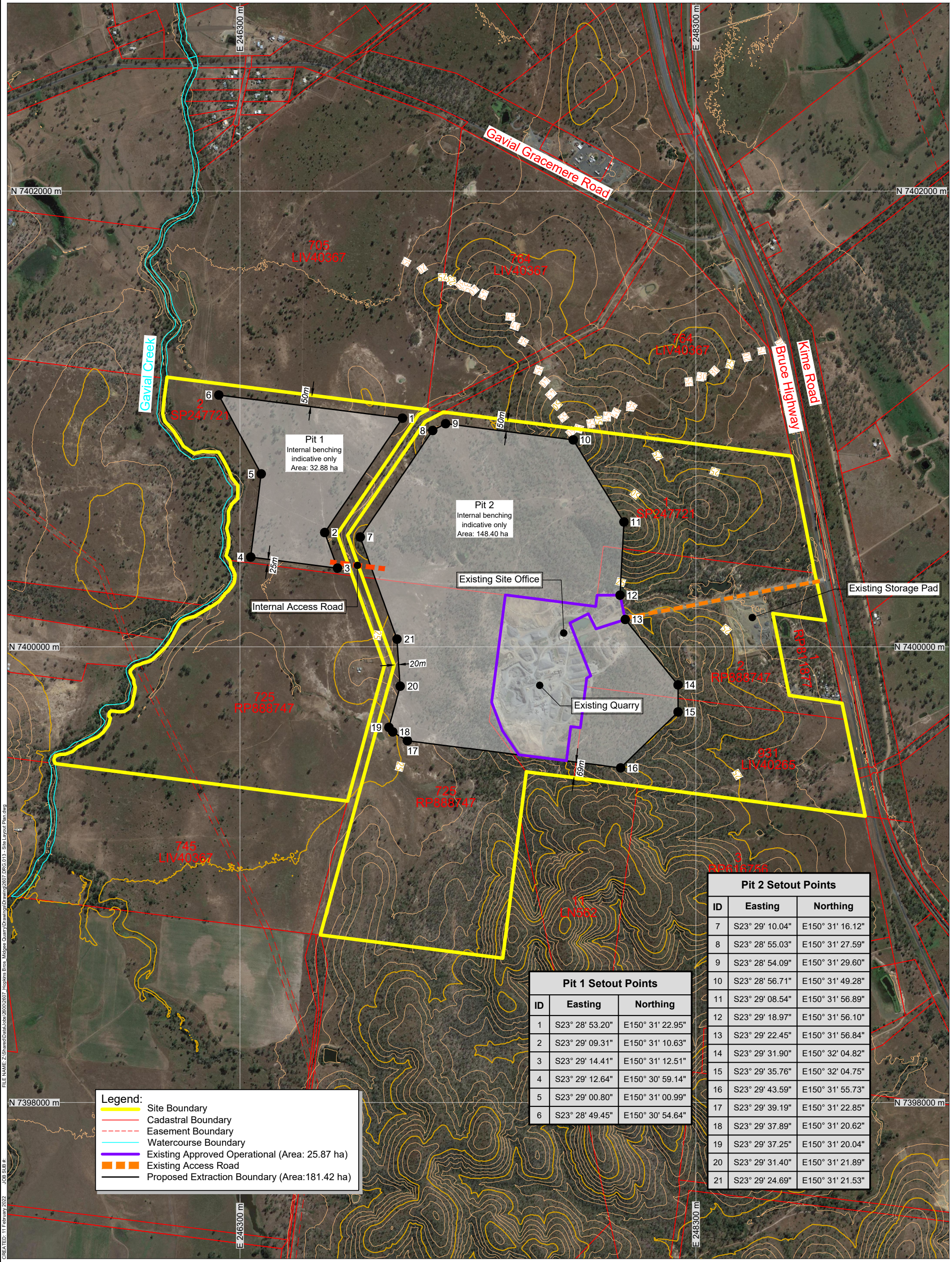
EHP, (Department of Environment and Heritage Protection), (2016). Planning for Noise Control.

Queensland Globe, (2022). Accessed via https://qldglobe.information.qld.gov.au/

Standards Australia (2018). ISO 31000:2018 Risk management – Guidelines. Standards Australia: Sydney, NSW

DRAWINGS

GROUNDWORK plus



Pit 1 Setout Points		
ID	Easting	Northing
1	S23° 28' 53.20"	E150° 31' 22.95"
2	S23° 29' 09.31"	E150° 31' 10.63"
3	S23° 29' 14.41"	E150° 31' 12.51"
4	S23° 29' 12.64"	E150° 30' 59.14"
5	S23° 29' 00.80"	E150° 31' 00.99"
6	S23° 28' 49.45"	E150° 30' 54.64"

Pit 2 Setout Points		
ID	Easting	Northing
7	S23° 29' 10.04"	E150° 31' 16.12"
8	S23° 28' 55.03"	E150° 31' 27.59"
9	S23° 28' 54.09"	E150° 31' 29.60"
10	S23° 28' 56.71"	E150° 31' 49.28"
11	S23° 29' 08.54"	E150° 31' 56.89"
12	S23° 29' 18.97"	E150° 31' 56.10"
13	S23° 29' 22.45"	E150° 31' 56.84"
14	S23° 29' 31.90"	E150° 32' 04.82"
15	S23° 29' 35.76"	E150° 32' 04.75"
16	S23° 29' 43.59"	E150° 31' 55.73"
17	S23° 29' 39.19"	E150° 31' 22.85"
18	S23° 29' 37.89"	E150° 31' 20.62"
19	S23° 29' 37.25"	E150° 31' 20.04"
20	S23° 29' 31.40"	E150° 31' 21.89"
21	S23° 29' 24.69"	E150° 31' 21.53"

Legend:
- Site Boundary
- Cadastral Boundary
- Easement Boundary
- Watercourse Boundary
- Existing Approved Operational (Area: 25.87 ha)
- Existing Access Road
- Proposed Extraction Boundary (Area:181.42 ha)

FILE NAME: Z:\Shared\Data\Jobs\2600\2607 Hopkins Bros Midgee Quarry\Drawings\Drawing\2607.DRG.013 - Site Layout Plan.dwg
JOB SUB #:
CREATED: 11 February 2022

REV	DESCRIPTION	DATE	BY

Data Sources:
Photography: © 2021 Microsoft Corporation; © 2021 Maxar; © CNES (2021) Distribution Airbus DS
Topography: © Commonwealth of Australia (Geoscience Australia) 2015, LiDAR 5m
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Ecosystem:
Other:

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PROJECT: Midgee Quarry

CLIENT: Hopkins Brothers

TITLE: Site Layout Plan - Quarry Footprint Extension

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SCALE: 1:15,000 When Printed On A3 — 0 — 300m
DRAWING NUMBER: 2607.DRG.013
REVISION:
DATE: 17 February 2022 DRAWN: MR
PRINTED: 17 February 2022 CHECKED: MB
DATUM: HORIZONTAL / VERTICAL / ZONE
GDA94 / MGA / AHD / 56

ATTACHMENTS

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Attachment 1

EMR / CLR Search Results

Department of Environment and Science (DES)
ABN 46 640 294 485
400 George St Brisbane, Queensland 4000
GPO Box 2454, Brisbane QLD 4001, AUSTRALIA
www.des.qld.gov.au

SEARCH RESPONSE

ENVIRONMENTAL MANAGEMENT REGISTER (EMR)
CONTAMINATED LAND REGISTER (CLR)

David Doolan
6 Mayneview Street
Milton QLD 4064

Transaction ID: 50751252 EMR Site Id: 17 January 2022
Cheque Number:
Client Reference:

This response relates to a search request received for the site:
Lot: 725 Plan: RP888747
BRUCE HWY
BOULDERCOMBE

EMR RESULT

The above site is NOT included on the Environmental Management Register.

CLR RESULT

The above site is NOT included on the Contaminated Land Register.

ADDITIONAL ADVICE

All search responses include particulars of land listed in the EMR/CLR when the search was generated.
The EMR/CLR does NOT include:-

1. land which is contaminated land (or a complete list of contamination) if DES has not been notified
2. land on which a notifiable activity is being or has been undertaken (or a complete list of activities) if DES has not been notified

If you have any queries in relation to this search please phone 13QGOV (13 74 68)

Administering Authority

Department of Environment and Science (DES)
ABN 46 640 294 485
400 George St Brisbane, Queensland 4000
GPO Box 2454, Brisbane QLD 4001, AUSTRALIA
www.des.qld.gov.au

SEARCH RESPONSE
ENVIRONMENTAL MANAGEMENT REGISTER (EMR)
CONTAMINATED LAND REGISTER (CLR)

David Doolan
6 Mayneview Street
Milton QLD 4064

Transaction ID: 50751251 EMR Site Id: 17 January 2022
Cheque Number:
Client Reference:

This response relates to a search request received for the site:
Lot: 931 Plan: LIV40265
BRUCE HWY
MIDGEE

EMR RESULT

The above site is NOT included on the Environmental Management Register.

CLR RESULT

The above site is NOT included on the Contaminated Land Register.

ADDITIONAL ADVICE

All search responses include particulars of land listed in the EMR/CLR when the search was generated.
The EMR/CLR does NOT include:-

1. land which is contaminated land (or a complete list of contamination) if DES has not been notified
2. land on which a notifiable activity is being or has been undertaken (or a complete list of activities) if DES has not been notified

If you have any queries in relation to this search please phone 13QGOV (13 74 68)

Administering Authority

Department of Environment and Science (DES)
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SEARCH RESPONSE
ENVIRONMENTAL MANAGEMENT REGISTER (EMR)
CONTAMINATED LAND REGISTER (CLR)

David Doolan
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Milton QLD 4064

Transaction ID: 50751254 EMR Site Id: 17 January 2022
Cheque Number:
Client Reference:

This response relates to a search request received for the site:
Lot: 1 Plan: SP247721

BOULDERCOMBE

EMR RESULT

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CLR RESULT

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ADDITIONAL ADVICE

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The EMR/CLR does NOT include:-

1. land which is contaminated land (or a complete list of contamination) if DES has not been notified
2. land on which a notifiable activity is being or has been undertaken (or a complete list of activities) if DES has not been notified

If you have any queries in relation to this search please phone 13QGOV (13 74 68)

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GPO Box 2454, Brisbane QLD 4001, AUSTRALIA
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SEARCH RESPONSE
ENVIRONMENTAL MANAGEMENT REGISTER (EMR)
CONTAMINATED LAND REGISTER (CLR)

David Doolan
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Transaction ID: 50751253 EMR Site Id: 17 January 2022
Cheque Number:
Client Reference:

This response relates to a search request received for the site:
Lot: 2 Plan: SP247721

BOULDERCOMBE

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CLR RESULT

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ADDITIONAL ADVICE

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The EMR/CLR does NOT include:-

1. land which is contaminated land (or a complete list of contamination) if DES has not been notified
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If you have any queries in relation to this search please phone 13QGOV (13 74 68)

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Attachment 2

Ecological Assessment

ASSESSMENT OF ECOLOGICAL MATTERS OF STATE AND LOCAL SIGNIFICANCE

MIDGEE QUARRY EXTENSION, ROCKHAMPTON

Prepared for
Groundwork Plus



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Document Control Sheet

File Number: 0049-122

Project Manager/s: Jedd Appleton

Client: Groundwork Plus

Project Title: Assessment of Ecological Matters of State and Local Significance – Midgee Quarry, Rockhampton

Project Author/s: Shelley Trevaskis, Dr Colin Trainor, Jedd Appleton

Project Summary: Assessment of ecological matters of State and Local Significance to inform future development of Midgee Quarry.

Draft Preparation History:

Draft No.	Date draft completed	Reviewed by	Issued by
0049-122 Working Draft	15/12/2021	Megan Benham	Jedd Appleton

Revision/ Checking History Track:

Version	Date of Issue	Checked by	Issued by
0049-122 Version 0	04/02/2022	Jedd Appleton	Jedd Appleton

Document Distribution:

Destination	Revision					
	1	Date Dispatched	2	Date Dispatched	3	Date Dispatched
Client Copy 1 - digital	Working Draft	15/12/2021	0	04/02/2022		
Client Copy 1- hard copy						
PDF - server	Working Draft	15/12/2021	0	04/02/2022		
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Biodiversity Assessment and Management Pty Ltd



Director

EXECUTIVE SUMMARY

INTRODUCTION

This report has been prepared for Groundwork Plus to document the results of an assessment of ecological matters of State and Local significance over land proposed for the future development of the existing Midgee Quarry, located adjacent to the Bruce Highway (Lot 2 RP888747, Lot 93 LIV42065, Lot 725 RP888747, Lot 1 SP747721, Lot 2 SP 747721; the 'Study Site').

METHODOLOGIES

The assessment combined a desktop review to broadly characterise the currently recognised ecological values of the Study Site, with a field survey to verify the presence or absence of Matters of State and/or Local Environment Significance identified as present or potentially present as part of the desktop review, including searching for the presence of any conservation significant species and their preferred habitats.

SUMMARY OF ECOLOGICAL CONSTRAINTS AND LEGISLATIVE OBLIGATIONS

Matters of State Environmental Significance (MSES)

Regulated Vegetation

The proposed development will impact upon prescribed MSES in the form of remnant vegetation within a defined distance from the defining banks of a relevant watercourse or relevant drainage feature (stream order 1). No other regulated vegetation representing prescribed MSES within the Study Site (i.e. remnant Of Concern regional ecosystems or Essential Habitat) will be impacted.

Where Category B regulated vegetation is to be removed under a development application (under the relevant purpose of extractive industry), the application must (subject to any exemptions) address State Code 16: Native vegetation clearing, with any acceptable significant residual impacts (SRIs) to prescribed MSES (including remnant vegetation within a defined distance from the defining banks of a relevant watercourse or relevant drainage feature) subject to offsets in accordance with the *Environmental Offsets Act 2014.* An assessment of the proposed development against the relevant performance outcomes of State Code 16 indicates the significance of residual impacts on remnant vegetation within the defined distance of a watercourse will need to be assessed (with respect to any mitigation measures proposed) to determine if offsets are required.

The proposed development will also be subject to assessment against State Code 22: Environmentally relevant activities, PO7 of which also requires any acceptable, SRIs to prescribed MSES to be offset in accordance with the *Environmental Offsets Act 2014*.

It is understood revegetation works will be undertaken to prevent or reduce overall environmental harm and degradation, and the likelihood of an SRI to MSES, including vegetation within a defined distance from the defining banks of a relevant watercourse or relevant drainage feature, in accordance with pre-lodgement advice from the State Assessment and Referral Agency (SARA) and in further consultation with the Department of Resources (DoR). It is expected this would involve the rehabilitation and legal security of an appropriately sized and located area of vegetation, under the guidance of an approved management plan, in conjunction with rehabilitation activities proposed to mitigate impacts on Category C/R vegetation and protected wildlife habitat, as necessary.

In terms of Category C and Category R regulated vegetation, Schedule 1, Part 2(i) of the *Planning Regulation 2017* indicates the clearing of regulated regrowth vegetation (other than in a category A area) for an extractive industry in a Key Resource Area (KRA) meets the definition of exempt clearing. If a KRA designation is not applicable, review of the proposed footprint against *Table 1 Clearing Requirements* of the Accepted Development Vegetation Clearing Code (ADVCC) for Extractive Industry indicates the proposed clearing of Category C and Category R regulated vegetation for the proposed quarry pits may trigger a requirement for an exchange area to be legally secured and managed until it achieves remnant status. Any necessary exchange area would be provided in conjunction with rehabilitation activities

proposed to mitigate impacts on remnant vegetation within a defined distance from the defining banks of a relevant watercourse / drainage feature.

Waterways for Waterway Barrier Works

The Study Site contains "low value" watercourses that are mapped as Waterways for Waterway Barrier Works by the Department of Agriculture and Fisheries (DAF). However, ground-truthing has determined that these drainage features do not provide for fish passage. Consequently, the proposed development will not impact upon Waterways for Waterway Barrier Works.

Protected Wildlife Habitat

MSES mapping indicates protected wildlife habitat for endangered /vulnerable species occurs within the Study Site. This mapping relates to records for Squatter Pigeon *Geophaps scripta scripta* (listed as Vulnerable under the Queensland *Nature Conservation Act 1992* [NC Act]) and wildlife habitat suitability modelling for Ornamental Snake *Denisonia maculata* (NC Act: Vulnerable), and corresponds with Essential Habitat mapping for these species.

Squatter Pigeon was confirmed to occur on the Study Site, such that protected wildlife habitat for this species is confirmed as occurring on the Study Site. Conversely, the apparent absence of seasonal wetlands and gilgai habitat with cracking clay indicates Ornamental Snake is unlikely to occur.

The proposed development will be subject to assessment against State Code 22: Environmentally relevant activities, PO7 of which requires any acceptable, significant residual impacts to prescribed MSES (including protected wildlife habitat) to be offset in accordance with the *Environmental Offsets Act 2014*.

It is noted that none of the protected wildlife habitat mapped by the State will be impacted, although Squatter Pigeon is known to utilise the proposed impact area.

Published information on habitat preferences for Squatter Pigeon is consistent with observations made during the current field survey, which recorded the species on or near lower-lying, alluvial substrates (land zone 3) and in close proximity to onsite dams. The birds were also recorded in or near areas of remnant vegetation on land zone 11 (hills and lowlands on metamorphic rocks), although this vegetation would typically be used more for shelter and dispersal rather than for foraging or breeding. In this case, the more fertile, lower lying areas on land zone 3 have been historically cleared for grazing and currently comprise mainly regrowth and non-remnant vegetation with sparser canopy cover, such that the areas of remnant vegetation on land zone 11 provide the best cover for sheltering purposes within the Study Site.

It is understood revegetation works will be undertaken to prevent or reduce overall environmental harm and degradation, and the likelihood of an SRI to MSES, including protected wildlife habitat for Squatter Pigeon. It is expected this would involve the rehabilitation and legal security of an appropriately sized and located area of vegetation, under the guidance of an approved management plan, in conjunction with rehabilitation activities proposed to mitigate impacts on remnant vegetation within a defined distance from the defining banks of a relevant watercourse / drainage feature and Category C/R vegetation, as necessary.

No other potentially occurring threatened species is expected to rely on the Study Site to such an extent that the removal of potential habitat will result in a significant impact.

NC Act Obligations

Protected Plants

The Study Site is not mapped as occurring within or containing a high risk area on the State's protected plants flora survey trigger map, and the field survey did not record any flora species listed as threatened or near threatened under the NC Act within the Study Site. Consequently, an NC Act protected plants clearing permit will not need to be obtained prior to the clearing of native vegetation from the Study Site.

Animal Breeding Places

No active animal breeding places were recorded during the field survey. However, there may be breeding places for threatened and non-threatened fauna species (present within the Study Site at certain times of the year).

Under the NC Act, any removal of vegetation that is required to tamper with a confirmed native animal breeding place in order to complete the scope of works must be undertaken in accordance with a Species Management Program (SMP) approved by the Queensland Department of Environment and Science (DES). It is recommended all wet areas and trees to be removed are inspected prior to removal to determine if any active animal breeding places are present and any necessary SMP is obtained prior to works, as advised by DES.

State Restricted Weeds

Restricted invasive weed species listed as Category 3 restricted invasive plants under the Queensland *Biosecurity Act 2014* were recorded and appropriate management of these species is required.

Matters of Local Environmental Significance (MLES)

The Rockhampton Regional Council has mapped MLES over the Study Site, with the Waterways, Biodiversity Corridor and MLES General overlays affecting the Study Site. These overlays trigger the application of the *Biodiversity Areas Overlay Code*.

Council mapped waterways appear to reflect those mapped as Waterways for Waterway Barrier Works by DAF, neither of which provide any notable ecological values in terms of fish passage or other aquatic or riparian habitat functions, such that the removal of these features is not considered to represent a significance impact upon MLES.

A Biodiversity Corridor is mapped through the eastern area of the Study Site, but will not be impacted by the proposed development.

MLES General reflects State-mapped, Least Concern remnant vegetation, which will be impacted by the proposed development. However, pre-lodgement advice from Rockhampton Regional Council states that, while an assessment of MLES is required, biodiversity offsets will not be triggered.

It is understood revegetation works will be undertaken to prevent or reduce overall environmental harm and degradation, and the likelihood of an SRI to MSES and MLES. It is expected this would involve the rehabilitation and legal security of an appropriately sized and located area of vegetation, under the guidance of an approved management plan, in conjunction with rehabilitation activities proposed to mitigate impacts on MSES, as necessary.

ASSESSMENT OF ECOLOGICAL MATTERS OF STATE AND LOCAL SIGNIFICANCE

MIDGEE QUARRY EXTENSION, ROCKHAMPTON

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Table of Terms and Abbreviations

ADVCC	Accepted Development Vegetation Clearing Code
BAAM	Biodiversity Assessment and Management Pty Ltd
DAF	Queensland Department of Agriculture and Fisheries
DES	Queensland Department of Environment and Science
EH	Essential Habitat
EVNT	Species listed as endangered, vulnerable or near threatened under the EPBC Act or NC Act
KRA	Key Resource Area
MLES	Matters of Local Environmental Significance
MSES	Matters of State Environmental Significance
NC Act	Queensland *Nature Conservation Act 1992*
RE	Regional Ecosystem
SARA	State Assessment and Referral Agency
SMP	Species Management Program
SRI	Significant Residual Impact

1.0 INTRODUCTION

1.1 BACKGROUND AND PURPOSE

This report has been prepared for Groundwork Plus to document the results of an assessment of ecological matters of State and Local significance over land proposed for the future development of the existing Midgee Quarry, at Midgee, Queensland; properly described as Lot 2 RP888747, Lot 93 LIV42065, Lot 725 RP888747, Lot 1 SP747721 and Lot 2 SP 747721 (the 'Study Site') (**Figure 1.1**).

It is understood future development will involve an expansion of the existing pit, the creation of a second pit to the west, and the creation of an internal access road between the two pits (**Figure 1.1**), while the existing access road to the Bruce Highway will continue to be utilised. The Study Site also included surrounding lot areas, as indicated in **Figure 1.1.**

Portions of the Study Site are mapped to contain Matters of State Environmental Significance (MSES) and Matters of Local Environmental Significance (MLES). As many MSES and MLES are associated with ecological values, an ecological assessment was required to verify the known or likely presence/absence of MSES and MLES and the accuracy of associated mapping.

The outcomes of this assessment will inform necessary approval applications under State and Local Government legislation.

1.2 STUDY SITE

Midgee Quarry is located on the Bruce Highway, 10km south of Rockhampton in central Queensland. An active quarry is located on Lot 2 RP888747.

The quarry is surrounded by native vegetation communities that are mapped as remnant and regrowth vegetation by the State. Non-remnant areas over the balance of the Study Site are typically mostly cleared and grazed.

Gavial Creek forms the western boundary of the Study Site. The Study Site also features stream order 1 and 2 waterways that include ephemeral watercourses, as well as retained water in dams.

2.0 METHODOLOGIES

2.1 DESKTOP REVIEW

An initial desktop review was undertaken, which comprised a search of the following information:

- The Wildlife Online database (**Appendix 1**) and Atlas of Living Australia database, to determine if any species listed as Endangered, Vulnerable or Near Threatened (EVNT) under the Queensland *Nature Conservation Act 1992* (NC Act) have been previously recorded in the vicinity.
- State Government mapping of MSES (**Appendix 2**) and local Council mapping of MLES (**Appendix 3**) currently recognised as occurring within the Study Site
- Reference material on the target flora/fauna species.

2.2 FIELD SURVEY

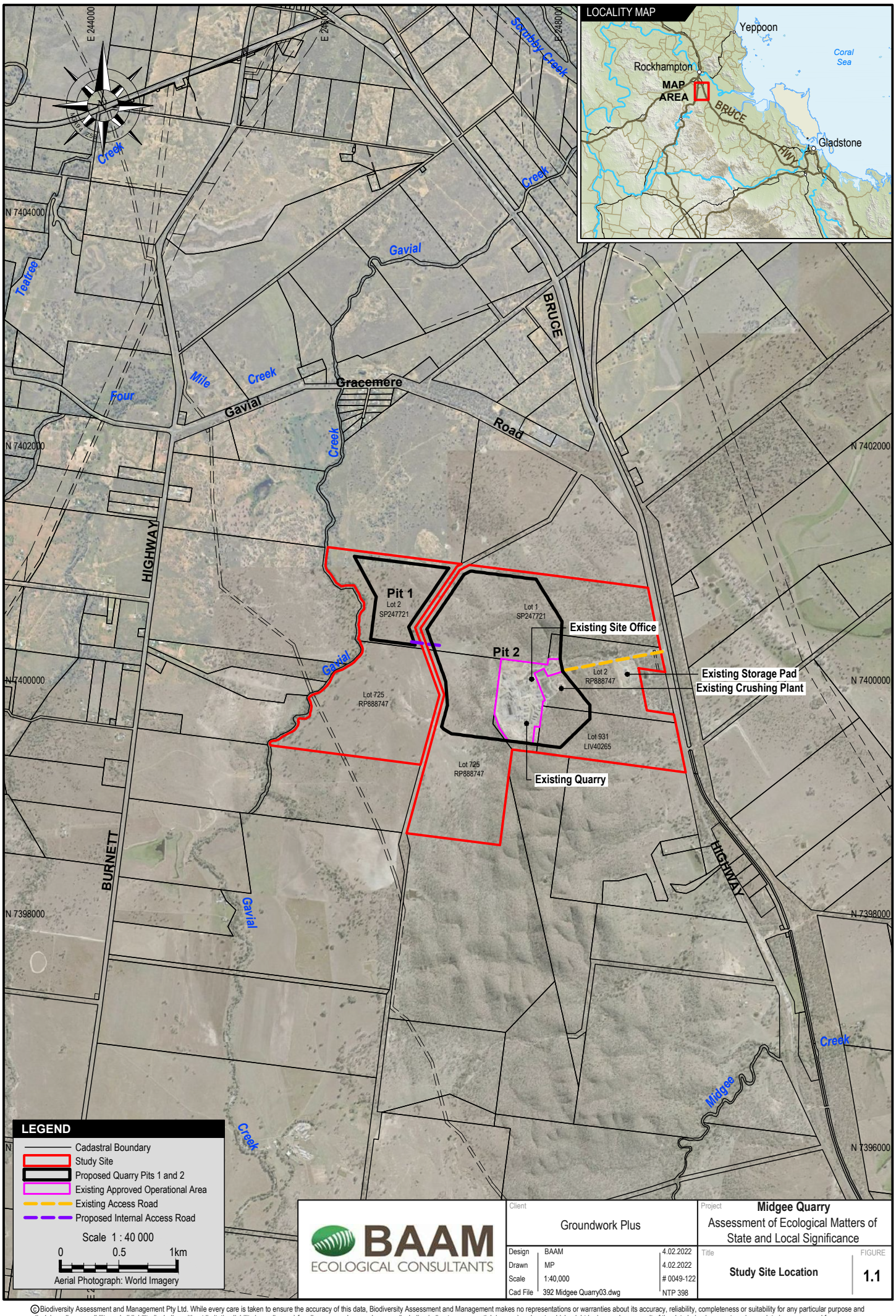
The ecological field survey involved a traverse of the Study Site undertaken by BAAM Senior Ecologists Dr Colin Trainor and Shelley Trevaskis and over two days and one night on 14-15 September during warm, dry conditions. All work was performed in accordance with BAAM's Scientific Purposes Permit and Animal Ethics Approval.

The focus of the field survey was to verify the known or likely presence or absence of MSES and MLES identified as present or potentially present as part of the desktop review, including searching for the presence of any conservation significant species and their preferred habitats.

To record the type and status of vegetation across the Study Site, Quaternary site data were recorded at representative locations (**Figure 2.1**) in accordance with the methodology prescribed in Neldner *et al.* (2019). Quaternary sites measure the height, canopy cover and dominant plant species present in each stratum of a vegetation community and inform the applicable remnant status and Regional Ecosystem (RE) type.

Diurnal flora and fauna searches were undertaken across the Study Site, targeting significant species identified by data searches as potentially present. A nocturnal spotlighting event was also completed in the eastern area of the Study Site (**Figure 2.1**).

The presence of wetlands and watercourses was also assessed to verify State and Local Government mapping of any such features.



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Cad File	392 Midgee Quarry03.dwg	NTP 398	

Project: **Midgee Quarry**
Assessment of Ecological Matters of State and Local Significance

Title: **Study Site Location**

FIGURE **1.1**

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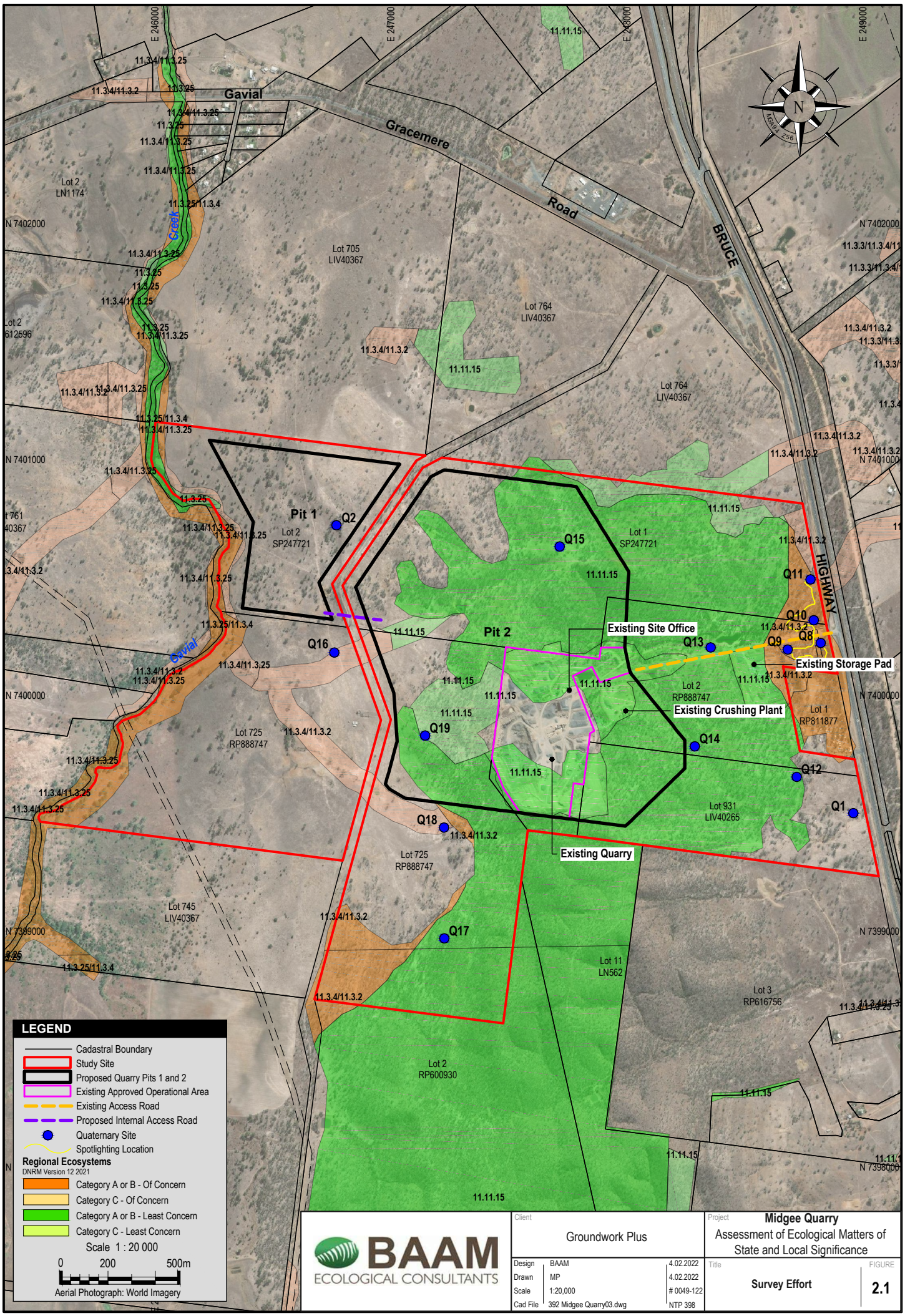

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Title: **Survey Effort**

FIGURE **2.1**

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3.0 MATTERS OF STATE ENVIRONMENTAL SIGNIFICANCE (MSES)

3.1 REGULATED VEGETATION

State regulated vegetation mapping (**Appendix 2, Figure 3.1**) identifies the Study Site as supporting areas mapped as Category B (remnant), Category C (high value regrowth) and Category R (reef regrowth watercourse) regulated vegetation, as well as remnant vegetation within a defined distance from the defining banks of a relevant watercourse or relevant drainage feature (stream orders 1, 2) supporting the following REs:

- RE11.3.25 (Least Concern);
- RE11.3.2 (Of Concern);
- RE11.3.4 (Of Concern); and
- RE11.11.15 (Least Concern).

All of the above listed REs were recorded on site, mostly in accordance with the extents indicated in State mapping. **Appendix 4** provides a description of vegetation recorded at representative locations across the Study Site, as shown on **Figure 2.1**.

Portions of State-mapped remnant vegetation are also mapped as Essential Habitat for two species listed as threatened under the NC Act: Squatter Pigeon *Geophaps scripta scripta* (NC Act: Vulnerable) and Ornamental Snake *Denisonia maculata* (NC Act: Vulnerable) (**Figure 3.1**).

Squatter Pigeon was observed on several occasions during the survey, all within 1.5 km of waterbodies recorded on site including Gavial Creek, dams and cattle drinking toughs (**Figure 3.1**). The Study Site appears to provide suitable, regular habitat for this species, as evidenced by the number of records and by one record of a larger flock of 10 birds. Consequently, the State's mapping of Essential Habitat for this species is verified as correct.

Historically (i.e. during the 1970's), Ornamental Snake was recorded at several locations within 15 km of the Study Site (ALA, 2021); however, the apparent absence of seasonal wetlands and gilgai habitat with cracking clay indicates that the species is unlikely to occur. Nevertheless, Essential Habitat factors for the species are present.; therefore (aside from dead vegetation in the southern portion of Lot 725 RP888747), the State's mapping of Essential Habitat for this species is verified as correct.

As shown on **Figure 3.1,** expansion of the existing pit will impact upon Least Concern remnant and regrowth RE 11.11.15 (Least Concern) and regrowth RE 11.3.4/11.3.25 (Of Concern), some of which is mapped by the State as a prescribed MSES in the form of remnant vegetation within a defined distance from the defining banks of a relevant watercourse or relevant drainage feature (stream order 1). Specifically, remnant vegetation is mapped within the defined distance of mapped watercourses traversing the eastern and north-western portions of Pit 2 (**Figure 3.1**).

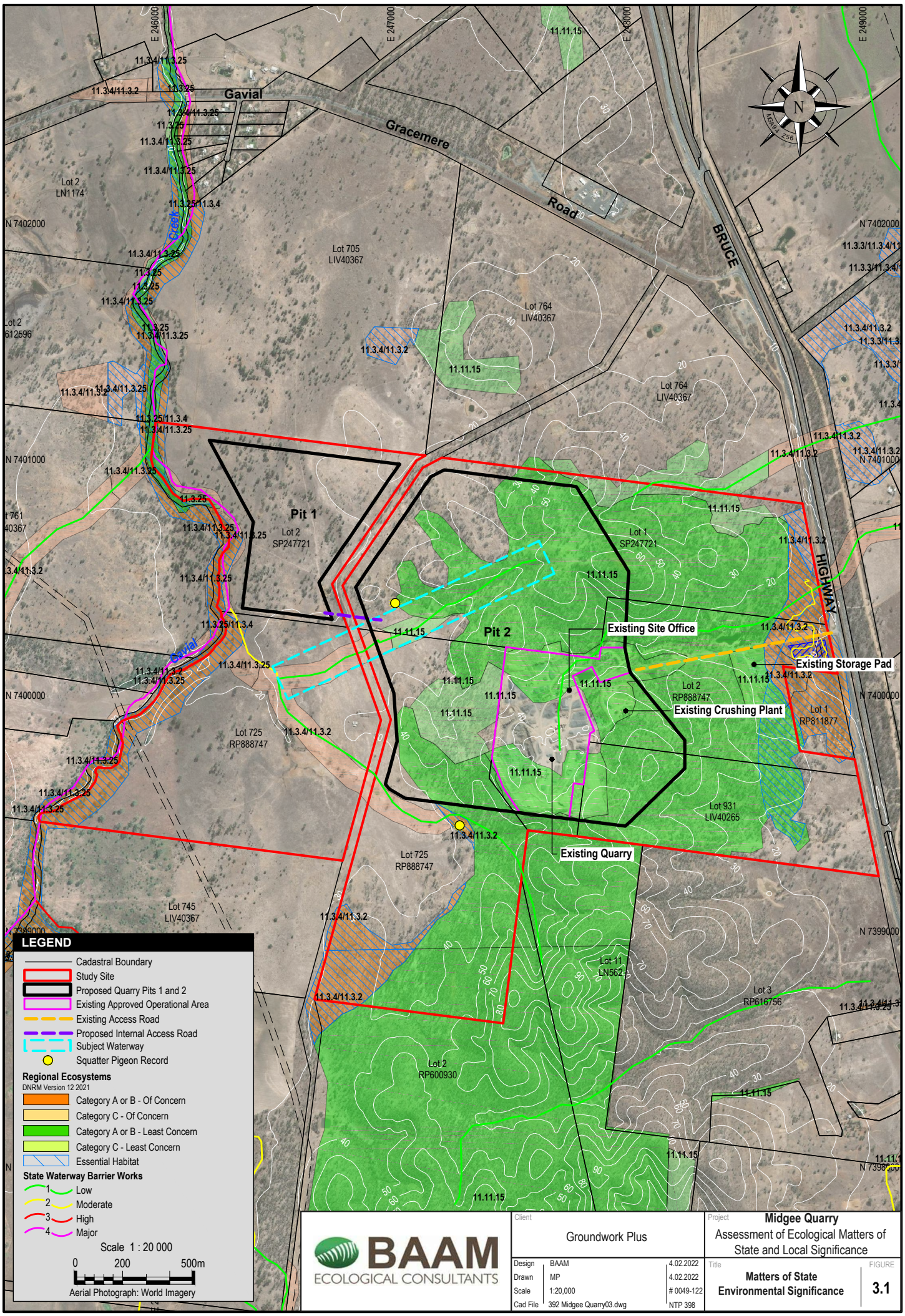
Analysis of aerial photography and recent site investigations have revealed that the previously approved, existing quarry footprint has already impacted the upstream portion of the eastern mapped watercourse in, and/or removed the remnant vegetation from within the defined distance of its defining banks, such that there will be no impact upon remnant vegetation within the defined distance from the defining banks of a watercourse or drainage feature at this location (refer **Image 1**). Consequently, impacts upon prescribed MSES will be restricted to 1 ha of remnant vegetation within the defined distance from the defining banks of the mapped watercourse / drainage feature (stream order 1) traversing the north-western portion of Pit 2.

No other regulated vegetation representing prescribed MSES within the Study Site (i.e. remnant Of Concern REs or Essential Habitat) will be impacted.

Legislative Implications

Pre-lodgement advice from the State Assessment and referral Agency (SARA) (REF: 2109-24772 SPL) for the clearing of regulated vegetation at Midgee Quarry states:

- *Clearing vegetation identified as category X on the regulated vegetation management map can be undertaken as exempt clearing work.*
- *Clearing vegetation identified as category C or R on the regulated vegetation management map can only be undertaken as exempt clearing or in accordance with an accepted development vegetation clearing code (ADVCC). If clearing is not exempt or in accordance with an ADVCC, then clearing is prohibited development* (i.e. for the purposes of the *Planning Act 2016*).



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Project: **Midgee Quarry**
Assessment of Ecological Matters of State and Local Significance

Title: **Matters of State Environmental Significance**

FIGURE **3.1**

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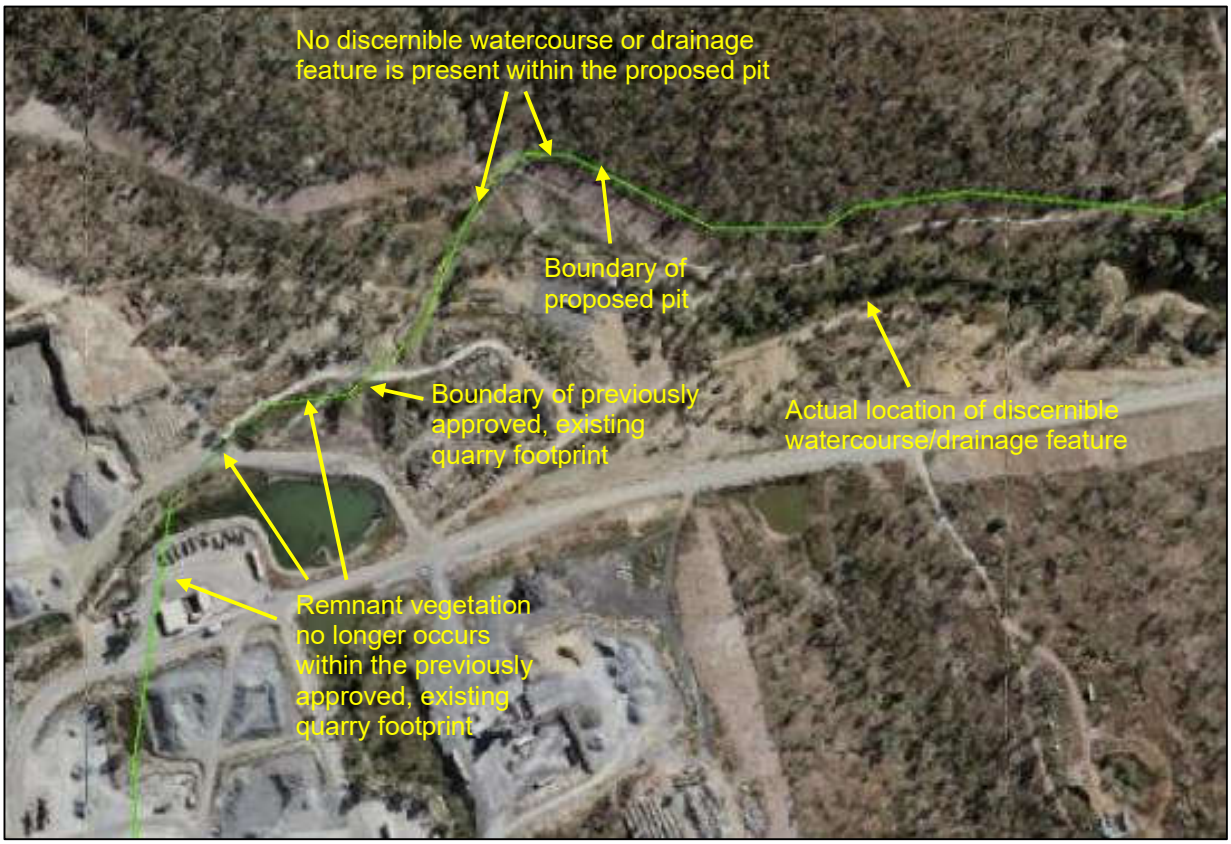

Image 1. State mapped watercourse in relation to existing quarry footprint and on-ground vegetation

- *Clearing vegetation identified as category B on the regulated vegetation management map will either be assessable development* (in which case it will be referred to the Department of Resources for assessment against State Code 16: Native vegetation clearing) *or accepted operational work under schedule 21.*
- *A Relevant Purpose Determination will be required under section 22A of the Vegetation Management Act 1999 for extractive activities. Prior to submitting the development application to clear native vegetation, written confirmation must be obtained from the Department of Resources that the proposed development is for a relevant purpose.*

Where Category B regulated vegetation is to be removed under a development application (under the relevant purpose of extractive industry), the application must (subject to any exemptions) address State Code 16: Native vegetation clearing, with any acceptable, significant residual impacts to relevant MSES (including regulated vegetation within a defined distance from the defining banks of a relevant watercourse or relevant drainage feature) subject to offsets in accordance with the *Environmental Offsets Act 2014*.

An assessment of the proposed development against the relevant performance outcomes of State Code 16: Native vegetation clearing is provided in **Appendix 5**. This indicates the significance of residual impacts on remnant vegetation within the defined distance of a watercourse will need to be assessed (with respect to any mitigation measures proposed) to determine if offsets are required.

The proposed development will also be subject to assessment against State Code 22: Environmentally relevant activities, PO7 of which also requires any acceptable, significant residual impacts to relevant MSES (including regulated vegetation within a defined distance from the defining banks of a relevant watercourse or relevant drainage feature) to be offset in accordance with the *Environmental Offsets Act 2014*.

Guidance for determining if the development will have a significant residual impact (SRI) on MSES is provided in the Significant Residual Impact Guideline, Department of State Development, Infrastructure and Planning, 2014. In this regard, it is noted the SARA pre-lodgement advice states:

- *The Significant Residual Impact Guideline identifies that 'rehabilitation works such as revegetation may help to prevent or reduce overall environmental harm and degradation, and the likelihood of a Significant Residual Impact (SRI)'. The likely and unlikely SRI criteria are provided as examples only, and the list is not exclusive. Should rehabilitation/revegetation be proposed for a development of this nature, the application would need to provide detailed information to confirm that the extent proposed is sufficient to maintain the current extent of vegetation.*
- *The revegetation/rehabilitation area should be of the same regional ecosystem description for which is proposed to be cleared or be capable of being mapped as such in the future on successful implementation of a management plan designed to achieve that performance outcome. The revegetation/rehabilitation areas would be legally secured through the voluntary declaration process and would be a condition of approval if the development application is supported.*

It is understood revegetation works will be undertaken to prevent or reduce overall environmental harm and degradation, and the likelihood of an SRI to MSES, including vegetation within a defined distance from the defining banks of a relevant watercourse or relevant drainage feature, in accordance with the above advice and in further consultation with DoR. It is expected this would involve the rehabilitation and legal security of an appropriately sized and located area of vegetation, under the guidance of an approved management plan, in conjunction with rehabilitation activities proposed to mitigate impacts on Category C/R vegetation (see below) and protected wildlife habitat (see **Section 3.3**), as necessary.

In terms of Category C and Category R regulated vegetation, Schedule 1, Part 2(i) of the *Planning Regulation 2017* indicates the clearing of regulated regrowth vegetation (other than in a category A area) for an extractive industry in a KRA meets the definition of exempt clearing.

It is understood the Study Site is not within a Key Resource Area (KRA) although the available resource would meet the KRA criteria. If a KRA designation is not applicable, review of the proposed footprint against *Table 1 Clearing Requirements* of the ADVCC for Extractive Industry indicates the proposed clearing of Category C and Category R regulated vegetation for the proposed quarry pits may exceed one or more specified area thresholds, such that an exchange area may need to be legally secured and managed until it achieves remnant status. Any necessary exchange area would be provided in conjunction with rehabilitation activities proposed to mitigate impacts on remnant vegetation within a defined distance from the defining banks of a relevant watercourse / drainage feature, as outlined above.

PO6 of State Code 22: Environmentally relevant activities also requires development to avoid impacts on category C areas of vegetation and category R areas of vegetation, or minimise impacts after demonstrating avoidance is not reasonably possible. In this case, it is noted that:

- extractive resources are both finite in extent and fixed in location as a result of fortuitous geological events, and the resource to be extracted at Midgee Quarry is associated with the steeper topography on site, which is an area that has likely avoided a high level of historical clearing due to its limitations for use as grazing land (steeper access and poorer soils comprising rocky outcrops). It is understood that areas of the site have been subject to historical disturbance and vegetation clearing, and these areas have been left to revegetate (i.e. Cat C area west of current extraction area)
- while disturbance of the area cannot be avoided by virtue of deposit location, an exchange area will be established pursuant to the ADVCC code, thereby minimising the impact of the clearing
- retained vegetation will be managed under the direction of the site Environmental Management Plan to mitigate impacts from adjacent quarrying activities.

3.2 WATERWAYS FOR WATERWAY BARRIER WORKS

As shown in **Figure 3.1,** the Study Site contains "low value" watercourses that are mapped as Waterways for Waterway Barrier Works by the Department of Agriculture and Fisheries (DAF).

Ground-truthing during the recent field survey has determined that the function of the mapped waterway traversing the north-western portion of proposed Pit 2 as a passage for fish is highly doubtful, as detailed in **Appendix 6**, and DAF have confirmed that this drainage feature does not provide for fish passage.

As outlined in **Section 3.1**, it is also apparent that the mapping of the fish passage waterway within the eastern portion of proposed Pit 2 is an error, given this feature no longer occurs in this part of the site (**Image 1**).

Consequently, the proposed development will not impact upon Waterways for Waterway Barrier Works.

3.3 PROTECTED WILDLIFE HABITAT

MSES mapping indicates protected wildlife habitat for endangered /vulnerable species occurs within the Study Site (refer **Appendix 2**). This mapping relates to records for Squatter Pigeon and wildlife habitat suitability modelling for Ornamental Snake, and corresponds with Essential Habitat mapping for these species to the east of the proposed footprint (**Figure 3.1**).

In terms of fauna, protected wildlife habitat for endangered /vulnerable species includes an area of land used by an endangered /vulnerable animal for foraging, roosting, nesting or breeding. As outlined in **Section 3.1**, Squatter Pigeon was confirmed to occur on the Study Site, such that protected wildlife habitat for this species is confirmed as occurring on the Study Site. Conversely, the apparent absence of seasonal wetlands and gilgai habitat with cracking clay indicates Ornamental Snake is unlikely to occur.

As indicated in the likelihood of occurrence assessment results in **Appendix 7**, other fauna species listed as threatened under the NC Act that have the potential to occur on the Study Site include White-throated Needletail (Vulnerable), Curlew Sandpiper *Calidris ferruginea* (Endangered), Australian Painted Snipe *Rostratula australis* (Vulnerable) and Koala (Vulnerable).

White-throated Needletail is an aerial migrant species that is unlikely to be impacted by terrestrial development.

Curlew Sandpiper and Australian Painted Snipe could occur as a rare visitors to man-made dams within the Study Site, although no natural wetland habitat for these species will be impacted.

No Koalas were recorded during diurnal surveys and nocturnal spotlighting, and no scats or tree scratches likened to this species were recorded. The majority of the proposed impact area does not contain preferred food tree species for Koala, and this species is considered unlikely to regularly utilise the proposed impact area.

Legislative Implications

The proposed development will be subject to assessment against State Code 22: Environmentally relevant activities, PO7 of which requires any acceptable, significant residual impacts to relevant MSES (including protected wildlife habitat) to be offset in accordance with the *Environmental Offsets Act 2014*.

The Significant Residual Impact Guideline, Department of State Development, Infrastructure and Planning, 2014 indicates an action is likely to have a significant impact on habitat for endangered and vulnerable wildlife if the action will:

- lead to a long-term decrease in the size of a local population; or
- reduce the extent of occurrence of the species; or
- fragment an existing population; or
- result in genetically distinct populations forming as a result of habitat isolation; or
- result in invasive species that are harmful to an endangered or vulnerable species becoming established in the endangered or vulnerable species' habitat; or
- introduce disease that may cause the population to decline, or
- interfere with the recovery of the species; or
- cause disruption to ecologically significant locations (breeding, feeding, nesting, migration or resting sites) of a species.

It is noted that none of the protected wildlife habitat mapped by the State will be impacted, although Squatter Pigeon is known to utilise the proposed impact area (refer **Figure 3.1**).

The southern subspecies of Squatter Pigeon occurs mainly in dry grassy eucalypt woodlands, open forests and scrub that are (Commonwealth of Australia 2021):

- open-forest to woodland communities mostly dominated in the overstorey by *Eucalyptus, Corymbia, Acacia* or *Callitris* species, with gravelly, sandy or loamy soils and patchy, relatively sparse (<33%) tussock-grassy understories,
- remnant, regrowth or partly modified vegetation communities, and

- within 3 km of a suitable, permanent or seasonal waterbody or watercourse, since the birds drink daily; birds breed within 1 km of a suitable water source.

Although foraging and breeding habitat is described as known to occur on well-draining, sandy or loamy soils on low, gently sloping, flat to undulating plains and foothills (i.e. Queensland Regional Ecosystem Land Zone 5), and lateritic (duplex) soils on low 'jump-ups' and escarpments (i.e. Land Zone 7) (Commonwealth of Australia 2021), analyses of high precision records show the species also likely forages in habitats on other land zones, particularly Land Zones 3 and 10, and the majority of nests were on land zone 3, with others on land zones 5, 8, 9 and 10 (BAAM 2019).

It is noted that the State's mapping of protected wildlife habitat (and essential habitat) for this species within the Study Site is largely restricted to vegetation on land zone 3.

Squatter Pigeons dust-bathe and are often encountered on dirt tracks and in areas of bare soil denuded of ground cover by livestock (Higgins and Davies 1996). However, the birds do not move far from woodland trees that provide protection from predatory birds, and do not typically forage further than 100 m from remnant trees or patches of wooded habitat (Commonwealth of Australia 2021).

This information is consistent with observations made during the current field survey, which recorded Squatter Pigeon on or near lower-lying, alluvial substrates (land zone 3) and in close proximity to onsite dams. The birds were also recorded in or near areas of remnant RE 11.11.15, although this vegetation would typically be used more for shelter and dispersal rather than for foraging or breeding. In this case, the more fertile, lower lying areas on land zone 3 have been historically cleared for grazing and currently comprise mainly regrowth and non-remnant vegetation with sparser canopy cover, such that the areas of remnant RE 11.11.15 provide the best cover for sheltering purposes within the Study Site.

It is understood revegetation works will be undertaken to prevent or reduce overall environmental harm and degradation, and the likelihood of an SRI to MSES, including protected wildlife habitat for Squatter Pigeon. It is expected this would involve the rehabilitation and legal security of an appropriately sized and located area of vegetation, under the guidance of an approved management plan, in conjunction with rehabilitation activities proposed to mitigate impacts on remnant vegetation within a defined distance from the defining banks of a relevant watercourse / drainage feature and Category C/R vegetation (see **Section 3.1**), as necessary.

No other potentially occurring threatened species is expected to rely on the Study Site to such an extent that the removal of potential habitat will result in a significant impact.

4.0 OTHER STATE ENVIRONMENTAL MATTERS

4.1 NATURE CONSERVATION ACT

4.1.1 Protected Plants

The Study Site is not mapped as occurring within or containing a high risk area on the State's protected plants flora survey trigger map (**Appendix 2**), and the field survey did not record any flora species listed as threatened or near threatened under the NC Act)within the Study Site. Consequently, an NC Act protected plants clearing permit will not need to be obtained prior to the clearing of native vegetation from the Study Site.

4.1.2 Animal Breeding Places

No active animal breeding places were recorded during the field survey. However, there may be breeding places for native fauna, including certain EVNT species (e.g. Tusked Frog *Adelotus brevis*, listed as Vulnerable under the NC Act), as well as Least Concern species such as common frog species, nesting birds and possums, present within the Study Site at certain times of the year.

Under the NC Act, any project activities that are required to tamper with a confirmed native animal breeding place in order to complete the scope of works must be undertaken in accordance with a Species Management Program (SMP) approved by DES.

DES provides two SMP templates, depending on the identified protected animals. The SMP "low risk of impacts" relates to protected animals classed as Least Concern under NC Act where the impacts are unlikely to affect broader population. The SMP "high risk of impacts" relates to protected animals identified as EVNT, Special Least Concern or Least Concern Colonial Breeder species, where the broader population is at a greater risk from impacts.

As breeding places for native fauna may be impacted, subject to the timing of works, it is recommended all wet areas and trees to be removed are inspected prior to removal to determine if any active animal breeding places are present and any necessary SMP is obtained prior to works, as advised by DES.

4.2 BIOSECURITY ACT 2014

4.2.1 State Restricted Weeds

Restricted invasive weed species listed as Category 3 restricted invasive plants under the Queensland *Biosecurity Act 2014* that were recorded on the Study Site include:

- Chinee Apple *Ziziphus mauritiana;*
- Lantana *Lantana camara*;
- Creeping Lantana *Lantana montevidensis;*
- Prickly Pear *Opuntia tomentosa;* and
- Prickly Acacia *Acacia nilotica.*

These Category 3 restricted invasive plants are species that are already established in Queensland and seriously threaten Queensland's primary industries, natural environment, livestock, human health and/or people's livelihoods. In accordance with the *Biosecurity Act 2014*, Category 3 restricted matters must not be distributed (i.e. released into the environment) unless the distribution or disposal is authorised in a regulation or under a permit. More generally, landowners are responsible for taking all reasonable and practical steps to minimise the risks associated with invasive plants under their control.

5.0 MATTERS OF LOCAL ENVIRONMENTAL SIGNIFICANCE (MLES)

The Rockhampton Regional Council has mapped MLES (**Appendix 3**) over the Study Site, which trigger the application of the *Biodiversity Areas Overlay Code*.

The purpose of this code is to protect, rehabilitate and manage areas of environmental significance and the ecological processes and biodiversity values of terrestrial and aquatic ecosystems, these being:

- land mapped as containing matters of state or local environmental significance;
- a biodiversity corridor or wildlife habitat; and
- a wetland or waterway and its buffer area.

Watercourses:

Council mapped waterways appear to reflect those mapped as Waterways for Waterway Barrier Works by DAF, as shown on **Figure 3.1**.

The Biodiversity Areas Overlay Code states that, for areas where environmental values have been mapped but are no longer present, a report certified by an appropriately qualified person that the development site does not contain the matter of environmental significance will be required.

As outlined in **Sections 3.1 and 3.2**, and **Appendix 6**, neither of the waterways mapped within the proposed footprint provide any notable ecological values in terms of fish passage or other aquatic or riparian habitat functions, such that the removal of these features is not considered to represent a significance impact upon MLES.

Biodiversity Corridor:

A Biodiversity Corridor is mapped through the eastern area of the Study Site, but will not be impacted by the proposed development.

MLES General:

MLES General reflects State-mapped, Least Concern remnant vegetation, which will be impacted by the proposed development.

Pre-lodgement advice from Rockhampton Regional Council states:

- *The site is affected by the Biodiversity Overlay. An assessment of these matters will be required. Biodiversity offsets will not be triggered.*

It is understood revegetation works will be undertaken to prevent or reduce overall environmental harm and degradation, and the likelihood of an SRI to MSES and MLES. It is expected this would involve the rehabilitation and legal security of an appropriately sized and located area of vegetation, under the guidance of an approved management plan, in conjunction with rehabilitation activities proposed to mitigate impacts on MSES (see **Sections 3.1 and 3.3**), as necessary.

6.0 REFERENCES

Atlas of Living Australia (ALA) (2021). Found at: https://www.ala.org.au/

BAAM (2019). Technical memorandum re EPBC 2004/1770 Poitrel Squatter Pigeon Offset Management Plan (OMP). Technical memorandum prepared by Biodiversity Assessment and Management Pty Ltd for BMC.

Commonwealth of Australia (2021). Species Profile and Threats Database, Department of the Environment, Canberra. Available from: http://www.environment.gov.au/sprat.

Higgins, P.J. and Davies, S.J.J.F. (eds.) (1996). *Handbook of Australian, New Zealand and Antarctic birds,* Vol. 3, *Snipe to pigeons.* Oxford University Press, Melbourne.

Neldner, V.J., Wilson, B.A., Dillewaard, H.A., Ryan, T.S., Butler, D.W., McDonald, W.J.F, Addicott, E.P. and Appelman, C.N. (2019). *Methodology for survey and mapping of regional ecosystems and vegetation communities in Queensland.* Version 5.0. Updated March 2019. Queensland Herbarium, Queensland Department of Environment and Science, Brisbane.

APPENDIX 1

Database Search Results

Queensland Government

WildNet species list

Search Criteria: Species List for a Specified Point
Species: All
Type: All
Queensland status: Rare and threatened species
Records: Confirmed
Date: Since 1980
Latitude: -23.4916
Longitude: 150.5290
Distance: 10
Email: shelley@baamecology.com
Date submitted: Wednesday 27 Oct 2021 14:08:52
Date extracted: Wednesday 27 Oct 2021 14:10:03

The number of records retrieved = 5

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Information about your Species lists request is logged for quality assurance, user support and product enhancement purposes only.
The information provided should be appropriately acknowledged as being derived from WildNet database when it is used. As the WildNet Program is still in a process of collating and vetting data, it is possible the information given is not complete. Go to the WildNet database webpage (https://www.qld.gov.au/environment/plants-animals/species-information/wildnet) to find out more about WildNet and where to access other WildNet information products approved for publication. Feedback about WildNet species lists should be emailed to wildlife.online@des.qld.gov.au.

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	birds	Columbidae	*Geophaps scripta scripta*	squatter pigeon (southern subspecies)		V	V	1
animals	birds	Rostratulidae	*Rostratula australis*	Australian painted snipe		E	E	2
animals	birds	Scolopacidae	*Calidris ferruginea*	curlew sandpiper		CR	CE	1
animals	reptiles	Elapidae	*Hemiaspis damelii*	grey snake		E		3
plants	land plants	Cycadaceae	*Cycas megacarpa*			E	E	2/2

CODES

I - Y indicates that the taxon is introduced to Queensland and has naturalised.

Q - Indicates the Queensland conservation status of each taxon under the *Nature Conservation Act 1992.*
The codes are Extinct (EX), Extinct in the Wild (PE), Critically Endangered (CR), Endangered (E), Vulnerable (V), Near Threatened (NT), Special Least Concern (SL) and Least Concern (C).

A - Indicates the Australian conservation status of each taxon under the *Environment Protection and Biodiversity Conservation Act 1999.*
The values of EPBC are Extinct (EX), Extinct in the Wild (XW), Critically Endangered (CE), Endangered (E), Vulnerable (V) and Conservation Dependent (CD).

Records - The first number indicates the total number of records of the taxon (wildlife records and species listings for selected areas).
This number is output as 99999 if it equals or exceeds this value. A second number located after a / indicates the number of specimen records for the taxon.
This number is output as 999 if it equals or exceeds this value.

APPENDIX 2

Matters of State Environmental Significance Mapping

Queensland Government

Department of Environment and Science

Environmental Reports

Matters of State Environmental Significance

For the selected area of interest

Environmental Reports - General Information

The Environmental Reports portal provides for the assessment of selected matters of interest relevant to a user specified location, or area of interest (AOI). All area and derivative figures are relevant to the extent of matters of interest contained within the AOI unless otherwise stated. Please note, if a user selects an AOI via the "central coordinates" option, the resulting assessment area encompasses an area extending for a 2km radius from the point of interest.

All area and area derived figures included in this report have been calculated via reprojecting relevant spatial features to Albers equal-area conic projection (central meridian = 146, datum Geocentric Datum of Australia 1994). As a result, area figures may differ slightly if calculated for the same features using a different co-ordinate system.

Figures in tables may be affected by rounding.

The matters of interest reported on in this document are based upon available state mapped datasets. Where the report indicates that a matter of interest is not present within the AOI (e.g. where area related calculations are equal to zero, or no values are listed), this may be due either to the fact that state mapping has not been undertaken for the AOI, that state mapping is incomplete for the AOI, or that no values have been identified within the site.

The information presented in this report should be considered as a guide only and field survey may be required to validate values on the ground.

Please direct queries about these reports to: Planning.Support@des.qld.gov.au

Disclaimer

Whilst every care is taken to ensure the accuracy of the information provided in this report, the Queensland Government makes no representations or warranties about its accuracy, reliability, completeness, or suitability, for any particular purpose and disclaims all responsibility and all liability (including without limitation, liability in negligence) for all expenses, losses, damages (including indirect or consequential damage) and costs which the user may incur as a consequence of the information being inaccurate or incomplete in any way and for any reason.



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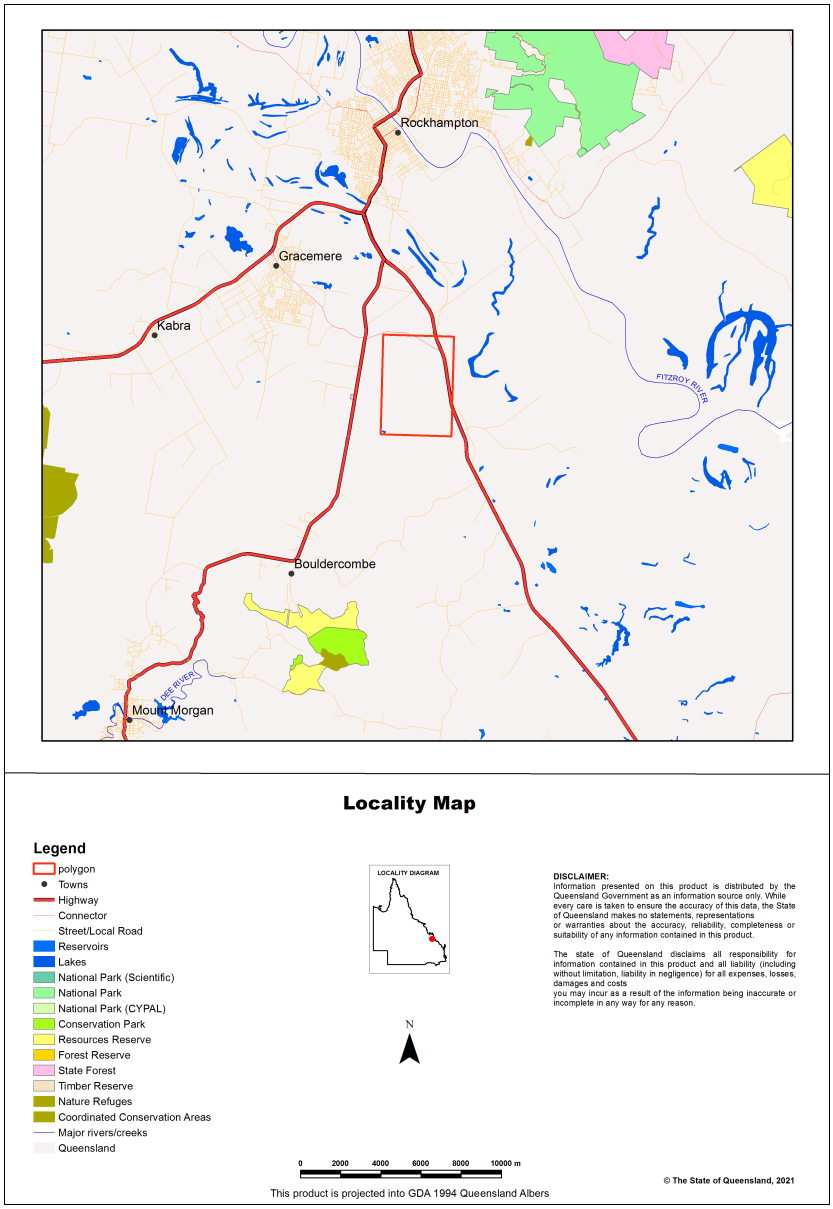
Assessment Area Details

The following table provides an overview of the area of interest (AOI) with respect to selected topographic and environmental values.

Table 1: Summary table, details for AOI

Size (ha)	1,750.87
Local Government(s)	Rockhampton Regional
Bioregion(s)	Brigalow Belt
Subregion(s)	Mount Morgan Ranges, Marlborough Plains
Catchment(s)	Fitzroy



Matters of State Environmental Significance (MSES)

MSES Categories

Queensland's State Planning Policy (SPP) includes a biodiversity State interest that states:

'The sustainable, long-term conservation of biodiversity is supported. Significant impacts on matters of national or state environmental significance are avoided, or where this cannot be reasonably achieved; impacts are minimised and residual impacts offset.'

The MSES mapping product is a guide to assist planning and development assessment decision-making. Its primary purpose is to support implementation of the SPP biodiversity policy. While it supports the SPP, the mapping does not replace the regulatory mapping or environmental values specifically called up under other laws or regulations. Similarly, the SPP biodiversity policy does not override or replace specific requirements of other Acts or regulations.

The SPP defines matters of state environmental significance as:

- Protected areas (including all classes of protected area except coordinated conservation areas) under the *Nature Conservation Act 1992* ;

- Marine parks and land within a 'marine national park', 'conservation park', 'scientific research', 'preservation' or 'buffer' zone under the *Marine Parks Act 2004* ;

- Areas within declared fish habitat areas that are management A areas or management B areas under the Fisheries Regulation 2008;

- Threatened wildlife under the *Nature Conservation Act 1992* and special least concern animals under the Nature Conservation (Wildlife) Regulation 2006;

- Regulated vegetation under the *Vegetation Management Act 1999* that is:

    • Category B areas on the regulated vegetation management map, that are 'endangered' or 'of concern' regional ecosystems;

    • Category C areas on the regulated vegetation management map that are 'endangered' or 'of concern' regional ecosystems;

    • Category R areas on the regulated vegetation management map;

    • Regional ecosystems that intersect with watercourses identified on the vegetation management watercourse and drainage feature map;

    • Regional ecosystems that intersect with wetlands identified on the vegetation management wetlands map;

- Strategic Environmental Areas under the *Regional Planning Interests Act 2014* ;

- Wetlands in a wetland protection area of wetlands of high ecological significance shown on the Map of Queensland Wetland Environmental Values under the Environment Protection Regulation 2019;

- Wetlands and watercourses in high ecological value waters defined in the Environmental Protection (Water) Policy 2009, schedule 2;

- Legally secured offset areas.

MSES Values Present

The MSES values that are present in the area of interest are summarised in the table below:

Table 2: Summary of MSES present within the AOI

1a Protected Areas- estates	0.0 ha	0.0 %
1b Protected Areas- nature refuges	0.0 ha	0.0 %
1c Protected Areas- special wildlife reserves	0.0 ha	0.0 %
2 State Marine Parks- highly protected zones	0.0 ha	0.0 %
3 Fish habitat areas (A and B areas)	0.0 ha	0.0 %
4 Strategic Environmental Areas (SEA)	0.0 ha	0.0 %
5 High Ecological Significance wetlands on the map of Referable Wetlands	1.62 ha	0.1%
6a High Ecological Value (HEV) wetlands	0.0 ha	0.0 %
6b High Ecological Value (HEV) waterways **	0.0 km	Not applicable
7a Threatened (endangered or vulnerable) wildlife	94.38 ha	5.4%
7b Special least concern animals	5.62 ha	0.3%
7c i Koala habitat area - core (SEQ)	0.0 ha	0.0 %
7c ii Koala habitat area - locally refined (SEQ)	0.0 ha	0.0 %
8a Regulated Vegetation - Endangered/Of concern in Category B (remnant)	59.14 ha	3.4%
8b Regulated Vegetation - Endangered/Of concern in Category C (regrowth)	21.26 ha	1.2%
8c Regulated Vegetation - Category R (GBR riverine regrowth)	44.89 ha	2.6%
8d Regulated Vegetation - Essential habitat	96.25 ha	5.5%
8e Regulated Vegetation - intersecting a watercourse **	18.4 km	Not applicable
8f Regulated Vegetation - within 100m of a Vegetation Management Wetland	5.63 ha	0.3%
9a Legally secured offset areas- offset register areas	0.0 ha	0.0 %
9b Legally secured offset areas- vegetation offsets through a Property Map of Assessable Vegetation	0.0 ha	0.0 %

Additional Information with Respect to MSES Values Present

MSES - State Conservation Areas

1a. Protected Areas - estates

(no results)

1b. Protected Areas - nature refuges

(no results)

1c. Protected Areas - special wildlife reserves

(no results)

2. State Marine Parks - highly protected zones

(no results)

3. Fish habitat areas (A and B areas)

(no results)

Refer to **Map 1 - MSES - State Conservation Areas** for an overview of the relevant MSES.

MSES - Wetlands and Waterways

4. Strategic Environmental Areas (SEA)

(no results)

5. High Ecological Significance wetlands on the Map of Queensland Wetland Environmental Values

Natural wetlands that are 'High Ecological Significance' (HES) on the Map of Queensland Wetland Environmental Values are present.

6a. Wetlands in High Ecological Value (HEV) waters

(no results)

6b. Waterways in High Ecological Value (HEV) waters

(no results)

Refer to **Map 2 - MSES - Wetlands and Waterways** for an overview of the relevant MSES.

MSES - Species

7a. Threatened (endangered or vulnerable) wildlife

Values are present

7b. Special least concern animals

Values are present

7c i. Koala habitat area - core (SEQ)

Not applicable

7c ii. Koala habitat area - locally refined (SEQ)

Not applicable

Threatened (endangered or vulnerable) wildlife habitat suitability models

Species	Common name	NCA status	Presence
Boronia keysii		V	None
Calyptorhynchus lathami	Glossy black cockatoo	V	None
Casuarius casuarius johnsonii	Sthn population cassowary	E	None
Crinia tinnula	Wallum froglet	V	None
Denisonia maculata	Ornamental snake	V	Core
Litoria freycineti	Wallum rocketfrog	V	None
Litoria olongburensis	Wallum sedgefrog	V	None
Melaleuca irbyana		E	None
Petaurus gracilis	Mahogany Glider	E	None
Petrogale persephone	Proserpine rock-wallaby	E	None
Phascolarctos cinereus	Koala - outside SEQ*	V	None
Pezoporus wallicus wallicus	Eastern ground parrot	V	None
Taudactylus pleione	Kroombit tinkerfrog	E	None
Xeromys myoides	Water Mouse	V	None

**For koala model, this includes areas outside SEQ. Check 7c SEQ koala habitat for presence/absence.*

Threatened (endangered or vulnerable) wildlife species records

Scientific name	Common name	NCA status	EPBC status	Migratory status
Geophaps scripta scripta	squatter pigeon (southern subspecies)	V	V	

Special least concern animal species records

Scientific name	Common name	Migratory status
Gallinago hardwickii	Latham's snipe	M-J/R/B/E

**Nature Conservation Act 1992 (NCA) Status- Endangered (E), Vulnerable (V) or Special Least Concern Animal (SL). Environment Protection and Biodiversity Conservation Act 1999 (EPBC) status: Critically Endangered (CE) Endangered (E), Vulnerable (V)*

Migratory status (M) - China and Australia Migratory Bird Agreement (C), Japan and Australia Migratory Bird Agreement (J), Republic of Korea and Australia Migratory Bird Agreement (R), Bonn Migratory Convention (B), Eastern Flyway (E)

To request a species list for an area, or search for a species profile, access Wildlife Online at:

https://www.qld.gov.au/environment/plants-animals/species-list/

Refer to **Map 3a - MSES - Species - Threatened (endangered or vulnerable) wildlife and special least concern animals** and **Map 3b - MSES - Species - Koala habitat area (SEQ)** for an overview of the relevant MSES.

MSES - Regulated Vegetation

For further information relating to regional ecosystems in general, go to:
https://www.qld.gov.au/environment/plants-animals/plants/ecosystems/
For a more detailed description of a particular regional ecosystem, access the regional ecosystem search page at:
https://environment.ehp.qld.gov.au/regional-ecosystems/

8a. Regulated Vegetation - Endangered/Of concern in Category B (remnant)

Regional ecosystem	Vegetation management polygon	Vegetation management status
11.3.25/11.3.4	O-subdom	rem_oc
11.3.4/11.3.2	O-dom	rem_oc
11.3.4/11.3.25	O-dom	rem_oc

8b. Regulated Vegetation - Endangered/Of concern in Category C (regrowth)

Regional ecosystem	Vegetation management polygon	Vegetation management status
11.3.4/11.3.2	O-dom	hvr_oc
11.3.4/11.3.25	O-dom	hvr_oc
11.3.3/11.3.4/11.3.2/11.3.3c/11.3.27x1b	O-dom	hvr_oc

8c. Regulated Vegetation - Category R (GBR riverine regrowth)

Regulated vegetation map category	Map number	RVM rule
R	9051	4
R	9050	4

8d. Regulated Vegetation - Essential habitat

Values are present

8e. Regulated Vegetation - intersecting a watercourse**

A vegetation management watercourse is mapped as present

8f. Regulated Vegetation - within 100m of a Vegetation Management wetland

Regulated vegetation map category	Map number	RVM rule
C	9051	3

Refer to **Map 4 - MSES - Regulated Vegetation** for an overview of the relevant MSES.

MSES - Offsets

9a. Legally secured offset areas - offset register areas

(no results)

9b. Legally secured offset areas - vegetation offsets through a Property Map of Assessable Vegetation

(no results)

Refer to **Map 5 - MSES - Offset Areas** for an overview of the relevant MSES.

Map 1 - MSES - State Conservation Areas

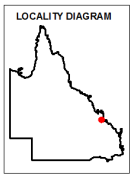


MSES - State Conservation Areas

Area of Interest

- polygon
- Towns
- Freeways/Highways
- Secondary roads
- Major rivers/creeks
- Protected area (estates, nature refuges, special wildlife reserves)
- Declared fish habitat area (A and B areas)
- Marine park (highly protected)

LOCALITY DIAGRAM



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N

0 300 600 900 1200 1500 m

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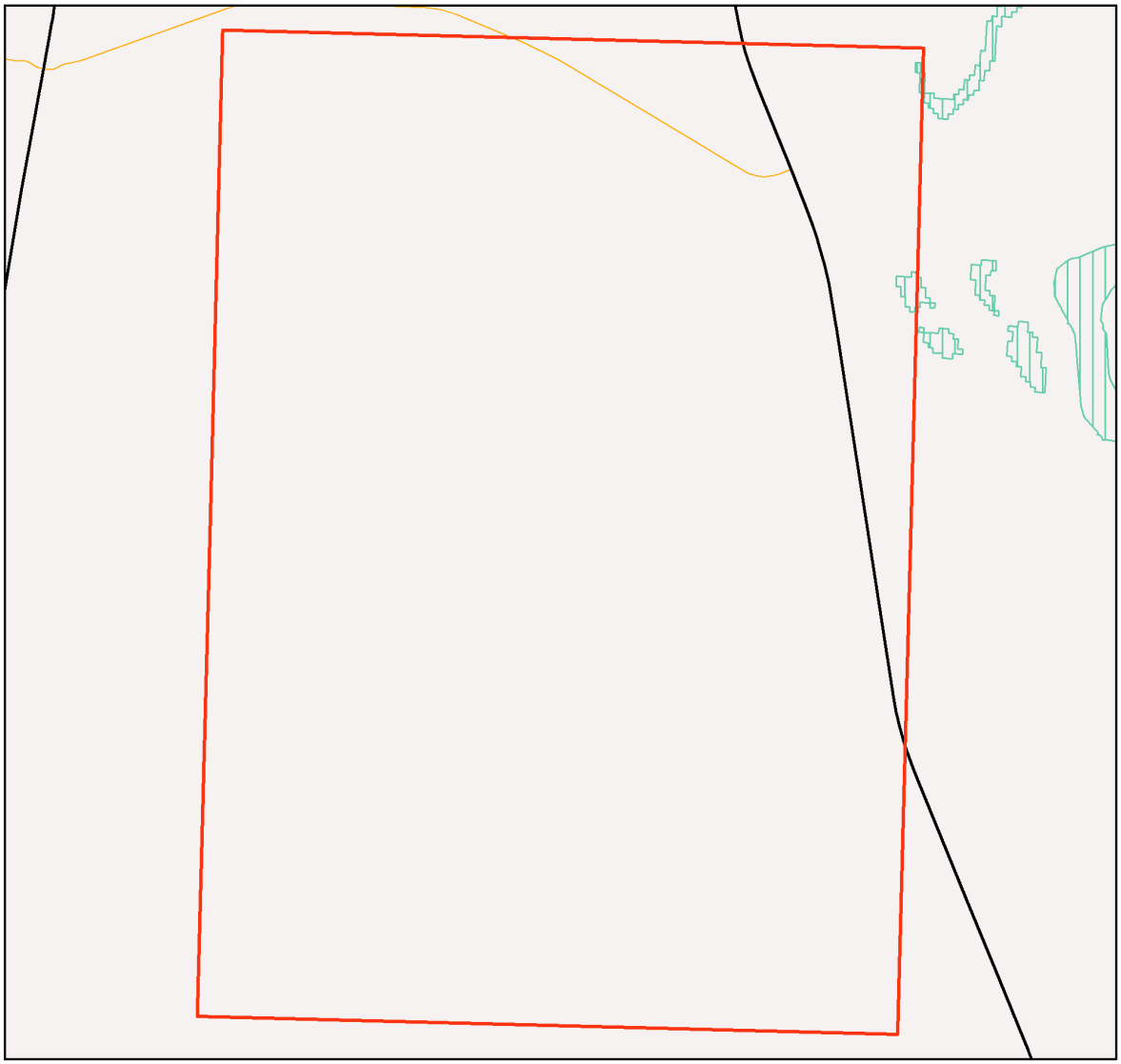
Map 2 - MSES - Wetlands and Waterways

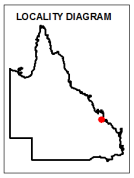


MSES - Wetlands and Waterways

Area of Interest

- polygon
- Towns
- Freeways/Highways
- Secondary roads
- Major rivers/creeks
- Declared high ecological value waters (watercourse)
- Strategic environmental area (designated precinct)
- Declared high ecological value waters (wetland)
- High ecological significance wetlands

LOCALITY DIAGRAM



N

0 300 600 900 1200 1500 m

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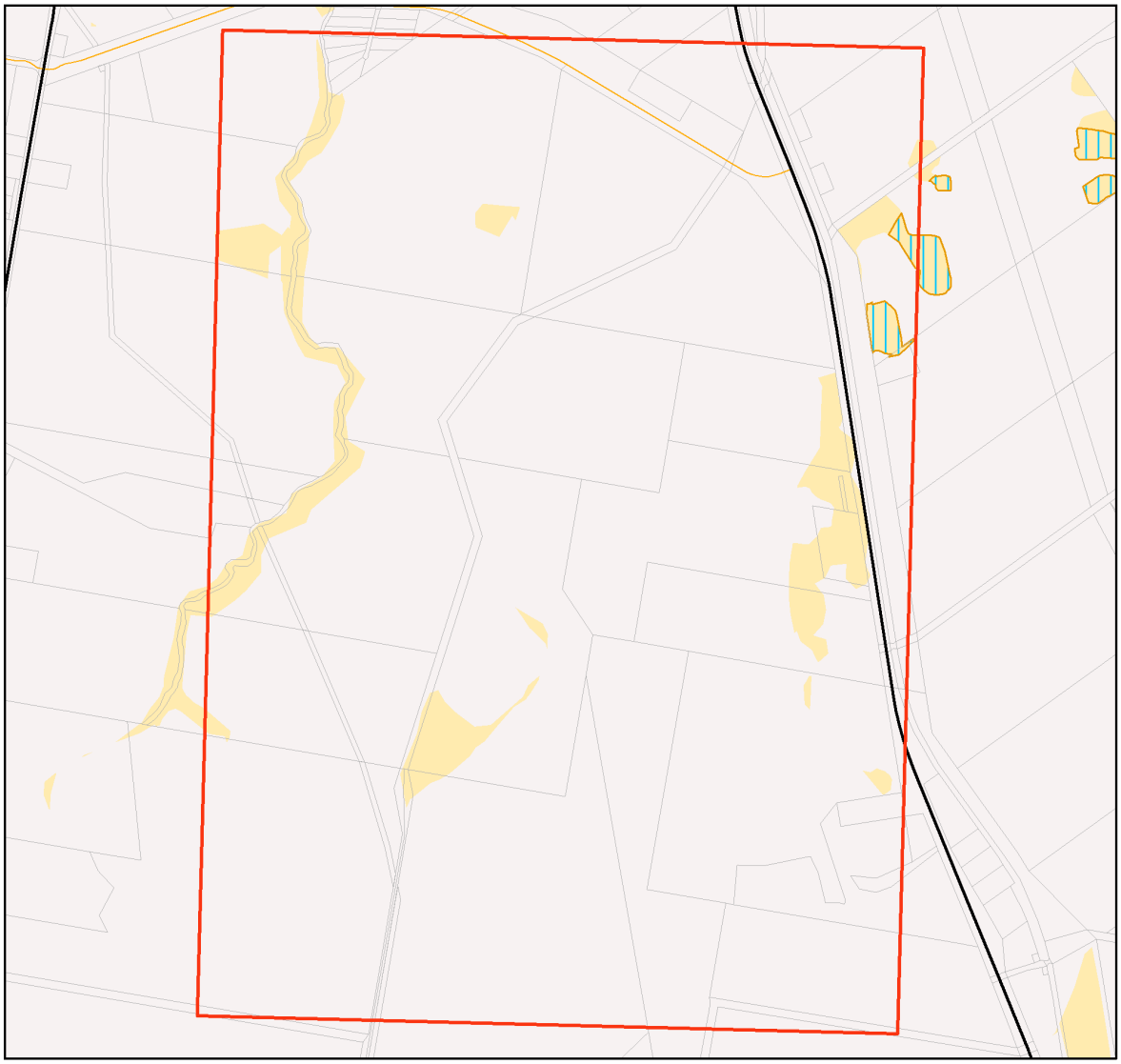
Map 3a - MSES - Species - Threatened (endangered or vulnerable) wildlife and special least concern animals

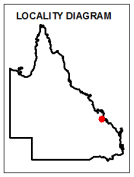


MSES - Species
Threatened (endangered or vulnerable) wildlife and special least concern animals

Area of Interest

- polygon
- Towns
- Freeways/Highways
- Secondary roads
- Major rivers/creeks
- Wildlife habitat (special least concern)
- Wildlife habitat (endangered or vulnerable)

LOCALITY DIAGRAM



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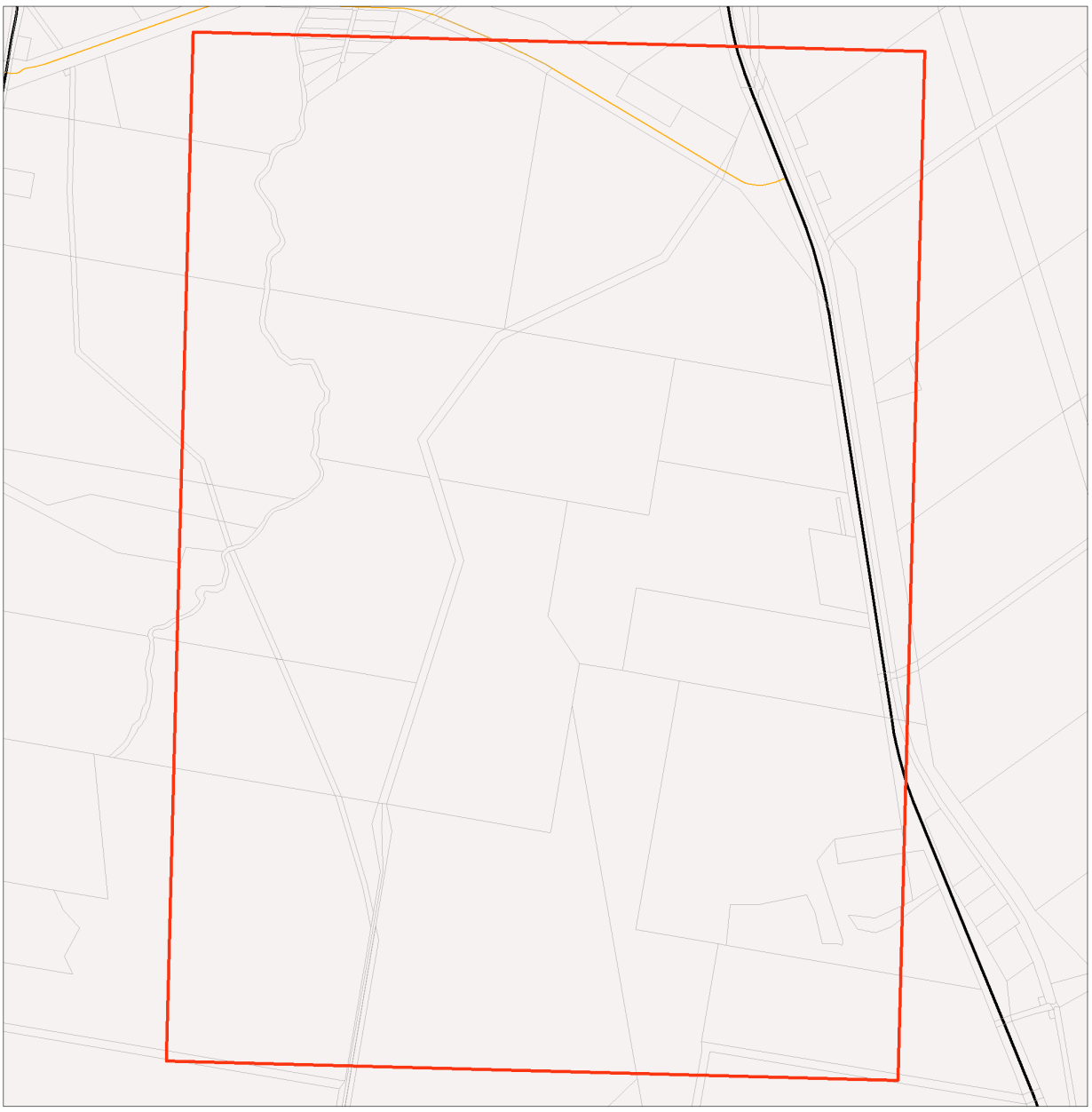
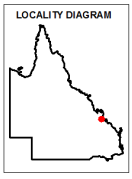
Map 3b - MSES - Species - Koala habitat area (SEQ)



MSES - Species
Koala habitat area (SEQ)

Area of Interest
- polygon
- Towns
- Freeways/Highways
- Secondary roads
- Major rivers/creeks
- Koala habitat area (core)
- Koala habitat area (locally refined)

LOCALITY DIAGRAM



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The represented layers for SEQ 'koala habitat area-core' and 'koala habitat area- locally refined' in MSES are sourced directly from the regulatory mapping under the Nature Conservation (Koala) Conservation Plan 2017. Whilst every effort is made to ensure the information remains current, there may be delays between updating versions. Please refer to the original mapping for the most recent version. See https://environment.des.qld.gov.au/wildlife/animals/living-with/koalas/mapping

The koala habitat mapping within South East Queensland uses regional ecosystem linework compiled at a scale varying from 1:25,000 to 1:100,000. Linework should be used as a guide only. The positional accuracy of regional ecosystem data mapped at a scale of 1:100,000 is +/- 100 metres.

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0 270 540 810 1,080 1,350 m

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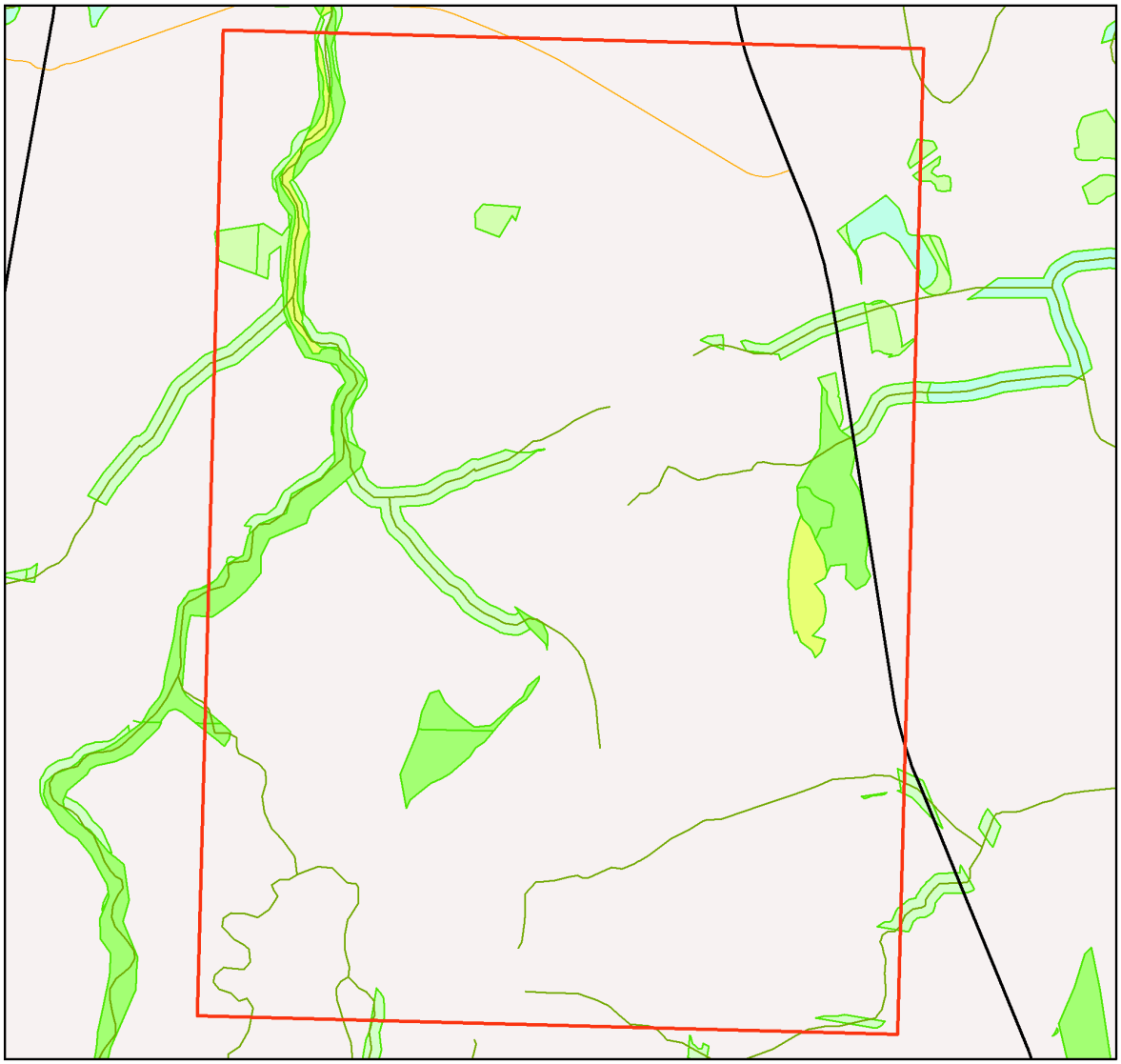
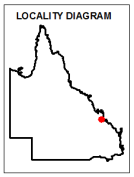
Map 4 - MSES - Regulated Vegetation



MSES - Regulated Vegetation

Area of Interest
- polygon
- Towns
- Freeways/Highways
- Secondary roads
- Major rivers/creeks
- Regulated vegetation (intersecting a watercourse)
- Regulated vegetation (100m from wetland)
- Regulated vegetation (category B - endangered or of concern)
- Regulated vegetation (category C - endangered or of concern)
- Regulated vegetation (category R - GBR riverine)
- Regulated vegetation (essential habitat)



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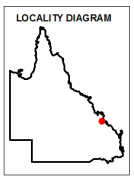
Map 5 - MSES - Offset Areas



MSES - Offsets

Area of Interest

- polygon
- Towns
- Freeways/Highways
- Secondary roads
- Major rivers/creeks
- Legally secured offset area (offset register)
- Legally secured offset area (vegetation offsets)



N

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Appendices

Appendix 1 - Matters of State Environmental Significance (MSES) methodology

MSES mapping is a regional-scale representation of the definition for MSES under the State Planning Policy (SPP). The compiled MSES mapping product is a guide to assist planning and development assessment decision-making. Its primary purpose is to support implementation of the SPP biodiversity policy. While it supports the SPP, the mapping does not replace the regulatory mapping or environmental values specifically called up under other laws or regulations. Similarly, the SPP biodiversity policy does not override or replace specific requirements of other Acts or regulations.

The Queensland Government's "Method for mapping - matters of state environmental significance for use in land use planning and development assessment" can be downloaded from:

http://www.ehp.qld.gov.au/land/natural-resource/method-mapping-mses.html .

Appendix 2 - Source Data

The datasets listed below are available on request from:

http://qldspatial.information.qld.gov.au/catalogue/custom/index.page

- Matters of State environmental significance

Note: MSES mapping is not based on new or unique data. The primary mapping product draws data from a number of underlying environment databases and geo-referenced information sources. MSES mapping is a versioned product that is updated generally on a twice-yearly basis to incorporate the changes to underlying data sources. Several components of MSES mapping made for the current version may differ from the current underlying data sources. To ensure accuracy, or proper representation of MSES values, it is strongly recommended that users refer to the underlying data sources and review the current definition of MSES in the State Planning Policy, before applying the MSES mapping.

Individual MSES layers can be attributed to the following source data available at QSpatial:

MSES layers	**current QSpatial data (http://qspatial.information.qld.gov.au)**
Protected Areas-Estates, Nature Refuges, Special Wildlife Reserves	- Protected areas of Queensland - Nature Refuges - Queensland - Special Wildlife Reserves- Queensland
Marine Park-Highly Protected Zones	Moreton Bay marine park zoning 2008
Fish Habitat Areas	Queensland fish habitat areas
Strategic Environmental Areas-designated	Regional Planning Interests Act - Strategic Environmental Areas
HES wetlands	Map of Queensland Wetland Environmental Values
Wetlands in HEV waters	HEV waters: - EPP Water intent for waters Source Wetlands: - Queensland Wetland Mapping (Current version 5) Source Watercourses: - Vegetation management watercourse and drainage feature map (1:100000 and 1:250000)
Wildlife habitat (threatened and special least concern)	-WildNet database species records - habitat suitability models (various) - SEQ koala habitat areas under the Koala Conservation Plan 2019
VMA regulated regional ecosystems	Vegetation management regional ecosystem and remnant map
VMA Essential Habitat	Vegetation management - essential habitat map
VMA Wetlands	Vegetation management wetlands map
Legally secured offsets	Vegetation Management Act property maps of assessable vegetation. For offset register data-contact DES
Regulated Vegetation Map	Vegetation management - regulated vegetation management map

Appendix 3 - Acronyms and Abbreviations

AOI	- Area of Interest
DES	- Department of Environment and Science
EP Act	- *Environmental Protection Act 1994*
EPP	- Environmental Protection Policy
GDA94	- Geocentric Datum of Australia 1994
GEM	- General Environmental Matters
GIS	- Geographic Information System
MSES	- Matters of State Environmental Significance
NCA	- *Nature Conservation Act 1992*
RE	- Regional Ecosystem
SPP	- State Planning Policy
VMA	- *Vegetation Management Act 1999*

APPENDIX 3

Matters of Local Environmental Significance Mapping

RichTextBox1

Spatial reference

GDA2020_MGA_Zone_56

A4 Page scale at 1: 35,493.00

Printed from RRPS on 08/09/21



Legend

- RRC Mask
- RRC Mask
- Biodiversity Corridors
- MSES - Wildlife Habitat
- Roads3
  - Main roads
  - Major council roads
  - Standard council roads
  - Access roads
  - Private roads
- Property Parcels
- Ocean
- CQ LGA Boundaries

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GDA 2020

Rockhampton Regional Council

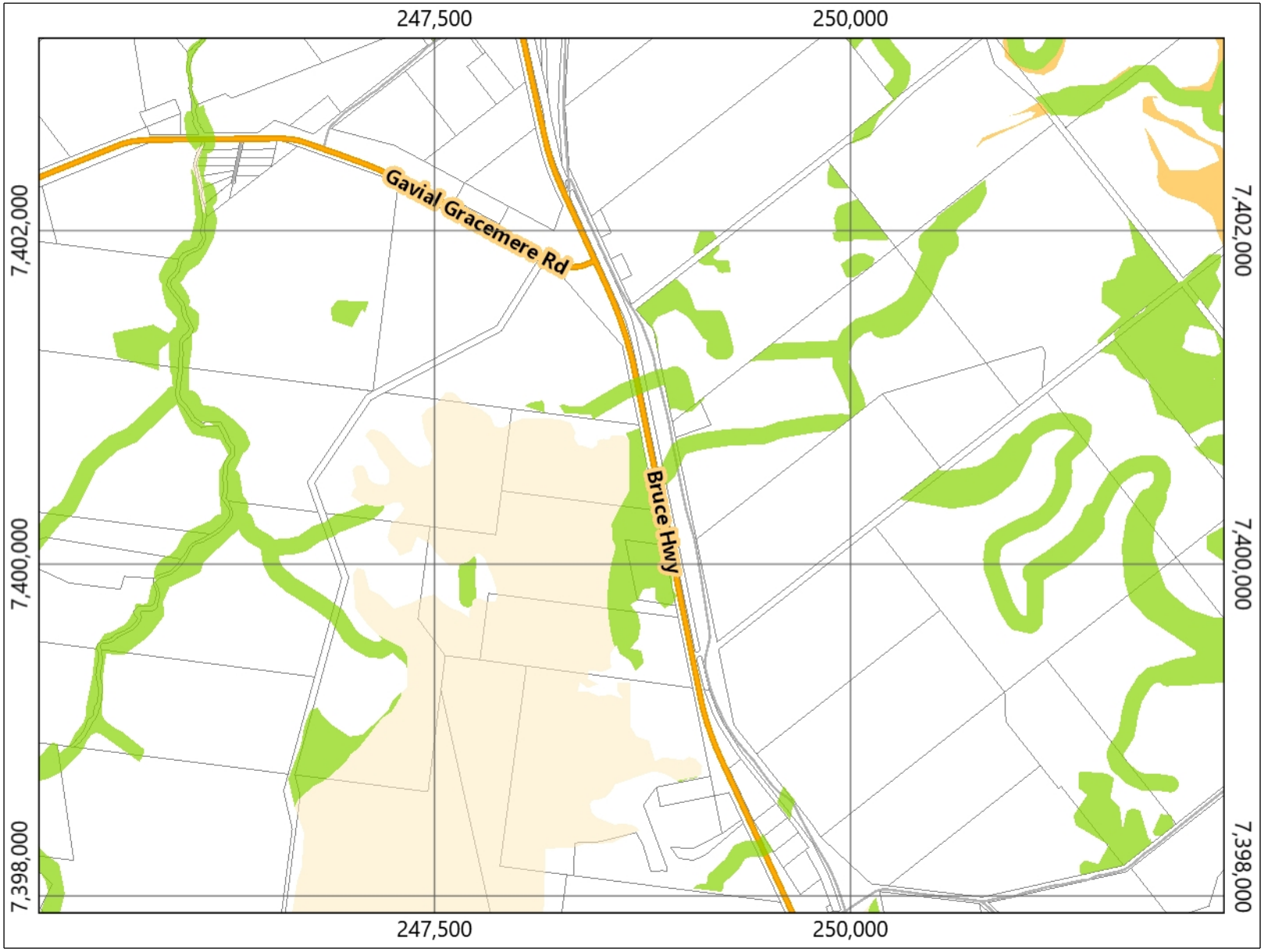
RichTextBox1

Spatial reference

GDA2020_MGA_Zone_56

A4 Page scale at 1: 35,493.00

Printed from RRPS on 08/09/21



Legend

- RRC Mask
- RRC Mask
- MSES
- MLES - High
- MLES - General
- Roads3
  - Main roads
  - Major council roads
  - Standard council roads
  - Access roads
  - Private roads
- Property Parcels
- Ocean
- CQ LGA Boundaries

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RichTextBox1

Spatial reference

GDA2020_MGA_Zone_56

A4 Page scale at 1: 35,492.51

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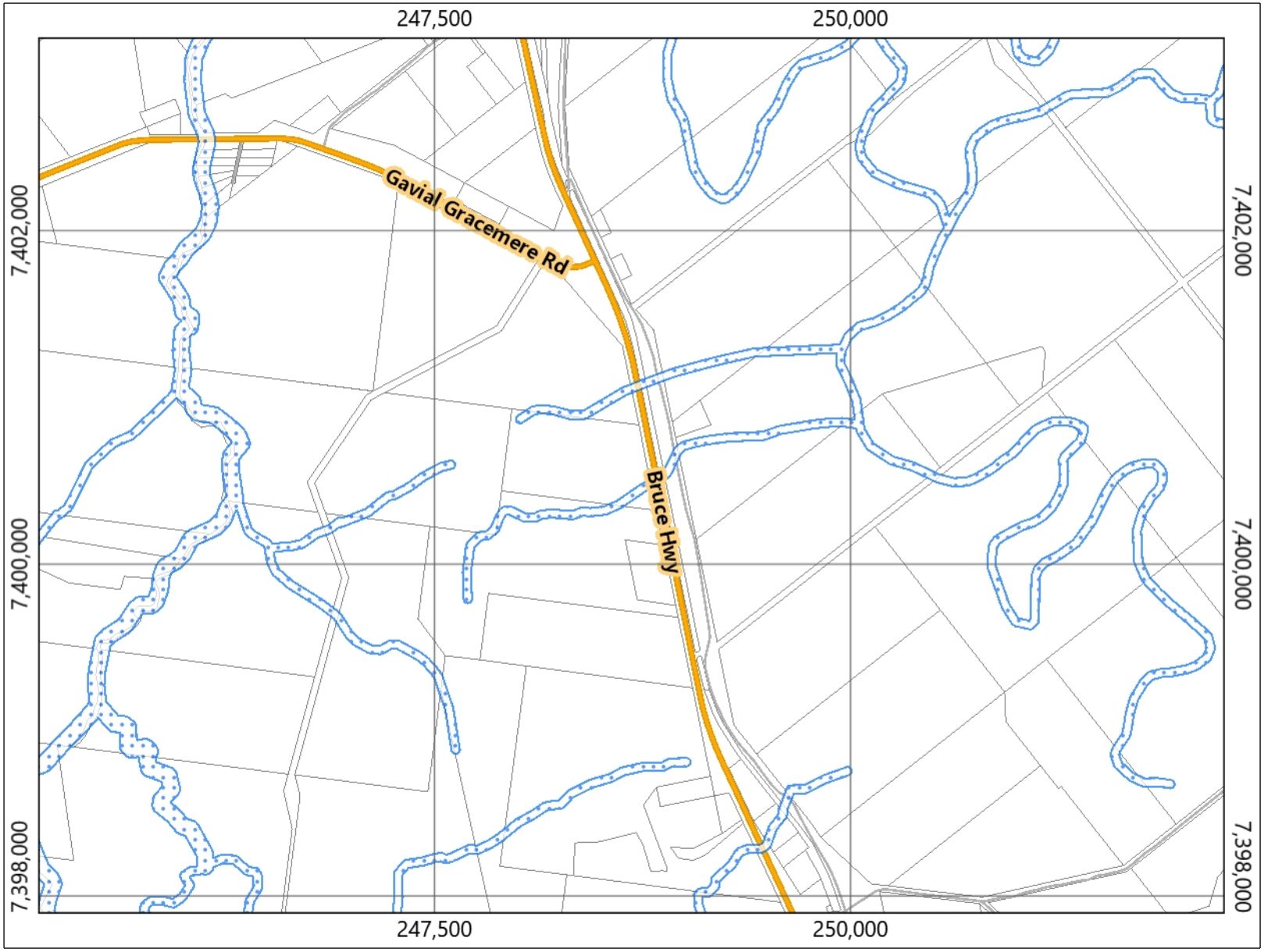

Legend

- RRC Mask
- RRC Mask
- MSES - Waterways
- Waterways
- Roads3
  - Main roads
  - Major council roads
  - Standard council roads
  - Access roads
  - Private roads
- Property Parcels
- Ocean
- CQ LGA Boundaries

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GDA 2020

Rockhampton Regional Council

APPENDIX 4

Flora Survey Data

Site	Habitat description	Representative photo
Q1	**Brief description:** non-remnant. **Canopy (T1):** Very sparse. Height range 7-12m; median height 9m. *Eucalyptus crebra, E.populnea.* **Shrub (S1):** Very sparse. Height range 1-2m; median height 1m. *Ziziphus mauritiana*, Acacia salicina.* **Groundcover:** Dense. Height range 0.1-0.4m; median height 0.1m. *Sida subspicata, Melinis repens*, Salsola kali, Stachytarpheta spp.*, Chloris gayana*, Opuntia tomentosa*. .*	
Q2	**Brief description:** non-remnant. **Canopy (T1):** Very sparse. Height range 7-15m; median height 15m. *Eucalyptus tereticornis, E.populnea, Corymbia tessellaris, C.intermedia* **Sub-canopy (T2):** Very sparse. Height range 3-6m; median height 4m: *Melaleuca viridiflora, Acacia salicina, Santalum lanceolatum.* **Groundcover:** Dense. Height range 1-1.5m; median height 1m. *Sida cordifolia, Melinis repens*, Salsola kali, Stachytarpheta spp.*, Chloris virgata*, Chloris inflata*, Dianella spp., Heteropogon contortus.*	
Q8	**Brief description:** RE11.3.2/11.3.4 (groundtruthed as RE11.3.2) **Canopy (T1):** Mid-dense. Height range 13-17m; median height 15m. *Eucalyptus populnea, E.crebra, E.tereticornis, C.tesselaris,* **Sub-canopy (T2):** Very sparse. Height range 7-9m; median height 8m: *Santalum lanceolatum, E.crebra, Maclura cochinchinensis, Acacia salicina, Acacia spp. .* **Shrub (S1):** Very sparse. Height range 0.5-1m; median height 0.5m. *Coelospermum reticulatum, Alphitonia excelsa, Opuntia tomentosa*, Capparis lasianthos, Lantana camara*, Sida cordifolia, E.populnea, Santalum lanceolatum, Breynia oblongifolia, Grewia latifolia.* *Senna pendula*, Maclura cochinchinensis.* **Groundcover:** Mid-Dense. Height range 0.5-1m; median height 0.3m. *Stachytarpheta spp.*, Lantana montevidensis*, Aristida spp., Glycine spp., Cyperus spp., Cyperus exaltatus, Dianella spp., Heteropogon contortus, Sida cordifolia, Eremophila debilis, Megathyrsus maximus*, Chloris virgata*, Argemone ochroleuca*.* **Potential to be classed as a TEC if below canopy native species diversity meets criteria following a wet season survey**	

Site	Habitat description	Representative photo
Q9	**Brief description:** RE11.3.2/11.3.4 (ground truthed RE11.3.4). **Canopy (T1):** Very sparse to Mid-dense (patchy). Height range 8-14m; median height 14m. *Corymbia tessellaris, E.crebra* **Sub-canopy (T2):** Very sparse. Height range 2-5m; median height 2m: *C.tessellaris, E.crebra, E.populnea.* **Shrub (S1):** Mid-dense. Height range 0.5-1m; median height 0.5m. *Sida subspicata. .* **Groundcover:** Mid-dense. Height range 0.1-0.4m; median height 0.3m. *Stachytarpheta spp.*, Chloris virgata*, Heteropogon contortus, Aristida spp., Megathyrsus maximus*.*	
Q10	**Brief description:** RE11.3.2/11.3.4 (groundtruthed as RE11.3.4) **Canopy (T1):** Mid-dense. Height range 10-16m; median height 15m. *Eucalyptus crebra, E.populnea, C.intermedia, E.tereticornis, C.tesselaris,* **Sub-canopy (T2):** Very sparse. Height range 7-9m; median height 8m: *Acacia salicina, Santalum lanceolatum, E.crebra, E.populnea, Grevillea striata.* **Shrub (S1):** Very sparse. Height range 0.5-1m; median height 0.5m. *Coelospermum reticulatum, Lantana camara*.* **Groundcover:** Mid-dense. Height range 0.1-0.4m; median height 0.3m. *Stachytarpheta spp.*, Chloris virgata*, Heteropogon contortus, Aristida spp., Megathyrsus maximus*.*	
Q11	**Brief description:** Remnant RE11.3.2/11.3.4 (ground truthed as remnant RE11.11.15). **Canopy (T1):** Mid-dense/Sparse. Height range 10-15m; median height 13m. *E.crebra* **Sub-canopy (T2):** Very sparse. Height range 3-6m; median height 4m: *Santalum lanceolatum, E.crebra, Alphitonia excelsa.* **Shrub (S1):** sparse. Height range 0.5-1m; median height 0.5m. *Coelospermum reticulatum, E.crebra, Alphitonia excelsa, Lantana camara*, Sida cordifolia.* **Groundcover:** Mid-dense. Height range 0.1-0.3m; median height 0.3m. *Heteropogon contortus, Stachytarpheta spp.*,*	

Site	Habitat description	Representative photo
Q12	**Brief description:** Remnant RE11.11.15. **Canopy (T1):** Mid-dense/Sparse. Height range 8-14m; median height 13m. *E.crebra* **Sub-canopy (T2):** Very sparse. Height range 4-6m; median height 5m: *Santalum lanceolatum, E.crebra,* **Shrub (S1):** Mid-dense. Height range 0.5-1m; median height 0.5m. *Sida subspicata, E.crebra, Alphitonia excelsa.* **Groundcover:** Mid-dense. Height range 0.1-0.3m; median height 0.3m. *Heteropogon contortus, Stachytarpheta spp.*,*	
Q13	**Brief description:** Remnant RE11.11.15. **Canopy (T1):** Mid-dense/Sparse.median height 20m. *E.crebra* **Sub-canopy (T2):** Very sparse. median height 10m: *E.tereticornis, C.tessellaris, Melaleuca fluviatilis.* **Shrub (S1):** Mid-dense. median height 2m. *Sida subspicata.* **Groundcover:** Mid-dense. median height 1m. *Heteropogon contortus, Melinis repens*, Chloris virgata*, Megathyrsus maximus*.*	
Q14	**Brief description:** Remnant RE11.11.15. **Canopy (T1):** Sparse. Height range 8-14m; median height 12m. *E.crebra, Corymbia erythrophloia* **Sub-canopy (T2):** Very sparse. Height range 4-6m; median height 6m: *Alphitonia excelsa, Acacia disparrima, Coelospermum reticulatum* **Shrub (S1):** Very sparse. Height range 1-2m; median height 1m. *Alphitonia excelsa, Sida subspicata, E.crebra, Lantana camara*, Coelospermum reticulatum, Pandorana pandorana* **Groundcover:** Mid-dense. Height range 0.1-0.3m; median height 0.3m. *Heteropogon contortus, Stachytarpheta spp.*,*	

Site	Habitat description	Representative photo
Q15	**Brief description:** Remnant RE11.11.15. **Canopy (T1):** Sparse. Height range 9-14m; median height 12m. *E.crebra, Corymbia erythrophloia, C.tessellaris.* **Sub-canopy (T2):** Very sparse. Height range 6-8m; median height 7m: *Santalum lanceolatum, E.crebra.* **Shrub (S1):** Very sparse. Height range 1-2m; median height 1m. *E.crebra.* **Groundcover:** Mid-dense. Height range 0.1-0.4m; median height 0.4m. *Heteropogon contortus, Stachytarpheta spp.*,Sida subspicata, Aristida spp., Chloris virgata*, Opuntia tomentosa*.*	
Q16	**Brief description:** Remnant 11.3.2/11.3.4. Dead vegetation, possibly ringbarked. Unlikely to be a natural cause of death. State mapping (RE11.3.2/11.3.4) was incorrect – this area would once have been RE11.11.15 (based on observations of remaining vegetation and vegetation in adjacent land).	
Q17	**Brief description:** Remnant RE11.11.15. **Canopy (T1):** Mid-dense. Height range 16-20m; median height 20m. *E.crebra..* **Sub-canopy (T2):** Very sparse. Height range 6-10m; median height 8m: *Santalum lanceolatum, E.crebra, Acacia decora. .* **Shrub (S1):** Very sparse. Height range 0.5-1m; median height 1m. *E.crebra.* **Groundcover:** Sparse. Height range 0.1-0.2m; median height 0.2m. *Heteropogon contortus, Stachytarpheta spp.*,Sida subspicata, Aristida spp.*	

Site	Habitat description	Representative photo
Q18	**Brief description:** RE11.3.2/11.3.4 (groundtruthed as RE11.3.4) **Canopy (T1):** Sparse. Height range 18-20m; median height 18m. *E.tereticornis,,* **Sub-canopy (T2):** Mid-dense. Height range 8-11m; median height 11m: *E.crebra, E.populnea, C.tessellaris, Melaleuca leucadendron.* **Shrub (S1):** Very sparse. Height range 1-2m; median height 1.5m. *Maclura cochinchinensis, E.tereticornis, E.populnea, E.crebra.* **Groundcover:** Mid-dense. Height range 0.1-0.4m; median height 0.3m. *Stachytarpheta spp.*, Heteropogon contortus, Aristida spp., Sida subspicata.*	
Q19	**Brief description:** Regrowth RE11.11.15. **Canopy (T1):** Very sparse. Height range 9-16m; median height 9m. *E.crebra..* **Sub-canopy (T2):** Very sparse. Height range 2-5m; median height 3m: *Santalum lanceolatum, E.crebra, Acacia decora. .* **Shrub (S1):** Very sparse. Height range 0.5-1m; median height 1m. *E.crebra, Coelospermum reticulatum,* **Groundcover:** Sparse. Height range 0.1-0.4m; median height 0.3m. *Heteropogon contortus, Stachytarpheta spp.*,Sida subspicata, Aristida spp.*	

* exotic species.

APPENDIX 5

State Code 16 Assessment

State Code 16: Native Vegetation Clearing: Extractive Industry Tables: 16.2.2 and 16.2.3

Table 16.2.2: POs 1-4

Performance Outcome	Acceptable Outcome	Response
Clearing avoids or minimises impacts		
PO1 Clearing and adverse impacts of clearing do not occur unless the application has demonstrated that the clearing and the adverse impacts of clearing have been: 1. reasonably avoided; or 2. reasonably minimised where it cannot be reasonably avoided.	No acceptable outcome is prescribed.	Extractive resources are both finite in extent and fixed in location as a result of fortuitous geological events. The resource in this instance is associated with the steeper topography on site, which is an area that has likely avoided a high level of historical clearing due to its limitations for use as grazing land (steeper access and poorer soils comprising rocky outcrops). Areas which have been previously cleared for agricultural activities, and are not mapped as possessing remnant vegetation, do not provide suitable resource. While disturbance of the area cannot be avoided by virtue of deposit location, the clearing can be minimised. Permanent site infrastructure and access road for the quarry exist on site and are proposed to remain unchanged as a result of the extension to the quarry footprint. The extension to the quarry footprint is necessary to extract the suitable quarry rock material. Retained vegetation will be managed under the direction of the site Environmental Management Plan to mitigate impacts from adjacent quarrying activities. Stormwater and sediment controls will limit impacts outside of the quarry footprint, in particular in the context of the ongoing agricultural activities. Revegetation works will be undertaken to prevent or reduce overall environmental harm and degradation, and the likelihood of an SRI to MSES, in accordance with pre-lodgement advice from SARA and in further consultation with DoR. This would involve the rehabilitation and legal security of an appropriately sized and located area of vegetation, under the guidance of an approved management plan.
Clearing on land in particular circumstances		
PO2 Clearing is consistent with any notice requiring compliance on the land subject to the development application, unless a better environmental outcome can be achieved. Note: The discharge of the vegetation management requirements under the notice requiring compliance can only	No acceptable outcome is prescribed.	**Not applicable.** The site is not subject to a notice requiring compliance.

Performance Outcome	Acceptable Outcome	Response
occur in conjunction with the better environmental outcome being legally secured.		
PO3 Clearing is consistent with vegetation management requirements for particular regulated areas unless a better environmental outcome can be achieved. Note: The discharge of the vegetation management requirements under the notice requiring compliance can only occur in conjunction with the better environmental outcome being legally secured.	No acceptable outcome is prescribed.	**Not applicable.** The site is not subject to a notice requiring compliance.
PO4 Clearing of a legally secured offset area: 1. is consistent with the offset delivery plan; or agreement for the offset area on the land subject to the development application; or 2. only occurs if an additional offset is provided. Note: Reference to 'agreement' above includes the 'agreed delivery arrangement' for the offset area as well as instruments associated with the legally secured offset area. Clearing should be consistent with any agreement however described.	No acceptable outcome is prescribed.	**Not applicable.** The site does not contain a legally secured offset area.

Table 16.2.3: POs 7, 11, 16, 22-24 and 27-28

Performance Outcome	Acceptable Outcome	Response
Clearing associated with wetlands (public safety and infrastructure, a coordinated project, extractive industry, high value agriculture clearing, and irrigated high value agriculture clearing)		
PO7 Clearing maintains the current extent of vegetation associated with any natural wetland to protect: 1. bank stability by protecting against bank erosion 2. water quality by filtering sediments, nutrients and other pollutants 3. aquatic habitat; and 4. terrestrial habitat	AO7.1 Clearing does not occur in a natural wetland or within 100 metres of the defining bank of any natural wetland. OR	**Complies.** Clearing will not occur in a natural wetland or within 100 metres of the defining bank of any natural wetland.
	AO7.2 Clearing within 100 metres of the defining bank of any natural wetland: **1.** does not occur within 50 metres of the defining bank of any natural wetland; and **2.** does not exceed widths in table 16.3.1 in this code. OR	
	AO7.3 Where clearing cannot be reasonably avoided, and clearing has been reasonably minimised, an offset is provided for any acceptable significant residual impact from clearing of vegetation associated with a natural wetland (matter of state environmental significance).	
Clearing associated with watercourses and drainage features (public safety and relevant infrastructure activities, coordinated project, extractive industry, high value agriculture clearing, irrigated high value agriculture clearing)		

Performance Outcome	Acceptable Outcome	Response
PO11 Clearing maintains the current extent of vegetation associated with any watercourse or drainage feature to protect: 1. bank stability by protecting against bank erosion 2. water quality by filtering sediments, nutrients and other pollutants 3. aquatic habitat; and 4. terrestrial habitat.	AO11.1 Clearing does not occur in any of the following areas: **1.** inside the defining bank of a watercourse or drainage feature; and **2.** within the relevant distance of the defining bank of any watercourse or drainage feature in table 16.3.2 of this code. OR AO11.2 Clearing within any watercourse or drainage feature, or within the relevant distance of the defining bank of any watercourse or drainage feature in table 16.3.2 of this code: 1. does not exceed the widths in table 16.3.1 of this code; and 2. does not occur within five metres of the defining bank, unless clearing is required into or across the watercourse or drainage feature. OR **AO11.3** Where clearing cannot be reasonably avoided, and clearing has been reasonably minimised, an offset is provided for any acceptable significant residual impact from clearing of vegetation associated with any watercourse or drainage feature (a matter of state environmental significance).	The proposed clearing will occur within mapped watercourses, and within the relevant distance of the defining bank of mapped watercourses, and will exceed the width prescribed in table 16.3.1 relating to RE 11.11.15 (sparse) – i.e. the proposed clearing will exceed 20 m in width. The *Significant Residual Impact Guideline, Department of State Development, Infrastructure and Planning, 2014* states an action is **LIKELY** to have a significant residual impact (SRI) on remnant vegetation within the defined distance of a watercourse if the action will result in: (a) permanent removal of vegetation within the defined distance of a stream order 2 or higher where no rehabilitation is proposed; (b) building of an online detention basin greater than 1ha in size or other similar works that result in the clearing of vegetation which fragments up and downstream remnant areas on any stream order; OR (c) permanent clearing of more than 0.5ha of an endangered or of concern RE, within the defined distance of a watercourse. The proposed clearing will not result in any of the above, such that an SRI should not be considered likely without further consideration of the guidelines and proposed mitigation measures. Notwithstanding the above, the *Significant Residual Impact Guideline, Department of State Development, Infrastructure and Planning, 2014* states an action is **UNLIKELY** to have a SRI on an 'endangered' or 'of concern' RE if the action will result in: (a) lineal clearing of vegetation (that is for a purpose under section 22A of the VMA) less than 25m in width on a stream order 1 or 2 mapped watercourse, where the works include: i. revegetation of exposed embankment areas (e.g. from a new road crossing and culvert installation) in accordance with a vegetation management or rehabilitation plan, ii. temporary erosion and sediment control until construction is completed or stream banks have been stabilised, AND iii. a crossing design which can be demonstrated (through a site specific study or similar) not to interfere with existing aquatic and terrestrial habitat of the watercourse; (b) temporary clearing of 'least concern' RE of up to 1 ha on a stream order 1 or 2 where erosion and sediment measures are in place and the area is to be rehabilitated on the subject site;

Performance Outcome	Acceptable Outcome	Response
		(c) removal of vegetation from a partially vegetated / degraded stream order 1 or 2 where revegetation greater than the area removed occurs on other stream order areas within or adjoining the site; (d) clearing of 'least concern' RE not containing Essential Habitat up to 1ha for lineal infrastructure (e.g. roads and rail); OR (e) removal of understorey vegetation of up to 3ha within a remnant area (excluding clearing within the high bank of the watercourse) for the purposes of open space or safety where not removing any trees with a trunk Diameter at Breast Height (DBH) greater than 150mm in diameter. The proposed clearing will result in the permanent removal of 1 ha of remnant RE 11.11.15 within the relevant distance (10m) of stream order 1 watercourses for the expansion of an existing quarry pit. Revegetation works will be undertaken to prevent or reduce overall environmental harm and degradation, and the likelihood of an SRI to MSES, including vegetation within a defined distance from the defining banks of a relevant watercourse or relevant drainage feature, in accordance with pre-lodgement advice from SARA and in further consultation with DoR. This would involve the rehabilitation and legal security of an appropriately sized and located area of vegetation, under the guidance of an approved management plan.
Maintaining connectivity (public safety and relevant infrastructure activities, extractive industry, high value agriculture clearing, irrigated high value agriculture clearing)		
PO16 In consideration of vegetation on the land subject to the development application and on adjacent land, sufficient vegetation is retained to maintain ecological processes and remains in the landscape despite threatening processes.	AO16.1 Clearing occurs in accordance with table 16.3.3 in this code.	The proposed clearing is in a coastal bioregion, and will not: • occur in areas of vegetation that are less than 10 hectares. • occur where the extent of vegetation on the subject lot(s) is reduced to, or less than, 30 percent of the total area of the lot(s). • reduce the extent of vegetation to less than 10 hectares; • occur in areas of vegetation less than 100 metres wide. The width of Category B vegetation to the north of the proposed footprint for Pit 2 will be reduced to less than 100 metres, although sufficient remnant vegetation will retained within the subject lots (i.e. 175ha), along with adjacent high value regrowth, to maintain ecological processes and remain in the landscape despite threatening processes.

Performance Outcome	Acceptable Outcome	Response
		Revegetation works will be undertaken to prevent or reduce overall environmental harm and degradation, including any reduction in connectivity. This would involve the rehabilitation and legal security of an appropriately sized and located area of vegetation, under the guidance of an approved management plan.
Salinity (public safety and relevant infrastructure activities, coordinated project, extractive industry, high value agriculture clearing, irrigated high value agriculture clearing, necessary environmental clearing, fodder harvesting)		
PO22 Clearing does not contribute to or accelerate land degradation through waterlogging, or through the salinisation of groundwater, surface water or soil.	AO22.1 Clearing does not occur within 100 metres of a salinity expression area.	No vegetation within a 'salinity expression area' (as defined in State Code 16) or within 100m of such an area, is proposed to be cleared. The regional ecosystems proposed to be cleared and those within 100m are primarily eucalypt communities on volcanics. Groundwater bore data indicates the site would not be in an area of shallow groundwater (i.e. <5m). A search of Queensland Globe (2021) for 'Potential Groundwater Dependant Ecosystem' (GDE) did not identify any confirmed GDEs either within the site or close proximity.
Conserving endangered and of concern regional ecosystems (public safety and relevant infrastructure activities, coordinated project, extractive industry, high value agriculture clearing, irrigated high value agriculture clearing)		
PO23 Clearing maintains the current extent of endangered regional ecosystems and of concern regional ecosystems.	AO23.1 Clearing does not occur in an endangered regional ecosystem or an of concern regional ecosystem. OR	**Complies.** Clearing will not occur in an endangered regional ecosystem or an of concern regional ecosystem (Category B). The avoidance and minimisation of the clearing of mapped remnant vegetation is addressed in the response to **PO1**.
	AO23.2 Total clearing of endangered regional ecosystems and of concern regional ecosystems combined does not exceed the widths prescribed in table 16.3.1 of this code. OR	
	AO23.3 Total clearing of endangered regional ecosystems and of concern regional ecosystems combined does not exceed areas prescribed in table 16.3.1 of this code. OR	
	AO23.4 Where clearing cannot be reasonably avoided, and clearing has been reasonably minimised, an offset is provided for any acceptable significant residual impact from clearing of	

Performance Outcome	Acceptable Outcome	Response
	endangered regional ecosystems and of concern regional ecosystems (a matter of state environmental significance).	
Essential habitat (public safety and relevant infrastructure activities, coordinated project, extractive industry, high value agriculture clearing and irrigated high value agriculture clearing, fodder harvesting)		
PO24 Clearing maintains the current extent of essential habitat.	AO24.1 Clearing does not occur in essential habitat. OR	**Complies.** Clearing will not occur in essential habitat.
	AO24.2 Clearing in essential habitat does not exceed the widths prescribed in table 16.3.1 of this code. OR	
	AO24.3 Clearing in essential habitat does not exceed the areas prescribed in table 16.3.1 of this code. OR	
	AO24.4 Where clearing cannot be reasonably avoided, and clearing has been reasonably minimised, an offset is provided for any acceptable significant residual impact from clearing of essential habitat (a matter of state environmental significance).	
Acid sulfate soils (public safety and relevant infrastructure activities, coordinated project, extractive industry, high value agriculture clearing, irrigated high value agriculture clearing, necessary environmental clearing, necessary to control non-native plants or declared pests, thinning, encroachment)		
PO27 Clearing does not result in, or accelerate, disturbance of acid sulfate soils or changes to the hydrology of the location that will result in either of the following: 1. aeration of horizons containing iron sulphides; or	AO27.1 Clearing does not occur in land zone 1, land zone 2 or land zone 3. OR	**Complies.** The local government is the assessment manager for the development application.
	AO27.2 Clearing in land zone 1, land zone 2 or land zone 3 in areas below the five metre Australian Height Datum only occurs where: 1. mechanical clearing does not disturb the soil to a depth greater than 30 centimetres; and	

Performance Outcome	Acceptable Outcome	Response
2. mobilisation of acid or metals.	2. acid sulfate soils are managed consistent with the State Planning Policy, Department of Infrastructure, Local Government and Planning, July 2017, and with the soil management guidelines in the Queensland Acid Sulfate Soil Technical Manual, Department of Science Information Technology Innovation and the Arts, 2014. OR **AO27.3** The local government is the assessment manager for the development application.	
Clearing is staged (extractive industry)		
PO28 Clearing: 1. is staged in line with operational needs that restrict clearing to the current operational area 2. only occurs in the area from which material will be extracted, and any reasonably associated infrastructure, within the term of the development approval; and 3. does not occur without required permits.	No acceptable outcome is prescribed.	**Complies.** Clearing will occur progressively, in line with operational needs. Extractive industry progresses horizontally and vertically in a slow and 'step like' manner and, hence, clearing on site will be required to be carried out in a progressive and sequential manner. As a result of the long time periods associated with extractive industry development, it is common (and best) practice to clear just ahead of extraction to ensure that other matters such as visual amenity and erosion and sediment control are managed in line with quarry development and in order to ensure ongoing compliance with the site Environmental Authority.

APPENDIX 6

Assessment of Waterway for Waterway Barrier Works

BAAM
ECOLOGICAL CONSULTANTS

specialised ecological knowledge
that reduces your risk

8 December 2021

Megan Benham
mbenham@groundwork.com.au

Dear Megan,

RE: Assessment of Waterway for Waterway Barrier Works, Midgee Quarry

Biodiversity Assessment and Management Pty Ltd (BAAM) was commissioned to groundtruth a drainage feature traversing land adjacent to the existing Midgee Quarry that is mapped as a Waterway for Waterway Barrier Works (WWBW). The purpose of the assessment was to determine if on-ground features of the drainage feature would or would not support fish passage, and if a WWBW mapping change was warranted.

The Subject Site was visited by BAAM Senior Ecologists Dr Colin Trainor and Shelley Trevaskis over two days on 14-15 September 2021, during warm, dry conditions.

We trust the following information meets your requirements.

Yours sincerely



Shelley Trevaskis
Senior Ecologist, CEnvP
Biodiversity Assessment and Management Pty Ltd

File No	Author	Reviewer
0049-122 WWBW Version 0		

BACKGROUND

As shown in **Figure 1,** the land around Midgee Quarry supports waterways that are mapped as Waterways for Waterway Barrier Works (WWBW) by the Department of Agriculture and Fisheries (DAF).

One waterway (indicated on **Figure 1**), classed 'Low', that traverses Lot 1 SP247721 and Lot 725 RP888747 and drains toward Gavial Creek, is the subject of this technical note.

FIELD RESULTS

The source of the waterway that is the subject of this assessment is a shallow gully that likely carries overland flow for a brief period in rain events (**Photo 1**). Flow from this gully is then collected in a dam located along this waterway (**Photo 2**). South-west of the dam, there is no discernible feature in the landscape to indicate that a waterway or overland flow path is present (**Photo 3**). Whilst the dam did support aquatic vegetation, no other section of the waterway supported vegetation representative of an aquatic environment.

The dam was not specifically surveyed to determine if it supports fish; however, the ephemeral flow paths that flow into and out of the dam are not considered likely to transport fish at any stage.



Photo 1: View of the source of the drainage feature, north-west (upstream) of dam



Photo 2: View of the dam located on the waterway

	**Photo 3: View of the land located south-east (downstream) of the dam. This land is a dry, flat plain with no discernible feature to indicate a waterway channel.**

ASSESSMENT AGAINST WATERWAY ATTRIBUTES

The definition of a waterway under the *Fisheries Act 1994* includes a river, creek, stream, watercourse or inlet of the sea. This definition includes permanent and ephemeral waterways, and drainage features. It also includes channels along which fish are expected to move if they connect isolated water bodies to defined waterways during times of flow. However, it does not include isolated waterbodies where no connectivity is available (DAF, 2017).

Although the watercourse may technically meet the definition of a waterway (as the upstream gully could be classed as an ephemeral waterway [DAF, 2017]), it's function as a passage for fish is highly doubtful.

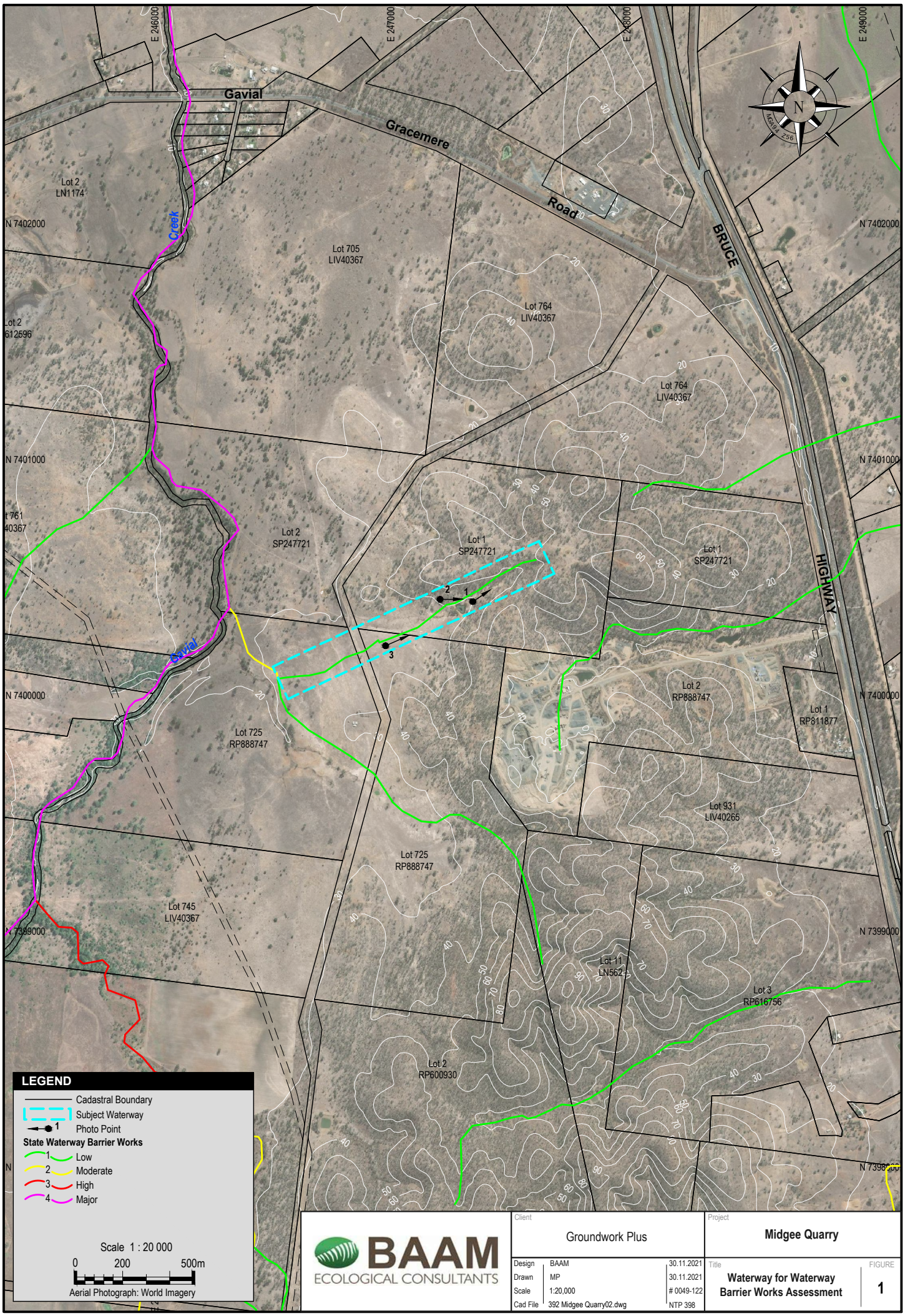
DAF (2017) identifies physical and hydrological attributes of a waterway that can be assessed in order to determine if a waterway can support fish passage. These attributes, together with site findings, are presented in **Table 1**.

Table 1: DAF attributes that define a waterway and site findings

DAF (2017) attribute criteria	Site findings
1. Defined bed and bank: The bed and banks need to be continuous upstream and downstream of the site rather than isolated and broken sections of a depression.	The dam was the only feature along the low value waterway that held water and displayed banks. There were no defined bed and banks along the balance of the mapped waterway.
2. An extended, if non-permanent, period of flow: Flow must continue beyond the duration of a rain event and have some reliability attached to rainfall. There is a need to distinguish between channels that funnel immediate localised rainfall, and waterways where flow has arisen from an upstream catchment.	The field assessment was undertaken during the dry season (October). At the time of the assessment, the dam was the only feature along the waterway that held water (**Photo 2**). It is expected that the gully upstream of the dam (**Photo 1**) collects flow only in rain events, which is then carried and held in the dam. The gully is a shallow depression in the landscape that does not feature any bed or banks that might indicate it holds water/flow beyond the duration of a rain event.

DAF (2017) attribute criteria	Site findings
	Downstream of the dam, no channel that may carry flow was present (**Photo 3**).
3. Flow adequacy: The flow needs to be sufficient to sustain basic ecological processes and habitats, and to maintain biodiversity within or across the feature. The adequacy of the flow depends on the ecological function of the channel, e.g. waterways that connect to fish habitat like a wetland or waterhole may only need infrequent and short-duration flows to provide connectivity for fish.	As discussed above, the only feature along the waterway that displayed features that may support sustained aquatic processes and habitats was the dam. The gully upstream of the dam will never support fish passage, as it is the head of the watercourse and emanates from dry eucalypt forest. Hence, it is not expected that the dam would ever support fish life (as no fish can enter from upstream) and, as a consequence, would never convey fish life downstream. Aside from the dam, no other point along the waterway featured bed or banks, aquatic vegetation, or evidence that the waterway maintains flow, or holds water for a long enough duration to sustain habitat that would support fish life.
4. Fish habitat at, or upstream of, the site: Most instream features provide habitat for fish under adequate flow conditions or, in the case of pools, during dry periods. Therefore, it is important to have some knowledge of the fish species for the site and their habitat use, particularly in headwater streams. Periodic connectivity to upstream and off stream fish habitat are also considered fish habitat.	As relayed above, the only feature along the waterway that displayed features that may support sustained aquatic processes and habitats was the dam. The gully upstream of the dam will never support fish passage, as it is the head of the waterway and emanates from dry eucalypt forest. Hence, it is not expected that the dam would ever support fish life (as no fish can enter from upstream), and as a consequence would never convey fish life downstream.

Based on the above assessment of attributes, there is evidence to demonstrate that the waterway that is the subject of this assessment does not support fish passage, and the WWBW designation is contestable.



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REFERENCES

Department of Agriculture and Fisheries (DAF) (2017) What is a Waterway? Found at: https://www.daf.qld.gov.au/business-priorities/fisheries/habitats/policies-guidelines/factsheets/what-is-a-waterway

APPENDIX 7

EVNT Species Likelihood of Occurrence Assessment

Criteria and categories used to assign likelihood of occurrence of species in the Study Site.

Category	Explanation
Known	The species is known from the current and/or past surveys and is not now considered locally extinct.
Likely	A medium to high probability that the species occurs in or visits the Study Site because suitable habitat occurs, the Study Site is within the known distribution of the species, there are records of the species in the vicinity (i.e. within 40km of the Study Site), the species is not now considered locally extinct and there is sufficient information on the occurrence of the species to categorise the species as likely.
Potential	Either: (a) suitable habitat occurs and there is insufficient information on the distribution/occurrence of the species (e.g. it is naturally rare and difficult to detect, or there has been insufficient survey effort) to categorise the species as likely or unlikely to occur; or (b) there are records of the species in the vicinity but habitat in the Study Site is marginal or spatially limited meaning that the species' presence in the Study Site would be transitory at best.
Unlikely	A low probability that the species occurs in the Study Site because suitable habitat does not occur, the Study Site is outside the known distribution of the species, there are no records of the species in the local region despite adequate survey effort, the species is considered locally extinct, or the species has not been observed despite sufficient spatial and temporal survey effort for detecting the species.

Assessment of the likelihood of occurrence in the Study Site of threatened and near-threatened fauna species identified from database searches.

Species	Common name	NC Act Status[1]	Source[2]		Preferred habitat characteristics	Likelihood of occurrence
			PM	WO		
Flora						
Cupaniopsis shirleyana	Wedge-leaf Tuckeroo	V	X		Variety of dry rainforest vegetation types, including vine thicket communities on hillsides, stream beds and along riverbanks	**Unlikely** – preferred habitat not recorded.
Cycas megacarpa		E	X	X	Woodland, open woodland and open forests, often in conjunction with a grassy understory. Found in habitat dominated by *Eucalyptus crebra* and *Corymbia citriodora* as well as *Corymbia erythrophloia*, *Eucalyptus melanophloia* and *Lophostemon confertus.*	**Unlikely** – preferred habitat is present, however the species was not recorded despite targeted searches across the Study Site. .
Cycas ophiolitica		E	X		Hills and slopes in sparse, grassy open forest at altitude ranges from 80–400 m above sea level. Frequently found on shallow, stony, infertile soils, which are developed on sandstone and serpentinite, and is associated with species such as *Corymbia dallachiana, C. erythrophloia, C. xanthope* and *Eucalyptus fibrosa*. Also been found on mudstone in association with *Corymbia dallachiana, C. erythrophloia* and *Eucalyptus crebra*, and on alluvial loams with *Corymbia intermedia, Eucalyptus drepanophylla and E. tereticornis*	**Unlikely** – preferred habitat above 80m is not present (site elevation is 60m ASL). .

Species	Common name	NC Act Status[1]	Source[2]		Preferred habitat characteristics	Likelihood of occurrence
			PM	WO		
Dichanthium setosum	Bluegrass	V	X		Typically associated with heavy basaltic black soils and red-brown loams with clay subsoil. Often found in moderately disturbed areas such as cleared woodland, grassy roadside remnants and highly disturbed pasture. It is often collected from disturbed open grassy woodlands on the northern tablelands, where the habitat has been variously grazed, nutrient-enriched and water-enriched.	**Potential –** potential habitat is present within the study area; however, there are no previous records in the Rockhampton area and there is no preferred habitat within the proposed impact area (ALA, 2021).
Marsdenia brevifolia		V	X		North of Rockhampton, grows on serpentine rock outcrops or crumbly black soils derived from serpentine in eucalypt woodland, often with *Eucalyptus fibrosa* and *Corymbia xanthope*.	**Unlikely -** suitable habitat does not occur and the Study Site is outside the known distribution of the species.
Phaius australis	Lesser Swamp Orchid	V	X		Commonly associated with coastal wet heath/sedgeland wetlands, swampy grassland or swampy forest and often where Broad-leaved Paperbark or Swamp Mahogany are found.	**Unlikely -** suitable habitat does not occur and no records are known from the Rockhampton area (ALA, 2021).
Samadera bidwillii	Quassia	V	X		Lowland rainforest or on rainforest margins, but it can also be found in other forest types, such as open forest and woodland. Commonly found in areas adjacent to both temporary and permanent watercourses.	**Potential –** marginal preferred habitat is present along Gavial Creek, but unlikely to occur within the proposed impact area.
Fauna						
Birds						
Botaurus poiciloptilus	Australasian Bittern	E	X		Shallow, permanent freshwater and brackish swamps or lagoons that are densely vegetated (e.g. tall reeds, sedges, lignum). They also inhabit bore drains with tussocky vegetation and occasionally saltmarsh.	**Unlikely** to occur through lack of suitable sedge or reed dominated wetlands
Calidris ferruginea	Curlew Sandpiper	E	X	X	Intertidal mudflats, also non-tidal swamps, lakes and lagoons near the coast, ponds in saltworks and sewage farms, and occasionally inland at ephemeral and permanent lakes, dams, waterholes and bore drains, usually with bare edges of mud or sand.	**Potential** to occur. Several records within 40km at inland dams and lagoons, though little suitable habitat is present in the Study Site.
Epthianura crocea macgregori	Yellow Chat (Dawson)	E	X		Marine plain wetlands that are subject to extensive seasonal inundation and varying degrees of both fresh and saltwater (tidal) influence	**Unlikely** to occur through lack of suitable habitat
Erythrotriorchis radiatus	Red Goshawk	E	X		Inhabits woodlands and forests, particularly riverine forests in coastal and sub-coastal areas of north-western, northern and eastern Australia, requiring large areas of forested habitat to support home ranges of 210-200 km2.	**Unlikely** to occur. One 1955 record from within 40km of the Study Site, but extensive habitat is absent from Study Site (and beyond).

Species	Common name	NC Act Status[1]	Source[2]		Preferred habitat characteristics	Likelihood of occurrence
			PM	WO		
Falco hypoleucos	Grey Falcon	V	X		Frequents timbered lowland plains, particularly acacia shrublands that are crossed by tree-lined water courses, and has been observed hunting in treeless areas and frequents tussock grassland and open woodland, especially in winter. Nests are usually in the tallest trees along watercourses, particularly River Red Gum (*Eucalyptus camaldulensis*) and Coolibah (*E. coolabah*).	**Unlikely** to occur. A single undated historical record from within c. 40km (location imprecise) of the Study Site, and a second 1908 record from about 100 km away.
Geophaps scripta scripta	Squatter Pigeon (Southern Subspecies)	V	X	X	Dry, grassy, eucalypt woodlands, open forests and scrub. The ground vegetation layer in foraging and breeding habitat is typically considerably patchy consisting of native, perennial tussock grasses or a mix of perennial tussock grasses and low shrubs or forbs. Ground vegetation cover rarely exceeds 33% with the remaining ground surface consisting of bare ground, leaf litter and coarse, woody debris.	**Known** to occur. Numerous previous records within 40km of Study Site and recorded during current survey.
Hirundapus caudacutus	White-throated Needletail	V	X		Almost exclusively aerial, therefore conventional habitat descriptions do not apply. Although they occur over most types of habitat, they are probably recorded most often above wooded areas	**Likely** to occur; however, this is an aerial migrant species that is unlikely to be impacted by terrestrial development
Neochmia ruficauda ruficauda	Star Finch (Eastern Subspecies)	E	X		Dense, damp grasslands bordering wetlands and watercourses; also, in open grassy woodlands that are near permanent water or are subject to regular inundation.	**Unlikely** to occur. One undated and spatially imprecise record from "Rockhampton" but out of range.
Numenius madagascariensis	Eastern Curlew	E	X		Most commonly associated with sheltered coasts, especially estuaries, bays, harbours, inlets and coastal lagoons, with large intertidal mudflats or sandflats, often with beds of seagrass. Occasionally occurs on ocean beaches (often near estuaries), and coral reefs, rock platforms, or rocky islets. The birds are often recorded among saltmarsh and on mudflats fringed by mangroves, and sometimes within the mangroves.	**Unlikely** to occur through lack of suitable coastal habitat
Poephila cincta cincta	Black-throated Finch (southern subspecies)	E	X		Dry open grassy woodlands and forests with seeding native grasses and free-standing water.	**Unlikely** to occur. A single undated and likely spatially imprecise specimen collected from Rockhampton, but otherwise out of range.
Rostratula australis	Australian Painted Snipe	V	X	X	Shallow terrestrial wetlands, ephemeral and permanent, usually freshwater but occasionally brackish. They also use inundated grasslands, saltmarsh, dams, rice crops, sewage farms and bore drains.	**Potential** to occur. Several records within 20km (Rockhampton) of the Study Site and could occur as a rare visitor to man-made dams within the Study Site.
Mammals						

Species	Common name	NC Act Status[1]	Source[2]		Preferred habitat characteristics	Likelihood of occurrence
			PM	WO		
Chalinolobus dwyeri	Large-eared Pied Bat	V	X		Sandstone cliffs and fertile woodland valley habitat within close proximity of each are important habitat; also, rainforest and moist eucalypt forest habitats on other geological substrates (rhyolite, trachyte and basalt) at high elevation in south-east Queensland. Almost all records have been found within several kilometres of cliff lines or rocky terrain. It has been found roosting in disused mine shafts, caves, overhangs and disused Fairy Martin *Petrochelidon ariel* nests. It also possibly roosts in the hollows of trees.	**Unlikely** to occur. No records within c. 100km, and the Study Site lacks rock escarpment habitats.
Macroderma gigas	Ghost Bat	E	X		Inhabits a broad range of habitats from arid spinifex hillsides to tropical rainforest but depends critically on deep caves, abandoned mines or deep rock fissures for roosting or breeding.	**Unlikely** to occur. A few records from within 40km including Rockhampton in 1966, but there are no known roosting sites for this species within 40km.
Nyctophilus corbeni	Eastern Long-eared Bat	V	X		Dry forests dominated by various *Eucalyptus* and bloodwoods (*Corymbia* spp.), most abundant in vegetation with a distinct canopy and a dense cluttered shrub layer.	**Unlikely** to occur. No records within c. 200km, and Study Site is out of range.
Petauroides volans	Greater Glider	V	X		Eucalypt forests and woodlands, favouring forests with a diversity of eucalypt species, and found in highest abundance in taller, montane, moist eucalypt forests with relatively old trees and abundant hollows.	**Unlikely** to occur. Numerous records within 40km (most proximate record was in 1929) but unlikely to occur in Study Site through lack of suitable large hollow bearing trees in extensive and well-connected forest.
Phascolarctos cinereus	Koala	V	X		Forests and woodlands with eucalypt trees, particularly *Eucalyptus* species.	**Potential** to occur. Recorded in urban Rockhampton and especially forests to the north. However, no evidence of the species was recorded during the current survey, and the majority of the proposed impact area does not comprise preferred food tree species.
Reptiles						
Delma torquata	Collared Delma	V	X		Open eucalypt forest with a shrub and tussock grass understorey. Soil type is usually shallow and deep-cracking or stony. Regional ecosystems include REs 11.3.2, 11.9.10, 11.10.1 and 11.10.4.	**Unlikely** to occur. A single 1974 record from within 40km (though location was imprecise) and habitat is likely unsuitable.

Species	Common name	NC Act Status[1]	Source[2]		Preferred habitat characteristics	Likelihood of occurrence
			PM	WO		
Denisonia maculata	Ornamental Snake	V	X		Woodlands and open forests associated with moist areas, particularly gilgai (melon-hole) mounds and depressions in Queensland Regional Ecosystem (RE) Land Zone 4, but also lake margins and wetlands; habitat includes REs 11.4.3, 11.4.6, 11.4.8, 11.4.9, 11.3.3 and 11.5.16. Can occur abundantly in non-remnant, cleared landscapes on cracking-clay soils where Brigalow (*Acacia harpophylla*) once grew.	**Unlikely** to occur. A small number of records within 40km of Study Site but the lack of suitable habitat in Study Site (soil cracks and gilgais) suggest that this snake is unlikely to occur. Not detected in current survey during limited spotlight survey and searches under c. 60 logs.
Egernia rugosa	Yakka Skink	V	X		Variety of drier forests and woodlands (usually on well drained, coarse gritty soils) including Poplar Box on alluvial soils, low ridges, Callitris on sands, Belah.	**Unlikely** to occur. There are no records within 40km, and habitat is unsuitable in the Study Site.
Furina dunmalli	Dunmall's Snake	V	X		Poorly known but most records appear in open forests and woodlands, particularly Brigalow and woodlands growing on cracking black clay and clay loams. Also recorded from dry eucalypt forests on sandstone derived soils and may occur in vine thickets.	**Unlikely** to occur. A few mostly historical records within 40km, although no preferred habitat within or near the Study Site.
Hemiaspis damelii	Grey Snake	E		X	Favours woodlands (typically Brigalow *Acacia harpophylla* and Belah *Casuarina cristata*), usually on heavier, cracking clay soils, particularly in association with water bodies or in areas with small gullies and ditches (gilgais)	**Unlikely** to occur as preferred habitat not present, although a series of specimens collected from Rockhampton, mostly in 1970s.
Rheodytes leukops	Fitzroy River Turtle	V	X		Rivers in the Fitzroy River catchment of central Queensland with large deep pools and rocky, gravelly or sandy substrates, connected by shallow riffles.	**Unlikely** to occur. No suitable riverine habitat and no records within 15km (in Fitzroy River).

[1]Status under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC) or *Nature Conservation Act 1992* (NC): E = endangered; V = vulnerable.

[2]Source: Protected Matters Search Tool (PM), Wildlife Online (WO), X = species recorded in search result.

Attachment 3

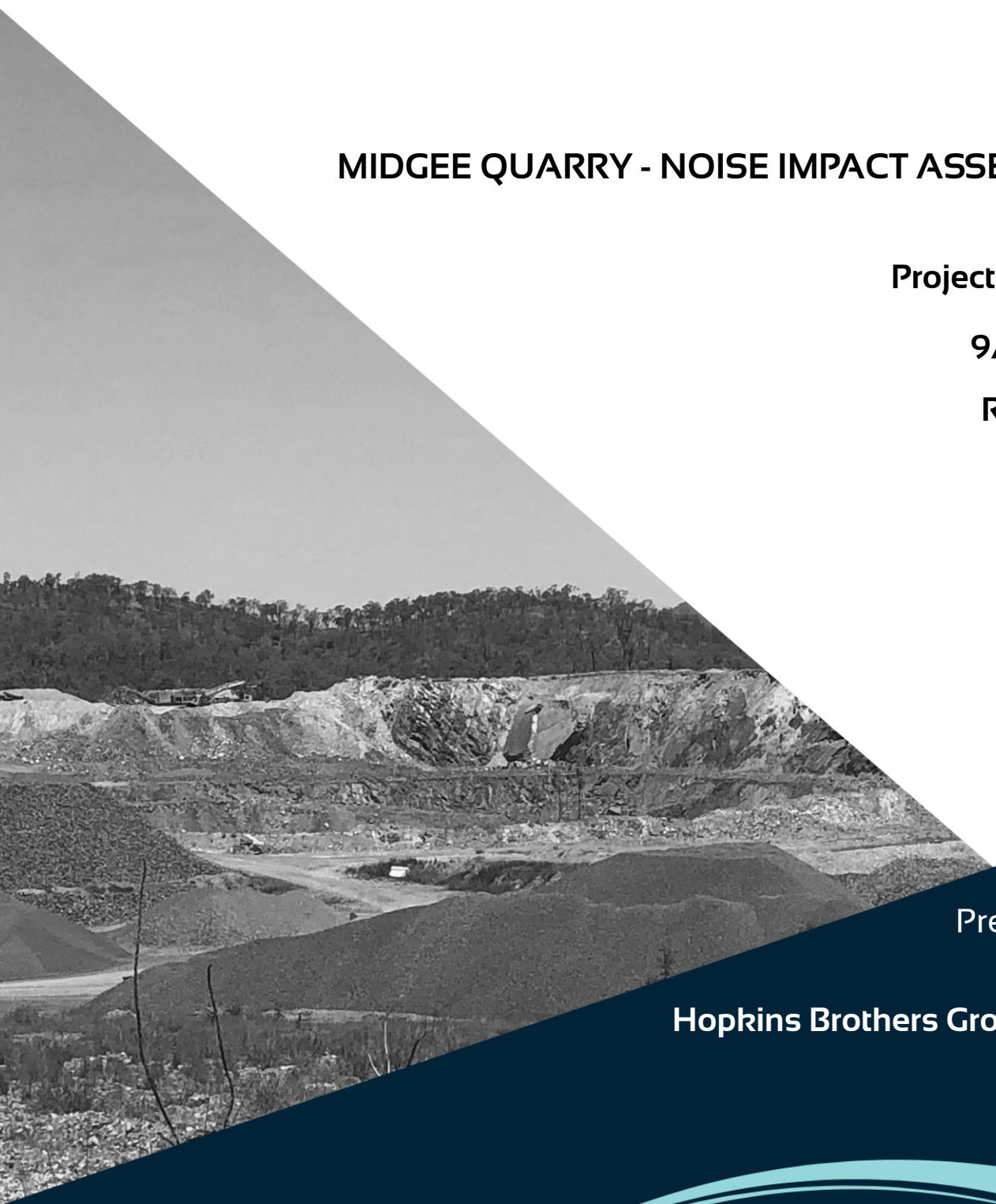
Noise Impact Assessment

MIDGEE QUARRY - NOISE IMPACT ASSESSMENT

Project ID: 14020

9/02/2022

Release: R1



Prepared For:

Hopkins Brothers Group Pty Ltd

Assured Environmental

DOCUMENT CONTROL PAGE

Project Title: MIDGEE QUARRY - NOISE IMPACT ASSESSMENT

Project Reference ID: 14020

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Table 1: History of Revisions

Revision	Date	Issued to	Changes
R0	28/01/2022	M. Benham	Initial Release
R0	9/02/2022	M. Benham	Initial Release

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GLOSSARY

A-Weighting	A response provided by an electronic circuit which modifies sound in such a way that the resulting level is similar to that perceived by the human ear.
Background Noise	Noise level at a given location and time measured in the absence of any alleged noise nuisance sources. Typically, represented by the L_{A90} noise statistic.
Calibrator	An instrument used to carry out 'field calibrations' before and after monitoring to ensure the sound level meter does not drift.
dB (decibel)	This is the scale on which sound pressure level is expressed. It is defined as 20 times the logarithm of the ratio between the root-mean-square pressure of the sound field and the reference pressure (0.00002 N/m^2).
dB(A) or dBA	This is a measure of the overall noise level of sound across the audible spectrum with a frequency weighting (i.e. 'A' weighting) to compensate for the varying sensitivity of the human ear to sound at different frequencies.
Fast Time Weighting	Sound level meters apply a time-smoothing function to the measured sound. Fast time weighting has an exponential smoothing time constant of 125 milliseconds.
Free-field	Refers to a sound pressure level determined at a point away from reflective surfaces other than the ground with no significant contribution due to sound from other reflective surfaces; generally, as measured outside and away from buildings.
L_{Aeq}	This is the equivalent steady sound level in dB(A) containing the same acoustic energy as the actual fluctuating sound level over the given period. Noise levels often fluctuate over a wide range with time. Therefore, when a noise varies over time, the LAeq is the equivalent continuous sound which would contain the same sound energy as the time varying sound. Many studies show that human reaction to level-varying sounds tends to relate closer to the LAeq noise level than any other descriptor.
L_{Amax}	The A-weighted, maximum, sound level. It should be noted that maximum noise levels are not peak levels.
L_{Amin}	The A-weighted, minimum, sound level.

ABBREVIATIONS

DES	Department of Environment and Science
tpa	Tonnes per annum
NPI	National Pollutant Inventory
WTS	Waste Transfer Station

1 INTRODUCTION

1.1 Background

Hopkins Brothers have been operating the Midgee Quarry on the Bruce Highway, Midgee, since the early 2000s. Historically, the site has been used to extract material since the 1960s. The quarry operation has evolved over the years to respond to market demand, resulting in various planning permits having been obtained from Rockhampton Regional Council (RRC).

Local demand for quarry resources is anticipated to increase in the next decade, driven by regional significant infrastructure projects and a general increase in development within the region. As such, Hopkins Brothers are seeking to secure access to the known resource.

The most recent approval was granted by RRC on 6 November 2018, which extended the existing operational area, concrete crushing operations and an outdoor storage area to store extracted material and equipment associated with the extractive and industrial operations on the site.

The permit change aims to increase the current hours of operation, pit area, and output to a to a maximum of 2,000,000 tonnes per annum..

1.2 Scope of Assessment

Assured Environmental (AE) was appointed by Groundwork Plus on behalf of Hopkins Brothers Group Pty Ltd to undertake an noise assessment from the expansion of the quarry.

In undertaking the assessment, reference has also been made to the Department of Environment & Science (DES) Guideline - *Application requirements for activities with impacts to noise* (2020).

In accordance with the requirements of the above guidelines, computational modelling and first principle calculations have been undertaken to assess the potential for adverse amenity and health impacts as a result of the proposed development.

1.3 This Report

This report summarises the methodology, results, and conclusions of the noise and vibration assessment.

2 MIDGEE QUARRY OPERATIONS

2.1 Existing Operations

Hopeman Pty Ltd trading as Hopkins Brothers Group Pty Ltd, operate the existing operations at Lot 2 on RP888747. The existing approvals for this site include the quarry and an asphalt plant.

2.1.1 Quarry

Resource has been sourced from the site since the 1960s. The current operation has evolved over the years to respond to market demand, resulting in various planning permits having been obtained from Council.

On 6 November 2018, Rockhampton Regional Council approved the current operation (Council Ref: D/79-2017). This permit extended the existing operational area, concreate crushing operations and the outdoor storage area to store extracted material and equipment associated with the extractive and industrial operations.

The site also operates pursuant to an Environmental Authority (EA) for Environmentally Relevant Activities 16(2)(b) and 16(3)(b) for extracting and screening between 100,000 to 1,000,000 tonnes of material per year (DES Ref: IPCE01813610), dated 19 January 2010.

Hopkins Brothers has advised that the existing quarry produced a total of 700,000 – 800,000 tonnes over past 5 years.

2.1.2 Asphalt Plant

On 9 April 2020, Rockhampton Regional Council granted approval to establish an asphalt plant on the site (Council Ref: D/83-2019). Council also issued an EA for Environmentally Relevant Activities (ERA) ERA6 for asphalt manufacturing (Council Ref: EPAEA/1/2019), dated 6 April 2020.

An asphalt plant has previously operated on the site under a temporary approval, however, is currently not located at the site. Consideration will be given that an asphalt plant may be established pursuant to the 2020 permit and EA.

The 2020 permit and EA do not provide limits on throughput or operating hours. There are no changes proposed to the approved asphalt plant operations. It is understood that the asphalt plant will produce a maximum of 100,000 tonnes per year. The location of the asphalt plant is where the existing crusher plant is located. Whilst the asphalt plant is approved to operate at the facility, it is currently not operating onsite.

2.2 Proposed Quarry Operations

A conceptual quarry layout has been prepared which incorporates four adjoining properties, properly described as Lot 2 on RP888747, Lot 1 on SP247721, Lot 2 on SP247721, Lot 725 on RP888747 and Lot 931 on LIV40265. Two pits have been proposed, so as to achieve a 50-metre buffer to the road reserve and also as a consequence of the differing resource/materials in each area. Each pit will be developed progressively, to meet market demand.

Midgee Quarry is project driven by blasting and ripping at times, depending on the product being targeted. The quarry will continue to use standard quarrying methodologies that involve clearing, topsoil, and overburden stripping, drilling, and blasting, extraction, processing and

stockpiling with the final products sold for use in the construction industry. The outline of the extraction area is shown in Figure 1

2.3 Comparison of Activities

Table 2 provides a comparison of current activities and proposed activities as part of the increase in production. Despite the increase in extraction, the number of blasts will not increase much as a significant proportion of the additional material will be road base/bulk fill which does not need blasting.

Table 2: Comparison of Quarry Activities

Aspect	Existing Activities	Future Activities
Quarry footprint	As per consent.	Ref to Figure 1
Hours of operation	6am and 6pm Monday to Saturday. No operations occur on public holidays.	24/7
Production and Transportation limits	Current production of approximately 200,000 tpa however is permitted to produce up to 1,000,000 tpa.	Maximum 2 Mtpa from the site.
Extraction method	Extraction by blast and drill	No change to extraction method.
Site infrastructure and plant	Primary and tertiary crushing and screening facilities as fixed and mobile plant	Primary and tertiary crushing and screening facilities as fixed and mobile plant. The locations of the mobile plant are flexible depending on commercial requirements
Asphalt plant	Temporary plant used previous but no longer at site.	Proposed 100,000 tpa of which approximately two thirds of raw material provided by quarry.
Product transport	Via truck	No change to method of transport or access road.
Blasting	4 per year	8 per year
Vegetation clearing	N/A	Approx. 2.5 ha every 5 years

2.4 Stages of Expansion

The expansion of the quarry is not detailed in many stages as the course of the quarry development will depend on customer requirements, however the expected expansion will occur to the east, north and west as shown in Figure 1.

It is predicted that a majority of the material required in the next five years will be general fill, which is generally found in the first bench (15 – 20 m below natural ground level). Pit 1 and Pit 2 will likely occur concurrently, however Pit 2 will remain the main source extraction area for the duration of the Project life. The expected average throughput is 1.6 Mtpa; with a typical breakdown by fraction, however up to 2 Mtpa is expected to be processed per year.

The areas of expansion and operations of the quarry are not finalised due to the client requirements. In consultation with the quarry operators, the following assumptions regarding quantities of material, location and activities are detailed in Table 3.

Table 3: Pit Operations

Activity	Pit Area				
	Existing	Pit 1	Pit 2 (North)	Pit 2 (East)	Pit 2 (West)
Production (tpa)	500,000	300,000	600,000	400,000	200,000
Material Type	Road base/ concrete agg	Bulk fill	Bulk fill	Bulk fill	Road base/ concrete agg
Blasting	Yes	-	-	-	Yes
Screening	Yes	Yes	-	Yes	Yes
Crushing	Yes	Yes	Yes	Yes	Yes
Intermediate product stockpile	Yes	Yes	Yes	Yes	Yes

2.5 Equipment

The quarry currently has a range of equipment. With the increase in capacity, it is expected that the current the equipment will be utilised more efficiently, however additional mobile plant will be added:

- Fixed screening/crushing plant;
- Mobile screening/crushing plants;
- Excavators;
- Wheeled loaders;
- Articulated trucks (including one utilised as a water truck); and
- Dozers.

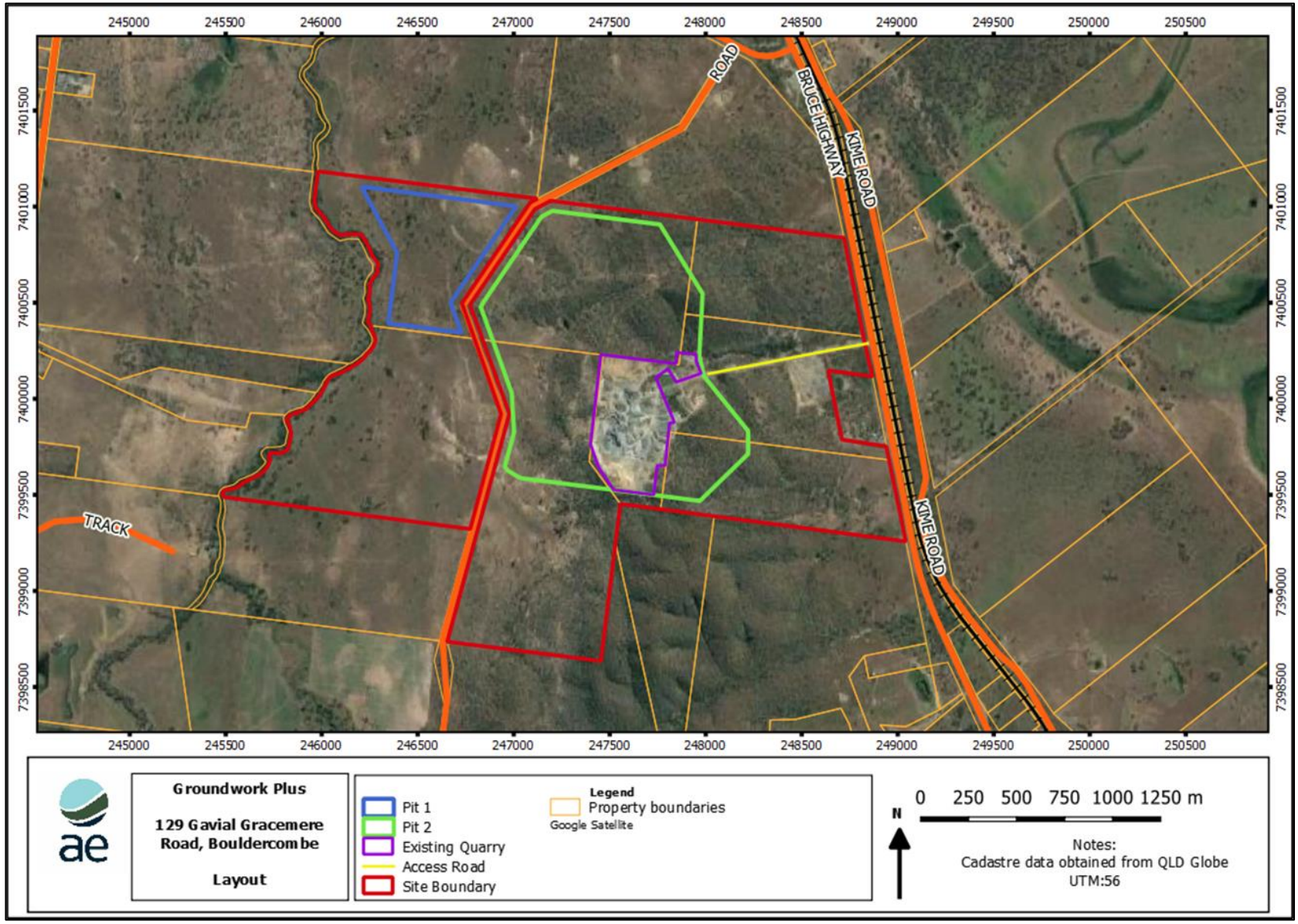


Figure 1: Site Location

3 DESCRIPTION OF ENVIRONMENTAL VALUES

3.1 Location

Midgee Quarry is located at 59793 Bruce Highway Midgee 4702, Lot 2 RP888747. The major regional centre of Rockhampton is approximately 12.5 kilometres to the north and Gracemere is approximately 9.5 kilometres to the north-west.

The surrounding land uses are primarily cattle grazing, with the exception of the adjacent Kangaroo Country Caravan Park (KCCP) which is situated on lot 1/RP811877. The entrance to the Midgee Quarry and the KCCP is situated on the Bruce Highway. The North Coast Rail Line also passes directly opposite the Midgee Quarry entrance and the caravan park. The North Coast line is also the major freight corridor from Brisbane to Cairns, with connecting services travelling as far west as Longreach and Mount Isa. The North Coast Line also connects to the central line which is the main coal freight corridor which services the Central Highlands Coal Fields.

The Subject Site covers five lots (Lot 2 on RP888747, Lot 1 on SP247721, Lot 2 on SP247721, Lot 725 on RP888747 and Lot 931 on LIV40265. The Subject Site location is shown in Figure 1.

3.2 Terrain

Figure 2 illustrates the local topography, as obtained from a combination of Lidar data at 5 m resolution.

3.3 Receptors

When completing this report, consideration has been given to the potential impacts of the changed operation to sensitive receptors within 3 - 5 kilometres of the operation. When considering the impacts, the nearby receptors have been identified as shown in Figure 3.

The closest receptors located in the KCCP to the east of the Subject Site boundary.

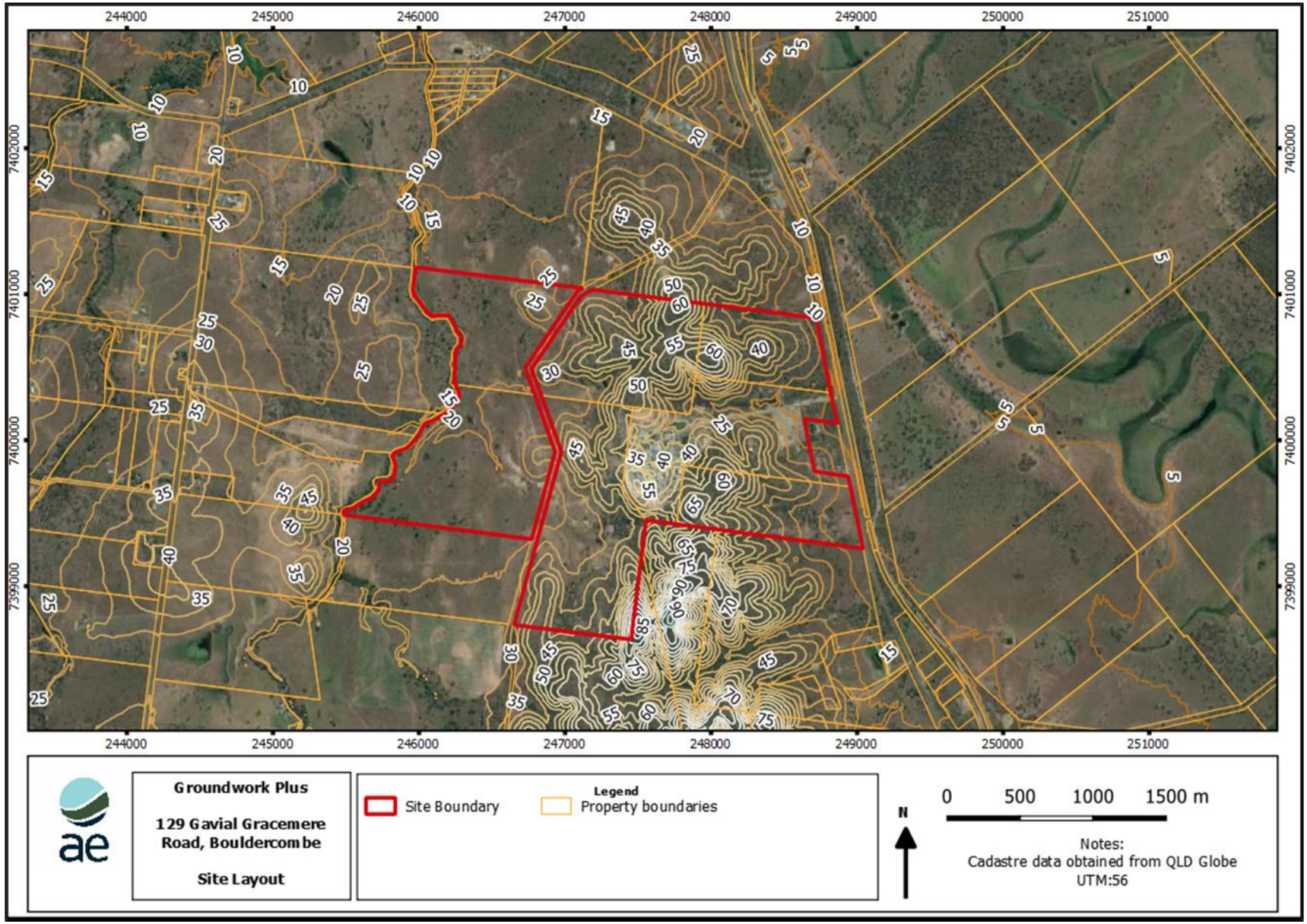


Figure 2: Surrounding Topography at 5 m Intervals (Extracted from LiDAR Data)

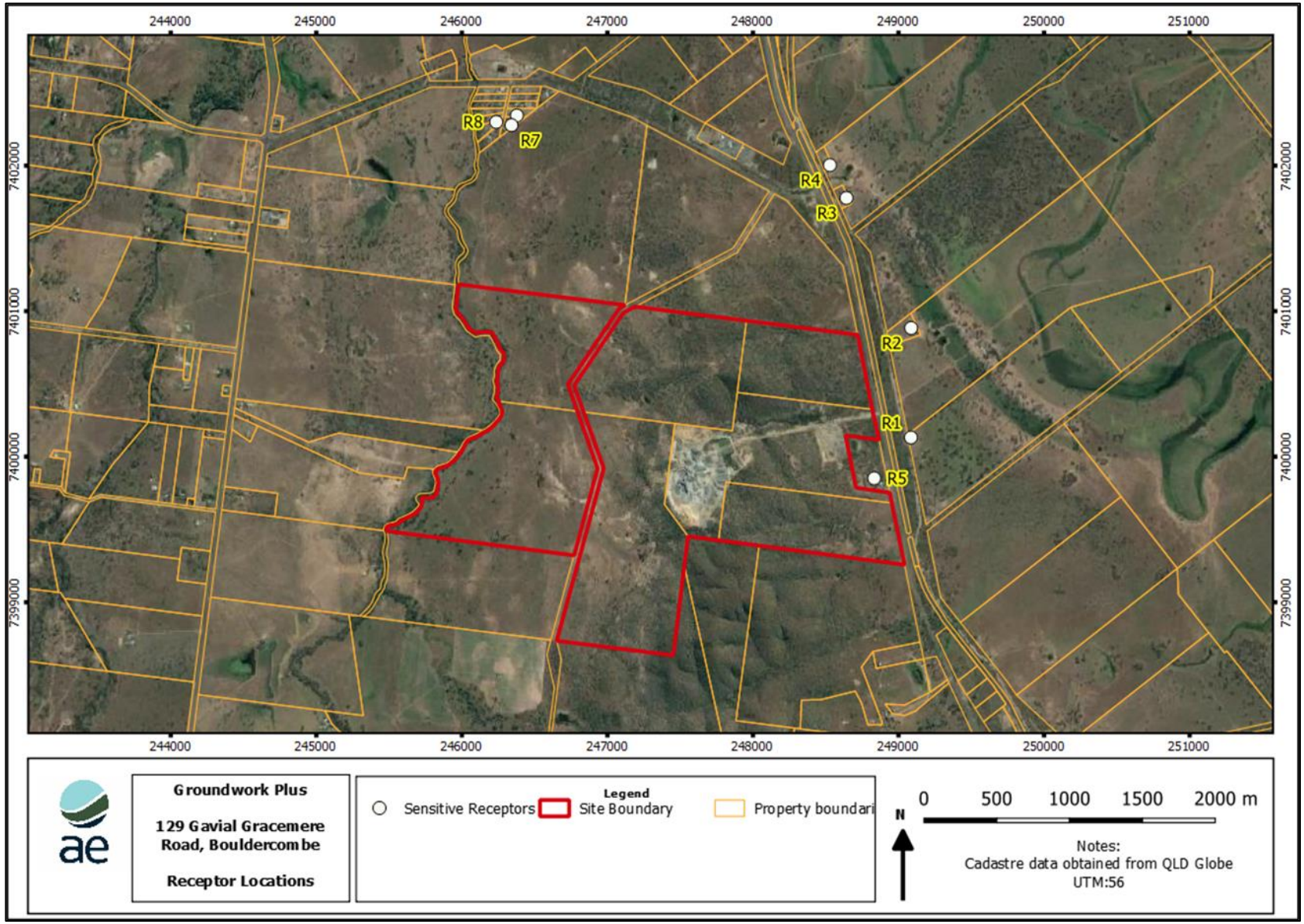


Figure 3: Modelled Sensitive Receptors

4 EXISTING NOISE ENVIRONMENT

4.1 Existing Sources of Noise

The existing acoustic environment in the area is influenced by traffic on the Bruce Highway and train pass-bys. Additional noise sources include birds and wind through vegetation at receptors.

4.2 Baseline Noise Monitoring

Background noise monitoring was undertaken from 2 December to 10 December 2021 at two locations in order to quantify the background noise levels at nearby sensitive receptors. The noise monitoring locations (NML) information is presented in Appendix A. The Subject Site could not be heard at either NML monitoring location.

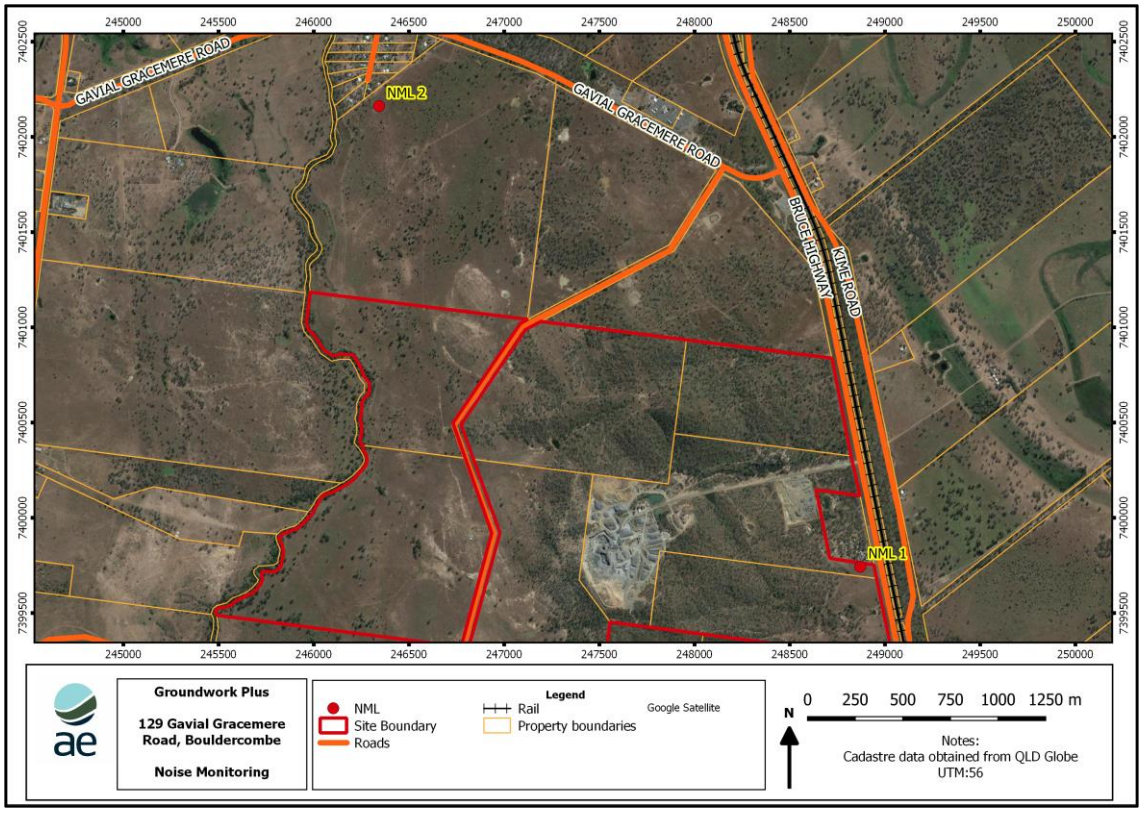


Figure 4: Monitoring Locations

Noise measurements were undertaken in accordance with the requirements of Australian Standard AS 1055-2018 *'Acoustics – Description and measurement of environmental noise'*. One sound level meter (SLM) was used for the continuous monitoring. The SLM was situated in a free-field position and a data logging time of 15 minutes was adopted. The microphone was positioned at a height of 1.2 metres above ground level and fitted with a windshield throughout the measurements. The serial numbers and calibration information for the instruments as well as daily measurement data and time histories are presented in Appendix A.

Noise monitoring has a potential to be affected by rainfall and wind speeds above 5 m/s. A review of meteorological data from the weather station co-located with the sound level meter at NML 1, found that one hour were potentially affected by high wind speeds and/or rain during the monitoring period (7 days). To avoid weather-related bias, and in accordance with the Noise

Measurement Manual noise data collected during the weather-affected periods have not been considered in the analysis.

Analysis of the noise monitoring data from NML 2, which was located close to the residential area, identified that on 5 December, there was an event which altered the noise monitoring profile. Communications with the company manager (James Hoseason-Smith) confirmed that the windshield was not on the equipment when collected on 10 December. As such, only three valid days of monitoring data was obtained for this location. Refer to Appendix A for more information.

Table 4 below provides a summary of noise levels of each period for a variety of statistical noise parameters.

Table 4: Summary of Noise Monitoring Results

Location	Period	L_{Amax}	L_{A1}	L_{A10}	L_{A90}	L_{Aeq}	RBL
NML 1	Day (7 am to 6 pm)	81	66	60	48	58	45
(2-10 Dec)	Evening (6 pm to 10 pm)	80	67	63	55	60	49
	Night (10 pm to 7 am)	83	66	61	50	59	43
NML 2	Day (7 am to 6 pm)	75	54	50	45	49	43
(2-5 Dec)	Evening (6 pm to 10 pm)	71	52	48	43	47	41
	Night (10 pm to 7 am)	77	50	46	40	46	37

Detailed noise monitoring analysis is presented in Appendix A.

5 LEGISLATIVE REQUIREMENTS

5.1 Environmental Authority

Conditions of Environmental Authority EPPR00233813 (dated 16 February 2010) issued by the Department of Environment and Science provides specific requirements relating to emissions of air from the activity as summarised in Table 5.

Table 5: Conditions Relevant to Air

Condition Number	Condition
D1	Noise Nuisance: Noise from the environmentally relevant activity must not cause an environmental nuisance at any **nuisance sensitive** or **commercial place**.
D2	Noise Monitoring: When requested by the administering authority, noise monitoring must be undertaken to investigate any complaint of noise nuisance, and the results of notified within 14 days to the administering authority.
D3	The method of measurement and reporting of noise levels must comply with the latest edition of the Administrating Authority's Measurement Manual
D4	The holder of this development approval is not permitted to conduct blasting at the authorised place

5.2 Environmental Protection (Noise) Policy 2019

The EPP (Noise) provides acoustic quality objectives for a range of receptors with respect to the potential impact of an activity upon on the health and well-being and biodiversity of the receptors. Specifically, the objectives are intended to enhance or protect the following environmental values:

- The qualities of the acoustic environment that are conducive to protecting the health and biodiversity of ecosystem.
- The qualities of the acoustic environment that are conducive to human health and wellbeing, including by ensuring a suitable acoustic environment for individuals to do any of the following:
- sleep
- study or learn
- be involved in recreation, including relaxation and conversation.
- The qualities of the acoustic environment that are conducive to protecting the amenity of the community.

Table 6 presents a summary of the acoustic quality objectives applicable to the receptors surrounding the Project.

Table 6: EPP(Noise) Schedule 1 Acoustic Quality Objectives

Sensitive receptor	Time of day	Acoustic quality objectives (measured at the receptor) *dB(A)*			Environmental value
		$L_{Aeq,adj,1hr}$	$L_{A10,adj,1hr}$	$L_{A1,adj,1hr}$	
Residence (for outdoors)	daytime and evening	50	55	65	health and wellbeing
Residence (for indoors)	daytime and evening	35	40	45	health and wellbeing
	night-time	30 (45)	35 (50)	40 (55)	health and wellbeing (ability to sleep)
Commercial and retail activity (for indoors)	When the activity is open for business	45 (60)	-	-	health and wellbeing (ability to converse)
Protected area or critical area	-	the level of noise that preserves the amenity of the existing area or place			-

Note: Brackets ( ) denote the external noise criteria assuming a 15 dB(A) façade transmission loss.

The EPP(Noise) provides amenity objectives which do not take into consideration the surrounding environment, which could be sensitive to any increase in noise environment. The EPP(Noise) explanatory note states:

> *The acoustic quality objectives are considered in assessment processes and help inform the decision-making process, including any conditions that may be placed on approvals for environmentally relevant activities. The acoustic quality objectives are not individual point source emission standards but are total levels of noise in the surrounding environment. They assist to inform what the point source acoustic emission level as a condition of approval for a particular activity at a site may be.*
>
> *It is not intended that, as part of achieving the acoustic quality objectives, any part of the existing acoustic environment be allowed to deteriorate. That means in using this policy for making decisions including under the Environmental Protection Act 1994, the acoustic quality objectives should not be seen as a noise limit without consideration of whether the acoustic environment is being allowed to deteriorate due to an existing acoustic environment that is better than the acoustic quality objective.*

The adopted project noise level criteria based on the EPP(Noise) 2019 are shown in Table 7.

Table 7: Project Noise Level Criteria (Outdoors)

Receiver Type	Receptors	$L_{Aeq,adj,1\ hr}$ dB(A)			$L_{A1,\ adj,\ 1\ hr}$ dB(A)
		Day	Evening	Night	Night
Residential Dwellings	R01-R08	50	50	45	55

Note: Assuming 15 dB(A) façade transmission loss is accounted for

In addition to the above acoustic quality objectives, the EPP (Noise) 2019 requires that, where reasonable to do so, background creep should be prevented or minimised [Section 9(2)(b)]. While specific noise limits to achieve this outcome are not provided in the EPP (Noise) 2019,

reference is made to the previous objectives provided in the now repealed EPP (Noise) 2008 as follows:

(a) for noise that is continuous noise measured by $L_{A90,T}$—more than nil dB(A) greater than the existing acoustic environment measured by $L_{A90,T}$; or

(b) for noise that varies over time measured by $L_{Aeq,adj,T}$—more than 5 dB(A) greater than the existing acoustic environment measured by $L_{A90,T}$.

Given the results of the baseline noise monitoring (see Table 4), Table 8 below presents indicative noise levels targets that may be considered appropriate to prevent or minimise background creep at nearby sensitive uses.

Table 8: Noise Level Targets for the Prevention of Background Creep

Monitoring Location	Receptors	Parameter	Day	Evening	Night
NML1	R01-R05	Continuous Noise ($L_{A90,T}$)	48	55	50
		Variable Noise ($L_{Aeq,adj,T}$)	53	60	55
NML2	R06-R08	Continuous Noise ($L_{A90,T}$)	45	43	40
		Variable Noise ($L_{Aeq,adj,T}$)	50	48	45

Since the EPP(Noise) 2019 does not nominate noise levels in relation to Background Creep, the noise level targets shown in Table 8 are not used as criteria in this assessment. However, the predicted noise levels have been included to provide a qualitative comment in relation to the requirements of the EPP(Noise) 2019 Clause 9 (2)(b).

6 NOISE ASSESSMENT

6.1 Modelling Methodology

For the purposes of predicting impacts associated with noise emissions from the Subject Site on nearby sensitive receptors, noise modelling of the sources was completed using the proprietary software CadnaA (version 2021 build 181.5100) developed by DataKustik. CadnaA incorporates the influence of meteorology, terrain, ground type and air absorption in addition to source characteristics to predict noise impacts at receptor locations. All predictions have been undertaken in accordance with the CONCAWE calculation method.

6.1.1 Meteorology

Noise levels were predicted using the CONCAWE propagation methodology, which incorporates the influence of meteorological conditions on the propagation of noise through the atmosphere. The modelled meteorological parameters shown in Table 9 were selected to predict the worst-case noise levels at all receptors during all seasons and all time periods.

Table 9: Model Parameters

Parameter	Day (Noise-Enhancing)	Evening (Noise-Enhancing)	Night (Noise-Enhancing)
Temperature (night)	20°C	10°C	10°C
Relative Humidity	75%	75%	75%
Wind Speed (m/s)	3.0	3.0	2.0
Stability Class	D	D	F
Wind Direction:	Worst Case	Worst Case	Worst Case
Ground Absorption	1	1	1

6.1.2 Topographical Data

Topographical data was based on that publicly available LiDAR data at one-meter intervals as well as contours provided by the client

6.1.3 Scenario Assessed

Three modelling scenarios are assessed:

1. Existing quarry operations;
2. Future quarry operations; and
3. Future quarry operations with asphalt plant.

6.2 Noise Sources

Most noise sources associated with the quarry are generally continuous in nature and are associated with fixed plant items operating in the production process. Short-term or variable sources include operation of the excavators and truck movements. It should be noted that some sources will be operated on a campaign basis but to account for worst-case scenario, they have been modelled on continuous day-time operation.

AE have taken undertaken measurements at a similar mobile asphalt plant to be installed at the quarry. For the purpose of this assessment, these measurements and layout will be used to represent the proposed asphalt plant.

Table 10 provides a summary of the noise sources adopted for this assessment and the operational details of each source. Sound power levels have been taken from AE's database and typical levels taken from verified sources.

Heights for all sources inside the pits where set to 15m above the approximate bench height, which is 0m. This is to represent the sources on top of the bench before the bench decreases to an unknown depth.

Table 10: Sound Power Levels Quarry

Activity	Noise Source	Qty	Height above Ground Level (m)	Sound Power Level (dB(A))		Corrections (tonality, low frequency, impulsiveness)	Usage (%) during Modelled Period
				L_{Aeq}	L_{Amax}		
Existing Site	Excavators	1	2	115	125	+5dB tonal and impulsiveness correction	100
	Cone crusher [a)]	2	2.5	103	113	-	100
	Screen [a)]	1	2.5	108	118	-	100
	Conveyor belts [a)]	4	2.5	89	-	-	100
	Conveyor Motors [a)]	6	2.5	84	-	-	100
	Drilling	1	2.5	118	-	-	100
	Truck Idling	1	2.5	112	-	-	100
	Screens	8	2.5	108	118	+5dB Tonal Correction	100
	Crushers	6	2.5	110	120	-	100
	Excavators	2	2.5	115	125	+5dB tonal and impulsiveness correction	100
Pit 1 - Quarry	Screens	4	19.5	108	118	+5dB Tonal Correction	100
	Crushers	3	19.5	110	120	-	100
	Excavators	2	19.5	115	125	-	100
Pit 2 - Northern Quarry Face	Crushers	3	19.5	110	120	-	100
	Excavators	1	19.5	115	125	-	100
Pit 2 - Eastern Quarry face	Screens	4	19.5	108	118	+5dB Tonal Correction	100
	Crushers	3	19.5	110	120	-	100
	Excavators	1	19.5	115	125	+5dB tonal and impulsiveness correction	100

Activity	Noise Source	Qty	Height above Ground Level (m)	Sound Power Level (dB(A))		Corrections (tonality, low frequency, impulsiveness)	Usage (%) during Modelled Period
				L_{Aeq}	L_{Amax}		
Pit 2 - Western Quarry face	Screens	4	19.5	108	118	+5dB Tonal Correction	100
	Crushers	3	19.5	110	120	-	100
	Excavators	1	19.5	115	125	+5dB tonal and impulsiveness correction	100
	Drilling	1	19.5	118	-	-	100
Overall	Articulated Trucks	3	19.5	107	117	-	100
	Water trucks	1	19.5	107	117	-	100
	B-Double	7/hr	2	100	110	-	100
	D9 Cat Dozer	1	19.5	108	118	+5dB Tonal Correction	100
	Cat D9H	1	19.5	108	118	+5dB Tonal Correction	100
Asphalt Plant	Bag House	1	2	96	-	-	100
	Burner/Blower	1	2	88	-	-	100
	Conveyor Motor	7	2	84	-	-	100
	Compressor	2	2	84	-	+5dB Tonal Correction	100
	Drum	1	2	93	-	-	100
	Exhaust Fan	2	2	93	-	+5dB Tonal Correction	100
	Fuel Pump	3	2	84	-	+5dB Tonal Correction	100
	Front Loader - Reverse Beeper	1	2	121	-	-	5
	FEL loading into bins	1	2	96	106	-	100
	Truck Idling	1	2	112	122	-	100
	Vibrating Hopper	5	2	80	-	-	100
	FEL	1	2	115	125	-	100

Activity	Noise Source	Qty	Height above Ground Level (m)	Sound Power Level (dB(A)		Corrections (tonality, low frequency, impulsiveness)	Usage (%) during Modelled Period
				L_{Aeq}	L_{Amax}		
	Conveyor	4	2	90	-	-	288

a) Fixed plant

Note: Contours have been imported that includes the future quarry bench. Sources at 19.5m and 50m represent equipment at the surface level before moving down and creating the bench

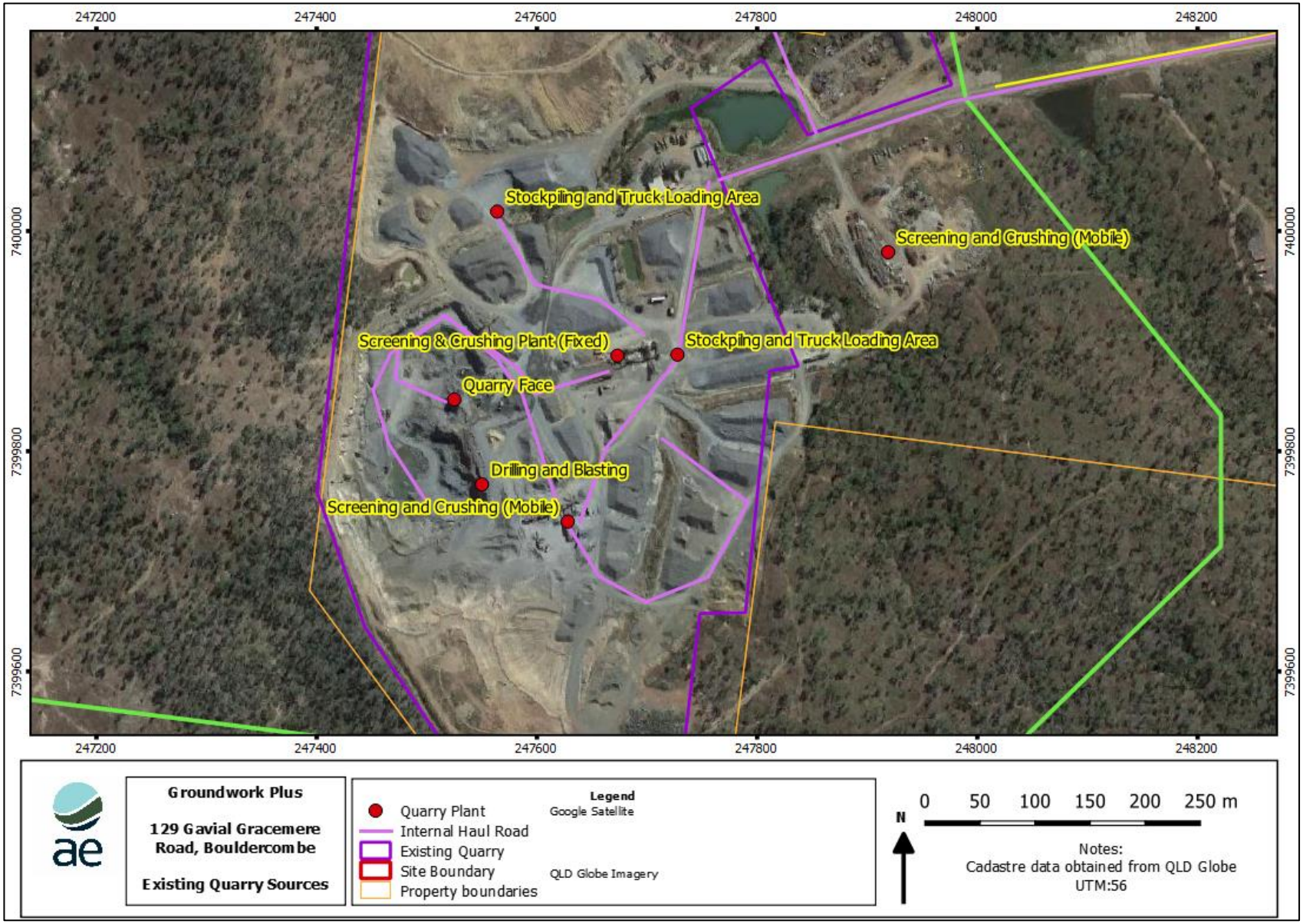


Figure 5: Modelled Source Location for Existing Quarry

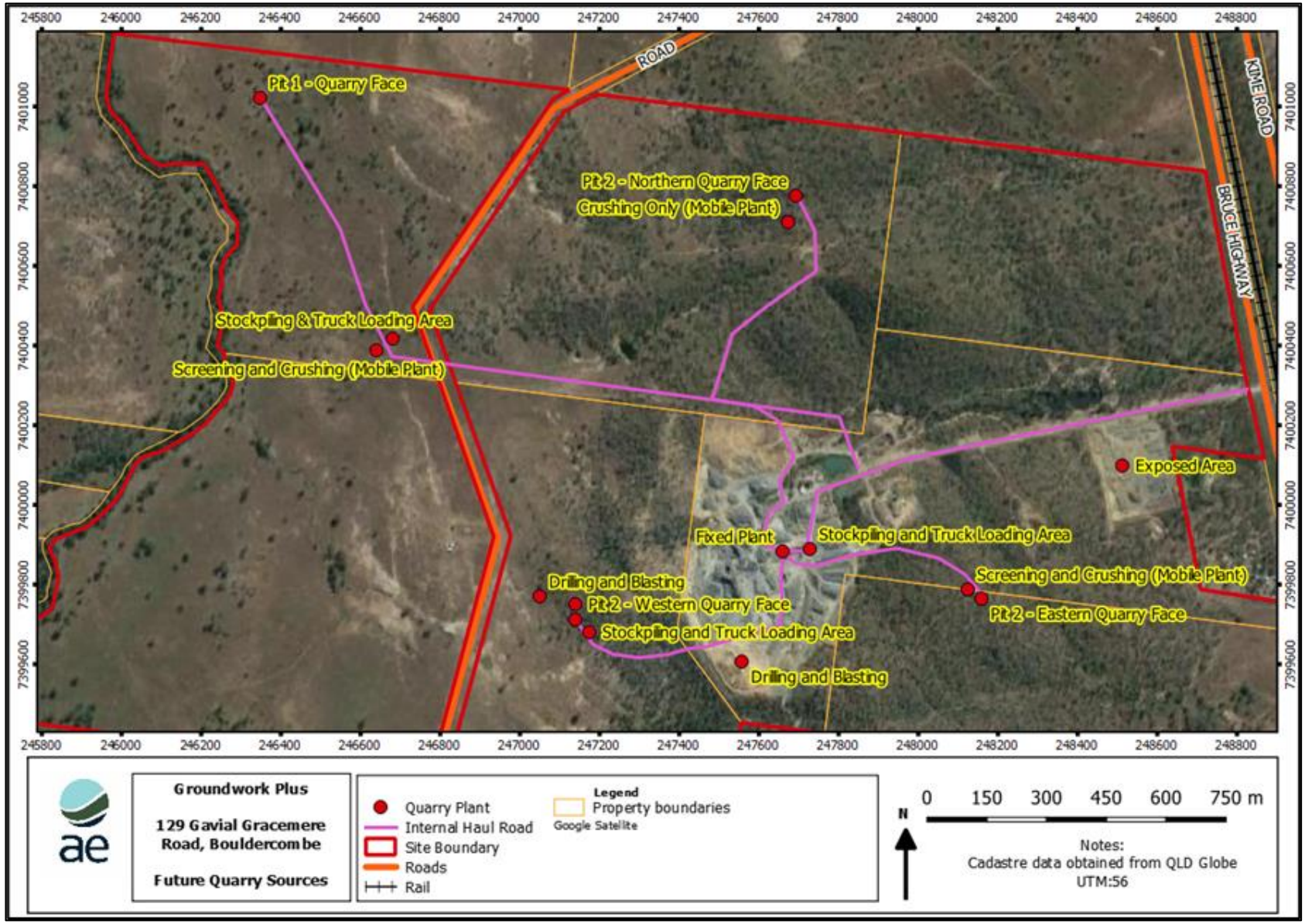


Figure 6: Modelled Source Location for Future Quarry Operations

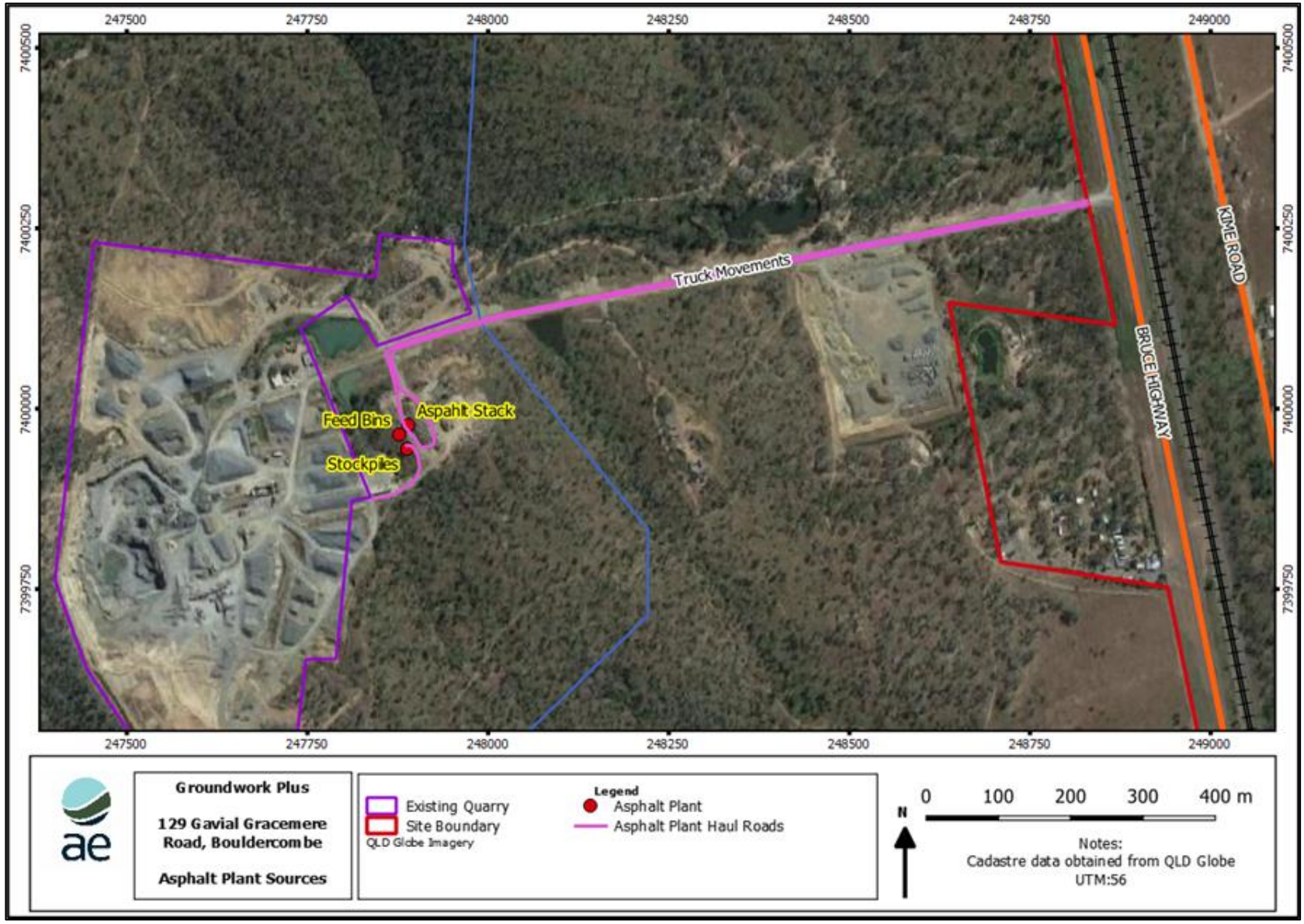


Figure 7: Asphalt Plant Source Locations

7 PREDICTED NOISE LEVELS

7.1 Overview

Criteria chosen was the lowest of the Project Noise Criteria (Table 7) and the Noise Level Targets for the Prevention of Background Creep (Table 8) over all monitoring locations. Appendix B provides contour noise level for each scenario.

7.2 Existing Quarry Activities

Table 11 provides the predicted noise for the existing quarry activities. All receptors comply with the EPP criteria.

Table 11: Maximum Predicted Results - Existing Quarry Activities

Receptor	Predicted Operational Noise Levels, $L_{Aeq,}$				Criteria Levels, $L_{Aeq,}$				Complies
	Day	Eve	Night	L_{AMax}	Day	Eve	Night	L_{AMax}	
R01	34	34	34	50	45	43	40	55	Y
R02	37	37	37	45	45	43	40	55	Y
R03	5	5	5	25	45	43	40	55	Y
R04	1	1	1	23	45	43	40	55	Y
R05	33	33	33	46	45	43	40	55	Y
R06	<10	<10	<10	<10	45	43	40	55	Y
R07	<10	<10	<10	<10	45	43	40	55	Y
R08	<10	<10	<10	<10	45	43	40	55	Y

7.3 Future Quarry Activities

Table 12 provides the predicted noise for the future quarry activities. All receptors comply with the EPP criteria.

Table 12: Maximum Predicted Results - Future Quarry Activities

Receptor	Predicted Operational Noise Levels, $L_{Aeq,}$				Criteria Levels, $L_{Aeq,}$				Complies
	Day	Eve	Night	L_{AMax}	Day	Eve	Night	L_{AMax}	
R01	38	38	38	50	45	43	40	55	Y
R02	37	37	37	45	45	43	40	55	Y
R03	19	19	19	28	45	43	40	55	Y
R04	18	18	18	26	45	43	40	55	Y
R05	40	40	40	49	45	43	40	55	Y
R06	33	33	33	42	45	43	40	55	Y
R07	34	34	34	43	45	43	40	55	Y

Receptor	Predicted Operational Noise Levels, $L_{Aeq,}$				Criteria Levels, $L_{Aeq,}$				Complies
	Day	Eve	Night	L_{AMax}	Day	Eve	Night	L_{AMax}	
R08	34	34	34	43	45	43	40	55	Y

7.4 Asphalt Activities

Table 13 provides the predicted noise for the Asphalt activities only. All receptors comply with the EPP criteria.

Table 13: Maximum Predicted Results - AshapIt Activities

Receptor	Predicted Operational Noise Levels, $L_{Aeq,}$				Criteria Levels, $L_{Aeq,}$				Complies
	Day	Eve	Night	L_{AMax}	Day	Eve	Night	L_{AMax}	
R01	34	34	34	50	45	43	40	55	Y
R02	34	34	34	38	45	43	40	55	Y
R03	20	20	20	25	45	43	40	55	Y
R04	<10	<10	<10	23	45	43	40	55	Y
R05	34	34	34	46	45	43	40	55	Y
R06	<10	<10	<10	<10	45	43	40	55	Y
R07	<10	<10	<10	<10	45	43	40	55	Y
R08	<10	<10	<10	<10	45	43	40	55	Y

7.5 Future Quarry Activities with Asphalt Plant

Table 14, provided the predicted noise for the future scenario, which includes benches, current plant and future plant. All receptors comply with the EPP criteria.

Table 14: Maximum Predicted Results - Future Quarry with Ashpalt Activities

Receptor	Predicted Operational Noise Levels, $L_{Aeq,}$				Predicted Operational Noise Levels, $L_{Aeq,}$				Complies
	Day	Eve	Night	L_{AMax}	Day	Eve	Night	L_{AMax}	
R01	38	38	38	50	45	43	40	55	Y
R02	39	39	39	45	45	43	40	55	Y
R03	22	22	22	28	45	43	40	55	Y
R04	18	18	18	26	45	43	40	55	Y
R05	40	40	40	49	45	43	40	55	Y
R06	33	33	33	42	45	43	40	55	Y
R07	34	34	34	43	45	43	40	55	Y

Receptor	Predicted Operational Noise Levels, $L_{Aeq,}$				Predicted Operational Noise Levels, $L_{Aeq,}$				Complies
	Day	Eve	Night	L_{AMax}	Day	Eve	Night	L_{AMax}	
R08	34	34	34	43	45	43	40	55	Y

8 VIBRATION ASSESSMENT

8.1 Introduction

An assessment of the potential for vibration impacts has been undertaken to determine potential impacts as a result of vibration generated by plant and equipment during quarry operation. In particular, the assessment has considered the potential for impacts on both human comfort and structural damage for the nearest residence to the quarry expansion.

8.2 Vibration Assessment Criteria

8.2.1 Criteria for Vibration from Non-Blasting Sources

The vibration criteria presented in the Environmental Noise Management – Assessing Vibration: A Technical Guideline (2006) published by the NSW Department of Environment Climate Change and Water (DECCW) have been adopted for the assessment. The technical guide provides vibration criteria associated with amenity impacts (human annoyance) for the three categories of vibration:

- Continuous vibration – e.g. road traffic, continuous construction activity;
- Impulsive vibration – includes less than 3 distinct vibration events in an assessment period (e.g. occasional dropping of heavy equipment); and
- Intermittent vibration – includes interrupted periods of continuous vibration (e.g. drilling), repeated periods of impulsive vibration (e.g. crushers) or continuous vibration that varies significantly in amplitude.

Table 15 and Table 16 present the criteria for continuous and impulsive vibration and intermittent vibration, respectively.

Table 15: Continuous & Impulsive Vibration Criteria for Residences – Peak Velocity

Location	Vibration Type	Preferred Limit (mm/s)	Maximum Limit (mm/s)
Residences	Continuous	0.28	0.56
Residences	Impulsive	8.6	17

Table 16: Intermittent Vibration Criteria for Residences

Location	Assessment Period	Preferred Limit (mm/s)	Maximum Limit (mm/s)
Residences	Day-time	0.20	0.40

The above criteria are suitable for assessing human annoyance in response to vibration levels. In order to assess potential damage to buildings, reference has been made to British Standard *BS 7385-2: 1993 Evaluation and measurement for vibration in buildings – Part 2: Guide to damage levels from ground borne vibration.* Table 17 presents vibration criteria for assessing the potential for building damage.

Table 17: Transient Vibration Guide Values for Cosmetic Damage

Type of Building	Peak Particle Velocity (mm/s)	
	4 Hz to 15 Hz	15 Hz and above

Unreinforced or light framed structures – residential or light commercial type buildings	15 mm/s at 4 Hz increasing to 20 mm/s at 15 Hz	20 mm/s at 15 Hz increasing to 50 mm/s at 40 Hz and above

8.2.2 Blasting Criteria

For blasting, the *Noise and Vibration Guideline*, states the following summarised in Table 18

Table 18: Noise and Vibration Criteria for Blasting For construction and quarry

Blasting Limits Surface Mining	Sensitive or commercial place criteria
	9am to 3pm Monday to Friday and 9am to 1pm Saturday
Airblast overpressure	115 dB (Linear) Peak for 9 out of 10 consecutive blasts initiated and not greater than 120 dB (Linear) Peak at any time
Ground vibration peak particle velocity	5 mm/second peak particle velocity for 9 out of 10 consecutive blasts and not greater than 10 mm/second peak particle velocity at any time

8.3 Assessment of Vibration Impacts

8.3.1 Assessment of Impacts – Operations (Except Blasting)

8.3.1.1 Vibration Sources

Table 19 provides indicative vibration source levels for the vibration-significant equipment used at the quarry. It should be noted that there are no vibration source levels for the processing plant, however these plant elements typically do not create high levels of ground vibration, as they are designed to constrain and direct almost all of their vibration energy into performing their primary functions on the product material.

Table 19: Intermittent Vibration Sources

Location	Preferred Limit (mm/s)	Source
Loaded trucks (rough surface)	5	USA DT [a)]
Loaded trucks (smooth surface)	1 – 2	USA DT [a)]
Excavator	2.5 – 4	DECCW
Loader	6 – 8	USA DT [a)]

a) Transit Noise and Vibration Impact Assessment, US Department of Transportation, May 2006.

8.3.1.2 Assessment of Potential Impacts

Based on the vibration source levels at 10 metres (presented in Table 19), peak particle velocities have been predicted at various separation distances. The NSW DECCW indicates that in predicting vibration levels, it can be assumed that the vibration level is inversely proportional to distance (with the relationship varying between $d^{-0.8}$ to $d^{-1.6}$ based on field data).

The US Department of Transportation's Transit Noise and Vibration Impact Assessment (May 2006) presents the following construction vibration propagation formula assuming an inverse relationship:

$$PPV@d_2 = PPV@d_1 \times (d_1/d_2)^{1.5}$$

where: d_1 = distance 1 (reference distance for source data) (m)

d_2 = distance 2 (separation distance for predicted PPV) (m)

PPV = peak particle velocity (mm/s)

The above formula has been considered for predicted PPVs at various distances from construction equipment. Based on the above information, Table 20 presents PPV predictions for the various construction equipment.

Table 20: Predicted Peak Particle Velocity at Sensitive Receptors (mm/s)

Distance from Source	Predicted Peak Particle Velocity (mm/s)			
	Loaded trucks (rough surface)	Loaded trucks (smooth surface)	Excavator	Loader
10	5	1 - 2	2.5 - 4	6 - 8
20	1.77	0.35 - 0.71	0.88 - 1.41	2.12 - 2.83
30	0.96	0.19 - 0.38	0.48 - 0.77	1.15 - 1.54
40	0.63	0.13 - 0.25	0.31 - 0.5	0.75 - 1
50	0.45	0.09 - 0.18	0.22 - 0.36	0.54 - 0.72
60	0.34	0.07 – 0.14	0.17 – 0.27	0.41 – 0.54
80	0.22	0.04 – 0.09	0.11 – 0.18	0.27 – 0.35
100	0.16	0.03 - 0.06	0.08 - 0.13	0.19 - 0.25
150	0.09	0.02 - 0.03	0.04 - 0.07	0.1 - 0.14
200	0.06	0.01 - 0.02	0.03 - 0.04	0.07 - 0.09
250	0.04	0.01 - 0.02	0.02 - 0.03	0.05 - 0.06
Type	Intermittent	Intermittent	Continuous	Continuous
Nuisance Criteria	8.6 (preferred) / 17 (max)		0.28 (preferred) / 0.56 (max)	
Building Criteria	15 mm/s at 4 Hz increasing to 20 mm/s at 15 Hz 20 mm/s at 15 Hz increasing to 50 mm/s at 40 Hz and above			

The predicted vibration levels presented in Table 20 indicate compliance with the continuous preferred vibration nuisance criteria for locations at a separation distance of 40-80 metres. As the closest receptors are beyond these distances, nuisance vibration criteria will be achieved.

Compliance with the building damage criteria is predicted at 10 metres from operations for each source.

For intermittent vibration associated with haul vehicles, it is difficult to provide an appropriate comparison with the relevant criteria (which is presented as a Vibration Dose Value (VDV) in $m/s^{1.75}$). The calculation of a VDV requires both the overall weighted RMS (root mean square), and acceleration (m/s^2), typically obtained from on-site measurements and the estimated time period for vibration events.

It is noted that, however, that haul truck movements (on rough surfaces) at distances of >50 m is predicted to comply within the maximum continuous criteria of 0.56 mm/s. This comparison with the continuous criteria (as a conservative approach) indicates that vibration levels associated with operation of the quarry are not considered to be significant (which is expected given the significant separation distances).

8.3.2 Assessment of Impacts - Blasting

8.3.2.1 Existing Monitoring and Blasting

During blasting events the contractor undertaking the blasting did not conduct any monitoring as receptors are about 2km away from the current blast location.

A drilling and blasting report provided the client conducted on the 30 April 2021 stated that the Heaviest Charge Detonated at any Instance (MIC) was 130kg, which was adopted for this assessment

8.3.2.2 Airblast Overpressure

Airblast levels have been estimated using the following equation from AS 2187.2-2006, *"Explosives - Storage and use - Use of explosives"*:

$$P = K_a \left(\frac{R}{Q^{1/3}}\right)^a$$

Where:

P = pressure (kPa)

Q = explosives mass charge (kg)

R = distance from charge (m)

K_a = site constant (10 – 100)

A = site exponent (-1.45)

Applying a site constant (K_a) of 10 for receptor R05, a conservative MIC of 130 kg results in predicted compliance with the criterion of 100 dB(Lin Peak) at all nearby receptors.

8.3.2.3 Ground Vibration

Ground vibration levels have been estimated using the following equation from AS 2187.2-2006 *"Explosives - Storage and use - Use of explosives"*:

$$V = K_g \left(\frac{R}{Q^{1/2}}\right)^{-B}$$

Where:

V = ground vibration as PPV (mm/s)

Q = explosives mass charge (kg)

R = distance from charge (m)

K_g = site constant (1140)

B = site constant (1.6)

Applying the MIC as determined from the air blast overpressure calculation of 130 kg, the ground vibration level predicted to occur at receptor R05 is 0.3 mm/s, which complies with the criterion of 5 mm/sec.

It should be noted however that the impacts of blasting are dependent on-site specific factors including the blast management techniques, ground conditions and geological strata types and locations.

9 CONCLUSIONS

9.1 Noise

A noise impact assessment has been undertaken to confirm the suitability of the proposal in terms of acoustic amenity for nearby sensitive uses. Specifically, the assessment has considered the potential for adverse impacts upon existing residential land uses as a result of noise emissions associated with current quarry, future quarry, asphalt plant and a combined scenario.

Predictive noise modelling has been undertaken for the site to assess the potential impacts of noise emission from quarry operations and traffic generation. The results of the predictive noise modelling have determined that compliance with the adopted noise criteria is expected to be achieved without any additional acoustic mitigation for the proposed modification.

9.2 Vibration

A vibration impact assessment has been undertaken to confirm the suitability of the proposed modification in terms of amenity for nearby sensitive uses. Specifically, the assessment has considered the potential for adverse impacts upon existing residential land uses from plant and equipment during quarry operations. In particular, the assessment has considered the potential for impacts on both human comfort and structural damage for the nearest residence to the quarry. The assessment indicates that the current and proposed quarry operations comply with the applicable vibration criteria.

Predictive screening assessment has been undertaken for the proposed modification to assess the potential impacts of ground vibration and airblast from blasting at the quarry based on conservative blasting assumptions. The results of the screening assessment have determined that compliance with the adopted criteria for ground vibration and airblast are expected to be achieved with a MIC size less than 1000 kg. Blasting at the quarry will be able to continue to achieve compliance with vibration and airblast limits using different sizes of MIC along with a combination of appropriate site-specific blast design parameters.

APPENDIX A: BACKGROUND NOISE MONITORING

Table 21: NML 1 - Site Details

Site Details: NML 1	
Coordinates:	-23.4930991 "S, 150.5410027"E
Start / End Date	2 Dec 2021 at 16:00 hours to 10 Dec 2021 at 15:00 hours
Logger Details	Norsonic 139 (serial number – 1392970) Next Laboratory Calibration Due: 10 October 2023
Calibration Details	Norsonic 1256 (serial number 125626741) Start / End Calibration Level: 94.0 dB(A) / 94.0 dB(A) Next Laboratory Calibration Due: 28 Oct 2022
Measurement Details:	Fast/ A-weighting / 15-min duration / 1.2 m microphone height / Free field position
Weather Details	Onsite weather station indicated during the monitoring period one hour of data was affected by rainfall.
On-site Observations:	Located on boundary of caravan park. Dominant noise sources were traffic, wind through trees, and birdsong.
Site Photo	

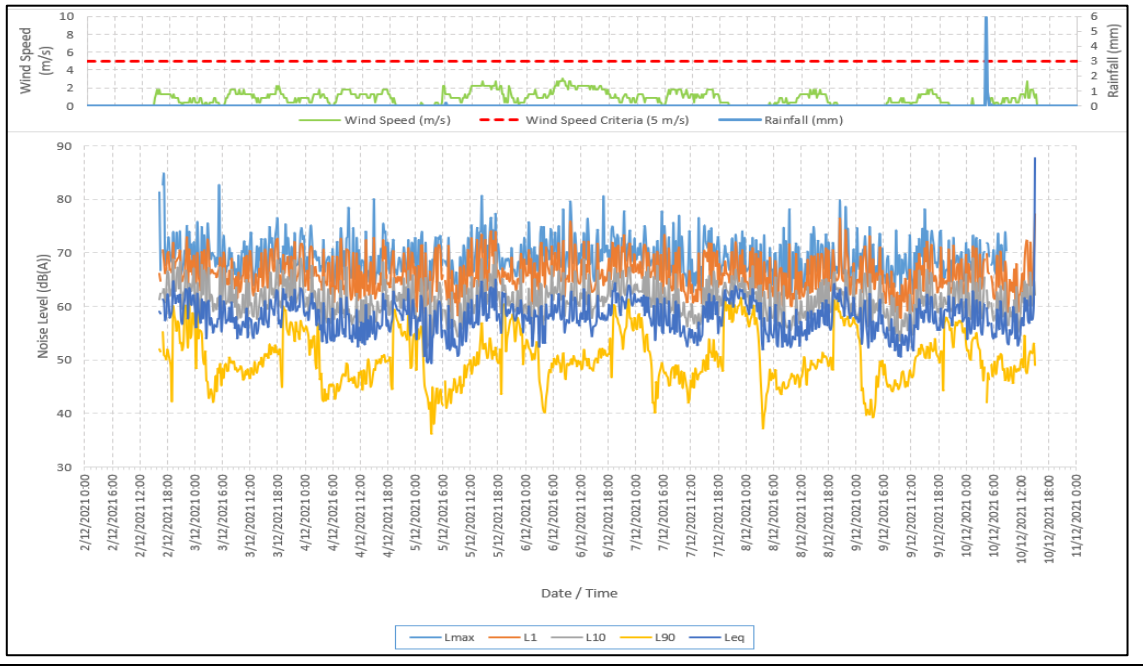
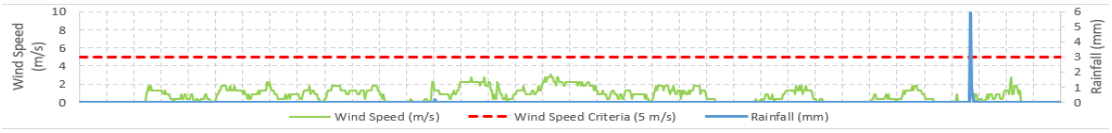


Table 22: NML 1 - Noise Monitoring Results

Date	Period	L_{max}	L_1	L_{10}	L_{90}	L_{eq}	minL_{90}, 1-hour	medianL_{eq}, 1-hour
2/12/2021	Day	-	-	-	-	-	-	-
	Evening	73.9	67.8	64.2	53.7	61.0	49.3	60.9
	Night	82.7	67.3	62.7	50.4	59.8	43.8	59.2
3/12/2021	Day	74.7	66.1	61.3	49.2	58.0	47.2	58.0
	Evening	76.3	67.2	63.5	54.4	60.6	49.5	60.5
	Night	75.1	66.3	61.3	50.2	58.9	42.7	58.3
4/12/2021	Day	80.0	65.7	59.7	47.4	57.2	45.0	56.2
	Evening	72.3	65.9	61.4	53.9	59.1	47.6	59.2
	Night	73.8	65.8	59.5	47.5	57.9	40.9	57.0
5/12/2021	Day	80.6	66.2	60.8	48.6	59.1	44.0	58.1
	Evening	71.6	65.6	61.4	54.7	59.5	49.5	59.1
	Night	75.7	66.8	60.8	49.9	58.3	43.2	58.4
6/12/2021	Day	80.6	66.6	61.9	49.7	58.9	48.2	58.7
	Evening	77.7	68.7	64.1	54.8	61.1	51.1	60.9
	Night	77.6	67.5	62.8	52.0	60.3	44.3	60.4
7/12/2021	Day	76.8	65.7	60.3	47.8	57.7	44.8	57.7
	Evening	73.2	66.4	62.8	56.1	60.9	48.8	61.5
	Night	74.0	65.7	61.7	52.4	59.9	42.8	59.7
8/12/2021	Day	78.1	64.9	59.5	47.5	56.6	44.7	56.2
	Evening	79.8	67.2	62.9	55.7	61.0	48.5	61.4
	Night	74.8	65.8	60.7	48.4	58.1	40.2	57.7
9/12/2021	Day	78.1	64.1	59.5	48.5	57.0	44.9	55.2
	Evening	74.1	65.4	60.9	53.9	58.8	49.9	59.1
	Night	73.2	65.8	61.0	51.6	58.4	47.0	58.4

Table 23: NML 2 - Site Details

Site Details: NML 2	
Coordinates:	-23.470884"S, 150.516685"E
Start / End Date	2 Dec 2021 at 13:27 hours to 5 Dec 2021 at 15:12 hours
Logger Details	Rion NL42 (serial number – 01047100) Next Laboratory Calibration Due: 13 August 2023
Calibration Details	Norsonic 1256 (serial number 125626741) Start / End Calibration Level: 94.0 dB(A) / 93.0 dB(A) Next Laboratory Calibration Due: 28 Oct 2022
Measurement Details:	Fast/ A-weighting / 15-minute duration / 1.2 m microphone height / Free field position
Weather Details	Onsite weather station indicated during the monitoring period 15 minutes of data was affected by rainfall.
On-site Observations:	Located near the northern aspect of site near the residential area off Gavial Gracemere Road. Dominant noise sources were animals, wind through trees, and birdsong.
Site Photo	



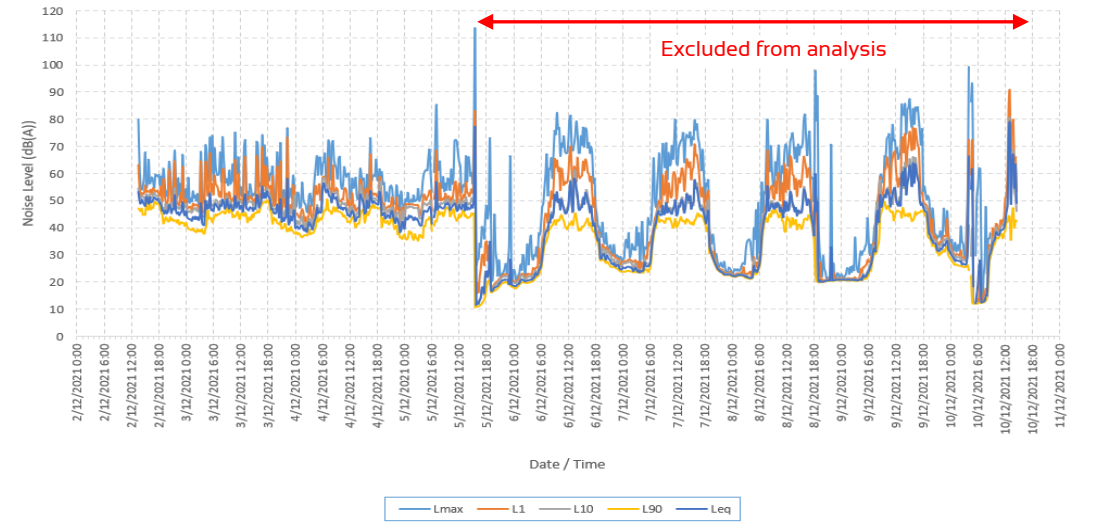
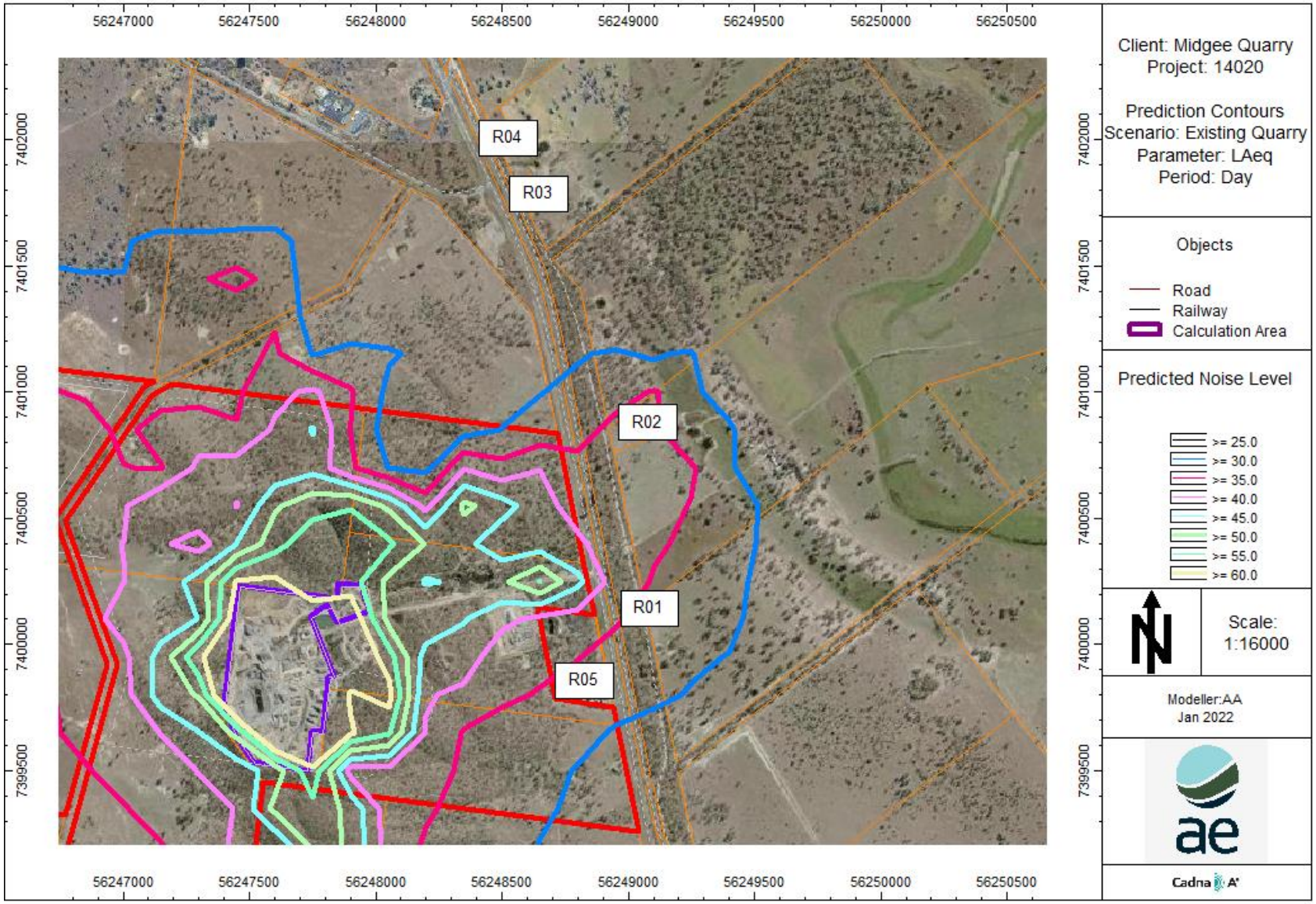


Table 24: NML 2 - Noise Monitoring Results

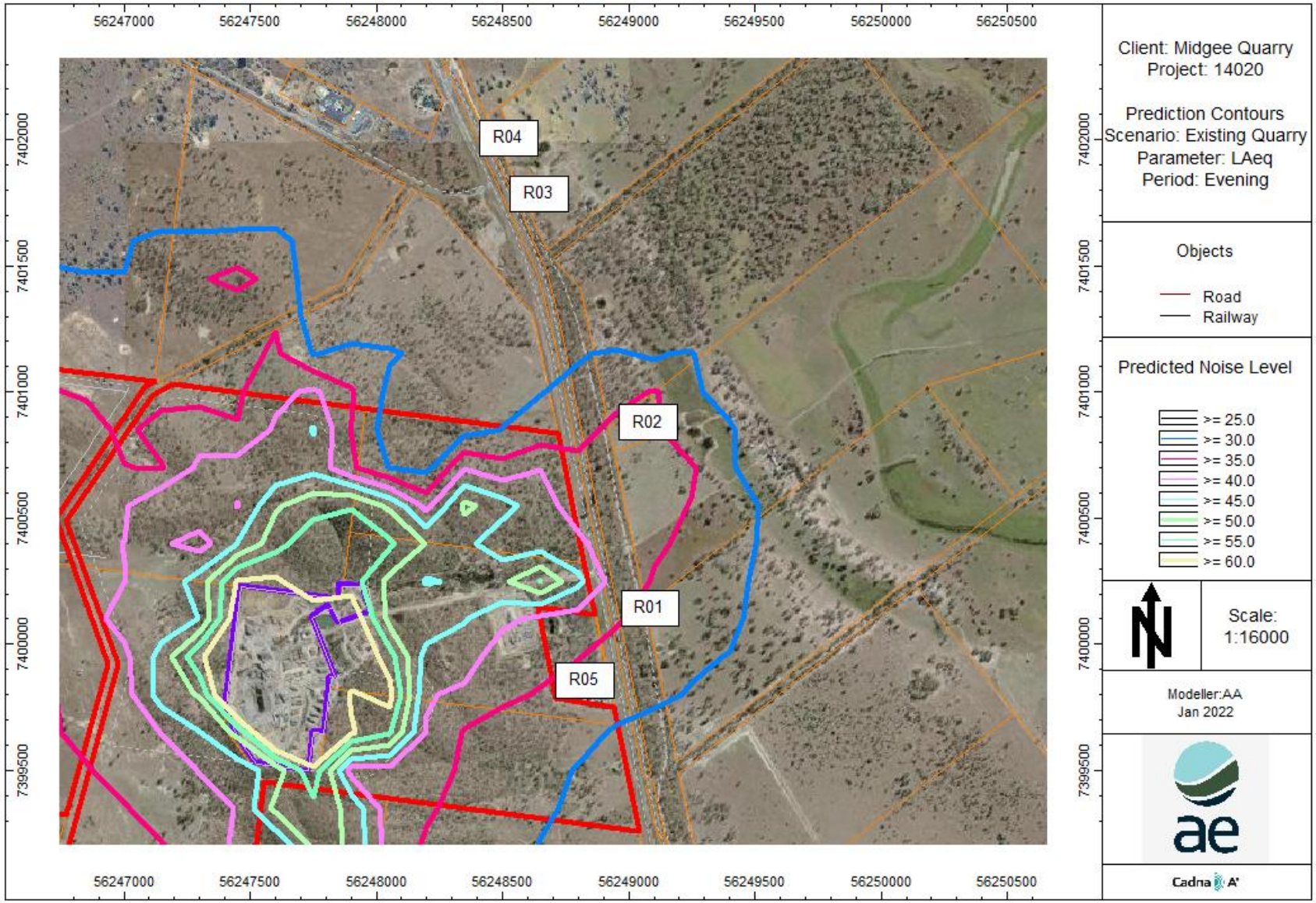
Date	Period	L_{max}	L_1	L_{10}	L_{90}	L_{eq}	minL_{90}, 1-hour	medianL_{eq}, 1-hour
2/12/2021	Day	-	-	-	-	-	-	-
	Evening	68.4	53.5	48.9	43.7	47.7	42.3	47.7
	Night	73.9	51.8	47.2	41.0	46.3	38.7	45.2
3/12/2021	Day	75.1	54.5	49.7	45.6	49.3	43.7	48.7
	Evening	71.2	53.1	47.6	43.1	47.5	40.1	46.8
	Night	76.7	49.5	45.6	39.8	48.3	37.2	44.5
4/12/2021	Day	73.0	52.7	49.8	45.0	49.1	41.9	49.1
	Evening	61.6	49.8	47.9	43.3	47.0	40.8	44.7
	Night	71.3	48.5	46.3	38.4	43.8	35.9	43.2

APPENDIX B: NOISE CONTOURS

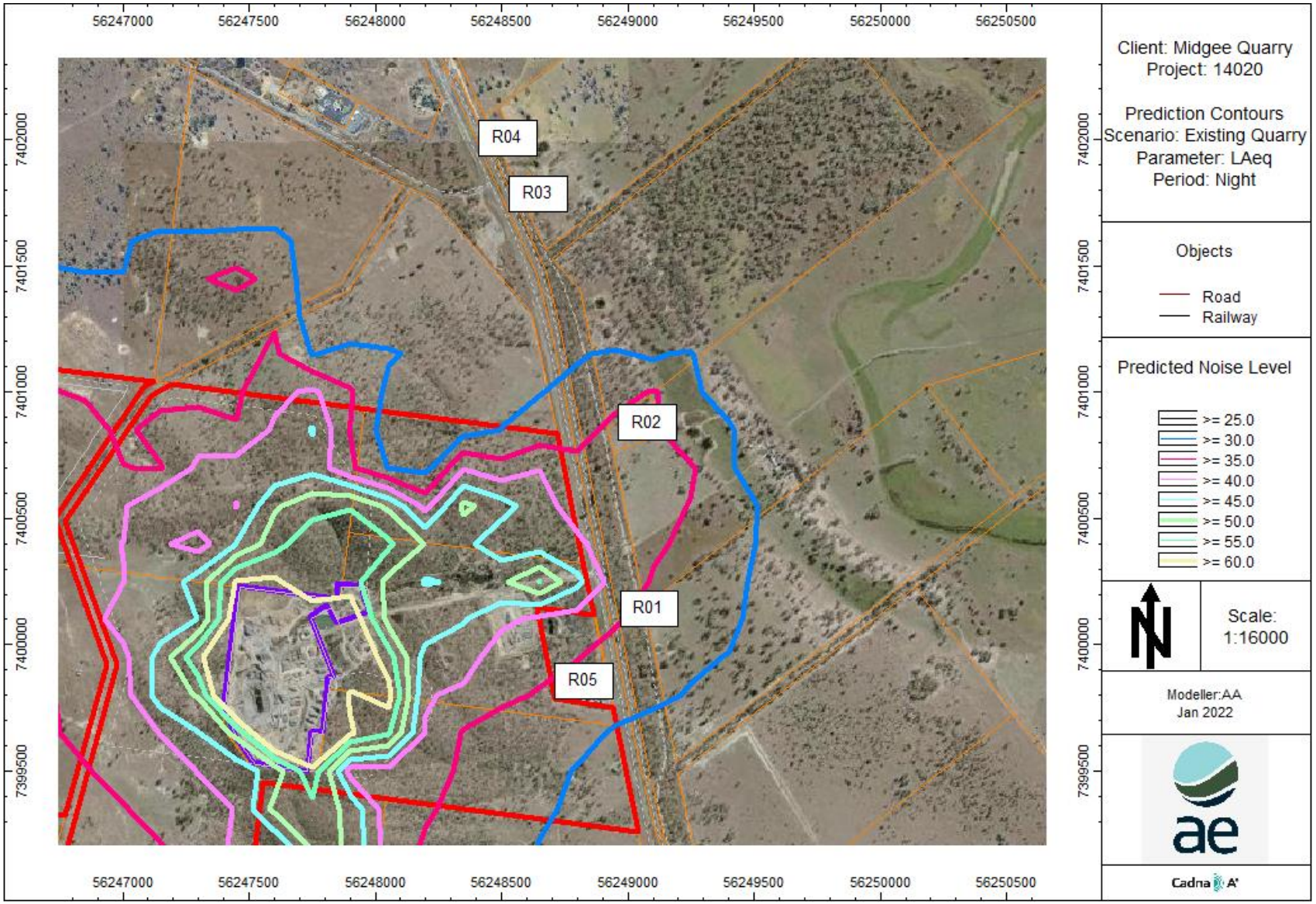
Contour plots illustrate the spatial distribution of ground-level concentrations across the modelling domain for each time period of interest. However, this process of interpolation causes a smoothing of the base data that can lead to minor differences between the contours and receptor model predictions.



Noise Contours Day Time for Existing Quarry at 1.5m- L_{Aeq}



Noise Contours Evening Time for Existing Quarry at 1.5m- L_{Aeq}



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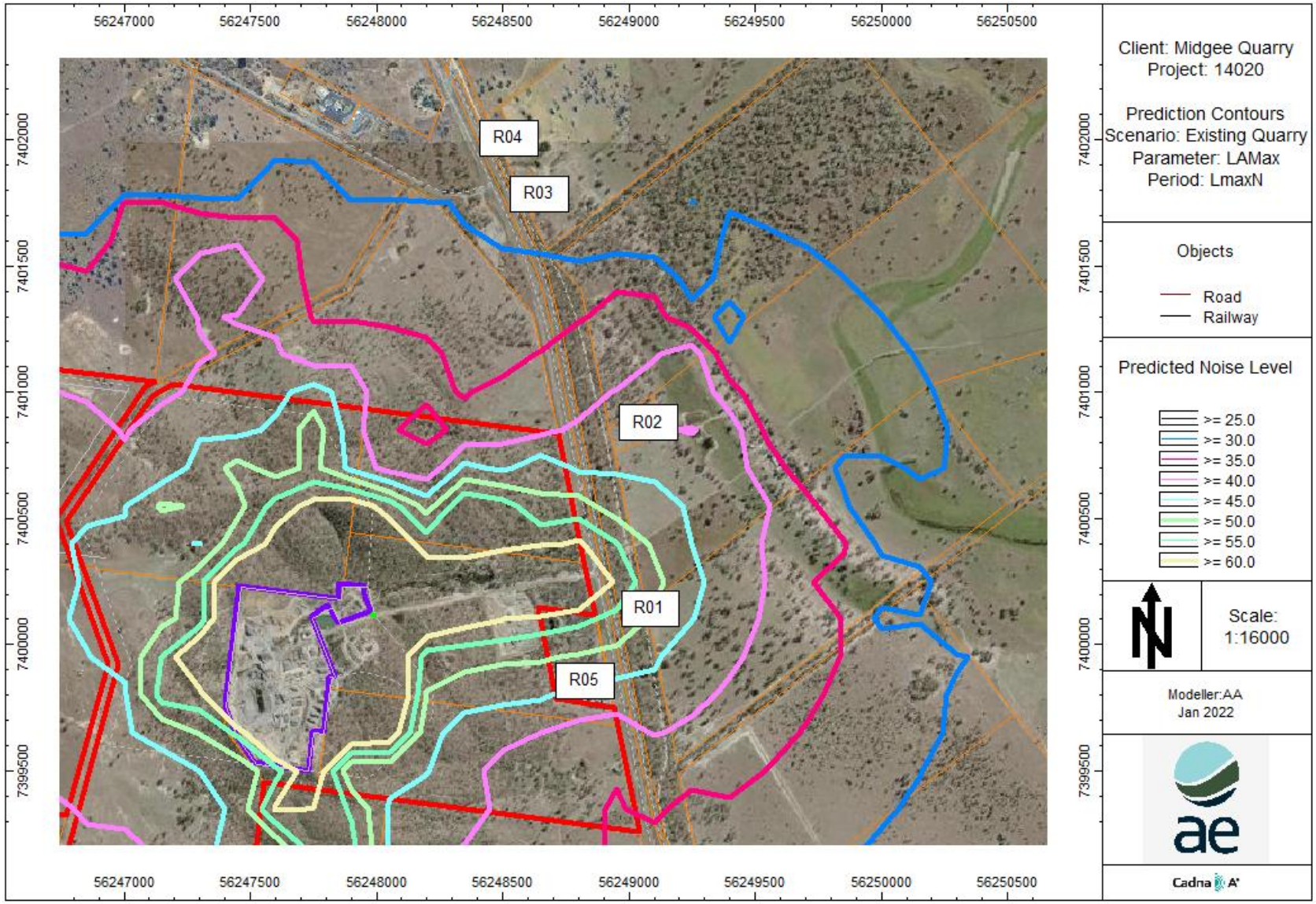
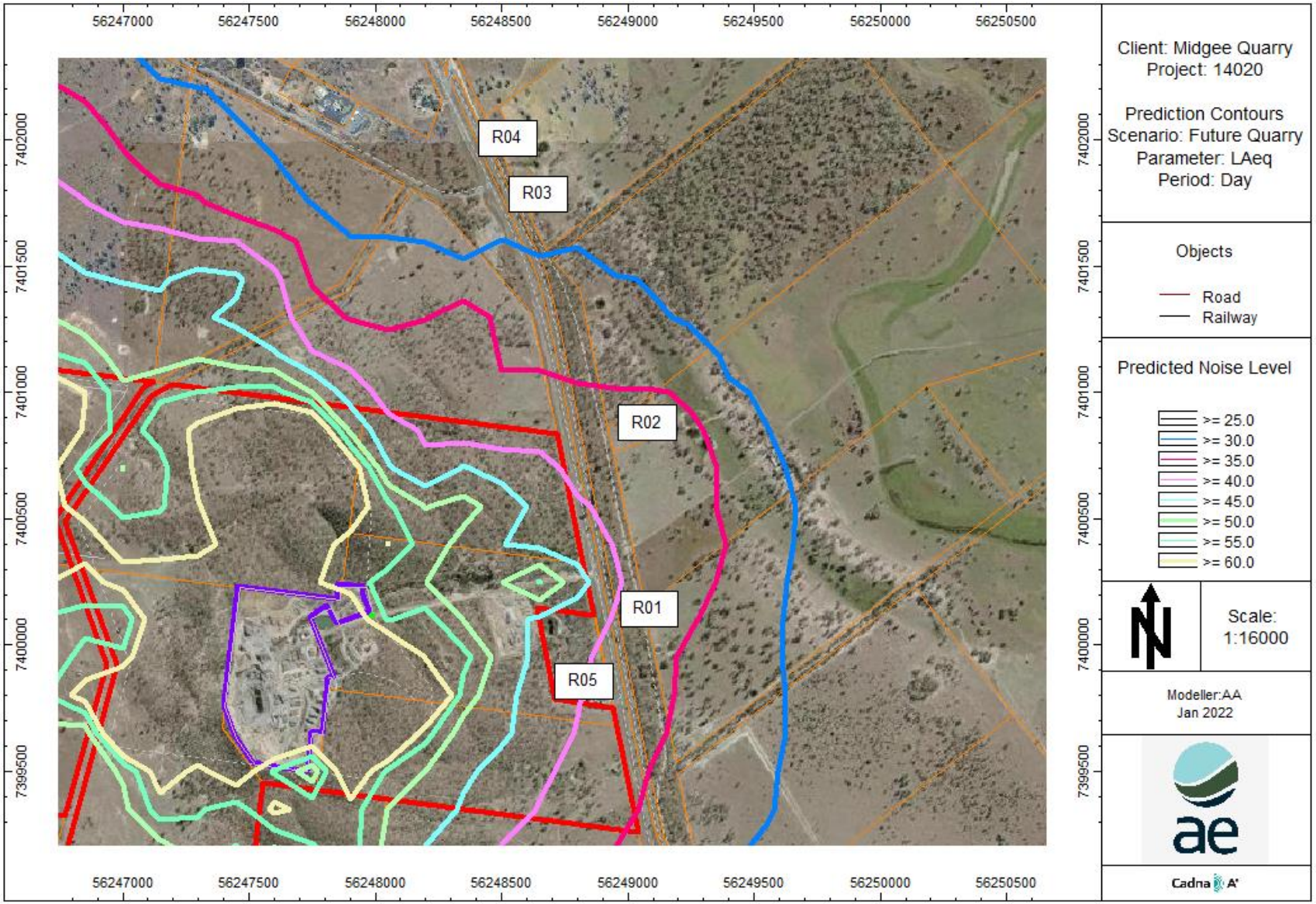
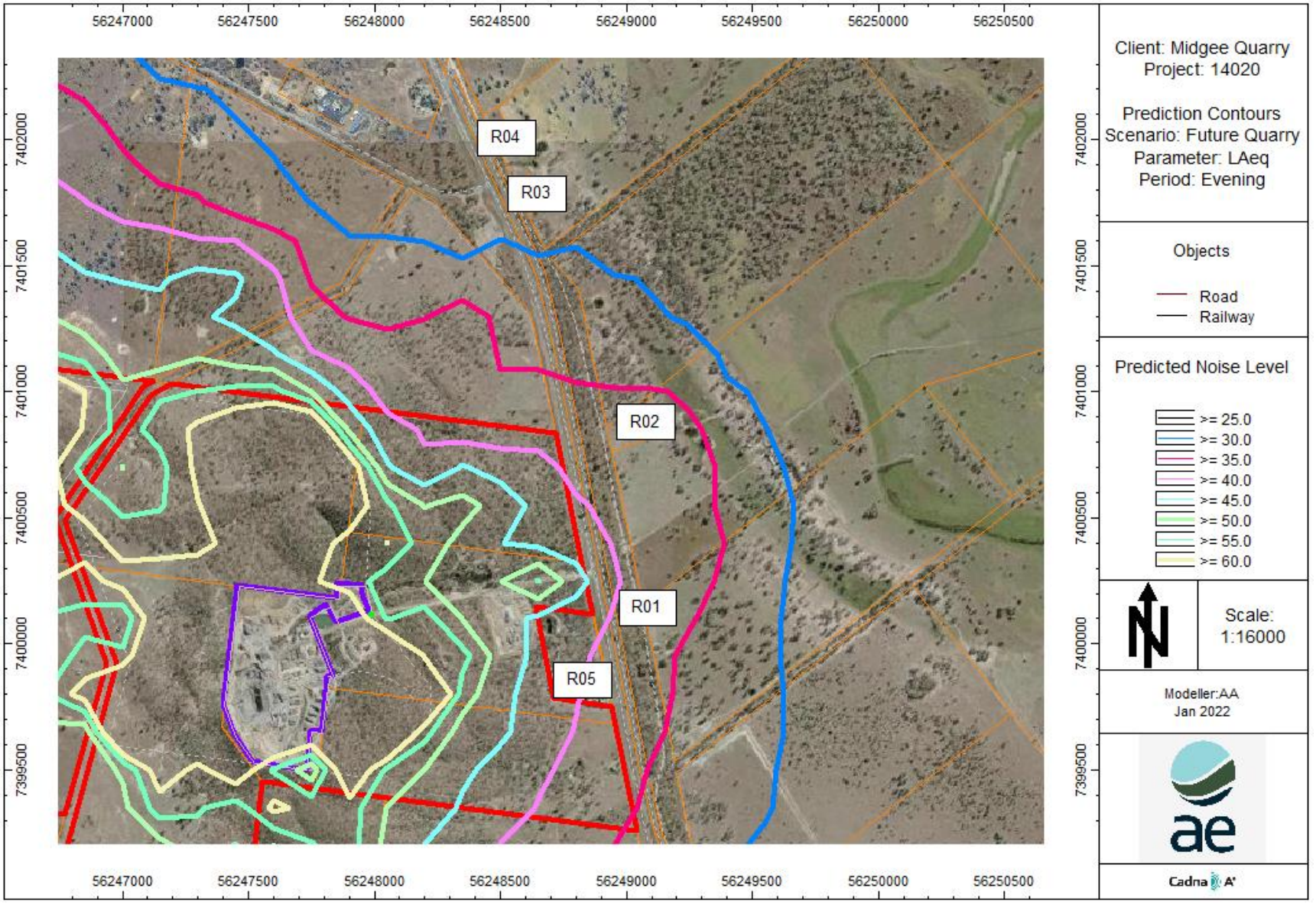


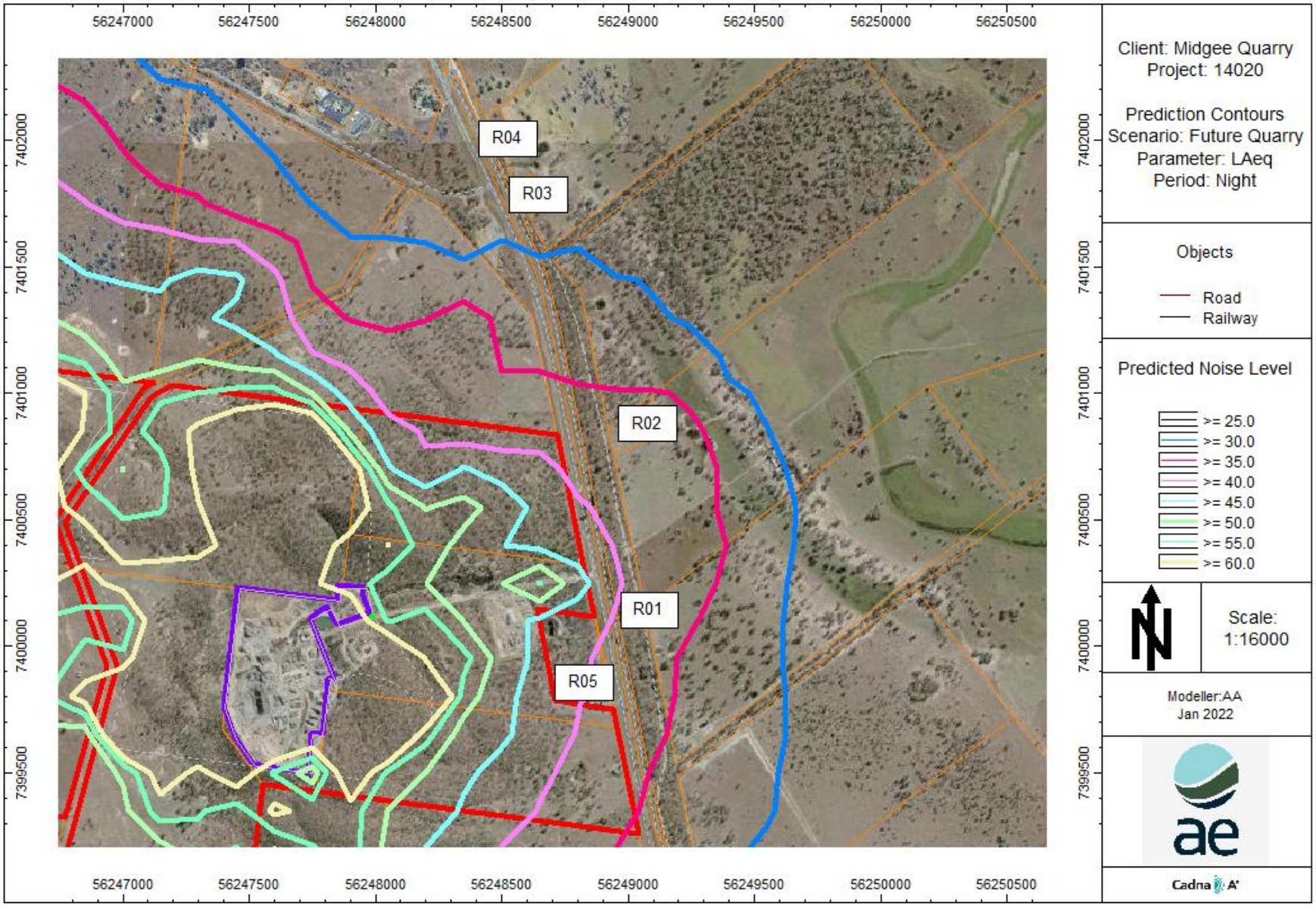
Noise Contours Night Time for Existing Quarry at 1.5m- L_{Amax}



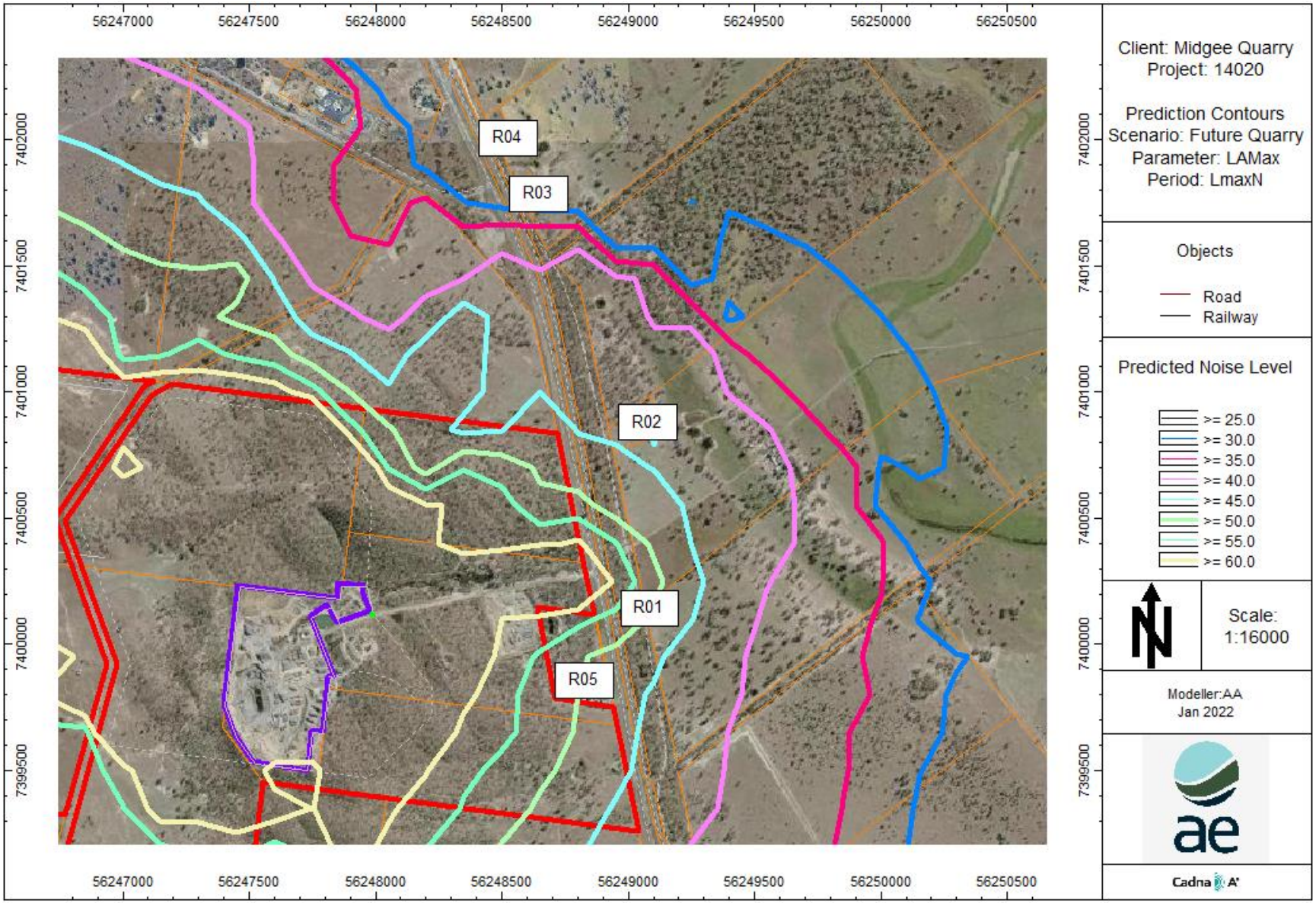
Noise Contours Day Time for Future Quarry at 1.5m- L_{Aeq}



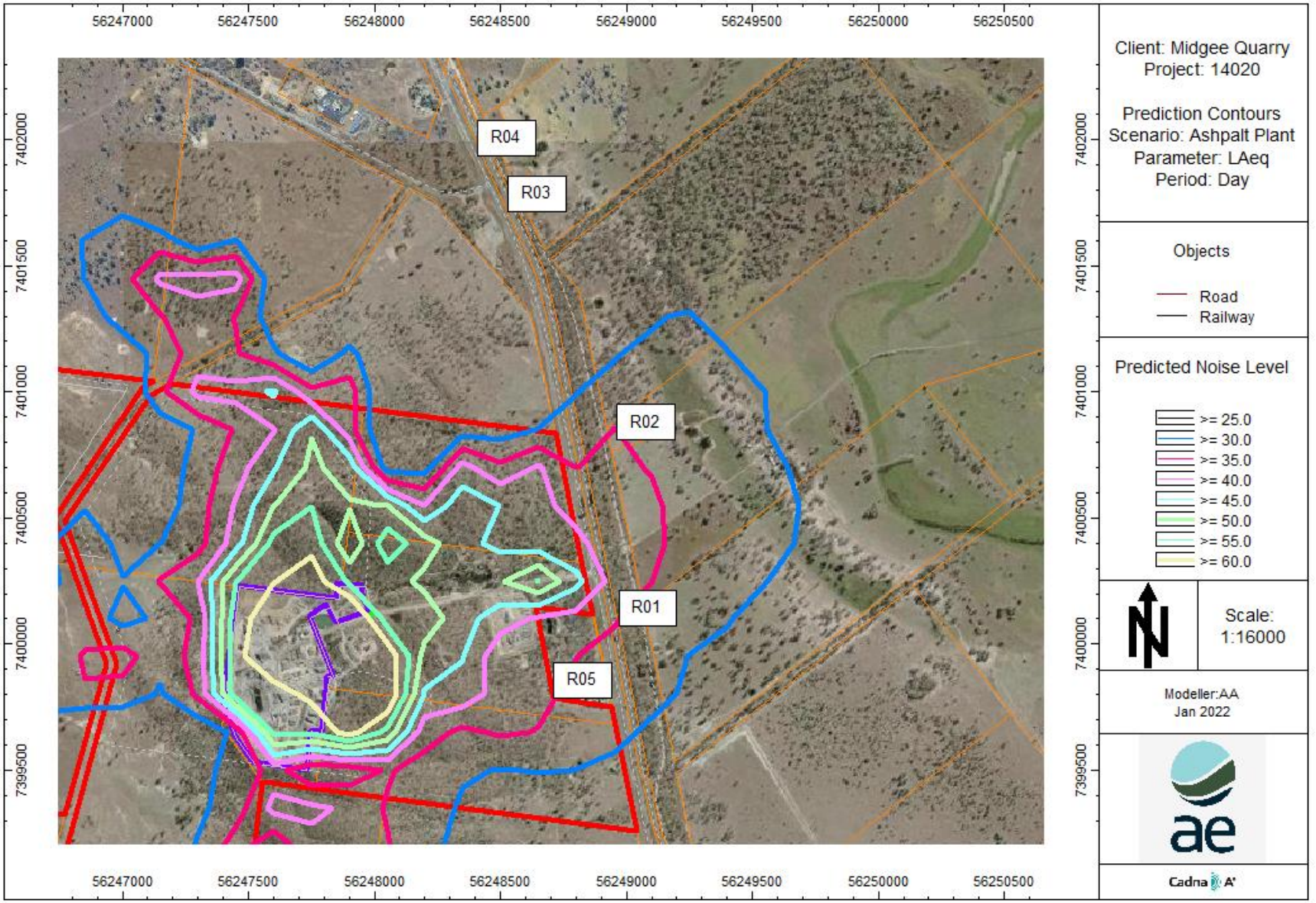
Noise Contours Evening Time for Future Quarry at 1.5m- L_{Aeq}



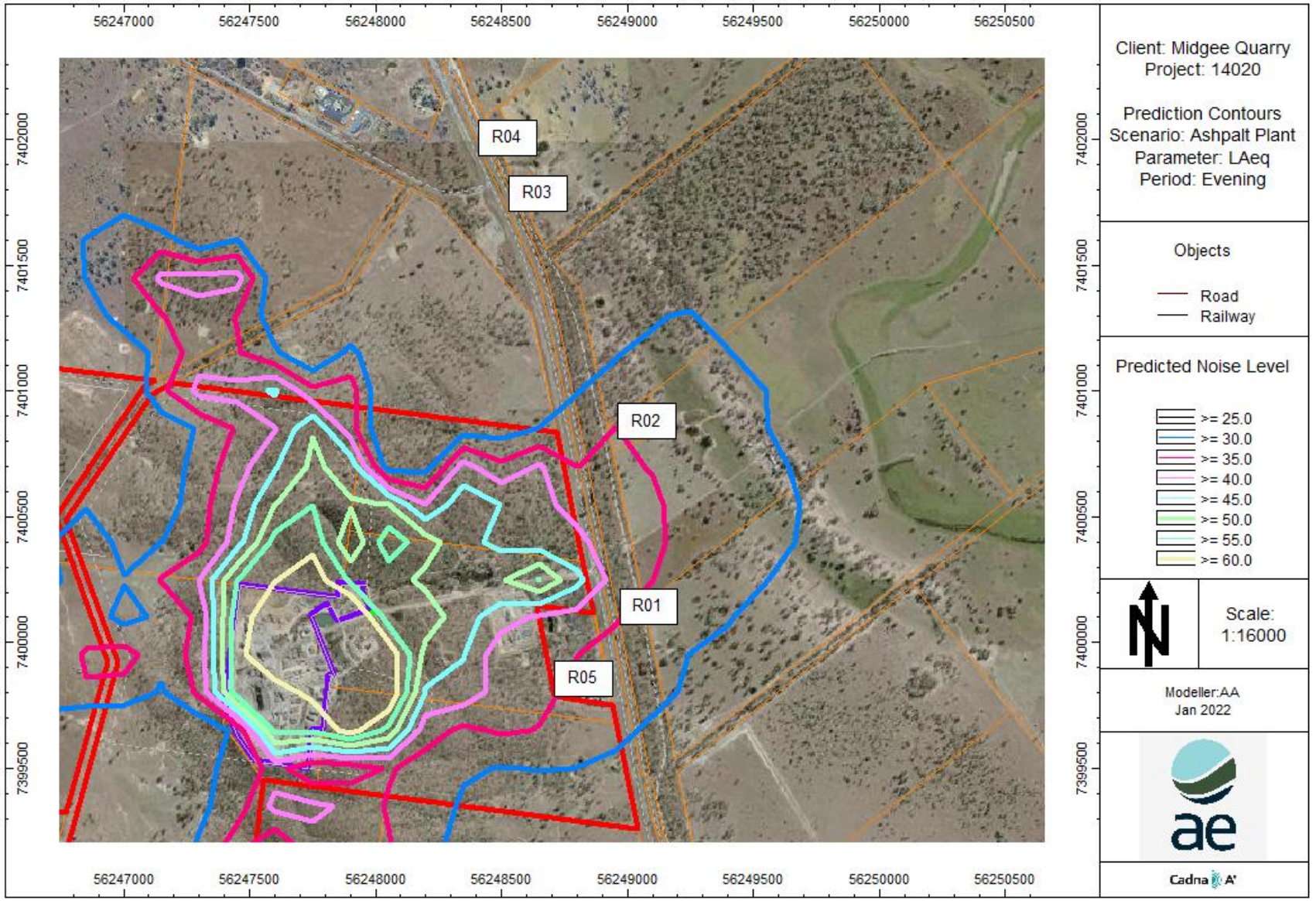
Noise Contours Night Time for Future Quarry at 1.5m- L_{Aeq}



Noise Contours Night Time for Future Quarry at 1.5m- L_{Amax}



Noise Contours Day Time for Asphalt Plant at 1.5m- L_{Aeq}



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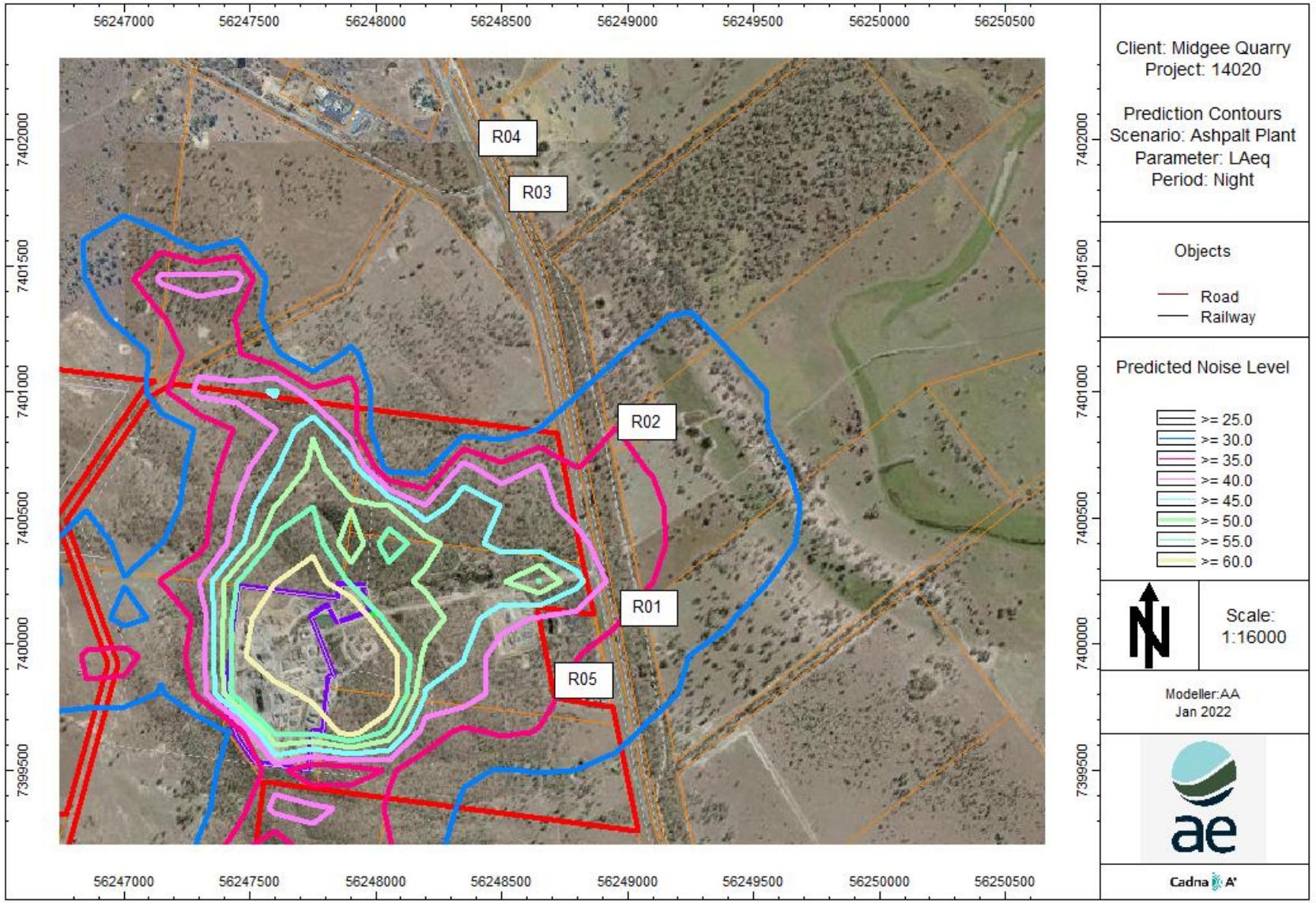
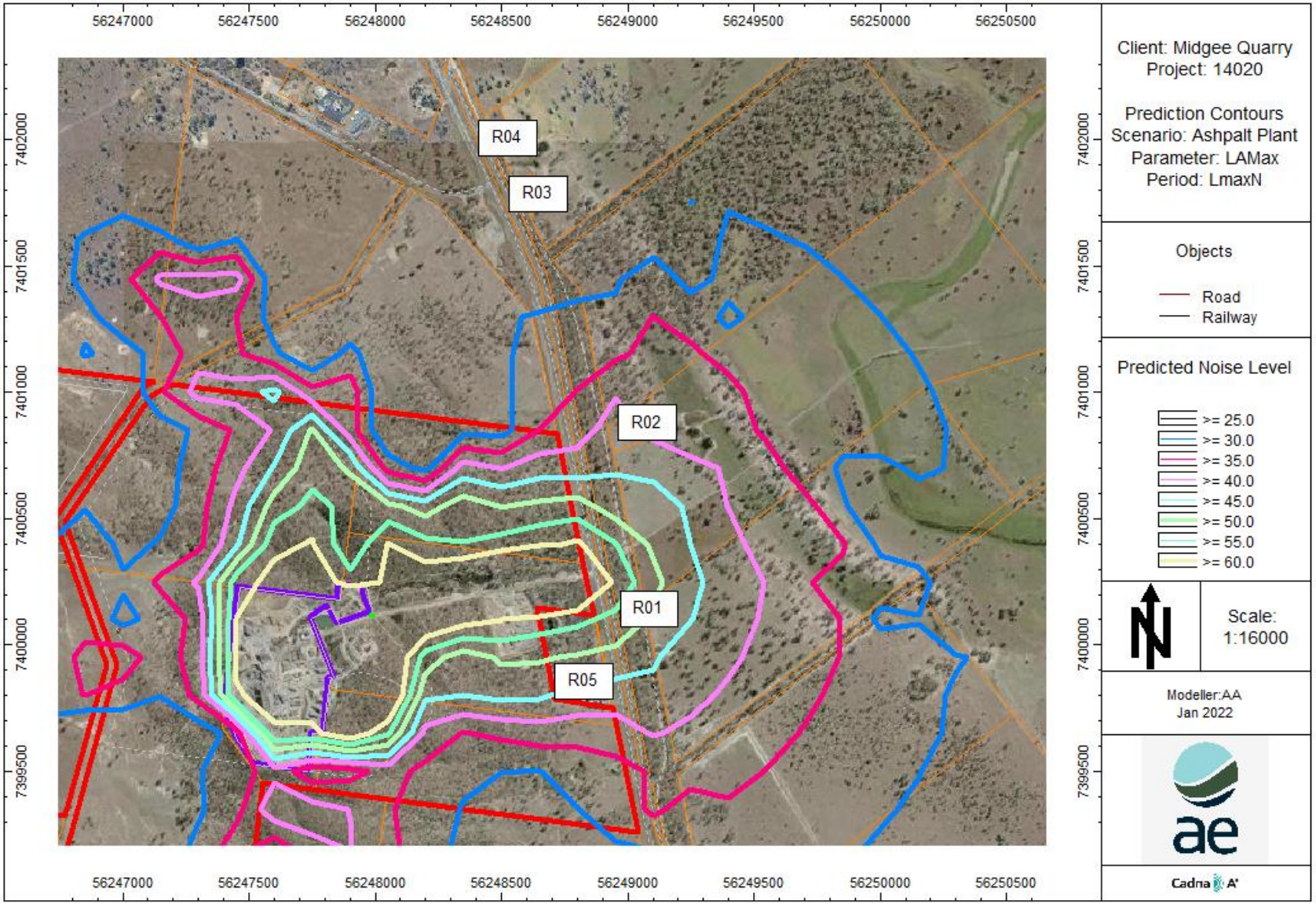
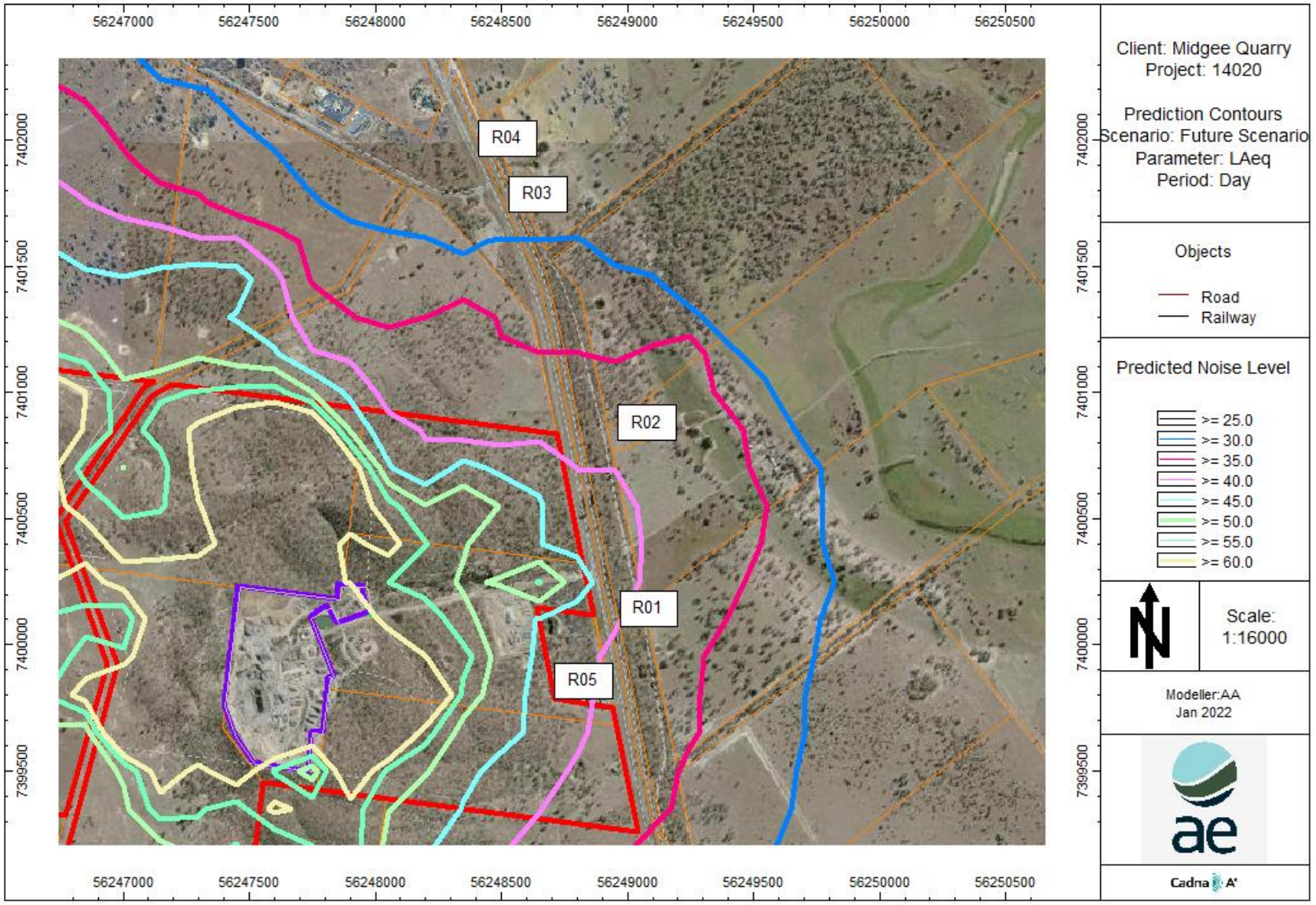


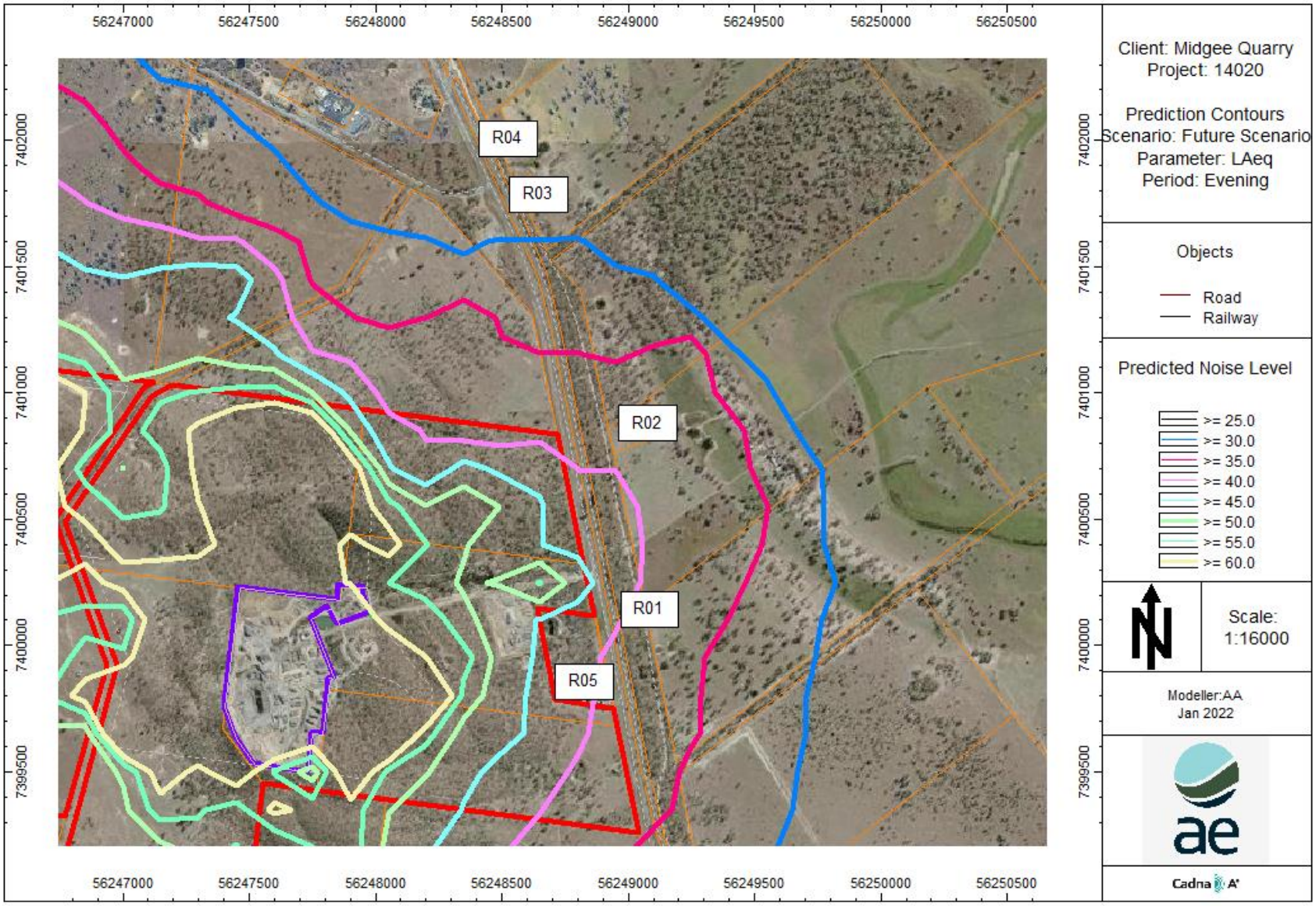
Noise Contours Night Time for Asphalt Plant at 1.5m- L_{Aeq}



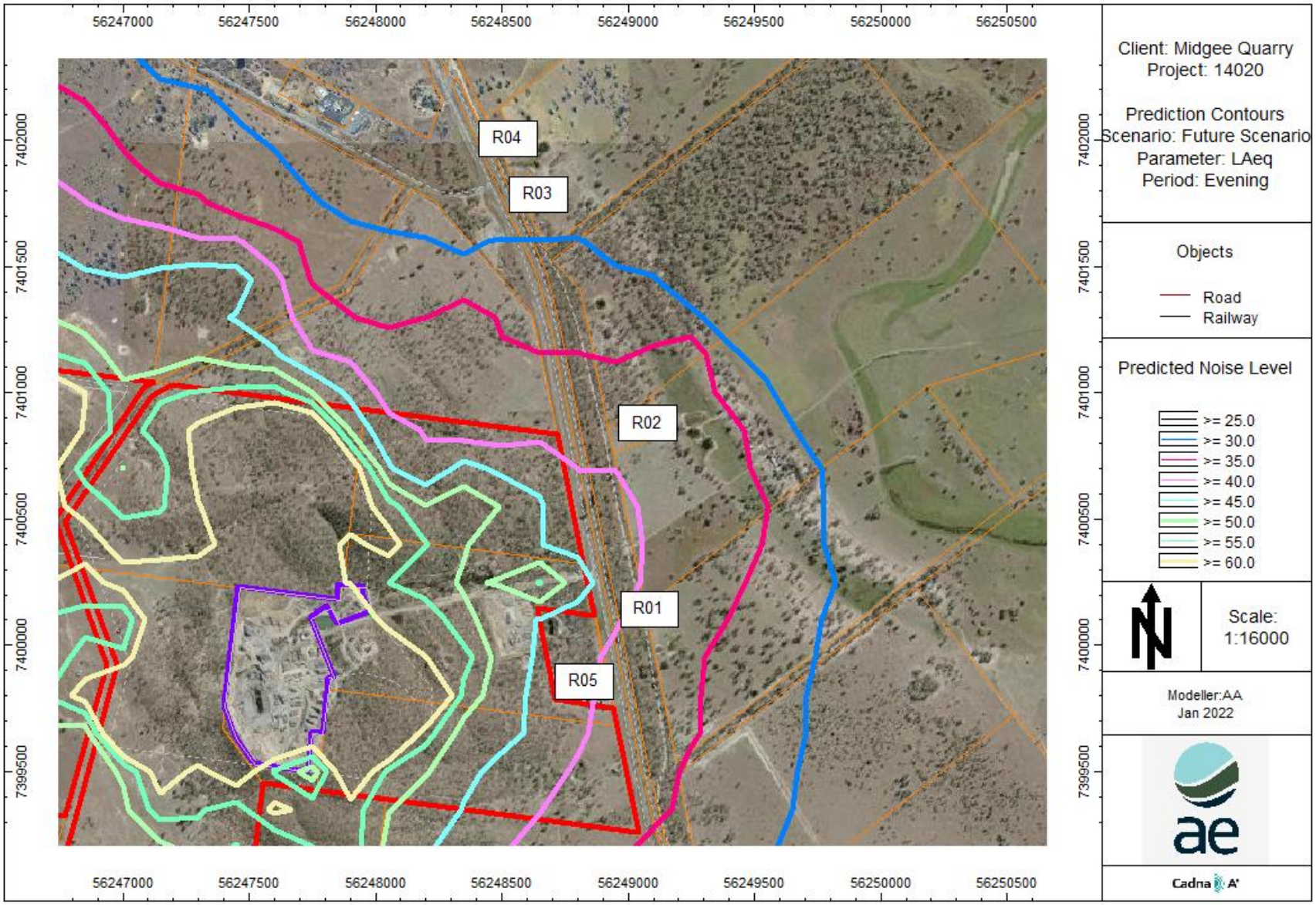
Noise Contours Nighttime for Asphalt Plant at 1.5m- L_{AMax}



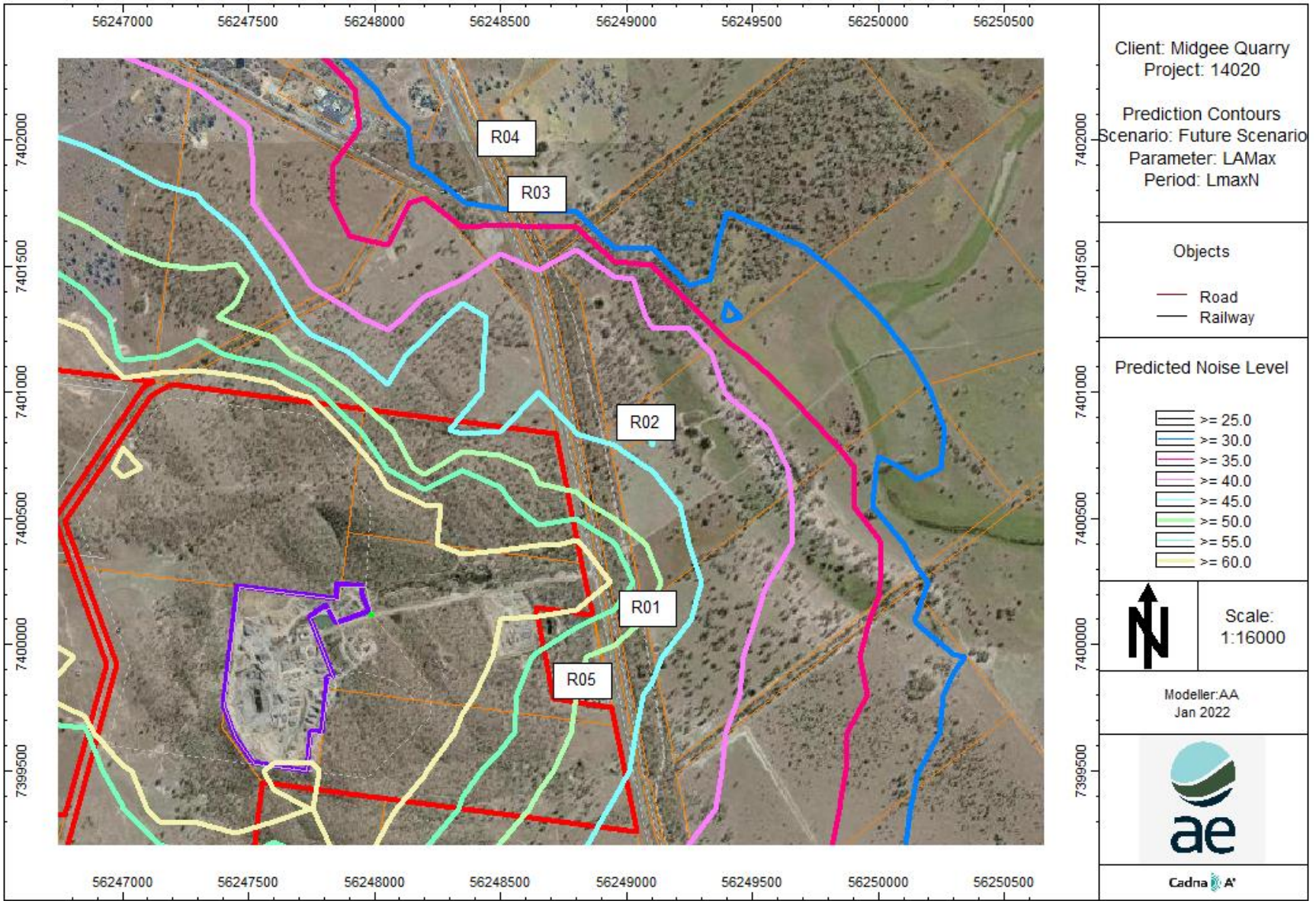
Noise Contours Day Time for Future Scenario at 1.5m- L_{Aeq}



Noise Contours Evening Time for Future Scenario at 1.5m- L_{Aeq}



Noise Contours Night Time for Future Scenario at 1.5m- L_{Aeq}



Noise Contours Night Time for Future Scenario at 1.5m- L_{AMax}

Attachment 4

Air Quality Assessment

MIDGEE QUARRY - AIR QUALITY ASSESSMENT

Project ID: 14020

8/02/2022

Release: R2



Prepared For:

Hopkins Brothers Group Pty Ltd

Assured Environmental

DOCUMENT CONTROL PAGE

Project Title: MIDGEE QUARRY - AIR QUALITY ASSESSMENT

Project Reference ID: 14020

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M. Clifton

Author: Michelle Clifton

Reviewer: Craig Beyers

Table 1: History of Revisions

Revision	Date	Issued to	Changes
R0	22/12/2021	M. Benham	Draft Release for Comment
R1	25/01/2022	M. Benham	Formal Release
R2	8/02/2022	M. Benham	Typos

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GLOSSARY

°C	Degrees centigrade
Conversion of ppm to mg/m^3	Where R is the ideal gas constant; T, the temperature in kelvin (273.16 + T°C); and P, the pressure in mm Hg, the conversion is as follows: $mg\ m^3 = (P/RT) \times Molecular\ weight \times (concentration\ in\ ppm)$ $= \frac{P \times Molecular\ weight \times (concentration\ in\ ppm)}{62.4 \times (273.2 + T°C)}$ For the purposes of the air quality assessment all conversions were made at 0°C unless stated otherwise.
g/s	Grams per second.
g/m^2	Gram per metre square.
g/m^2/month	Gram per metre square per month.
ha	Hectares.
m	Metre.
m/s	Metres per second
mg/m^3	Milligrams (10-3) per cubic metre. Conversions from mg/m^3 to parts per volume concentrations (i.e., ppm) are calculated at 0 °C.
kg	Kilograms.
kg/annum	Kilograms per annum.
km	Kilometre
$\mu g/m^3$	Micrograms (10-6) per cubic metre. Conversions from $\mu g/m^3$ to parts per volume concentrations (i.e., ppb) are calculated at 0 °C.
ppb	Parts per billion.
ppm	Parts per million.
PM_{10}, $PM_{2.5}$, PM_1	Fine particulate matter with an equivalent aerodynamic diameter of less than 10, 2.5 or 1 micrometres, respectively. Fine particulates are predominantly sourced from combustion processes. Vehicle emissions are a key source in urban environments.
TSP	Total suspended particulate.
70th percentile	The value exceeded for 70 % of the time.

ABBREVIATIONS

AQMP	Air Quality Management Plan
DES	Department of Environment and Science
EA	Environmental Authority
ERA	Environmentally Relevant Activities
GLC	Ground Level Concentration
tpa	Tonnes per annum

Mtpa	Million tonnes per annum
NPI	National Pollutant Inventory
RRC	Rockhampton Regional Council

1 INTRODUCTION

1.1 Background

Hopkins Brothers have been operating the Midgee Quarry on the Bruce Highway, Midgee, since the early 2000s. Historically, the site has been used to extract material since the 1960s. The quarry operation has evolved over the years to respond to market demand, resulting in various planning permits having been obtained from Rockhampton Regional Council (RRC).

Local demand for quarry resources is anticipated to increase in the next decade, driven by regional significant infrastructure projects and a general increase in development within the region. As such, Hopkins Brothers are seeking to secure access to the known resource.

The most recent approval was granted by RRC on 6 November 2018, which extended the existing operational area, concrete crushing operations and an outdoor storage area to store extracted material and equipment associated with the extractive and industrial operations on the site.

The permit change aims to increase the current hours of operation, pit area, and output to a maximum of 2,000,000 tonnes per annum.

1.2 Scope of Assessment

Assured Environmental (AE) was appointed by Groundwork Plus on behalf of Hopkins Brothers Group Pty Ltd to undertake an air quality assessment from the expansion of the quarry.

In undertaking the assessment, reference has also been made to the Department of Environment & Science (DES) *Guideline - Application requirements for activities with impacts to air* (2019).

In accordance with the requirements of the above guidelines, computational modelling and first principle calculations have been undertaken to assess the potential for adverse amenity and health impacts as a result of the proposed development.

1.3 This Report

This report summarises the methodology, results, and conclusions of the air quality assessment.

2 MIDGEE QUARRY OPERATIONS

2.1 Existing Operations

Hopeman Pty Ltd trading as Hopkins Brothers Group Pty Ltd, operate the existing operations at Lot 2 on RP888747. The existing approvals for this site include the quarry and an asphalt plant.

2.1.1 Quarry

Resource has been sourced from the site since the 1960s. The current operation has evolved over the years to respond to market demand, resulting in various planning permits having been obtained from Council.

On 6 November 2018, Rockhampton Regional Council approved the current operation (Council Ref: D/79-2017). This permit extended the existing operational area, concreate crushing operations and the outdoor storage area to store extracted material and equipment associated with the extractive and industrial operations.

The site also operates pursuant to an Environmental Authority (EA) for Environmentally Relevant Activities 16(2)(b) and 16(3)(b) for extracting and screening between 100,000 to 1,000,000 tonnes of material per year (DES Ref: IPCE01813610), dated 19 January 2010.

Hopkins Brothers has advised that the existing quarry produced a total of 700,000 – 800,000 tonnes over past 5 years.

2.1.2 Asphalt Plant

On 9 April 2020, Rockhampton Regional Council granted approval to establish an asphalt plant on the site (Council Ref: D/83-2019). Council also issued an EA for Environmentally Relevant Activities (ERA) ERA6 for asphalt manufacturing (Council Ref: EPAEA/1/2019), dated 6 April 2020.

An asphalt plant has previously operated on the site under a temporary approval, however, is currently not located at the site. Consideration will be given that an asphalt plant may be established pursuant to the 2020 permit and EA. .

The 2020 permit and EA do not provide limits on throughput or operating hours. There are no changes proposed to the approved asphalt plant operations. It is understood that the asphalt plant will produce a maximum of 100,000 tonnes per year. The location of the asphalt plant is where the existing crusher plant is located. Whilst the asphalt plant is approved to operate at the facility, it is not permanent. As such, the asphalt plant is discussed in more detail in Section 7.4.

2.2 Proposed Quarry Operations

A conceptual quarry layout has been prepared which incorporates five adjoining properties, properly described as Lot 2 on RP888747, Lot 1 on SP247721, Lot 2 on SP247721, Lot 725 on RP888747 and Lot 931 on LIV40265. Two pits have been proposed, so as to achieve a 50-metre buffer to the road reserve and also as a consequence of the differing resource/materials in each area. Each pit will be developed progressively, to meet market demand.

Midgee Quarry is project driven by blasting and ripping at times, depending on the product being targeted. The quarry will continue to use standard quarrying methodologies that involve clearing, topsoil, and overburden stripping, drilling, and blasting, extraction, processing and

stockpiling with the final products sold for use in the construction industry. The outline of the extraction area is shown in Figure 1.

2.3 Comparison of Activities

Table 2 provides a comparison of current activities and proposed activities as part of the increase in production. Despite the increase in extraction, the number of blasts will not increase much as a significant proportion of the additional material will be road base/bulk fill which does not need blasting.

Table 2: Comparison of Quarry Activities

Aspect	Existing Activities	Future Activities
Quarry footprint	As per consent.	Ref to Figure 1.
Hours of operation	6am and 6pm Monday to Saturday. No operations occur on public holidays.	24/7
Production and Transportation limits	Current production of approximately 200,000 tpa however is permitted to produce up to 1,000,000 tpa.	Maximum 2 Mtpa from the site.
Extraction method	Extraction by blast and drill	No change to extraction method.
Site infrastructure and plant	Primary and tertiary crushing and screening facilities as fixed and mobile plant	Primary and tertiary crushing and screening facilities as fixed and mobile plant. The locations of the mobile plant are flexible depending on commercial requirements
Asphalt plant	Temporary plant used previous but no longer at site.	Proposed 100,000 tpa of which approximately two thirds of raw material provided by quarry.
Product transport	Via truck	No change to method of transport or access road.
Blasting	4 per year	8 per year
Vegetation clearing	N/A	Approx. 2.5 ha every 5 years

2.4 Stages of Expansion

The expansion of the quarry is not detailed in many stages as the course of the quarry development will depend on customer requirements, however the expected expansion will occur to the east, north and west as shown in Figure 1.

It is predicted that a majority of the material required in the next five years will be general fill, which is generally found in the first bench (15 – 20 m below natural ground level). Pit 1 and Pit 2 will likely occur concurrently, however Pit 2 will remain the main source extraction area for the duration of the Project life. The expected average throughput is 1.6 Mtpa; with a typical breakdown by fraction, however up to 2 Mtpa is expected to be processed per year.

The areas of expansion and operations of the quarry are not finalised due to the client requirements. In consultation with the quarry operators, the following assumptions regarding quantities of material, location and activities are detailed in Table 3.

Table 3: Pit Operations

Activity	Pit Area				
	Existing	Pit 1	Pit 2 (North)	Pit 2 (East)	Pit 2 (West)
Production (tpa)	500,000	300,000	600,000	400,000	200,000
Material Type	Road base/ concrete agg	Bulk fill	Bulk fill	Bulk fill	Road base/ concrete agg
Blasting	Yes	-	-	-	Yes
Screening	Yes	Yes	-	Yes	Yes
Crushing	Yes	Yes	Yes	Yes	Yes
Intermediate product stockpile	Yes	Yes	Yes	Yes	Yes

2.5 Equipment

The quarry currently has a range of equipment. With the increase in capacity, it is expected that the current the equipment will be utilised more efficiently, however additional mobile plant will be added:

- Fixed screening/crushing plant;
- Mobile screening/crushing plants;
- Excavators;
- Wheeled loaders;
- Articulated trucks (including one utilised as a water truck); and
- Dozers.

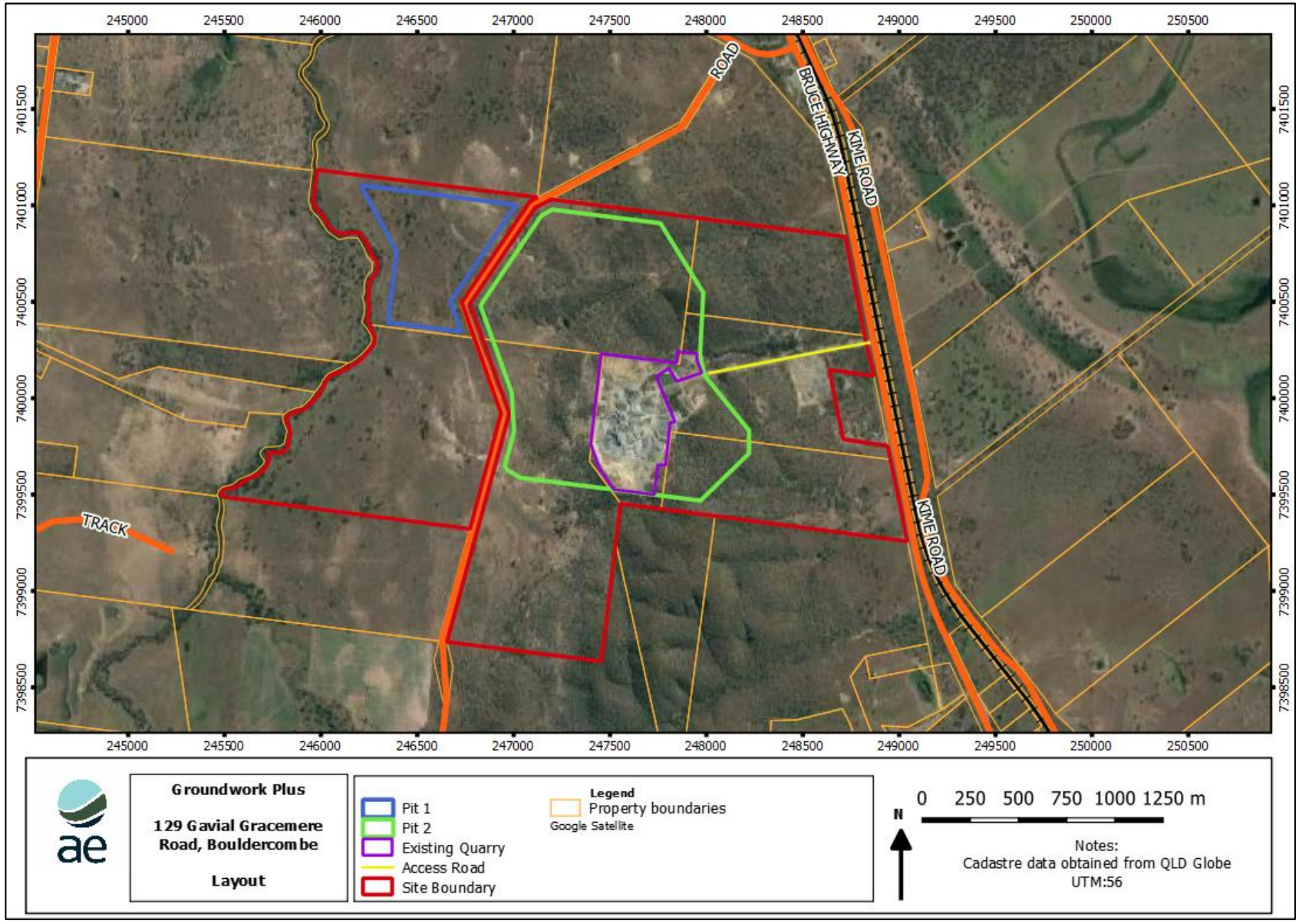


Figure 1: Site Location

3 DESCRIPTION OF ENVIRONMENTAL VALUES

3.1 Location

Midgee Quarry is located at 59793 Bruce Highway Midgee 4702, Lot 2 RP888747. The major regional centre of Rockhampton is approximately 12.5 kilometres to the north and Gracemere is approximately 9.5 kilometres to the north-west.

The surrounding land uses are primarily cattle grazing, with the exception of the adjacent Kangaroo Country Caravan Park (KCCP) which is situated on lot 1/RP811877. The entrance to the Midgee Quarry and the KCCP are situated on the Bruce Highway. The North Coast Rail Line also passes directly opposite the Midgee Quarry entrance and the caravan park. The North Coast line is also the major freight corridor from Brisbane to Cairns, with connecting services travelling as far west as Longreach and Mount Isa. The North Coast Line also connects to the central line which is the main coal freight corridor which services the Central Highlands Coal Fields.

The Subject Site covers five lots (Lot 2 on RP888747, Lot 1 on SP247721, Lot 2 on SP247721, Lot 725 on RP888747 and Lot 931 on LIV40265. The Subject Site location is shown in Figure 1.

3.2 Terrain

Figure 3 illustrates the local topography, as obtained from a combination of Lidar data at 5 m resolution.

3.3 Climate

The Rockhampton climate may be classified as Subtropical. little over 800 mm across an average of 82 rain days. Rainfall averages suggest a distinct wet and dry season, with the wet generally December to March and the dry June to September. Typical daytime temperature ranges are 32°C max, 22°C min in the summer /wet season and 23°C max, 9°C min in the winter/dry season.

The prevailing winds are predominately southeast but during spring and summer late afternoon northeast sea breezes give some relief from the higher temperatures. During winter and early spring the high-pressure systems of the sub-tropical ridge can be far enough north to replace the southeast trades with southwesterlies winds behind the trough systems that split the high cells. Figure 3 presents a summary of average rainfall per month across a typical year.

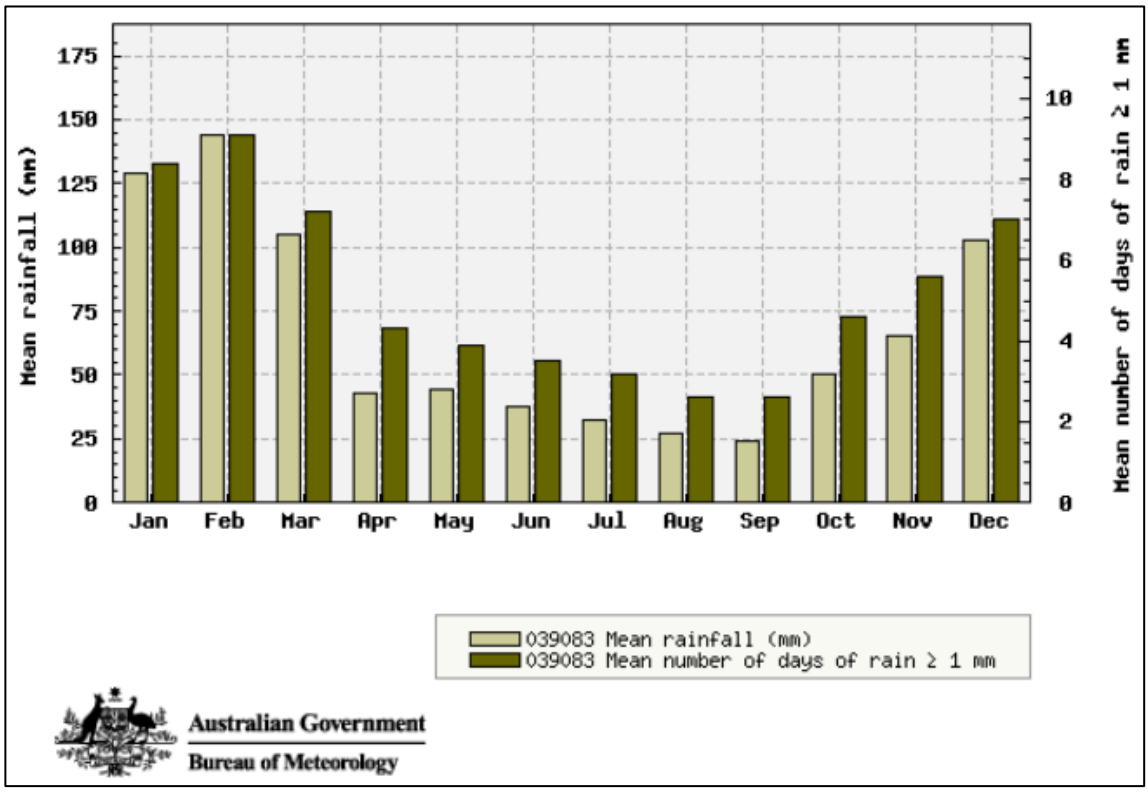


Figure 2: Long-Term Rainfall Patterns for Rockhampton Airport (Average 1939 - 2021)

3.4 Receptors

When completing this report, consideration has been given to the potential impacts of the changed operation to sensitive receptors within 3 - 5 kilometres of the operation. When considering the impacts, the nearby receptors have been identified as shown in Figure 4.

The closest receptors located in the Kangaroo Country Caravan Park to the east of the Subject Site boundary.

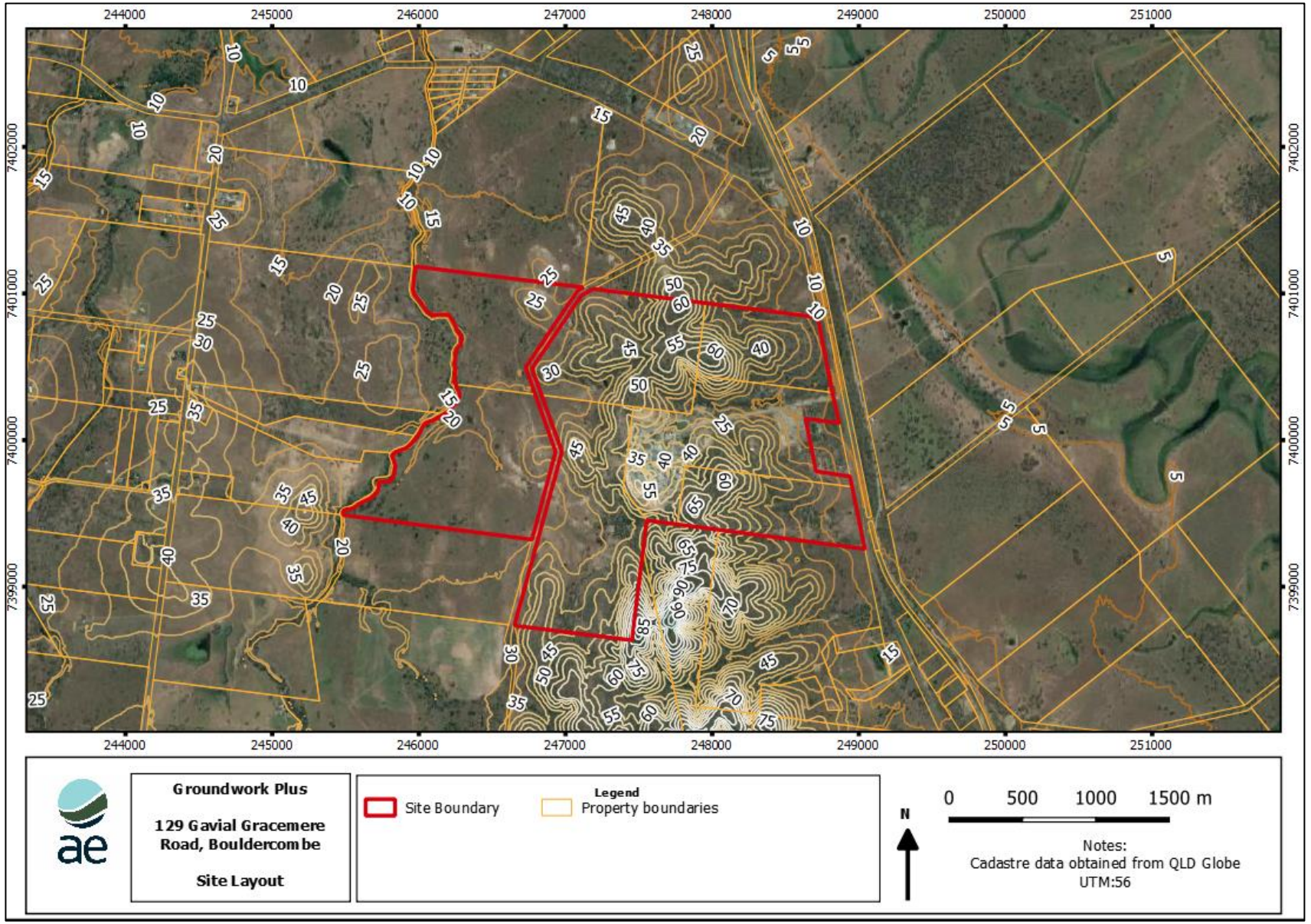


Figure 3: Surrounding Topography at 5 m Intervals (Extracted from LiDAR Data)

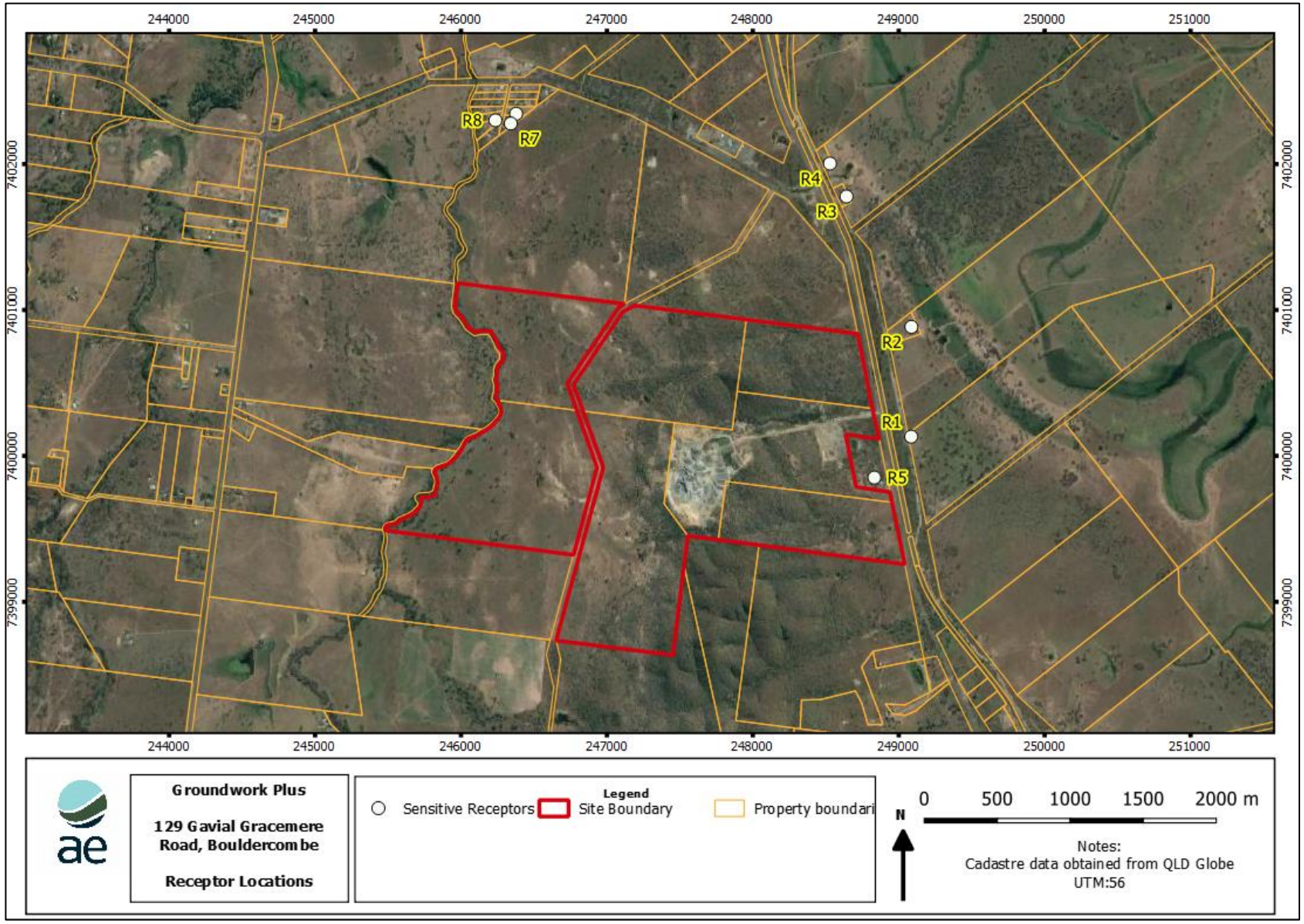


Figure 4: Modelled Sensitive Receptors

4 LEGISLATIVE REQUIREMENTS

4.1 Environmental Authority

Conditions of Environmental Authority EPPR00233813 (dated 16 February 2010) issued by the Department of Environment and Science provides specific requirements relating to emissions of air from the activity as summarised in Table 4.

Table 4: Conditions Relevant to Air

Condition number	Condition
B1	Dust Nuisance: The release of dust and/or particulate matter resulting from the environmentally relevant activity must not cause an environmental nuisance at any **nuisance sensitive** or **commercial place**.
B2	Dust and particulate matter must not exceed the following levels when measured at any nuisance sensitive or commercial place: a) Dust deposition of 120 milligrams per square metre per day, when monitored in accordance with Australian Standard AS 3580.10.1 of 2003 (or more recent editions); OR b) A concentration of particulate matter with an aerodynamic diameter of less than 10 micrometre (µm) (PM_{10}) suspended in the atmosphere of 150 micrograms per cubic metre over a 24-hour averaging time, at a nuisance sensitive or commercial place downwind of the site, when monitored in accordance with - Australian Standard AS 3580.9.6 of 2003 (or more recent editions) 'Ambient air – Particulate matter – Determination of suspended particulate PM10 high-volume sampler with size-sensitive inlet -Gravimetric method'; or - any alternative method of monitoring PM10 which may be permitted by the 'Air Quality Sampling Manual' as published from time to time by the administering authority.
B3	When requested by the administering authority, dust and particulate monitoring must be undertaken to investigate any complaint of environmental nuisance caused by dust and/or particulate matter, and within 14 days of the completion of monitoring the results must be notified to the administering authority. Monitoring must be carried out at a place or places relevant to the potentially affected dust sensitive place and at upwind control sites and must include: a) For a complaint alleging dust nuisance, dust deposition; and b) For a complaint alleging adverse health effects caused by dust, the concentration per cubic metre of particulate matter with an aerodynamic diameter of less than 10 micrometre (µm) (PM10) suspended in the atmosphere over a 24hr averaging time.

4.2 Environmental Protection (Air Quality) Policy 2019

The Environmental Protection (Air Quality) Policy 2019 (EPP (Air)) provides air quality objectives for a range of compounds with the potential to impact on the health and well-being and aesthetics of the environment. Specifically, the objectives are intended to enhance or protect the following environmental values:

> *(a) the qualities of the air environment that are conducive to protecting the health and biodiversity of ecosystems; and*

(b) the qualities of the air environment that are conducive to human health and wellbeing; and

(c) the qualities of the air environment that are conducive to protecting the aesthetics of the environment, including the appearance of buildings, structures, and other property; and

(d) the qualities of the air environment that are conducive to protecting agricultural use of the environment.

Table 5 presents a summary of the air quality objectives applicable to the assessment.

Table 5: Schedule 1 Air Quality Objectives

Indicator	Environmental value	Air quality objectives ($\mu g/m^3$)	Period
PM_{10}	health and wellbeing	50	24 hours
		25	1 year
$PM_{2.5}$	health and wellbeing	25	24 hours
		8	1 year
Total suspended particles	health and wellbeing	90	1 year

5 EXISTING AIR ENVIRONMENT

5.1 Ambient Monitoring

To assess cumulative impacts, ambient monitoring data has been obtained from the Department of Environment and Science (DES) for 2017, as this is the same year as the meteorological dataset utilised in this assessment.

There are no ambient air monitoring stations in Rockhampton; the nearest NEPM reportable monitoring station is located at South Gladstone, approximately 89 km SE from the Project. Pollutants monitored at this site, which are relevant to this assessment are PM_{10} and $PM_{2.5}$.

The *Queensland Air Monitoring 2017 (National Environment Protection (Ambient Air Quality) Measure Report* (DES, 2018) confirms that there was one exceedence of the $PM_{2.5}$ 24-hour objective as a result of bushfire smoke. This exceedence occurred on 29 September 2017 and has been removed from the data analysis.

The nearest station that records total suspended particles (TSP) is located at Townsville. In lieu of this, research indicates that in rural areas, PM_{10} typically represents 49% of total TSP, therefore, TSP concentrations have been estimated based on the application of this ratio[a].

Table 6 provides the background concentrations for particulates for 2017. For this assessment, the hourly background concentrations presented in Figure 5 to Figure 6 have been modelled contemporaneously. Where no data is available, the annual average has been applied.

Table 6: Background Concentrations for 2017

Compound	Time Period	24-hour Concentration (µg/m³)			Annual Average (µg/m³)	DES Station
		Max	90th Percentile	70th Percentile		
TSP	Annual	82.1	39.9	31.8	28.2	Calculated from PM_{10}
PM_{10}	24-hour	40.2	19.5	15.6	13.8	South Gladstone
$PM_{2.5}$	24-hour	22.7	8.6	6.2	5.6	

[a] Air Noise Environment Pty Ltd (1999) 'Fine dust and the implications for the coal industry', ACARP Project C7009.

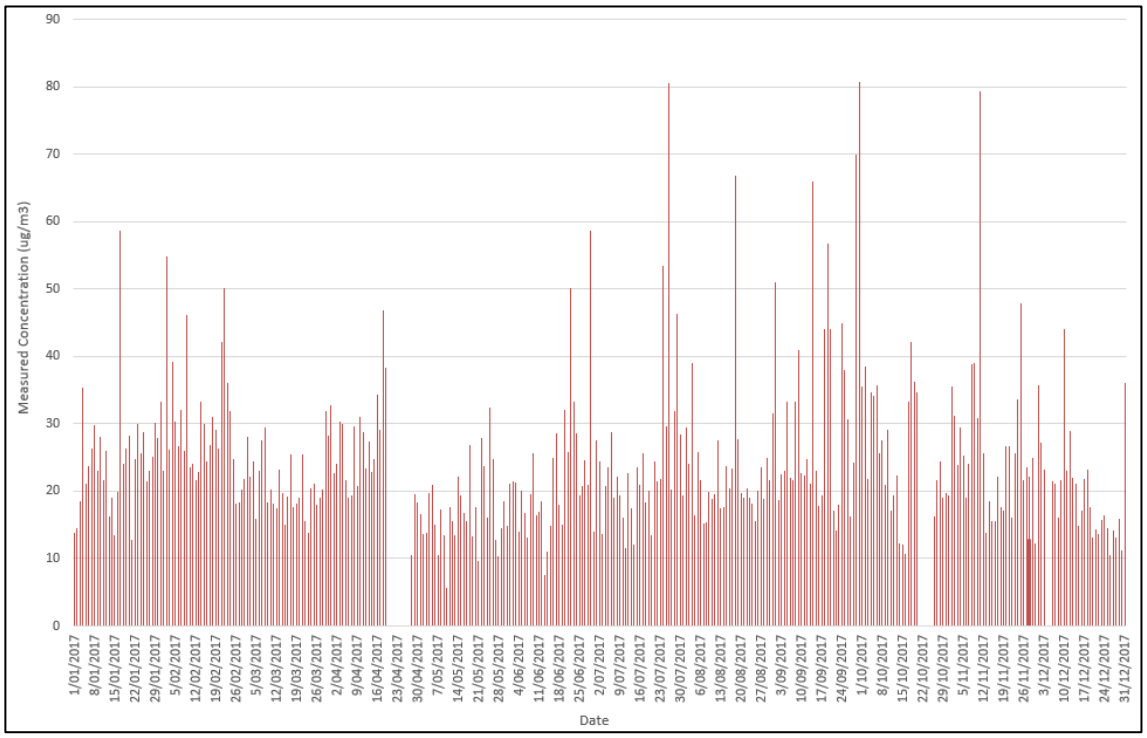


Figure 5: Hourly PM_{10} Concentrations at South Gladstone for 2017

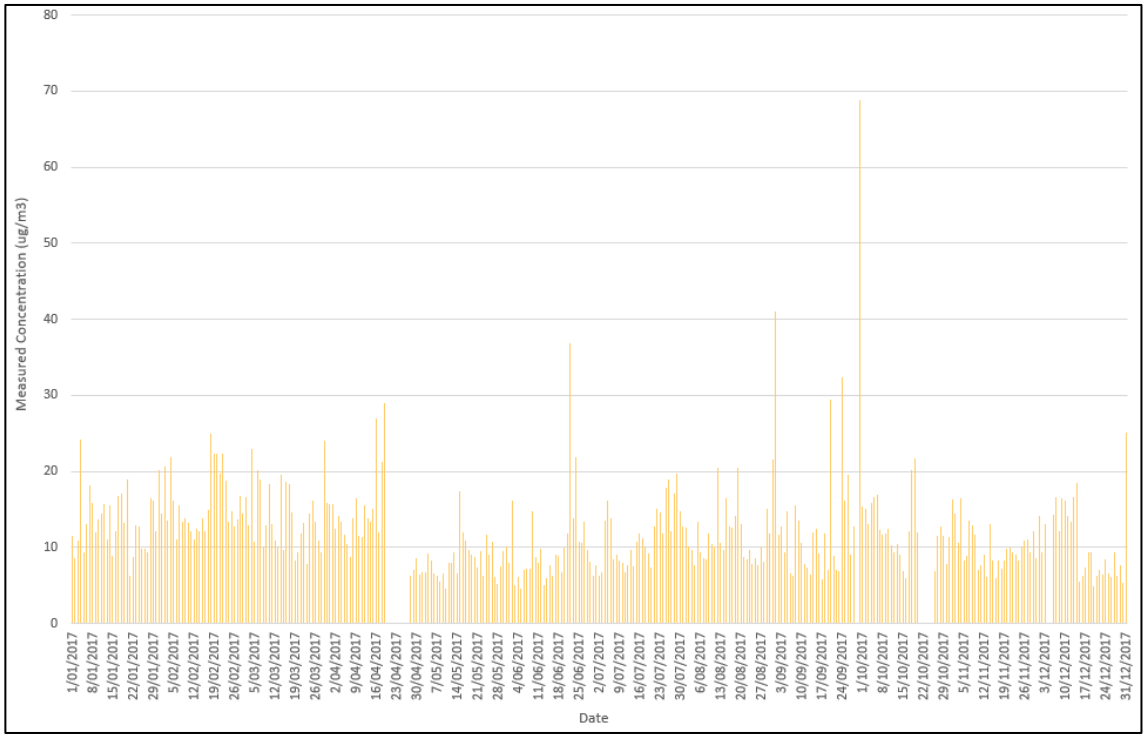


Figure 6: Hourly $PM_{2.5}$ Concentrations at South Gladstone for 2017

DES does not monitor dust deposition, however for the purposes of this assessment background dust deposition has been assumed to be 40 mg/m^2/day, which is typical for the surrounding environment.

5.2 National Pollution Inventory (NPI)

A review of the National Pollution Inventory (NPI) database has identified there are no nearby industrial activities that have to submit an annual report to NPI.

6 MODELLING METHODOLOGY

6.1 TAPM Predictions

Atmospheric dispersion modelling involves the mathematical simulation of the dispersion of air contaminants in the environment. The modelling utilises a range of information to estimate the dispersion of pollutants released from a source, including:

- Meteorological data for surface and upper air winds, temperature, and pressure profiles, as well as humidity, rainfall, cloud cover and ceiling height information;
- Emissions parameters including source, location, and height, source dimensions and physical parameters (e.g. exit velocity and temperature) along with pollutant mass emission rates;
- Terrain elevations and land use both at the source and throughout the surrounding region; and
- The location, height, and width of any obstructions (such as buildings or other structures) that could significantly impact on the dispersion of the plume.

For the purpose of the assessment, meteorological modelling has been undertaken using TAPM (The Air Pollution Model) and CALMET to predict localised meteorological conditions. The meteorological data derived from these models have been used as an input for the CALPUFF dispersion modelling.

A site-specific meteorological dataset has been determined using the prognostic model TAPM (The Air Pollution Model). Prognostic models, such as TAPM, permit the development of localised meteorological datasets, based on synoptic weather conditions. The model predicts the regional flows important to dispersion, such as sea breezes and terrain induced flows, against a background of larger-scale meteorology provided by synoptic analyses.

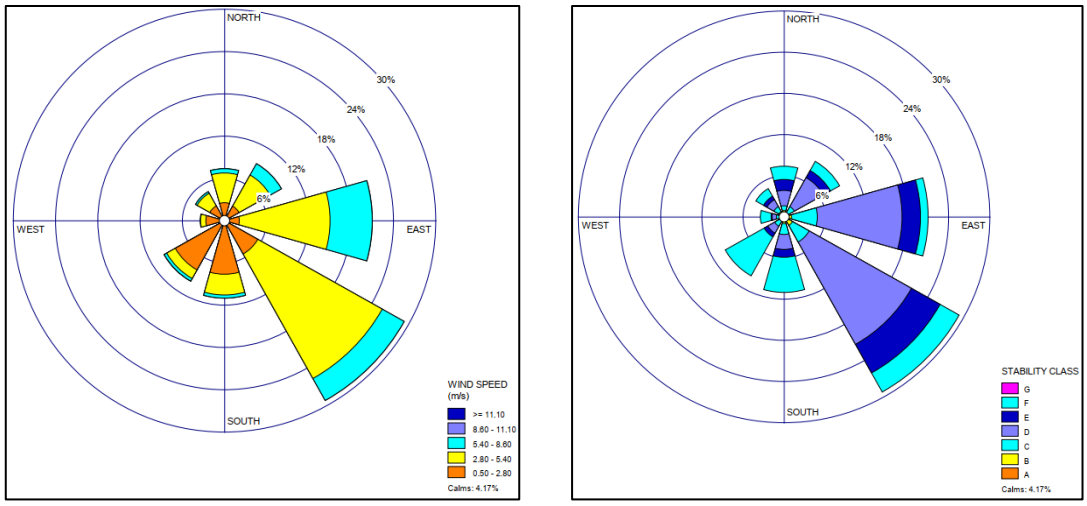
The output of this model, when used with a diagnostic meteorological model, such as CALMET, provides a meteorological dataset suitable for introduction into the wind field results. This methodology is the recommended approach for the modelling of contaminant concentrations using CALMET[b].

[b] TRC Environmental Corporation (March 2011) 'Generic Guidance and Optimum Model Settings for the CALPUFF Modelling System for Inclusion into the 'Approved Methods for the Modelling and Assessments of Air Pollutants in NSW, Australia' prepared on behalf of the NSW Office of Environment and Heritage

Table 7: Summary of Meteorological Modelling Parameter

Model	Aspect	Assigned Parameter
TAPM (v4.04)	Year Modelled	One full year - 2017 which is compared to long-term observations to demonstrate suitability. Observations from BOM Rockhampton Airport were assimilated into TAPM
	Coordinates	Latitude: -23.28 / Longitude: 150.31
	Domain Grids	30 x 30 x 25 grid points
	Nesting Spacing	30 km, 10 km, 3 km, and 1 km
CALMET (v 7.1)	Databases	Default databases for sea temperature, terrain and land cover applied
	Model Domain	27-km x 27-km grid (100 m grid intervals)
	Terrain Data	Nasa Shuttle Radar Topography Mission (SRTM) 1-second (approximately 30 m) digital elevation model
	Land Use	Default from USGS for 1 km spacing. Review of the land use was undertaken and updated based on recent aerial imagery
	Vertical Layers	12 Layers - 20 m, 50 m, 75 m, 150 m, 200 m, 500 m, 750 m, 1,000 m, 1,500 m, 2,000 m, 3,000 m, and 4,000 m

Figure 7 presents the annual wind rose for the Subject Site during 2017. Detailed meteorological analysis of the dataset is presented in Appendix A.



Wind Rose

Stability Class Rose

Figure 7: Predicted Annual Wind and Stability Class Roses at Subject Site for 2017

6.2 CALPUFF Dispersion Modelling

The CALPUFF modelling system treats emissions as a series of puffs. These puffs are then dispersed throughout the modelling area and allowed to grow and bend with spatial variations in meteorology. In doing so, the model can retain a memory of the plume's movement throughout a single hour and from one hour to the next while continuing to better approximate the effects of complex air flows.

CALPUFF utilises the meteorological processing and prediction model CALMET to provide three-dimensional wind field predictions for the area of interest. The final wind field developed

by the model (for consideration by CALPUFF) includes an approximation of the effects of local topography, the effects of varying surface temperatures (as is observed in land and sea bodies) and surface roughness (resulting from varied land uses and vegetation cover in an area). The CALPUFF model can resolve complex terrain influences on local wind fields including consideration of katabatic flows and terrain blocking.

Post processing of modelled emissions is undertaken using the CALPOST package. This allows the rigorous analysis of pollutant predictions generated by the CALPUFF system. CALPOST is able to provide an analysis of predicted pollutant concentrations for a range of averaging periods from 1 hour to 1 year.

6.3 Receptors

A computational grid of 11 km by 11 km at 200 m spacing has been modelled. A nested grid centred on the Subject Site was modelled as follows:

- 500 m at 50 m spacing; and
- 3,000 m at 100 m spacing.

In addition, existing and future receptors were modelled as shown in Figure 4 and receptors were placed at 50 m intervals along the boundary of the Subject Site.

6.4 Other Settings

For the purposes of the assessment, the air dispersion modelling has utilised the following settings for CALPUFF:

- three-dimensional mode using meteorological data file from CALMET;
- ISC rural wind speed profile;
- no chemical transformation;
- no gaseous deposition;
- transitional plume rise;
- stack tip downwash for point sources;
- partial plume penetration for point sources;
- dispersion coefficients using Pasquill–Gifford coefficients or turbulence calculated from micro-meteorology;
- no adjustment of dispersion curves for roughness;
- partial plume path adjustment method for terrain using default coefficients; and
- no building wakes were modelled
- no pit retention was applied

7 AIR EMISSION ESTIMATION

7.1 Scenario Assessed

For the purposes of the assessment, the following scenario is assessed:

- Existing quarry operations for 200,000 tpa; and
- Future quarry operations for 2 Mtpa based on final extent designs with asphalt plant at maximum daily production.

7.2 Sources of Emissions

Dust emissions from the quarry are fugitive particulates TSP, PM_{10} and $PM_{2.5}$. The main sources of fugitive particulates are from the following sources:

- wheel generated emissions on unpaved roads;
- material unloading from trucks;
- drilling and blasting rock;
- screening, crushing, and conveying of material; and
- wind erosion from stockpiles and exposed surfaces.

The auxiliary asphalt plant also generates fugitive emissions from similar activities listed above but also direct emissions from the dryer stack.

7.3 Quarry Emissions

Emission estimates for the above activities have been derived based on the USEPA AP-42: Compilation of Air Emission Factors (US Environmental Protection Agency, Various Dates) and National Pollution Inventory (NPI) *Emission Estimation Technique Manual for Mining* (2012).

Emission factors within these documents are used to estimate emissions of TSP, PM_{10} and $PM_{2.5}$ to the air from various sources. Emission factors relate to the quantity of a substance emitted from a source to some measure of activity associated with the source.

7.3.1 Existing Quarry Operations

As detailed in Section 2, the existing quarry operates at an average of 200,000 tpa without the asphalt plant. Table 8 presents the emission rates for the quarry based on the operational information detailed in Appendix B.

Table 8: Summary of Emission Rates: Quarry Existing

Activity	Emission Rate (kg/annum)			Emissions Control
	TSP	PM_{10}	$PM_{2.5}$	
Drill	378	196	11	
Blast	76	40	2	
Trucks Loading in Pit	395	187	28	
Truck Unloading at Processing Area	395	187	28	
Screening (5 transfer points)	12500	4300	291	
Crushing (3 transfer points)	1620	720	133	
Stockpile Loading	300	110	31	

Activity	Emission Rate (kg/annum)			Emissions Control
	TSP	PM_{10}	$PM_{2.5}$	
Trucks loading to stockpiles	300	110	31	
Trucks Unloading from stockpiles	395	187	28	
FEL in Materials Storage Area	395	187	28	
Internal Haul Roads (Unpaved)	11306	779	117	Level 2 watering
Truck Movements Unpaved (Access Road)	9509	655	98	Level 2 watering
Wind erosion area exposed area	7719	3859	579	
Wind erosion on stockpiles	8135	4068	610	
Total	**53,423**	**15,584**	**2,017**	

Figure 8 presents the location of existing sources. In addition to the sources identified below, the equipment storage area located close to the Bruce Highway is also modelled as exposed areas for wind erosion.

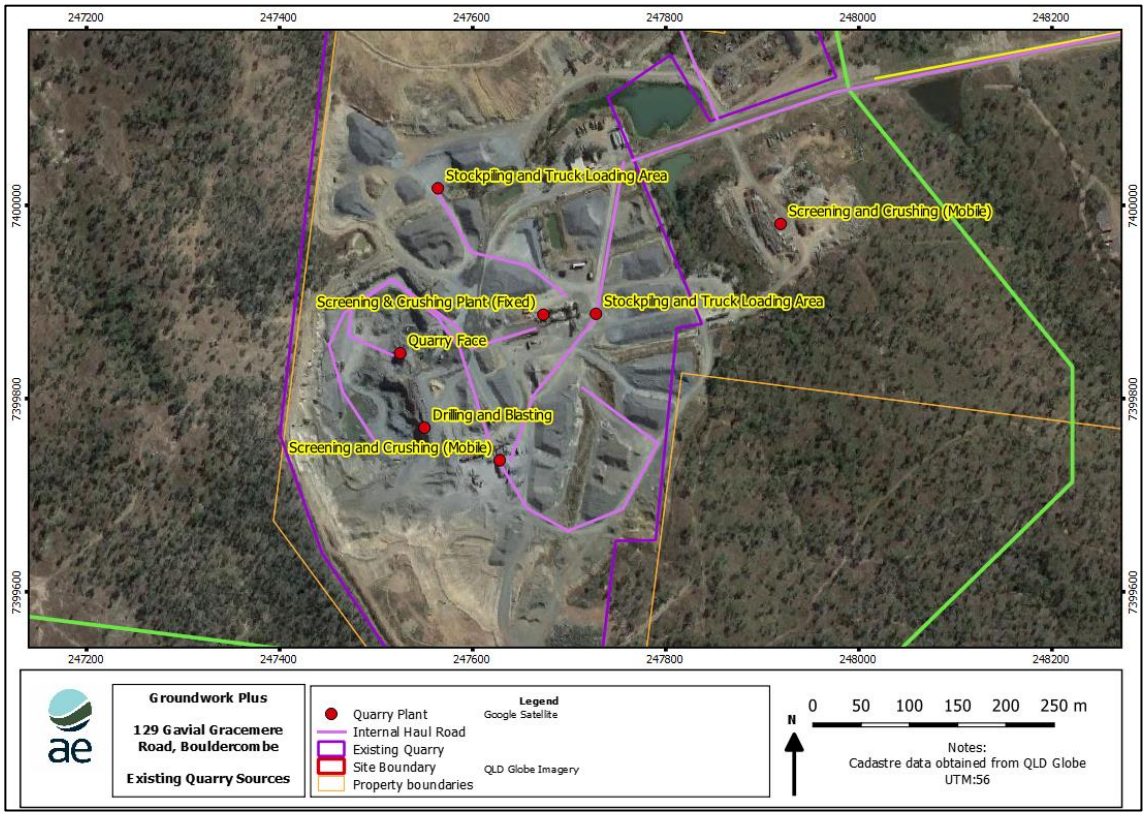


Figure 8: Modelled Source Location for Existing Quarry

7.3.2 Future Quarry Operations

As detailed in Section 2.4, the future quarry anticipates annual production of 1.6 Mtpa, however the maximum will be no more than 2 Mtpa. The expansion of the quarry will depend on customer requirements; a worst-case scenario has been applied as described in Table 3. This report compares the average existing production volume with the maximum future volume. It is noted that the current operation is approved to produce up to 1 Mtpa.

Table 8 presents the emission rates for the quarry based on the operational information detailed in Appendix B whilst Figure 8 presents the location of future sources.

Table 9: Summary of Emission Rates: Quarry Future

Activity	Emission Rate (kg/annum)			Emissions Control
	TSP	PM_{10}	$PM_{2.5}$	
Drill	755	393	23	
Blast	153	79	5	
Trucks Loading in Pit	3948	1867	283	
Truck Unloading at Processing Area	3948	1867	283	
Screening	125000	43000	2905	
Crushing	16200	7200	1333	
Stockpile Loading	3000	1100	311	
Trucks loading to stockpiles	3000	1100	311	
Trucks Unloading from stockpiles	3948	1867	283	
FEL in Materials Storage Area	3948	1867	283	
Internal Haul Roads (Unpaved)	129942	8954	1343	Level 2 watering
Truck Movements Unpaved (Access Road)	95088	6552	983	Level 2 watering
Wind erosion area exposed area	10702	5351	803	
Wind erosion on stockpiles	33973	16987	2548	
Total	**433606**	**98185**	**11695**	

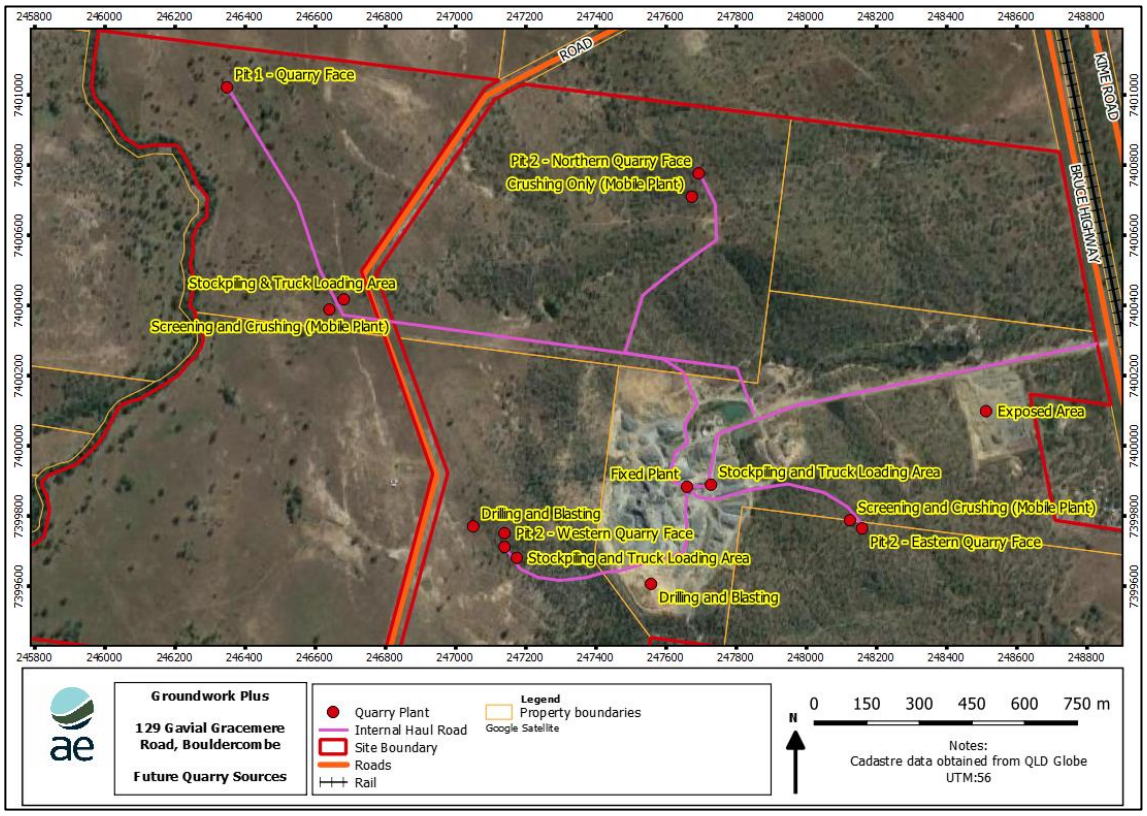


Figure 9: Modelled Source Location for Future Quarry Operations

7.4 Asphalt Plant

As detailed in Section 2.1.2, there is an existing approval for an asphalt plant to be located on the Subject Site as shown in Figure 6. Based on the predicted quarry output over a three-year period, the asphalt plant is expected to produce 100,000 tpa with an estimated 68,050 tpa of raw materials provided by the quarry. The maximum daily production is 2,500 tpd as shown in Table 10.

Table 10: Asphalt Production

	Production Rates	
Activity	Annual Maximum	Daily Maximum
Raw Material Incoming from Quarry	65,000 – 70,000	1,750
Product Material Outgoing	100,000	2,500

Emissions estimations of the fugitive dust is presented in Table 13 and based on information detailed in Appendix B.

Emissions from the stack are presented in Table 11 and are from the Environmental Authority for the approved asphalt plant. Due to the separation distance of the asphalt plant and the sensitive receptors, only particulates are cumulative to the dust emissions to the quarry and therefore only particulates will be assessed form the stack.

The Development Application for the asphalt plant identifies that a baghouse is installed to mitigate the particulate emissions and operates 24/7.

Based on an similar Colas facility, a diameter of 0.85 m has been used to calculate the flow rate and a temperature of 70°C has been used. The calculated TSP emission rate is 0.709 g/sec. For the purposes of this assessment, PM_{10} is considered to be 100% of TSP and $PM_{2.5}$ is considered to be 96% of PM_{10}.

Table 11: Condition 8 of EPAEA/1/2019

Release Point	Minimum Release Height (m)	Minimum Velocity (m/sec)	Contaminant Release	Maximum Release Limit (15% O_2)
Asphalt plant stack	10	25	Total suspended particulates	50 mg/Nm^3
			Nitrogen Oxides (as NO_X)	350 mg/Nm^3
			Carbon Monoxide (CO)	400 mg/Nm^3
			Total Heavy Metals	1 mg/Nm^3
			Hydrogen Sulphide (H_2S)	5 mg/Nm^3
			Volatile Organic Compounds (VOC)	40 mg/Nm^3

a) Total heavy metals includes the elements of antimony, arsenic, cadmium, lead, beryllium, chromium, cobalt, manganese, nickel, selenium, tin, vanadium, mercury, and any compound containing one of those elements.

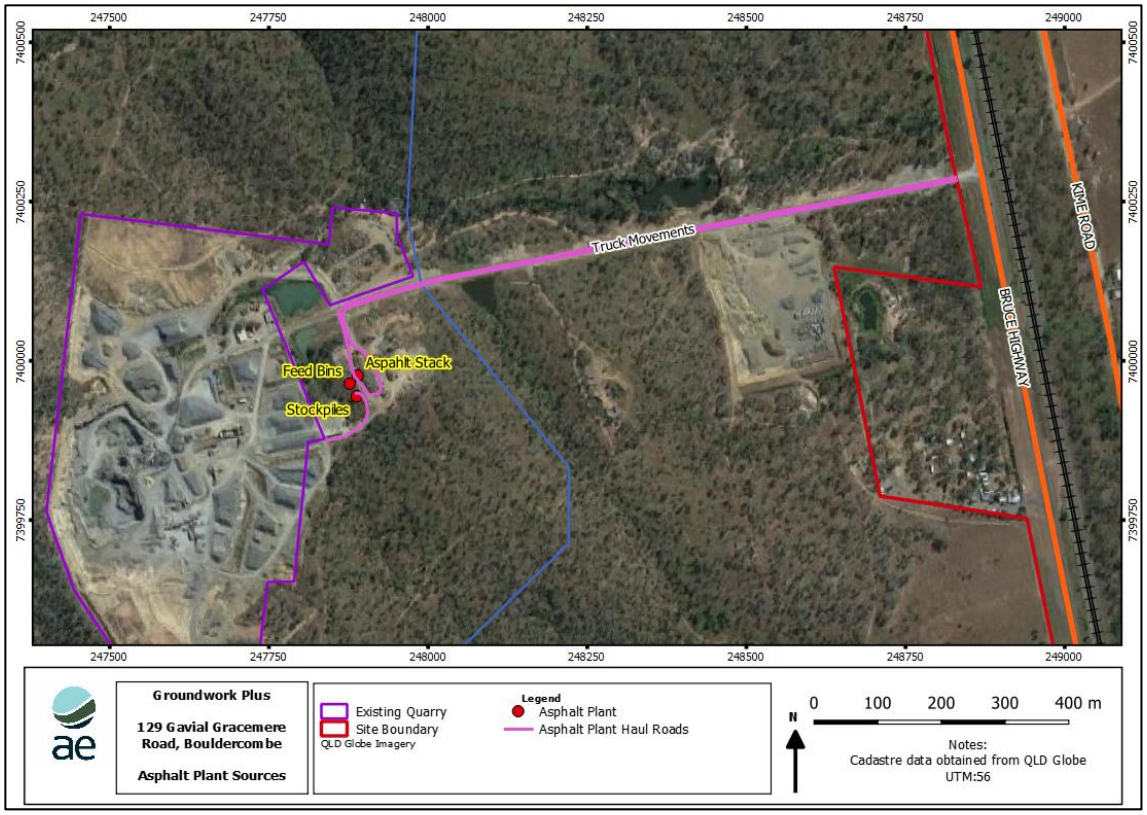


Figure 10: Asphalt Plant Source Locations

The emissions from the dryer stack are presented in Table 12 based on the Condition 8 of the EPAEA//1/2019.

Table 12: Stack Emissions

Source	Location (UTM 56)	Stack Parameters [a]				Emission Rates		
		Height (m)	Dia (m)	Velocity (m/s)	Temp (K)	TSP (g/s)	PM_{10} (g/s)	$PM_{2.5}$ (g/s)
Dryer Stack	247888, 7399977	10	0.85	25	343	0.709 [a]	0.709 [a]	0.680 [a]

a) Exhaust is fitted with a baghouse. PM_{10} is 100% TSP and $PM_{2.5}$ is 96% of PM_{10}

Table 13: Summary of Fugitive Emissions: Asphalt

Activity	Maximum Daily (kg/year)			Mitigation Applied
	TSP	PM_{10}	$PM_{2.5}$	
Raw Material Haulage (unpaved)	6128	1689	169	Level 2 watering (>2 litres/m^2/h)
Product Haulage (unpaved)	48737	13433	1343	Level 2 watering (>2 litres/m^2/h)
Truck unloading (raw materials)	1515	717	109	N/A
FEL Loading	1515	717	109	N/A
Feed bin loading	1515	717	109	N/A
Truck Loading (product)	1136	537	81	Dust suppression chute
Wind Erosion (stockpile)	155	77	12	N/A
Wind Erosion (exposed areas)	1291	646	97	N/A
Total	**61,993**	**18,532**	**2,028**	

7.5 Source Parameters

Source parameters adopted in the preparation of the model are presented in Table 14 with the location of sources as modelled presented in Figure 8, Figure 9 and Figure 10.

Table 14: Source Parameters

Activity	Source Type	Source Parameters			
		Area (m^2)	Effective Height (m)	Sigma Y (m)	Sigma (z)
Asphalt Plant Sources					
Unpaved Road	Line volume	N/A	5.1	N/A	2.55
Truck unloading	Volume	N/A	4.0	1.16	0.93
Truck loading		N/A	4.0	1.16	0.93
Feed bin loading		N/A	3.0	0.47	0.93
Wind erosion from stockpiles	Area	Refer to App B	3.0	N/A	2.0
Wind erosion from exposed areas			1.0	N/A	1.0
Quarry Sources (Existing and Future)					
Drilling and Blasting	Volume	N/A	20	10.3	2.0

Activity	Source Type	Source Parameters			
		Area (m^2)	Effective Height (m)	Sigma Y (m)	Sigma (z)
Unpaved Roads	Line volume	N/A	5.1	N/A	2.55
Truck Loading	Volume	N/A	4.0	7.0	0.93
Processing Plant	Volume	N/A	10.0	9.3	1.4
Stockpile Loading	Volume	N/A	8.0	9.3	1.4
Quarry Extraction	Volume	N/A	5.0	6.9	0.93
Wind erosion from stockpiles	Area	Refer to App B	7.0	N/A	1.0
Wind erosion from exposed areas			1.0	N/A	1.0

8 PREDICTED GROUND LEVEL CONCENTRATIONS

8.1 Summary

In accordance with the EPP(Air Quality), the maximum predicted concentrations at the discrete receptors identified in Figure 4 are presented as well as the maximum predicted concentrations at the Subject Site boundary.

The results presented in this section are the total predictions which include the emissions from the Subject Site as presented in Table 8, surrounding industrial emissions as presented in Appendix B and contemporaneous background concentrations detailed in Section 5.

Table 15 presents a summary of the maximum predicted cumulative ground level concentrations at the sensitive receptors. It can be seen that the predicted concentrations comply at all sensitive receptors and at the site boundary for all pollutants and time periods.

Table 15: Summary of Maximum Predicted Ground Level Concentrations at Sensitive Receptors

Pollutant	Averaging Period	Maximum Predicted GLC (including Background Concentrations) at Sensitive Receptors (µg/m^3)			Criteria (µg/m^3)
		Existing Operations	Future Operations	Future Operations with Asphalt Plant	
TSP	Annual	28.4	29.7	30.2	90
PM_{10}	24 hours	41.8	65.8	81.4	50
	Annual	14.1	19.8	20.7	25
$PM_{2.5}$	24 hours	21.7	22.6	23.4	25
	Annual	5.6	6.4	6.6	8
Deposited Dust	Month	42.5	61.6	67.7	120 mg/m^2/day

As detailed in Appendix B, the only emission control applied to the scenarios is level 2 watering. A review of the monitoring results in Table 15 identifies the following:

- The predicted ground level concentrations from the existing quarry operations are compliant at all sensitive receptors.
- The future quarry operations identified significant exceedences in the 24-hour PM_{10} concentration at two receptors (R1 and R5).
- The future quarry operations with the asphalt plant identified significant exceedences in the 24-hour PM_{10} concentration at two receptors (R1 and R5).

The following sections provide individual sensitive receptors results for all scenarios and concentration isopleths.

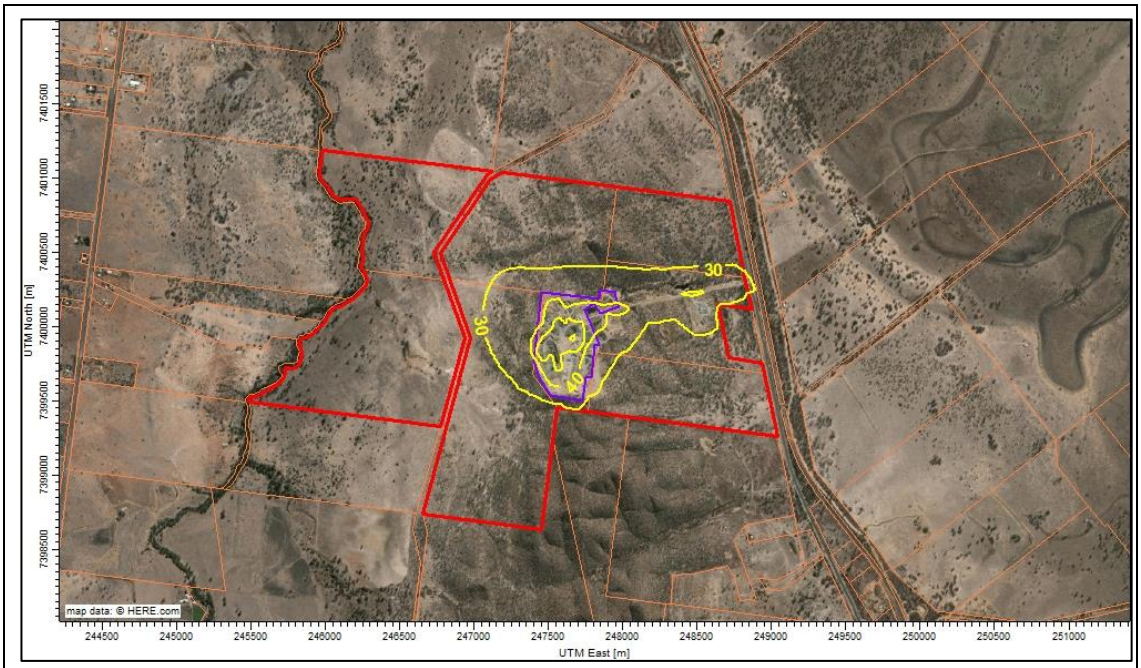
8.2 Existing Quarry Operations

Table 16 presents the maximum predicted cumulative ground level concentrations at each sensitive receptor and are driven by background concentrations. It can be seen that the predicted concentrations comply at all sensitive receptors and at the site boundary for all pollutants and time periods.

Table 16: Existing Quarry Operations – Predicted GLC at Sensitive Receptors

Predicted Pollutant Concentration (µg/m³) from Existing Quarry Operations							
Pollutant / Period	TSP	PM_{10}		$PM_{2.5}$		Deposited Dust	Complaint?
	1 year	24 hrs	1 year	24 hrs	1 year	Month	
Criteria	90 µg/m³	50 µg/m³	25 µg/m³	25 µg/m³	8 µg/m³	120 mg/m²/day	
R1	28.4	41.5	14.1	21.7	5.6	41.8	Yes
R2	28.4	41.7	14.0	21.7	5.6	40.8	Yes
R3	28.3	41.4	14.0	21.7	5.6	40.9	Yes
R4	28.3	41.3	14.0	21.7	5.6	40.8	Yes
R5	28.4	41.8	14.1	21.7	5.6	42.5	Yes
R6	28.3	41.2	13.9	21.7	5.6	40.1	Yes
R7	28.3	41.2	14.0	21.7	5.6	40.5	Yes
R8	28.3	41.2	14.0	21.7	5.6	40.6	Yes

Figure 11 to Figure 16 present the predicted contours for the existing quarry operations.



Pollutant:	Period:	Percentile:	Criteria:
TSP	1 Year	100th	90 µg/m³

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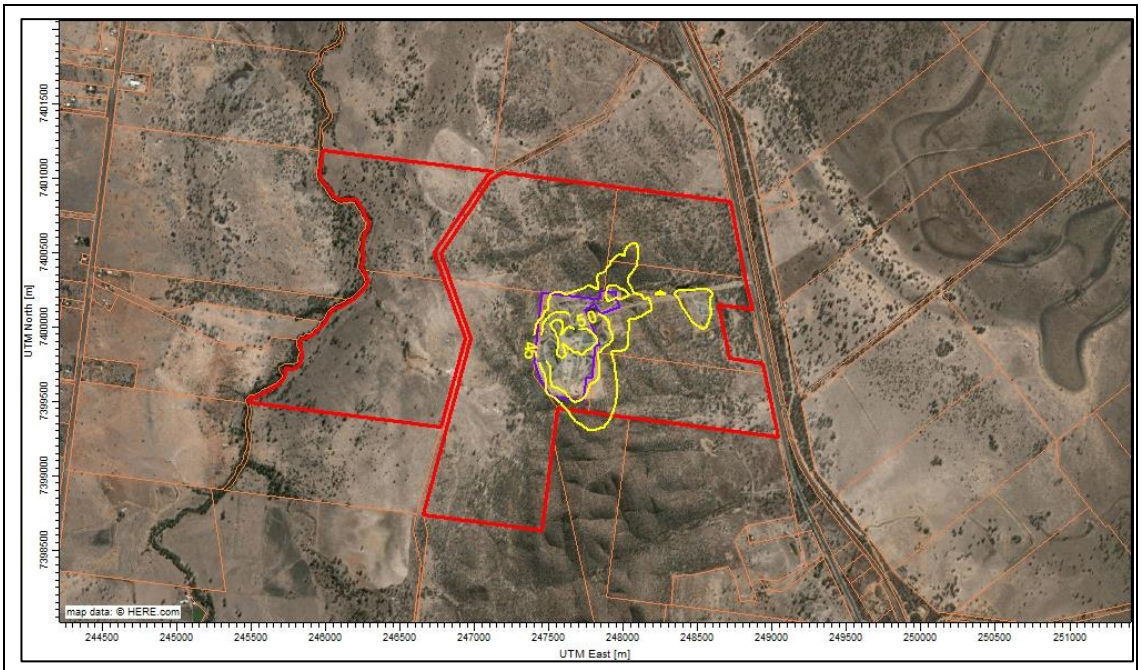
Figure 11: Existing TSP concentrations from quarry operations at 200,000 tpa as detailed in Table 23

Background Concentrations: Included



Pollutant:	Period:	Percentile:	Criteria:
PM_{10}	24 Hour	100th	50 µg/m3

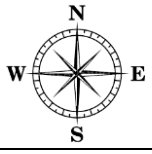
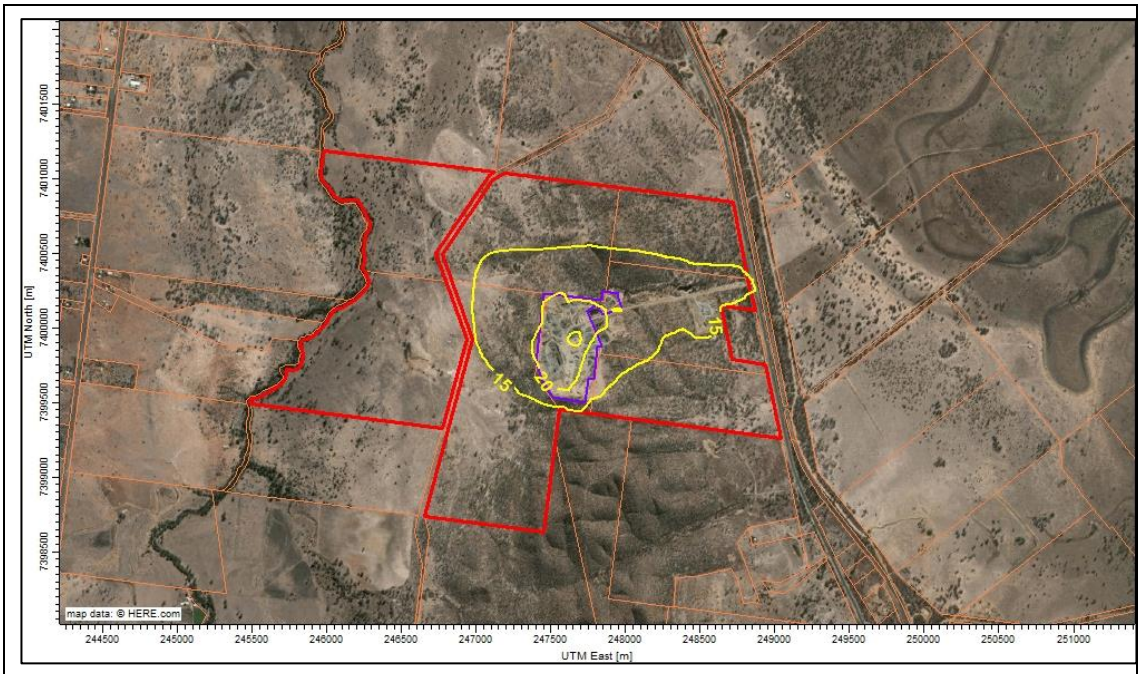


Figure 12: Existing PM_{10} 24-hour concentrations from quarry operations at 200,000 tpa as detailed in Table 23

Background Concentrations: Included



Pollutant:	Period:	Percentile:	Criteria:
PM_{10}	1 Year	100th	25 µg/m3

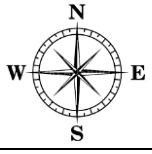
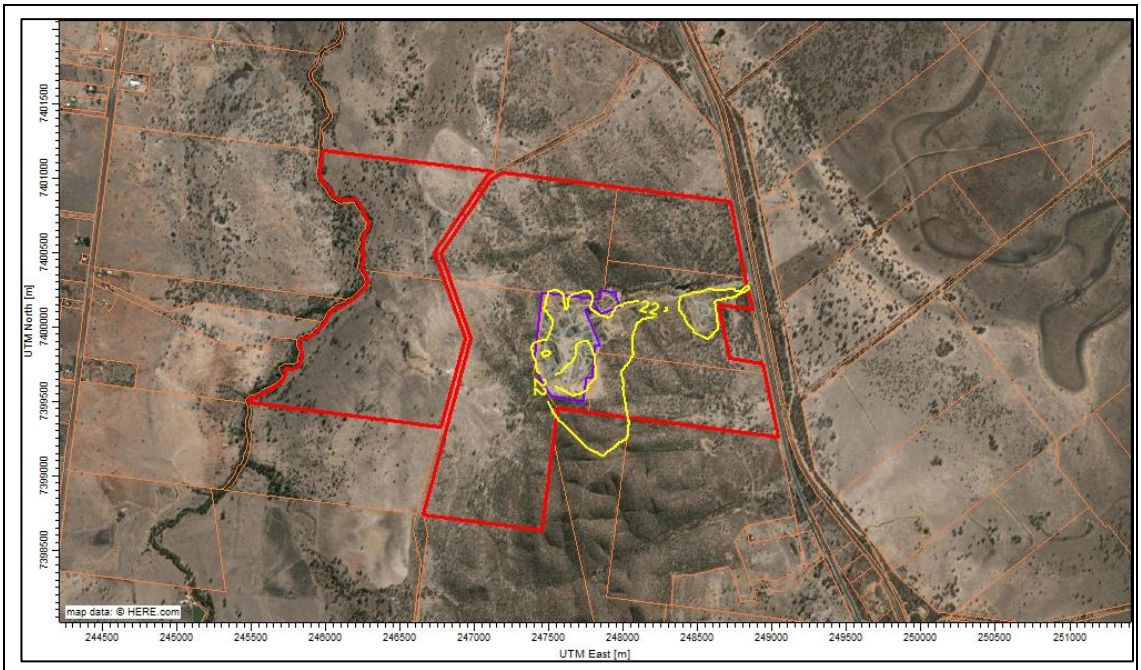


Figure 13: Existing PM_{10} annual concentrations from quarry operations at 200,000 tpa as detailed in Table 23

Background Concentrations: Included



Pollutant:	Period:	Percentile:	Criteria:
$PM_{2.5}$	24 hours	100th	25 µg/m³

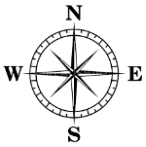
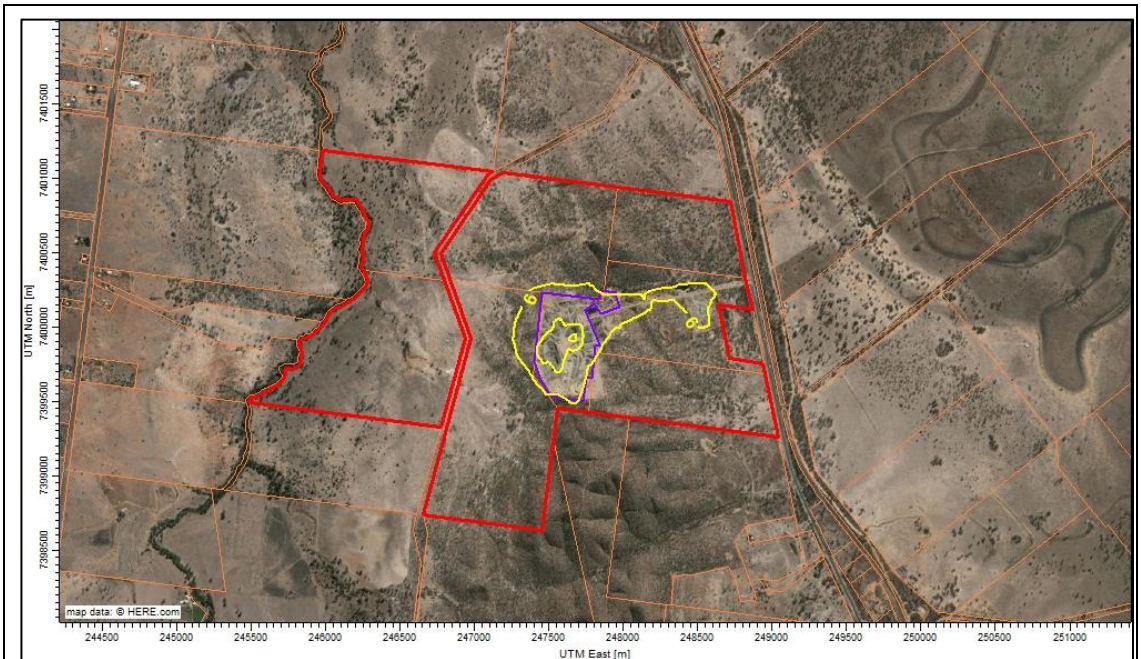


Figure 14: Existing $PM_{2.5}$ 24-hour concentrations from quarry operations at 200,000 tpa as detailed in Table 23

Background Concentrations: Included



Pollutant:	Period:	Percentile:	Criteria:
$PM_{2.5}$	1 Year	100th	8 µg/m³

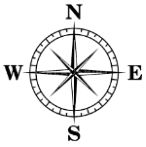
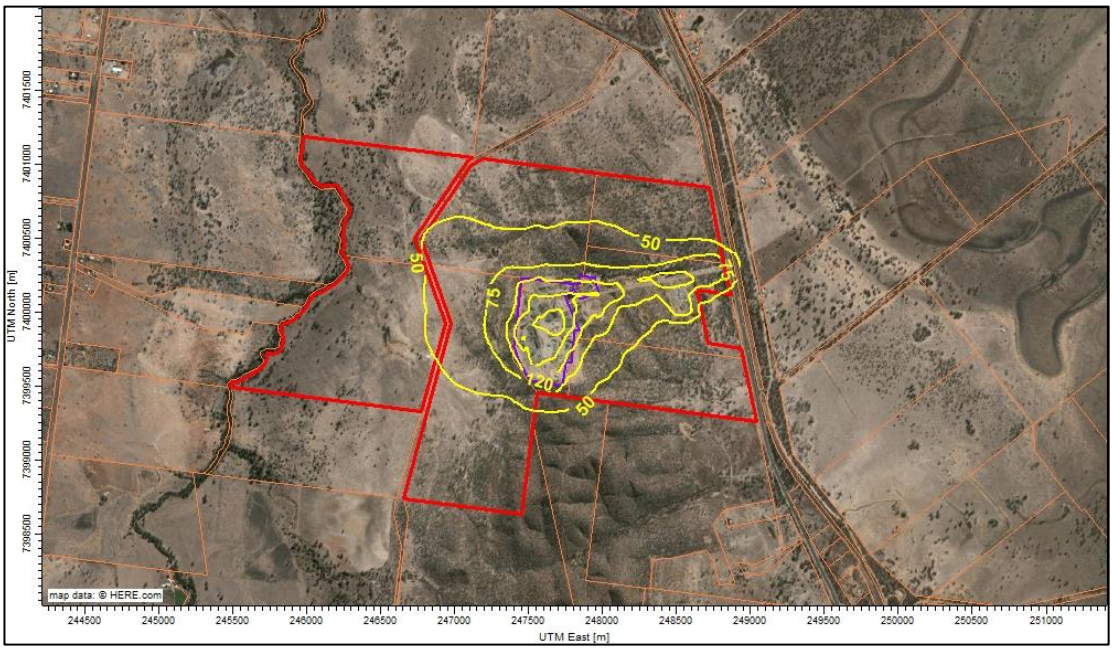


Figure 15: Existing $PM_{2.5}$ annual concentrations from quarry operations at 200,000 tpa as detailed in Table 23

Background Concentrations: Included



Pollutant:	Period:	Percentile:	Criteria:
Deposited Dust	1 Month	100th	120 mg/m²/day

Figure 16: Existing deposited dust from quarry operations at 200,000 tpa as detailed in Table 23

Background Concentrations: Included

8.3 Future Quarry Operations

Table 17 presents the maximum predicted cumulative ground level concentrations at each sensitive receptor for future quarry operations without and with the asphalt plant in operation. The activities upon which the scenarios are based are presented in Appendix B.

It can be seen that the predicted concentrations exceed the PM_{10} 24-hour concentration at two sensitive receptors. A review of the individual activities has identified the following activities primarily contribute to predicted PM_{10} concentrations:

- The main haul road which extends from Bruce Highway to the quarry entrance; and
- Screening and crushing activities at the Pit 2 East operations.

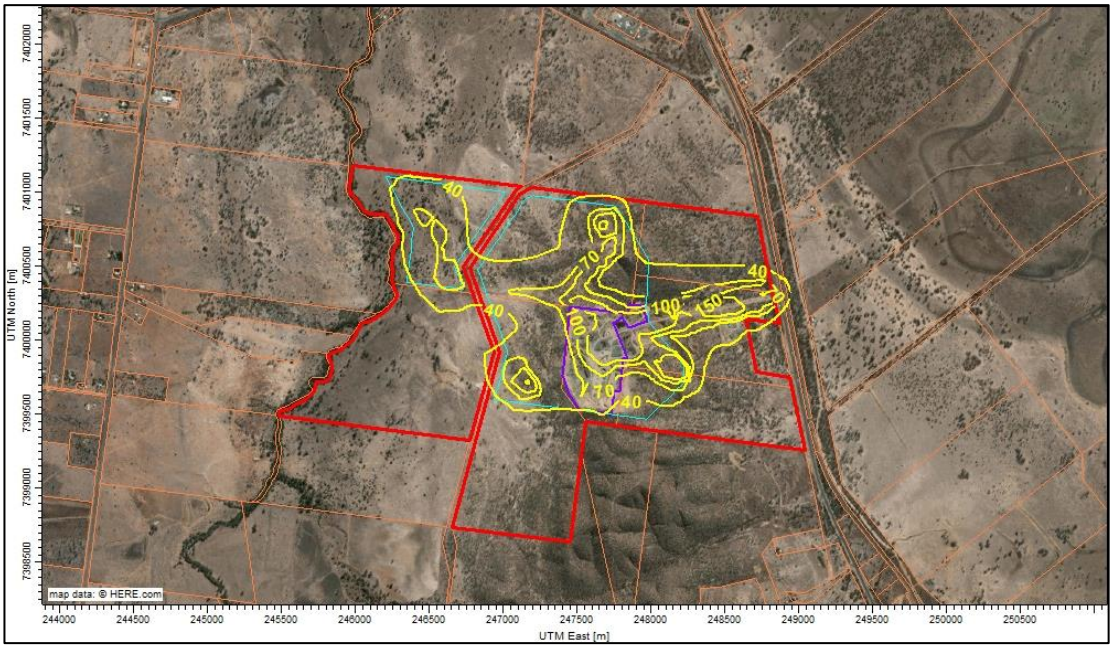
Figure 17 to Figure 22 present the predicted contours for the future quarry operations of 2 Mtpa with the asphalt plant in operation under maximum daily operations.

Table 17: Future Quarry Operations Without Asphalt Plant – Predicted GLC at Sensitive Receptors

Predicted Pollutant Concentration (µg/m³) from Existing Quarry Operations							
Pollutant / Period	TSP	PM_{10}		$PM_{2.5}$		Deposited Dust	Complaint?
	1 year	24 hrs	1 year	24 hrs	1 year	Month	
Criteria	90 µg/m³	50 µg/m³	25 µg/m³	25 µg/m³	8 µg/m³	120 mg/m²/day	
R1	29.1	**65.2**	18.7	21.8	6.2	52.0	No
R2	28.8	46.9	19.8	21.7	6.4	46.6	Yes
R3	28.5	45.5	17.3	21.7	6.0	44.3	Yes
R4	28.5	44.3	16.9	21.7	6.0	44.1	Yes
R5	29.7	**65.8**	19.7	22.6	6.4	61.6	No
R6	28.3	41.4	14.9	21.7	5.7	40.7	Yes
R7	28.7	42.4	17.0	21.7	6.0	46.0	Yes
R8	28.8	44.4	17.2	21.7	6.0	47.0	Yes

Table 18: Future Quarry Operations with Asphalt Plant – Predicted GLC at Sensitive Receptors

Predicted Pollutant Concentration (µg/m³) from Existing Quarry Operations							
Pollutant / Period	TSP	PM_{10}		$PM_{2.5}$		Deposited Dust	Complaint?
	1 year	24 hrs	1 year	24 hrs	1 year	Month	
Criteria	90 µg/m³	50 µg/m³	25 µg/m³	25 µg/m³	8 µg/m³	120 mg/m²/day	
R1	29.5	**79.9**	19.5	22.1	6.4	58.1	No
R2	28.9	47.4	20.3	21.7	6.5	49.2	Yes
R3	28.6	49.3	17.6	21.7	6.1	45.8	Yes
R4	28.6	47.2	17.2	21.7	6.1	45.3	Yes
R5	30.2	**81.4**	20.7	23.4	6.6	67.7	No
R6	28.3	41.4	14.9	21.7	5.7	40.8	Yes
R7	28.8	42.7	17.2	21.7	6.1	46.9	Yes
R8	28.9	44.7	17.4	21.7	6.1	48.0	Yes



Pollutant:	Period:	Percentile:	Criteria:
TSP	1 Year	100th	90 µg/m³

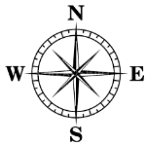
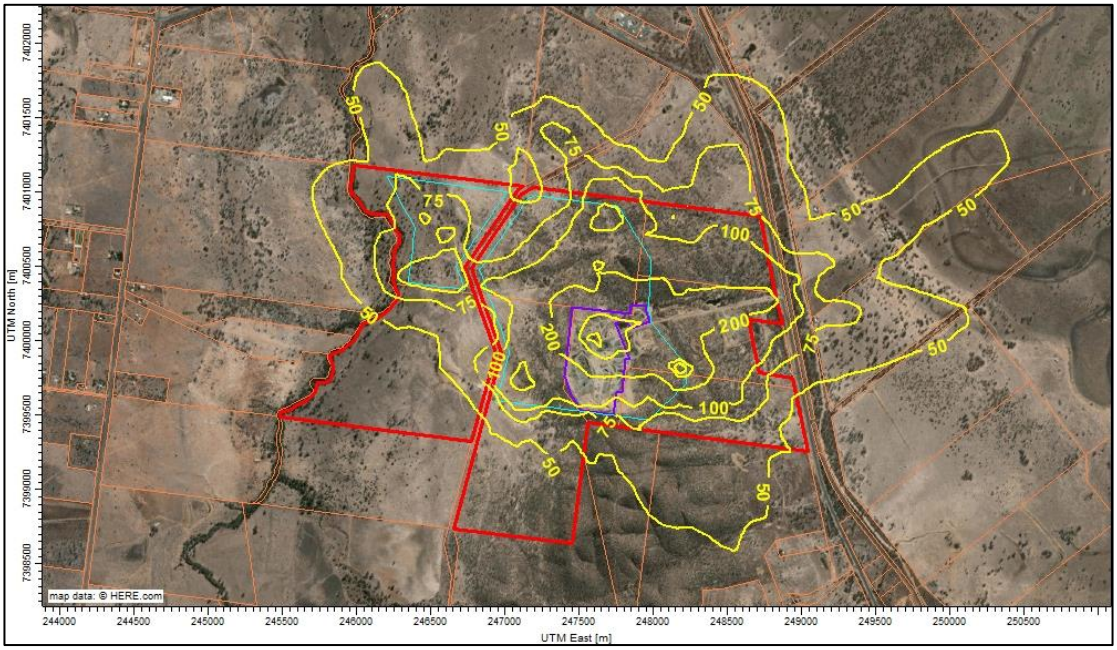


Figure 17: Future TSP concentrations from quarry operations at 2,000,000 tpa as detailed in Table 23 and asphalt plant as detailed in Table 24

Background Concentrations: Included



Pollutant:	Period:	Percentile:	Criteria:
PM_{10}	24 Hour	100th	50 µg/m³

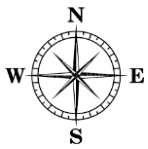
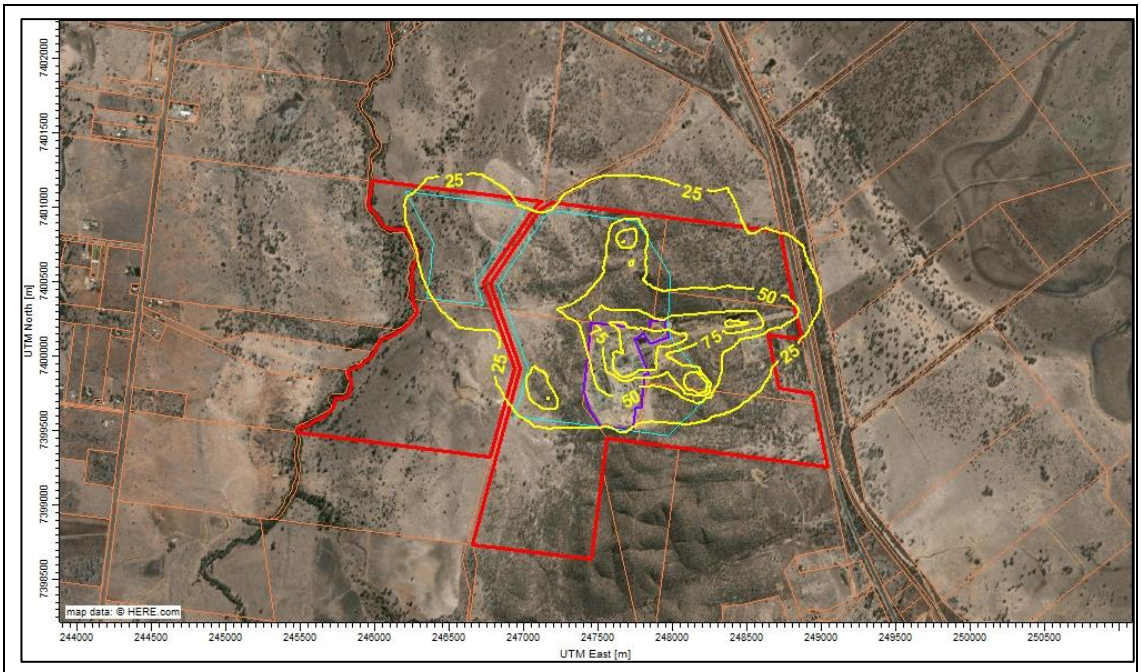


Figure 18: Future PM_{10} 24-hour concentrations from quarry operations at 2,000,000 tpa as detailed in Table 23 and asphalt plant as detailed in Table 24

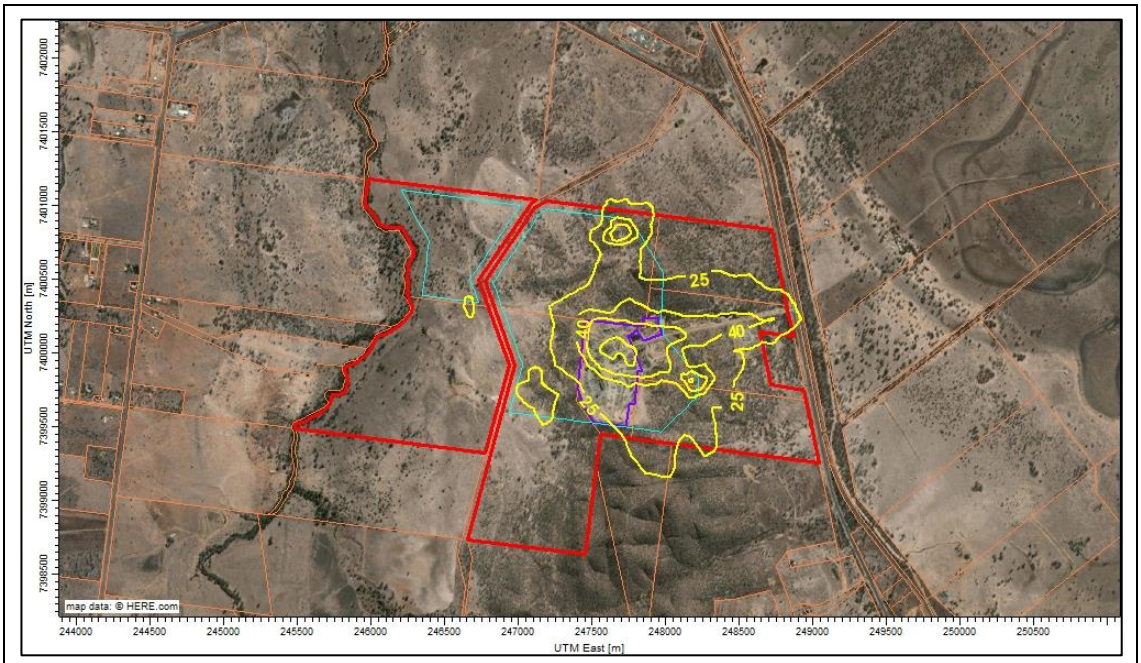
Background Concentrations: Included



Pollutant:	Period:	Percentile:	Criteria:
PM_{10}	1 Year	100th	25 µg/m³

Figure 19: Future PM_{10} annual concentrations from quarry operations at 2,000,000 tpa as detailed in Table 23 and asphalt plant as detailed in Table 24

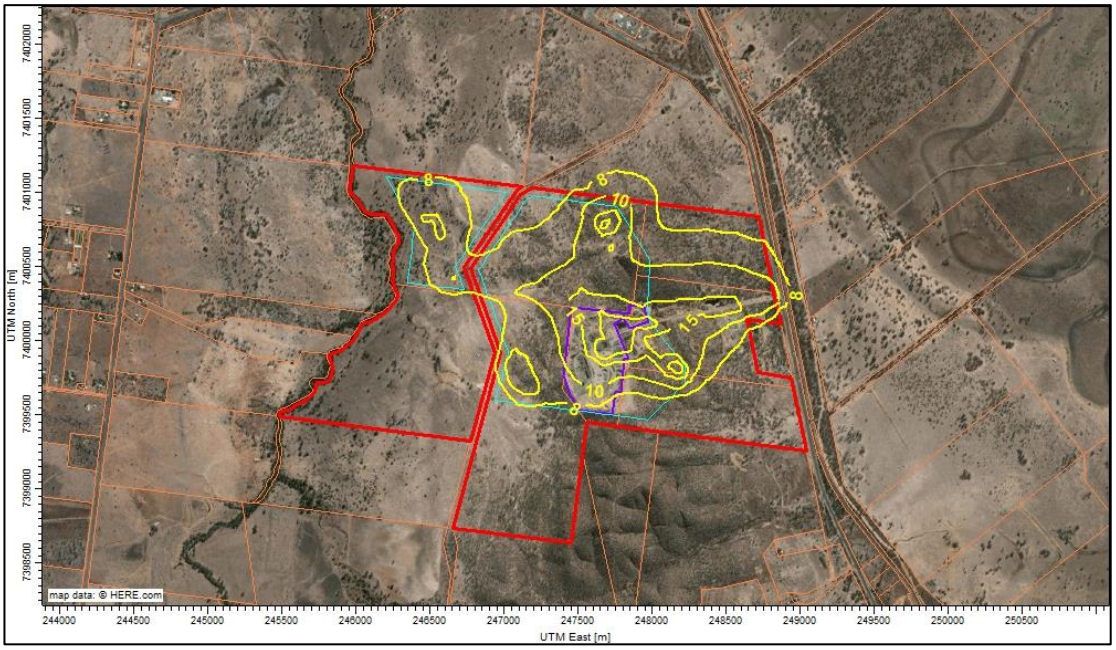
Background Concentrations: Included



Pollutant:	Period:	Percentile:	Criteria:
$PM_{2.5}$	24 hours	100th	25 µg/m³

Figure 20: Future $PM_{2.5}$ 24-hour concentrations from quarry operations at 2,000,000 tpa as detailed in Table 23 and asphalt plant as detailed in Table 24

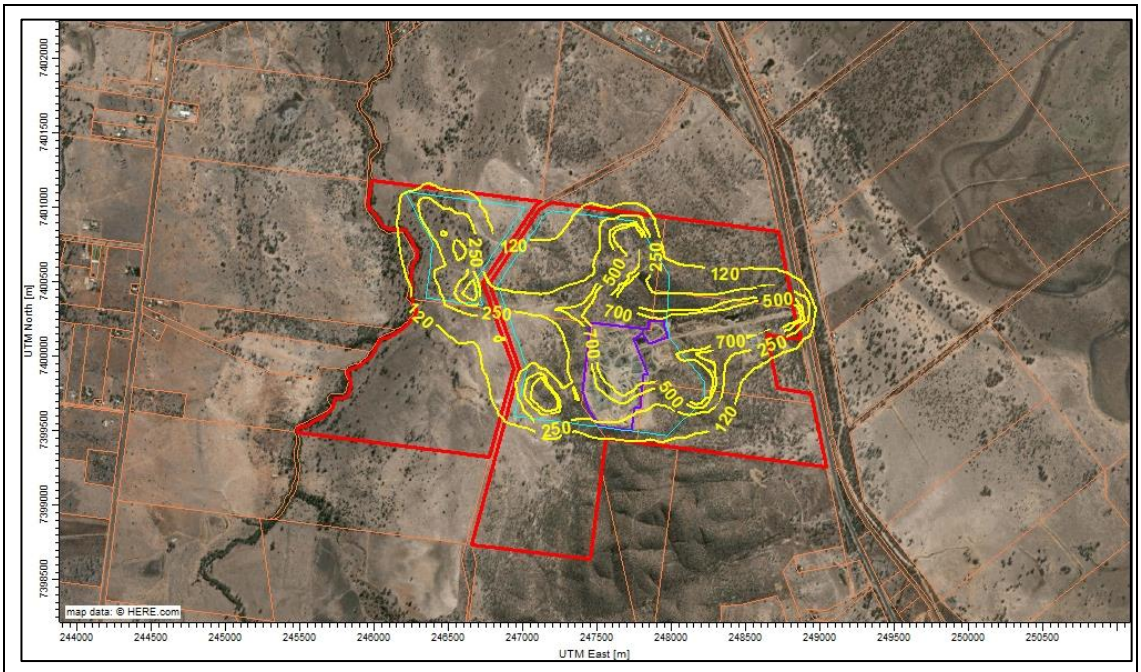
Background Concentrations: Included



Pollutant:	Period:	Percentile:	Criteria:
$PM_{2.5}$	1 Year	100th	8 µg/m³

Figure 21: Future $PM_{2.5}$ annual concentrations from quarry operations at 2,000,000 tpa as detailed in Table 23 and asphalt plant as detailed in Table 24

Background Concentrations: Included



Pollutant:	Period:	Percentile:	Criteria:
Deposited Dust	1 Month	100th	120 mg/m²/day

Figure 22: Future deposited dust from quarry operations at 2,000,000 tpa as detailed in Table 23 and asphalt plant as detailed in Table 24

Background Concentrations: Included

8.4 Additional Emissions Controls

The predicted ground level contours presented in Table 17 and Table 18 are based on level 2 watering of the haul roads A review of the results identified that the two main source contributions to the PM_{10} 24-hour concentrations are the main haul road and screening/crushing activities in the eastern part of Pit 2.

Table 19 presents the maximum predicted concentrations with background concentrations included at sensitive receptors with the following additional controls:

- paving the main haul road from Bruce Highway to the pit entrance; and
- watering during the screening and crushing activities in Pit 2 East.

Table 19: Summary of Maximum Predicted Ground Level Concentrations at Sensitive Receptors with Additional Emissions Controls Implemented

Pollutant	Averaging Period	Maximum Predicted GLC at Sensitive Receptors with Additional Control Measures (µg/m^3)	Criteria (µg/m^3)
TSP	Annual	29.2	90
PM_{10}	24 hours	49.1	50
	Annual	17.4	25
$PM_{2.5}$	24 hours	22.7	25
	Annual	6.1	8
Deposited Dust	Month	52.7	120 mg/m^2/day

It can be seen from Table 19 that all sensitive receptors are compliant with the respective criteria.

A review of the main haul road emissions has identified that paving the main haul road from Bruce Highway to the pit entrance should be completed whenever the following occurs first:

- when the quarry production reaches 1.2 Mtpa without the asphalt plant operating; or
- when the quarry production reaches 500,000 tpa with the asphalt plant operating at maximum daily capacity; or
- when the quarry production reaches 800,000 tpa and the asphalt plant is operating at 50% capacity.

Whilst it is recommended the entire haul road is paved eventually (based on production rates), it is acknowledged that paving the entire road at once may be financially disadvantageous. If this occurs, paving the first 200 m from Bruce Highway would be most beneficial to the closest sensitive receptors.

If a staged approach is taken, it is recommended that particulate monitoring, in accordance with the Site Based Management Plan and visual inspections are completed to ensure PM_{10} 24-hour criteria is not exceeded. If the monitoring data indicates an exceedence, the remainder of the haul road will need to be paved or site operations should be reviewed, such as location of processing plant.

9 MITIGATION MEASURES

The Environment Protection (Air) Policy management hierarchy gives priority to avoiding emissions where reasonable to do so. Where this is not possible, emissions reduction and management currently at the quarry are best practice.

The quarry aims to reduce emissions of dust and other pollutants by implementing the following control measures, which are consistent with the site-based management plan for the quarry. The management plan aims to reduce emissions from dust and other pollutants by implementing the following control measures listed in Table 20.

Table 20: Mitigation Controls by Activity

Activity	Mitigation Measure
Work Areas / Trafficable Area	▪ Limit high dust generating activities (e.g., removal of topsoil/overburden and blasting) to periods of favourable weather conditions. ▪ Dampen down (approx. rate of 2 litres/m²/hour) work areas, stockpiles, access roads and other hardstand areas by water spraying when visual surveillance indicates excessive dust generation. ▪ Restrict vehicle movements to designated routes to the extent practicable. ▪ Enforce speed limits on internal roads. ▪ Maintain road surfaces in good condition. ▪ Prevent and clean up any raw material / product spillages or dust accumulation on driveways or sealed roads. ▪ Use dust extraction systems on drill rigs where possible, or wet down drilling via water sprays
Processing Plant	▪ Use water sprays and/or dust collection systems at transfer points. ▪ Use shielding and/or windbreaks where possible. ▪ Maintain equipment in accordance with the original equipment manufacturers' specifications. ▪ Dampen materials prior to transport/handling.
Stockpiles	▪ Limit the height of any stockpiles to <6m, where practicable. ▪ Regularly water stockpiles to keep down dust emissions. ▪ Apply additional water sprays to stockpiles during high wind conditions.
Transport of Materials	▪ Ensure that incoming and outgoing truckloads of materials are covered during transport

10 CONCLUSIONS

Hopkins Brothers have been operating the Midgee Quarry on the Bruce Highway, Midgee, since the early 2000s. Historically, the site has been used to extract material since the 1960s. The quarry operation has evolved over the years to respond to market demand, resulting in various planning permits having been obtained from Rockhampton Regional Council (RRC).

Local demand for quarry resources is anticipated to increase in the next decade, driven by regional significant infrastructure projects and a general increase in development within the region. As such, Hopkins Brothers are seeking to secure access to the known resource.

An air quality impact assessment has been undertaken to demonstrate the increase in production and associated changes to infrastructure will not have adverse effects on surrounding receptors. The assessment has been conducted in accordance with Department of Environment & Science (DES) *Guideline - Application requirements for activities with impacts to air* (2019).

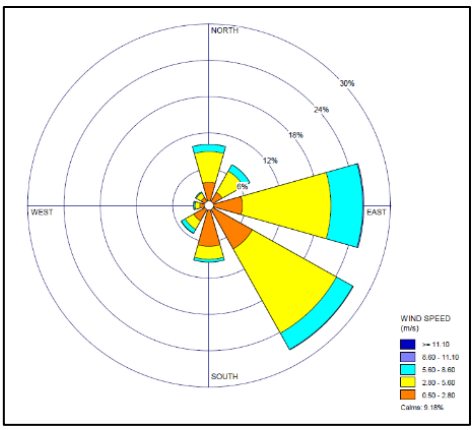
The results of the contemporaneous modelling for future operations (2 Mtpa with and without the asphalt plant) has identified an exceedence of the PM_{10} 24-hour criteria at two receptors. Paving the main haul road as detailed in Section 8.4 has determined compliance can be achieved at these receptors.

Overall, the proposed increase in production is not expected to adversely impact on the air environment of nearby sensitive uses if the haul road is paved at the required stages in Section 8.4.

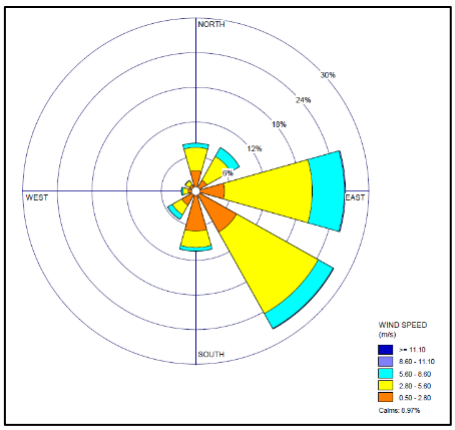
APPENDIX A: METEOROLOGICAL REVIEW

Section of Representative Year

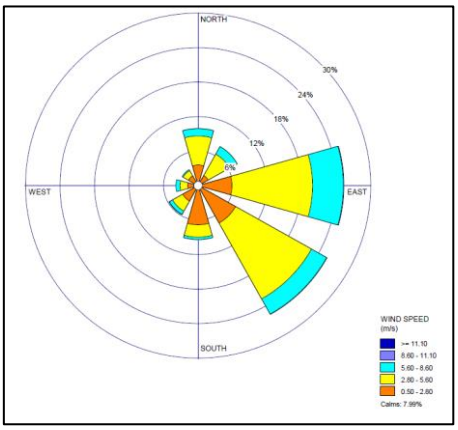
To determine the most representative meteorological year to utilise in the modelling, seven years (2012 - 2019) of meteorological observations from BOM Rockhampton Airport (station number 039083) were reviewed. The Figure below presents the wind roses for 2012 – 2019.



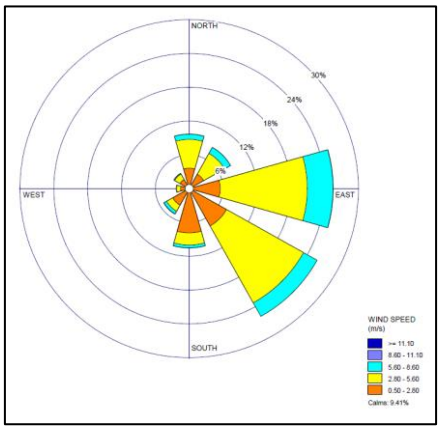
Annual 2012 - 2019



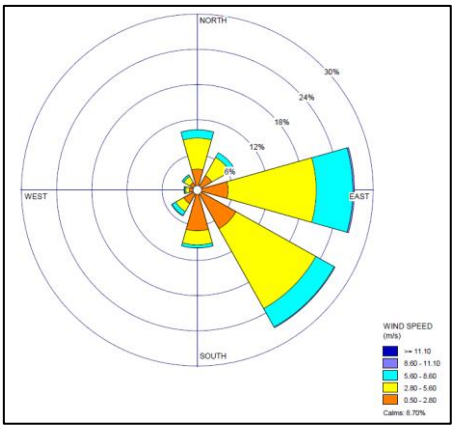
Annual 2015



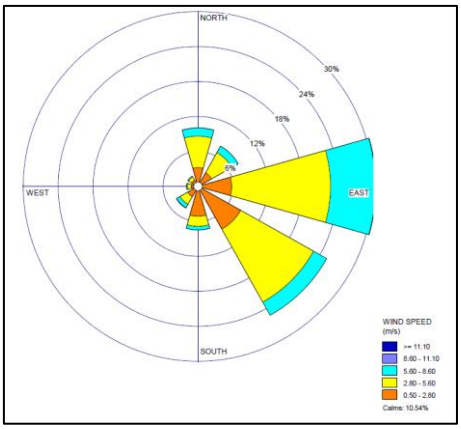
Annual 2016



Annual 2017



Annual 2018



Annual 2019

Long-term Wind Roses from BOM Rockhampton Airport (2012 - 2019)

Figure in this section present the observed annual and seasonal wind roses for BOM Rockhampton Airport. The following is noted:

- The annual wind roses for 2012 - 2019 show that the dominant wind directions are easterly and south easterly wind flows.
- The annual wind roses for 2016 and 2017 are the closest wind roses to the long-term average.

Based on the wind roses alone, 2016 and 2017 are considered the most representative years. Table 21 presents a yearly comparison of various meteorological parameters against the seven-year dataset. It can be seen form the Table that 2017 is the most conservative (highest occurrence of calms and lowest wind speeds) representative year based on the percentage of calm conditions and the strongest correlation for relative humidity, temperature, and wind speed by month.

Table 21: Data Analysis

Parameter		Year					
		2012 - 2019	2015	2016	2017	2018	2019
Wind Conditions	Data Availability	99.63	99.91	98.77	99.98	99.97	99.95
	Calm Conditions (%)	9.18	8.97	7.99	9.41	8.70	10.54
	Ave. Wind Speed (m/s)	3.26	5.24	5.33	3.16	3.39	3.30
Rainfall	Data Availability	99.65	99.91	98.77	99.98	99.97	99.95
	Rainfall (mm)	815	678	809	802	469	268
	Average Hourly Rainfall (mm/hour)	0.07	0.08	0.09	0.09	0.05	0.03
Correlations of Datasets by Month	RH (%)		0.40	0.58	0.83	0.68	0.32
	Temperature (°C)		0.98	0.98	0.97	0.99	0.61
	Wind Speed (m/s)		0.88	0.89	0.92	0.92	0.67

a) Based on long-term data from BOM website

As such, 2017 is considered the most representative year for locations close to Rockhampton.

Validation of Model Performance

An evaluation of the performance of the meteorological model is presented in this section. The evaluation compares the observed meteorological data from BOM Amberley with the output from CALMET, which included data assimilation in TAPM.

Figure 23 presents a comparison of the 9 am, 3 pm and annual 2017 predicted and observed wind roses at BOM Rockhampton Airport monitoring station which is located approximately 14 km to the NNW of the Subject Site. Comparison of the BOM site observed wind roses with predicted wind roses indicate that whilst the model has more wind flows from the east on an annual basis, the prediction model is accurately representing the wind flows for 9 am and 3 pm.

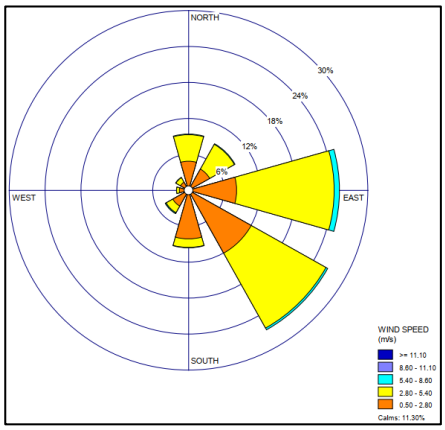
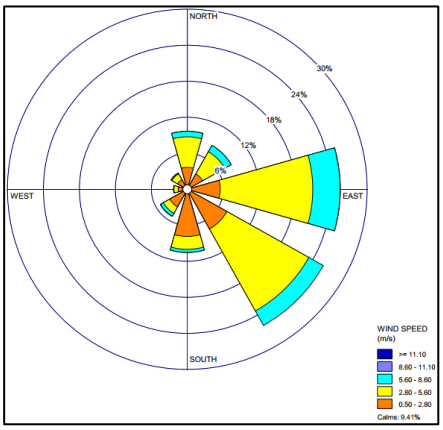
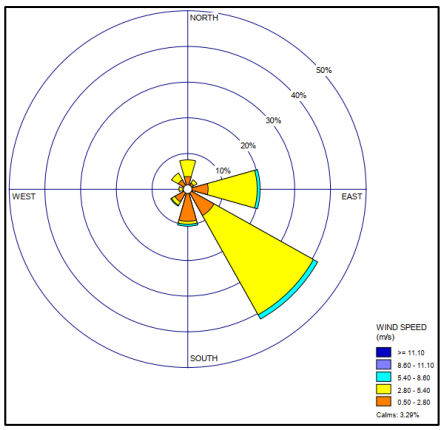
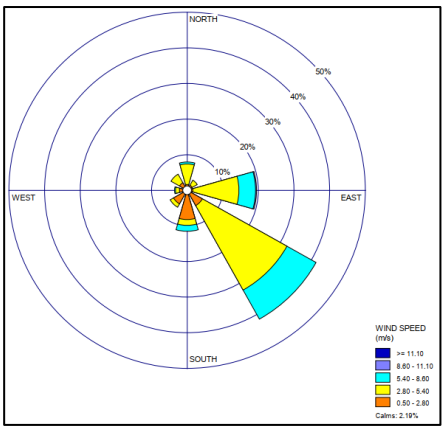
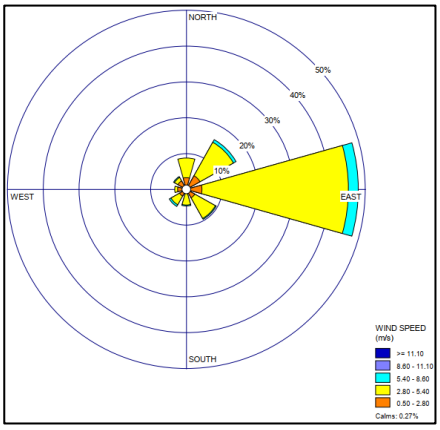
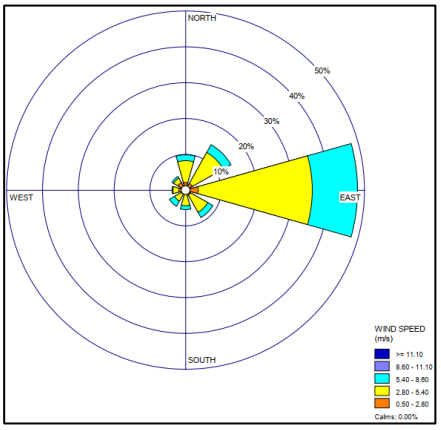
Period	BOM Rockhampton Predicted (2017)	BOM Rockhampton Observed (2017)
Annual		
0900		
1500		

Figure 23: Comparison of Predicted (2017) and BOM Observed Wind Roses (2017) at BOM Rockhampton

Figure 24 shows the probability density functions that graphically compare statistical distributions of individual meteorological parameters between TAPM/CALMET output and observational data, as extracted from the BOM Amberley location.

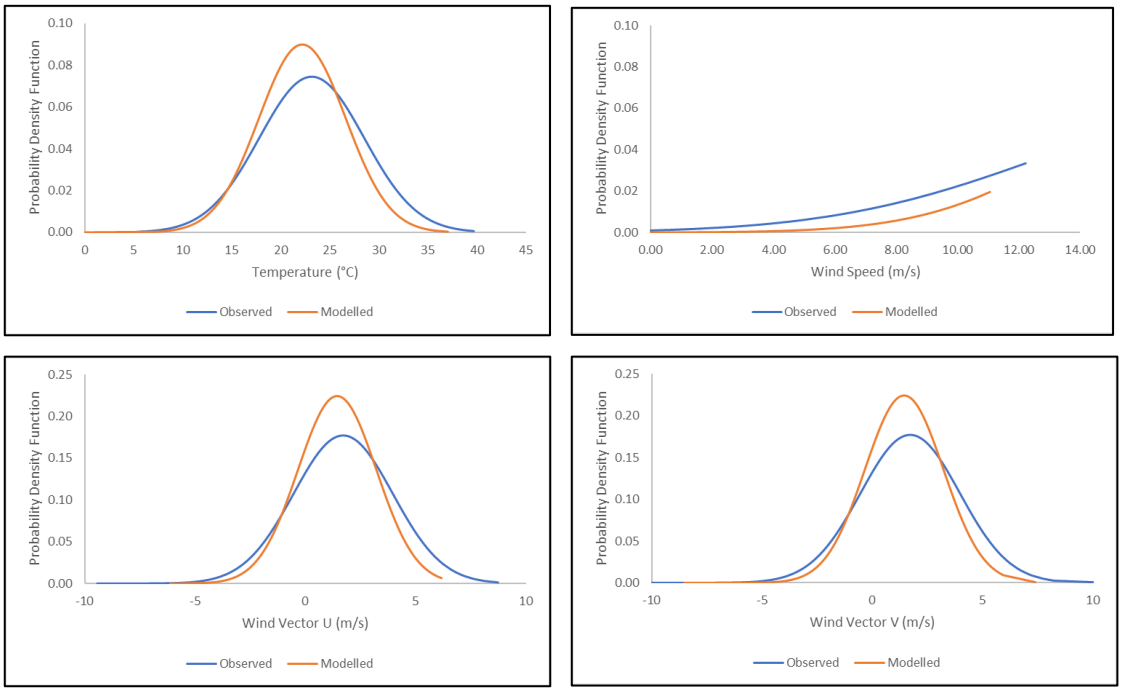


Figure 24: Probability Density Functions (pdf) Comparing Observational and Modelled Data at BOM Rockhampton

Review of the data has identified that the modelled and observed datasets are very similar, with the following noted:

- The modelled temperatures are more likely to be higher than those observed;
- The model has a cut of wind speed of 11 m/s;
- The wind vectors U (east/west component) and V (south/north component) are very similar.

On this basis, the prognostic dataset is considered suitable for the purposes of the assessment.

Prognostic Dataset Review at Subject Site

This section provides an analysis of the prognostic meteorological dataset extracted from the CALMET model for 2017 at the Subject Site.

Predicted Atmospheric Stability

The amount of turbulence in the ambient air has a major effect upon the rise and dispersion of emissions. In particular, the amount of turbulence in the atmosphere plays a key role in diffusion of an emitted plume in the air with stronger turbulence (increased instability) increasing the rate of diffusion. Where the atmosphere exhibits weak turbulence (increased stability), downwind contaminant concentrations can be expected to increase due to the limited diffusion.

Figure 25 presents the diurnal variability in atmospheric stability identified in the predicted meteorological dataset. As can be seen, atmospheric instability increased during the day where the influence of solar energy drives convection in the atmosphere. Conversely, increased stability can be seen during night periods where stable conditions are predicted for more than 90% of the time.

Monin-Obukhov Length

The Monin-Obukhov Length represents a parameter (with dimension of length) which provides a relationship between parameters characterising dynamic, thermal, and buoyant processes. The parameter, first described by Obukhov in 1946, is the characteristic height scale of the dynamic sub-layer of the atmosphere and is positive for stable stratifications and negative for unstable stratifications.

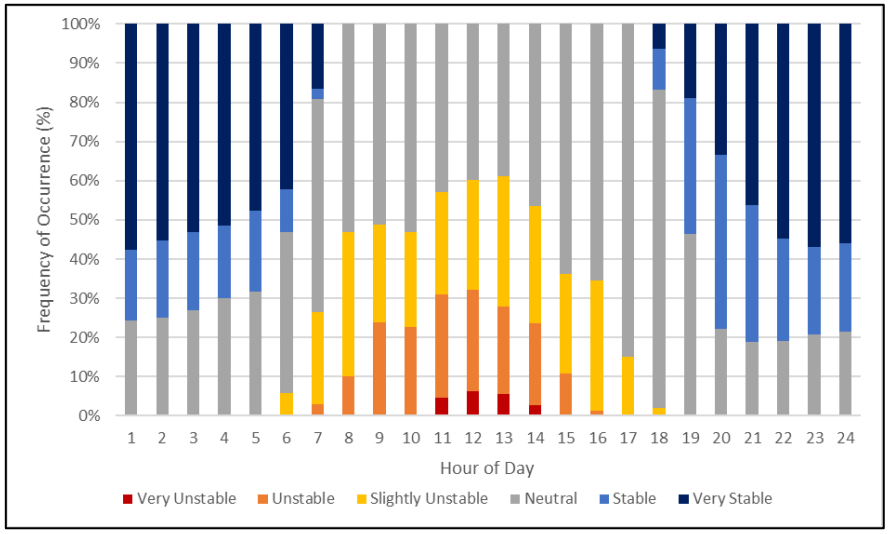
Figure 25 presents a graphical representation of the reciprocal of the Monin-Obukhov length (1/L) for the 2017 prognostic (CALMET) dataset. In this figure, neutral stability conditions have the 1/L value of zero (0), stable conditions have positive values of 1/L and unstable conditions have negative values of 1/L. The more positive 1/L value, the more stable the atmosphere is assumed to be by the model. Similarly, the more negative 1/L becomes, the more unstable the atmosphere is assumed to be by the model.

Predicted Atmospheric Mixing Height

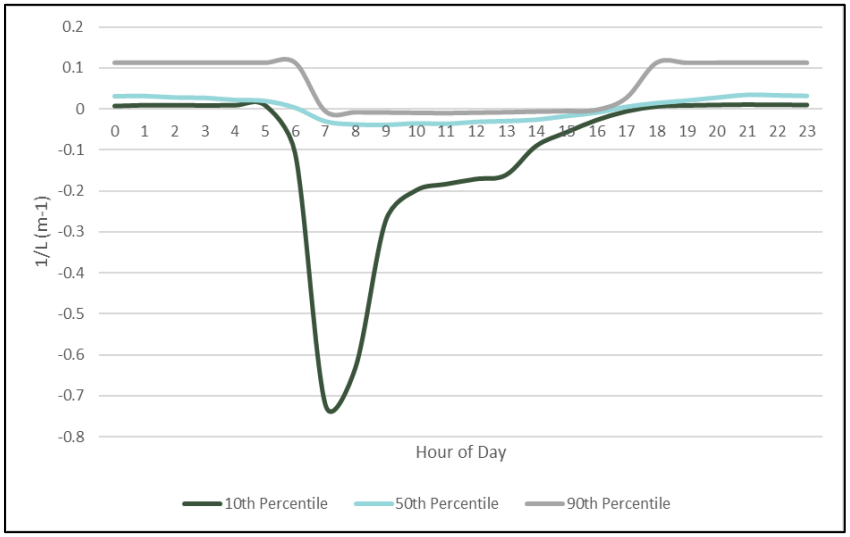
Figure 25 presents an illustration of diurnal variations in maximum and average mixing heights predicted by CALMET at the Subject Site across the 2017 prognostic meteorological dataset. As expected, an increase in mixing height during the morning is apparent, arising due to the onset of vertical mixing following sunrise. Maximum mixing heights generally occur in the mid to late afternoon, due to the dissipation of ground-based temperature inversions and growth of the convective mixing layer. The highest maximum mixing height for the Subject Site occurs during the late afternoon period.

Temperature

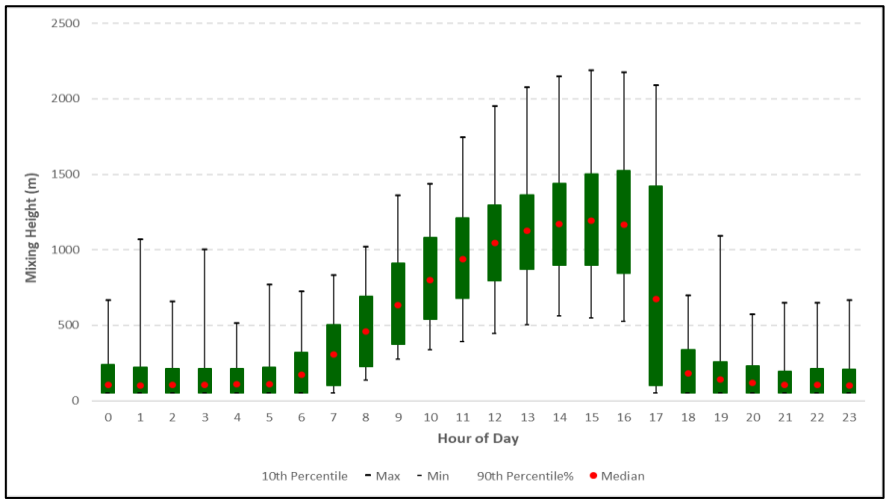
Figure 25 presents an illustration of diurnal variations in maximum and average temperatures predicted by CALMET at the Subject Site across the 2017 prognostic meteorological dataset.



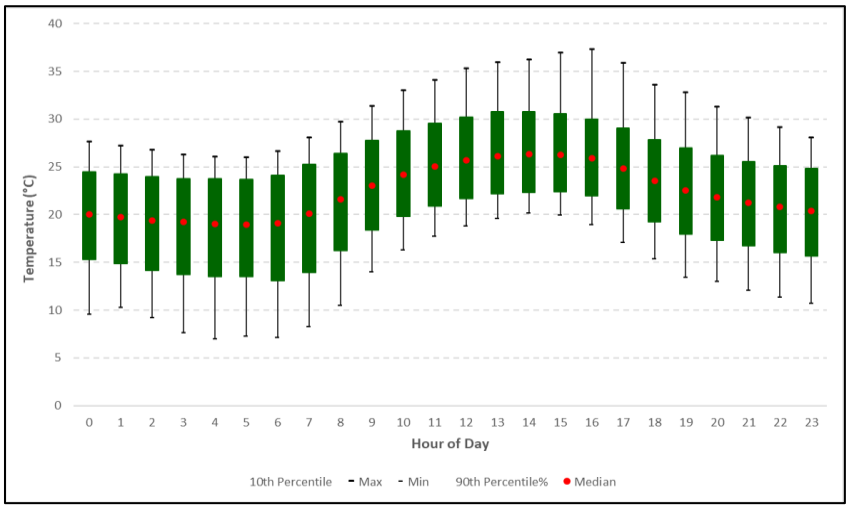
Annual Atmospheric Stability by Hour



Annual Variability of Monin-Obukhov Length by Hour



Atmospheric Mixing Height by Hour



Temperature by Hour

Figure 25: Meteorological Analysis at Subject Site

APPENDIX B: EMISSION ESTIMATION

Emission factors shown in Table 22 and operational information listed in Table 23 can be used to estimate emissions of TSP, PM_{10} and $PM_{2.5}$ to the air from various sources associated with the site.

Table 22: Emission Factor by Activity

Activity	Units	TSP Emission Factor	PM_{10} Emission Factor	$PM_{2.5}$ Emission Factor	Source
Wind Erosion for exposed areas	t/ha/hr	0.85 x (365-RD)/365	TSP x 0.5	PM_{10} x 0.075	NPI Mining
Wind Erosion from active stockpiles	kg/ha/hr	1.8 x U x (365-RD)/365	TSP x 0.5	PM_{10} x 0.075	NPI Mining
Loading / unloading trucks from stockpiles	kg/t	$0.74\ x\ 0.0016\ x\ \frac{(U/2.2)^{1.3}}{(M/2)^{1.4}}$	$0.35\ x\ 0.0016\ x\ \frac{(U/2.2)^{1.3}}{(M/2)^{1.4}}$	$0.053\ x\ 0.0016\ x\ \frac{(U/2.2)^{1.3}}{(M/2)^{1.4}}$	NPI Mining
Wheel generated particulates on paved roads	g/VKT	$3.23\ x\ \frac{S^{0.91}}{W^{1.02}}$	$0.62\ x\ \frac{S^{0.91}}{W^{1.02}}$	$0.15\ x\ \frac{S^{0.91}}{W^{1.02}}$	AP-42 13.2.1
Wheel generated particulates on unpaved roads (heavy vehicles)	kg/VKT	$\frac{0.4536}{1.6093}\ x\ 4.9\ x\ (S/12)^{0.7}\ x\ (W/3)^{0.45}$	$\frac{0.4536}{1.6093}\ x\ 1.5\ x\ (S/12)^{0.9}\ x\ (W/3)^{0.45}$	PM_{10} x 0.15	NPI Mining
Wheel generated particulates on unpaved roads (light vehicles)	kg/VKT	$1.69\ x\ \frac{(S/12)\ x\ (S/48)^{0.3}}{(M/0.5)^{0.3}}$ - 0.0013	$0.51\ x\ \frac{(S/12)\ x\ (S/48)^{0.5}}{(M/0.5)^{0.2}}$ - 0.0013	PM_{10} x 0.15	NPI Mining
Material transfer (misc)	kg/t per transfer point	$0.74\ x\ 0.0016\ x\ \frac{(U/2.2)^{1.3}}{(M/2)^{1.4}}$	$0.35\ x\ 0.0016\ x\ \frac{(U/2.2)^{1.3}}{(M/2)^{1.4}}$	$0.053\ x\ 0.0016\ x\ \frac{(U/2.2)^{1.3}}{(M/2)^{1.4}}$	NPI Mining
Tertiary Crushing - Controlled	kg/t	0.0027	0.0012	0.00022	NPI Mining
Screening - Controlled	kg/t	0.01250	0.00430	0.00029	NPI Mining
Conveyor Transfer Point	kg/t	0.00150	0.00055	0.00016	NPI Mining

Where:

- M = material moisture content (%)
- S = material silt content (or surface content in unpaved roads (%) or silt loading on paved roads (g/m^2))
- U = wind speed (m/s)
- RD = rainfall days >0.25 mm
- W = mean vehicle weight (tonnes)
- Area (m^2)

Table 23: List of Activity Data and Assumptions for Dust Emission Rates for Quarry

Parameter	Units	Existing	Future
Operating Times			
Operating hours	hrs per day	12	24
Operating days	day / year	312	365
Operating days	days	Mon to Sat	Mon to Sun
Volumes / Areas			
Annual Production	tonnes/yr	200,000	2,000,000
Exposed Areas (Quarry)	ha	8.8	48.1
Exposed Areas (Storage Area)	ha	2.8	2.8
Exposed stockpiles	ha	4.3	6.0
Rehabilitated Area	ha	-	-
Material Transfer			
Trucks Loading in Pit	tonnes/yr	200,000	2,000,000
Truck Unloading at Screening Plant	tonnes/yr	200,000	2,000,000
Screening (5 transfer points)	tonnes/yr	1,000,000	10,000,000
Crushing (3 transfer points)	tonnes/yr	600,000	6,000,000
Stockpile Loading	tonnes/yr	200,000	2,000,000
Trucks Loading from Stockpile	tonnes/yr	200,000	2,000,000
Trucks Unloading in Storage Area	tonnes/yr	200,000	2,000,000
FEL in Materials Storage Area	tonnes/yr	200,000	2,000,000
Vehicle Movements			
Product Truck Weight (unladen)	tonnes	32	32
Product Truck Weight (laden)	tonnes	61	61
Raw Materials Truck (unladen)	tonnes	47	47
Raw Materials Truck (laden)	tonnes	79	79
Access Road (Bruce Highway to Pit 2 Entrance)	km / VKT	1.1 / 13,225	1.1 / 117,556
Internal Haul Road (Existing Pit to Fixed Plant)	km / VKT	0.9 / 2,813	-
Internal Haul Road (Existing Pit to Mobile Plant)	km / VKT	1.0 / 3,188	-
Internal Haul Road (Mobile Plant to Access Road)	km / VKT	1.0 / 6,163	-
Internal Haul Road (Fixed Plant to Main Haul Road)	km / VKT	-	0.2 / 22,250
Internal Haul Road (Pit 1 to Main Haul Road)	km / VKT	-	2.0 / 36,806
Internal Haul Road (Pit 2 East to Main Haul Road)	km / VKT	-	0.5 / 12,900
Internal Haul Road (Pit 2 North to Main Haul Road)	km / VKT	-	0.6 / 24,338
Internal Haul Road (Pit 2 West to Fixed Plant)	km / VKT	-	0.9 / 11,075

Parameter	Units	Existing	Future
Internal Haul Road (Fixed Plant to Pite 1 Haul Road)	km / VKT	-	0.7 / 25,875
Drilling and Blasting			
Number of Holes	per blast	160	160
Area per Blast	m^2	1,960	1,960
Number of Blasts per Year	-	4	6
Weather			
Mean wind speed (Rockhampton Airport)	m/s	3.26	3.26
Rainfall >0.25 mm	Days per yr	62	62
Material Characteristics			
Raw material moisture content	%	2	2
Silt content of unpaved road	%	7.1	7.1
Emission Controls			
Material transfers (loading stockpiles)	%	0	0
Material transfers (processing)	%	0	0
Material transfers (loading trucks)	%	0	0
Unpaved roads (water truck)	%	75	75
Wind erosion of stockpile	%	0	0
In pit retention	%	TSP – 50% PM_{10} – 5%	N/A

Table 24: List of Activity Data and Assumptions for Dust Emission Rates for Asphalt Plant

Parameter	Units	Asphalt Plant
Operating Times		
Operating hours	hrs per day	12
Operating days	day / year	307
Operating days	days	Mon to Sat
Volumes / Areas		
Annual Production	tonnes/yr	100,000
Maximum Production	tonnes/day	2,500
Maximum Production (based on daily maximum production)	tonnes/yr	997,750
Exposed Areas	ha	1.8
Exposed stockpiles	ha	0.09
Material Transfer		
Truck unloading (raw materials)	tonnes/yr	767,500
Loading material to crusher	tonnes/yr	-
Rehandling of material / FEL	tonnes/yr	767,500
Rehandling of material / bin loading	tonnes/yr	767,500

Parameter	Units	Asphalt Plant
Truck loading	tonnes/yr	997,750
Asphalt Product Truck Weight (unladen)	tonnes	25
Asphalt Product Truck Weight (laden)	tonnes	61
Access Road (Bruce Highway to Asphalt Plant)	km / VKT	1.09 / 60,198
Raw Materials Truck (unladen)	tonnes	47
Raw Materials Truck (laden)	tonnes	79
Internal Haul Road (Quarry Stockpiles to Asphalt Plant)	km / VKT	0.13 / 6,284
Weather		
Mean wind speed (Rockhampton Airport)	m/s	3.26
Rainfall >0.25 mm	Days per yr	62
Material Characteristics		
Raw material moisture content	%	2
Silt content of unpaved road	%	7.1
Emission Controls		
Material transfers (loading stockpiles)	%	0
Material transfers (processing)	%	0
Material transfers (loading trucks)	%	25
Unpaved roads (water truck)	%	75
Wind erosion of stockpile	%	0

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Midgee Quarry

Site Based Management Plan

Prepared for: Hopkins Brothers

Date: 17 February 2022

File Reference: documents / 2607_610_001

DOCUMENT CONTROL

PROJECT / DETAILS REPORT

Document Title:	Midgee Quarry Site Based Management Plan
Principal Author:	D. Doolan
Client:	Hopkins Brothers
Reference Number:	2607_610_001

DOCUMENT STATUS

Issue	Description	Date	Author	Reviewer
1	Lodgement	17 February 2022	D. Doolan, C. Sheidler	Y. Dowling

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Figure 2 Batter Treatment Schematic (Drawing No. 2607.DRG.010)

ATTACHMENTS

Attachment 1 Annual Environmental Performance Review

1 Introduction

1.1 Background

Hopkins Brothers is the operator of the extractive industry operation located at 59793 Bruce Highway, Midgee, QLD 4702 on land properly described as Lot 2 RP888747. Hopkins Brothers intend to obtain an approval for an increase in extraction threshold, resulting in the following Prescribed Environmentally Relevant Activities ('ERAs') under the *Environmental Protection Regulation 2019* ('EP Reg'):

- ERA 16 Threshold (2)(c) Extracting, other than by dredging, in a year, more than 1,000,000 tonnes of material; and
- ERA 16 Threshold (3)(c) Screening, in a year, more than 1,000,000 tonnes of material.

It is also proposed to extend the quarry operation over adjacent land at 1 and 931 Bruce Highway, Midgee, Lot 725 Bruce Highway, Bouldercombe, and 33 Gavial-Gracemere Road Bouldercombe, properly described as Lot 1 on SP247721, Lot 931 on LIV40265, Lot 725 on RP888747 and Lot 2 on SP247721 (the 'site').

This Site Based Management Plan ('SBMP') describes the site operations, the potential environmental impacts of these activities, and how any potential impacts may be mitigated or managed to achieve acceptable environmental outcomes for the activity.

1.2 Activity Overview

Included as **Diagram 1 – Conceptual On-Site Extractive Operations** is an illustration of the quarry development. The quarry operations comprise of the following basic elements:

- Clearing of vegetation and stripping of topsoil and overburden via mechanical means (i.e., bulldozer or excavator).
- Stockpiling topsoil and overburden for future use as saleable general fill, incorporation into onsite rehabilitation works where required, or use in construction of stormwater controls (e.g., perimeter banks / bunds).
- Drilling and blasting rock to manageable size from the developed quarry benches to the quarry pit or bench below.
- Transferring raw material to the crushing and screening plant/stockpile area using off-road haul truck(s) loaded by an excavator or front-end loader.
- Crushing and screening raw material using a mobile crushing and screening plant.
- Stockpiling the final products before the material is sold and loaded into trucks for transportation off-site for use.
- Rehabilitating disturbed areas progressively once the terminal quarry benches have been established.

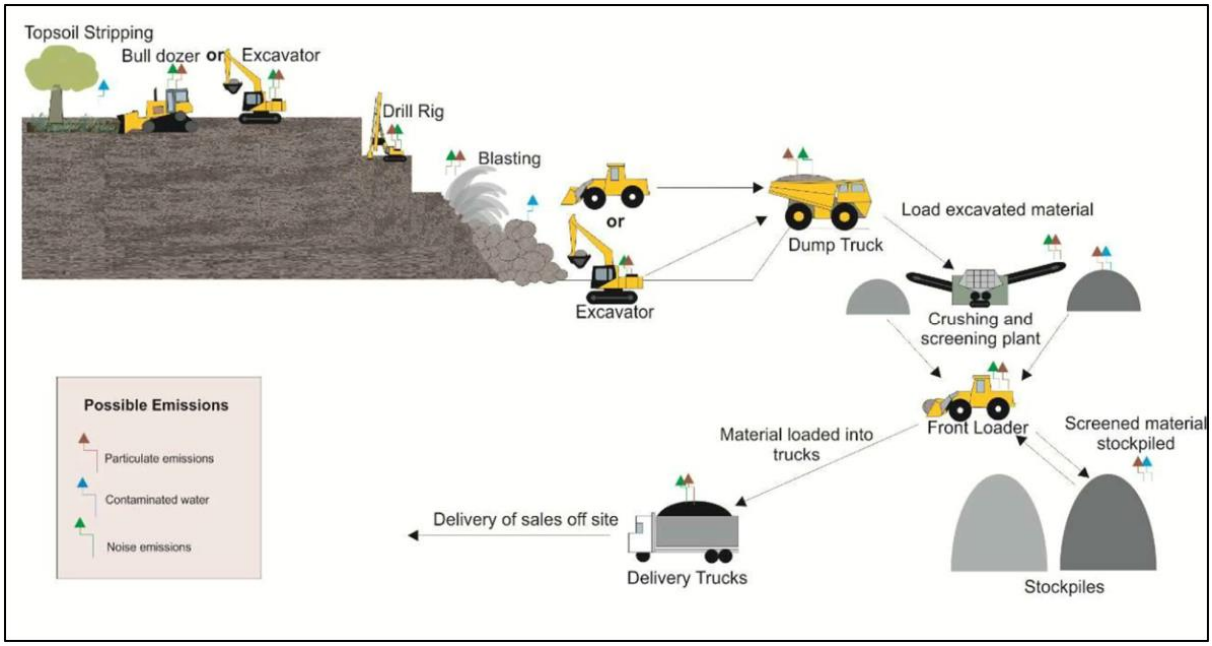


Diagram 1 – Conceptual On-Site Extractive Operations

1.3 Plant and Equipment

The operations are supported by a range of ancillary building and structures including, but not limited to:

- Site office and amenities block, car park and truck parking areas.
- Weighbridge.
- Storage container and scrap material / excess equipment area.
- Fuel storage (self-bunded transportable tank).
- Internal haul and access roads.
- Water tanks.

The number of plant and equipment deployed on-site is anticipated to vary from time-to-time to service the project demands. Types of major plant and equipment deployed on-site may include, but not limited to:

- Excavator.
- Moxy dump truck.
- Front end loader.
- Processing plant.
- Bulldozer.
- Grader.
- Water cart.
- Haul road trucks.

Equipment is generally be serviced in the field unless it is practical for the parts to be dismantled and transported off-site. Consumables (e.g., tyres, oils, and greases) will be supplied by contractors and removed (including associated packaging) for disposal off-site in accordance with the requirements of the prevailing legislation and the local authority.

1.4 Hours of Operation

It is proposed, through the Development Application, to operate the quarry 24 hours, 7 days a week. Blasting will be limited to 9am to 3pm, Monday to Friday. No blasting will occur on Sundays or public holidays.

1.5 Purpose of SBMP

This SBMP has been prepared to provide written procedures for the site activities that:

- Identify potential risks to the environment from the activity during routine operations and emergencies.
- Establish and maintain control measures that minimise the potential for environmental harm.
- Ensure plant, equipment and measures are maintained in a proper and effective condition.
- Ensure plant, equipment and measures are operated in a proper and effective manner.
- Ensure that staff are trained and aware of their obligations under the *Environmental Protection Act 1994* ('EP Act').
- Ensure that reviews of environmental performance are undertaken at least annually.

1.6 Relevant Legislation

In Queensland, the EP Act is the principal legislation for protecting the environment. The EP Act was assented on 1 December 1994 and was proclaimed on 1 March 1995. The object of the EP Act is to:

> "*protect Queensland's environment while allowing for development that improves the total quality of life, both now and in the future, in a way that maintains the ecological processes on which life depends (ecologically sustainable development)*".

The EP Act imposes a General Environmental Duty on corporations, government departments and individuals, in order to meet the primary objective (s319 of the EP Act). The duty relates to the notion that everyone must take all reasonable and practicable measures to prevent or minimise environmental harm. The general environmental duty is extracted below for reference:

*"**319 General environmental duty***

1. *A person must not carry out any activity that causes, or is likely to cause, environmental harm unless the person takes all reasonable and practicable measures to prevent or minimise the harm (the **general environmental duty**).*

   Note— See section 24 (3) (Effect of Act on other rights, civil remedies etc.).

2. *In deciding the measures required to be taken under subsection (1), regard must be had to, for example—*
   a) *the nature of the harm or potential harm; and*
   b) *the sensitivity of the receiving environment; and*
   c) *the current state of technical knowledge for the activity; and*
   d) *the likelihood of successful application of the different measures that might be taken; and*
   e) *the financial implications of the different measures as they would relate to the type of activity."*

In addition, the EP Act states that it is an offence to cause environmental nuisance (s440 of EP Act), material environmental harm (s438 of EP Act), serious environmental harm (s437 of EP Act), and it is an offence to contravene a condition of an Environmental Authority (s430 of EP Act).

2 Policies and Procedures

2.1 Staff Training

All site personnel, including contractors, are to be inducted on the environmental management requirements for the site and informed of the environmental management objectives and specifics of the SBMP as well as obligations under the EP Act. Training may include awareness on impact minimisation measures, operational practices, maintenance measures, reporting, and individual responsibilities.

Site personnel are to be made aware of penalties if conditions of approval are breached and reporting requirements for incidents involving environmental nuisance and/or harm in accordance with the relevant environmental legislation. A record of all employee training is to be maintained on-site.

2.2 Communication

Communication must take place regarding environmental matters at the site between operational personnel, management, and external stakeholders. Internal communication mechanisms relating to environmental matters and potential impacts, objectives and targets, training and awareness, complaints and incidents, and suggestions for improvement may include, but shall not be limited to:

- Self-assessments and audits.
- Action requests, memos, noticeboards, etc.
- Environmental incident reporting.
- Environmental compliance monitoring and reporting.
- Inductions and environmental awareness training.
- Toolbox talks or verbal advice.
- Weekly construction meetings.
- Management reviews.
- Site meetings.

All external communications are to be undertaken by management. External communication mechanisms for environmental matters may include:

- Formal and informal correspondence with the administering authorities.
- Formal correspondence with interest groups.
- Community complaints and enquiries.

2.3 Complaint Recording and Response

All complaints received are to be reported to the Quarry Manager or delegate immediately.

The following details are to be recorded upon receipt of any complaint:

- Date and time the complaint was received.
- Name and contact details for the complainant when provided and authorised by the complainant.
- Nature of the complaint.
- Investigation undertaken.
- Conclusions formed.
- Actions taken.

The Quarry Manager is to liaise with any complainants to discuss the nature of the complaint and to determine a suitable resolution. Initial contact with the complainant is to be made within 24 hours of the complaint being received to initiate a resolution to the matter.

The administering authority may request additional monitoring to investigate any complaint of environmental nuisance received directly by the administering authority. A copy of any monitoring results must be provided to the Department (currently the Department of Environment and Science) as per the specifics of their request.

2.4 Incident Response Procedure

2.4.1 Overview

The objective of this Incident Response Procedure is to ensure that any breaches of the EA, or incidents and activities that cause or threaten to cause serious or material environmental harm, are reported, investigated, and addressed to prevent recurrence or remedy harm caused. A diagrammatic overview of incidents procedure is provided in **Diagram 2 – Incident Response Procedure Overview**. The Quarry Manager will be responsible for ensuring that all employees at the site are familiar with the procedure for incidents procedures.

Environmental harm is defined under the EP Act as:

- Any adverse effect, or potential adverse effect (whether temporary or permanent and of whatever magnitude, duration or frequency) on an environmental value, and includes environmental nuisance.
- May be caused by an activity—
    - whether the harm is a direct or indirect result of the activity; or
    - whether the harm results from the activity alone or from the combined effects of the activity and other activities or factors.

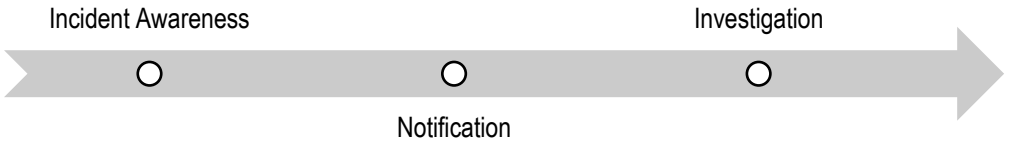


Diagram 2 – Incident Response Procedure Overview

2.4.2 Incident Awareness

When an employee becomes aware of an event resulting in the breach of an EA condition, or an incident with actual or potential environmental harm implications, the employee must report the incident to the Quarry Manager or delegate immediately (no more than 24 hours after becoming aware of the incident).

To demonstrate regard for the general environmental duty, all possible breaches of the EA should be reported to the administering authority as soon becoming aware of the matter, even if there is uncertainty as to whether a condition of the EA has been breached.

2.4.3 Notification

If the matter is an emergency, call 000.

Under Sections 320 to 320G of the EP Act, persons have a duty to notify the administering authority within 24 hours of becoming aware of any incidents or activities that cause or threaten to cause serious environmental harm or material environmental harm. In addition, the EA requires that any breach of a condition of the EA is reported no more than as soon as practicable within 24 hours of becoming aware of the breach.

The Quarry Manager must notify the administering authority via telephone and email within 24 hours of becoming aware of the incident. The contact details of the administering authority for notification purposes are as follows:

Department of Environment and Science
Phone: 1300 130 372 and select option 2 (during business hours of 8.30am to 5.00pm)
Email: PollutionHotline@des.qld.gov.au

Notification must include the following where known:

- Contact details for a site representative.
- Details of the affected land (e.g., site address, real property description, local government area, maps / plans of affected areas).
- EA reference number.
- Nature of the activity / circumstances that led to the incident.
- Timeframes for the event and when staff became aware (date and time).
- Event type (e.g., spill, fire, leaks, release, etc), source and environment affect (e.g. waterways, drains, land, etc).
- Details of any potential contaminants.
- Actions taken to resolve or remedy potential impacts.

All records of the incident or breach are to be stored at the site and made available to the administering authority upon request.

2.4.4 Investigation

All incidents are to be investigated. The investigations should include:

- Determining what activities were being carried out at the time of the incident and any equipment involved.
- Identifying whether equipment or activities on-site were the cause of the incident.
- Determining what potential actions may be carried out to resolve the matter and/or minimise the likelihood of further impacts.

Corrective action is to be implemented and an assessment conducted to determine what actions are to be taken to remedy the matter and/or prevent a similar incident from occurring.

Where monitoring is required to investigate an incident (e.g., water quality monitoring), a suitably qualified person as identified under the EP Act must be engaged to perform the monitoring and interpret any results.

2.5 Record Keeping

All environmentally relevant documentation, including approvals, corporate policies, procedures, forms, records, and reports required to be kept as per this SBMP or conditions of approval shall be available at the approved premises for a period of at least five (5) years, and must be available for inspection by an authorised person.

2.6 Monitoring

Any monitoring required by a condition of approval or by this SBMP must be carried out by a suitably qualified person(s) as defined under the EP Act.

All instruments, equipment and measuring devices used for measuring or monitoring in accordance with a condition of approval must be calibrated and appropriately operated and maintained.

All analyses of samples must be carried out by a laboratory that has National Association of Testing Authorities ('NATA') certification, or an equivalent certification, for such analyses.

2.7 Periodic Review of Environmental Performance and Continual Improvement

The SBMP has been prepared for implementation as a continuous improvement program. The following key aspects of this SBMP ensures continuous improvement results from the implementation of this SBMP.

Commitment and Environmental Policy

Senior management are to commit to environmental performance through ensuring regulatory compliance, prevention of actual or potential environmental harm, and continuous improvement.

Planning

The SBMP identifies environmental aspects associated with the site operations, such as potential impacts. SBMP outlines the environmental objectives, performance targets and management measures for each environmental aspect.

Implementation

Implementation of the SBMP outlines responsibilities, training requirements, communication procedures, and contingency plans. Hopkins Brothers will be responsible for ensuring additional implementation requirements are in place, such as preparing monitoring documentation, following procedures, and establishing communication pathways.

Checking

Monitoring of compliance will determine whether the environmental objectives are being met and will identify non-compliances. Additional actions that will check environmental performance include audits and review of the SBMP.

Review

Reviews of environmental performance are to be undertaken at least annually and should review:

- Any monitoring data produced under the conditions of the EA and any trends.
- Any non-compliances reported, or complaints received, over the preceding 12 months and actions taken to achieve compliance / resolution.
- Changes in site approval documents, legislation and standards.
- The suitability of the SBMP against the site development.
- Any measures that are proposed to be implemented over the coming 12 months to improve the environmental performance of the site.

A template for annual environmental performance reviews is included as **Attachment 1 – Annual Environmental Performance Review**.

The outcomes of all environmental performance reviews must be communicated to senior management for actioning as required.

The Quarry Manager may commission updates to this SBMP as required to ensure that it meets the operational needs of the site. Periodic review of the SBMP will ensure continuous improvement of the site environmental performance through adaption of management strategies to meet the changing needs of the site.

2.8 Responsibilities

Although responsibilities for implementation of the SBMP have been assigned to the Quarry Manager, it must be noted that the Quarry Manager may delegate these responsibilities to a nominated person where required. Prior to delegation of duties, the Quarry Manager is to ensure that the nominated person has been adequately trained in relation to the delegated duties and is aware of their responsibilities.

3 Potential Environmental Risks

3.1 Risk Assessment Methodology

The purpose of this assessment is to determine the site activities requiring ongoing management to reduce residual risk of potential environmental impacts. This risk assessment methodology has been adopted from the process for risk management as set out in Clause 6 of the *AS ISO 31000:2018 Risk management - Guidelines* (Standards Australia 2018). The risk assessment follows the following process:

- Risk identification (source activity and potential impact).
- Risk Analysis (risk level = likelihood x consequence).
- Risk Evaluation (commentary on risk / management measures proposed).

The risk treatment outlines the controls / management measures that can be implemented to reduce the level of risk to as low as reasonably possible.

The risk analysis qualitatively estimates the level of risk based on the likelihood of an environmental impact or event occurring (**Table 1 – Definitions of Likelihood**), and the consequences of the occurrence (**Table 2 – Definitions of Consequence**).

Table 1 – Definitions of Likelihood

Rating	Descriptor	Score
Rare	May occur only in exceptional circumstances	1
Unlikely	Could occur but doubtful	2
Possible	Might occur at some time in the future	3
Likely	Will probably occur	4
Almost Certain	Is expected to occur in most circumstances	5

Table 2 – Definitions of Consequence

Rating	Descriptor	Score
Negligible	Impacts not requiring any treatment or management action	1
Minor	Nuisance or insignificant environmental harm requiring minor management action	2
Moderate	Serious environmental impacts, readily manageable at low cost	3
Major	Substantial environmental impacts, manageable but at considerable cost and some disruption	4
Severe	Severe environmental impacts with major consequent disruption and heavy cost	5

The consequence and likelihood scores are plotted on the risk vs consequence matrix (**Table 3 – Risk Assessment Matrix**) and the final risk level assigned is a product of the likelihood and consequence

scores, which equals the magnitude of the impacts. The higher the risk score, the higher the priority is for management.

Table 3 – Risk Assessment Matrix

Likelihood		Consequence				
		Negligible	Minor	Moderate	Major	Severe
		1	2	3	4	5
Almost Certain	**5**	5 Medium	10 High	15 High	20 Very High	25 Very High
Likely	**4**	4 Low	8 Medium	12 High	16 High	20 Very High
Possible	**3**	3 Low	6 Medium	9 Medium	12 High	15 High
Unlikely	**2**	2 Low	4 Low	6 Medium	8 Medium	10 High
Rare	**1**	1 Low	2 Low	3 Low	4 Low	5 Medium

Table 4 – Indicative Management Option for Each Risk Assessment Rating describes the possible actions required for each risk assessment rating.

Table 4 – Indicative Management Option for Each Risk Assessment Rating

Risk Rating	Risk Rating Scores	Indicative Management Option
Very High	**17 – 25**	Manage by implementing site management and emergency procedures, plant design controls and regular monitoring.
High	**10 – 16**	Manage by implementing site management procedures, specific monitoring and may require some operation/plant design controls.
Medium	**5 – 9**	Manage by implementing specific monitoring or response procedures.
Low	**1 – 4**	Manage by routine procedures, unlikely to need specific application of resources.

3.2 Environmental Risk Assessment

Activities associated with the ERAs which have the potential to cause environmental harm and/or nuisance and the potential impacts have been identified and tabulated. The inherent risk of the impacts occurring, and the residual risk following the implementation of management strategies, has then been assessed. Refer to **Table 5 – Identification of Potential Impacts and Risks** for the assessment.

Table 5 – Identification of Potential Impacts and Risks

Environmental Aspect	Potential Environmental Impact	Source Activity	Inherent Risk Rating [a]	Evaluation and Risk Treatment	Residual Risk Rating [b]
Table notes: (a) "Inherent risk" is the level of risk that exists if the impacts go unmitigated. (b) "Residual risk" is the risk that remains after implementation of the proposed control / management measures.					
Air	• Clearing of vegetation and topsoil / overburden ahead of the extraction activity. • Excavation activities within the quarry footprint. • Storage and handling of materials within the quarry footprint. • Vehicle movements on unsealed roads and access tracks. • Cumulative impacts should an asphalt plant be established on the site.	Emission of dust to air impacting nearby sensitive receptors.	4 x 3 = 12 (**High**)	In the absence of control measures, potential incidents associated with air emissions impacting nearby sensitive receptors is scored high due to the proximity of sensitive receptors to the site, particular the haul road / access. An air quality assessment has been undertaken by Assured Environmental ('AE'), who noted that the two (2) main source contributions are the main site haul road and the screening / crushing activities in the eastern part of Pit 2. Controls will be required to address these specific contributing sources, which may include: • Paving the haul road from the Bruce Highway to the Pit Entrance. • Watering during the screening and crushing activities in Pit 2 east. Other general quarry controls will include: • Watering of haul road, access road and stockpile area at a rate of up to 2 litres/m^2/hour as required to manage emissions from unsealed roads and the stockpile area;	2 x 2 = 4 (**Low**)

Environmental Aspect	Potential Environmental Impact	Source Activity	Inherent Risk Rating [a]	Evaluation and Risk Treatment	Residual Risk Rating [b]
Table notes: (a) "Inherent risk" is the level of risk that exists if the impacts go unmitigated. (b) "Residual risk" is the risk that remains after implementation of the proposed control / management measures.					
				• Water sprays to processing plant at transfer points, at a minimum; • Rock drill to have an appropriate dust extraction system with collector fitted to rig and/or wet drilling via water sprays; and • Management of dust emissions from stockpiles during high wind speed conditions through appropriate use of sprinklers and/or suitable water truck as required. AE (2022) confirmed that the site activities will achieve compliance with the Air Quality Objectives prescribed in the *Environmental Protection Policy (Air) 2019* ('EPP (Air')) provided the following control measures are implemented: **Section 4.1 - Air Quality Management Plan** of this SBMP contains the above measures in addition to additional controls to minimise potential for air quality impacts. Residual risk is scored low as the likelihood of an incident occurring, and its consequences, are reduced through the implementation of control measures outlined in this SBMP.	

Environmental Aspect	Potential Environmental Impact	Source Activity	Inherent Risk Rating [a]	Evaluation and Risk Treatment	Residual Risk Rating [b]
Table notes: (a) "Inherent risk" is the level of risk that exists if the impacts go unmitigated. (b) "Residual risk" is the risk that remains after implementation of the proposed control / management measures.					
Water	• Clearing of vegetation and topsoil. • Stockpiling of topsoil and overburden. • Extraction and handling of raw materials (e.g., transfer of materials, processing, blending, stockpiling, transportation).	Release of contaminated water to the receiving environment.	4 x 3 = 12 (**High**)	Stormwater runoff will interact with disturbed areas created through the development of the extraction areas. Inherent risks to off-site waters are conservatively scored high in the absence of any environmental controls to mitigate these risks. To manage potential impacts to waters from the proposed extraction area, the *Midgee Quarry: Stormwater Management Plan (Doc ref. 2610.800.001)* ('SMP') has been prepared for the site. In addition, **Section 4.2 - Water Quality Management Plan** of this SBMP contains supplementary measures to minimise impacts to waters. Provided that the management measures outlined in the SMP and SBMP are implemented, and the EA conditions complied with, the residual risk score is reduced to medium based on a possible likelihood and a moderate consequence which can be management in accordance with the measures in the SBMP and SMP. Proposed Pit 1 is located on land that is <20mAHD, and thus has the potential to contain ASS. Soil and geological mapping for the area	2 x 3 = 6 (**Medium**)

Environmental Aspect	Potential Environmental Impact	Source Activity	Inherent Risk Rating [a]	Evaluation and Risk Treatment	Residual Risk Rating [b]
Table notes: (a) "Inherent risk" is the level of risk that exists if the impacts go unmitigated. (b) "Residual risk" is the risk that remains after implementation of the proposed control / management measures.					
				has not identified or confirmed the presence of ASS. **Section 4.3 - ASS Management Plan** has been included to provide measures to manage ASS in the event they are exposed / disturbance through site operations.	
Groundwater	• Clearing of vegetation and topsoil. • Excavation activities within the quarry footprint. • Storage and handling of materials within the quarry footprint. • Excavation within Pit 1.	Release of contaminants to groundwater.	3 x 3 = 9 (**Medium**)	No groundwater has been intercepted within the hard rock extraction areas (Pit 2) at the site. Proposed Pit 1, located adjacent to Gavial Creek will likely have shallow groundwater, as shown by the groundwater records for this area. It is not proposed to operate a wet extraction activity, and avoidance of groundwater interaction is the preferred approach by Midgee Quarry. Unmitigated, the potential for indirect impacts through release of contaminants which have the potential to be transported to groundwaters is scored medium, based on a possible likelihood and a moderate consequence. The **Section 4.2 - Water Quality Management Plan** and the SMP include measures for capture and treatment of surface waters that may interact with potential contaminants at the site that could impact groundwater. **Section 4.4 - Hydrocarbons and Chemical Management Plan** provides measures for management of	2 x 3 = 6 (**Medium**)

Environmental Aspect	Potential Environmental Impact	Source Activity	Inherent Risk Rating [a]	Evaluation and Risk Treatment	Residual Risk Rating [b]
Table notes: (a) "Inherent risk" is the level of risk that exists if the impacts go unmitigated. (b) "Residual risk" is the risk that remains after implementation of the proposed control / management measures.					
				other potential groundwater contaminants. In addition, it is understood that extraction will be undertaken so as to not intercept groundwater within the extraction areas. Provided Midgee Quarry implement the SBMP, potential for indirect impacts to groundwater will be reduced, and the residual risk is reduced to a lower score based on a decreased likelihood of an event occurring. The risk is reduced to a lower score however remains medium, which will require ongoing management through the implementation of the SBMP.	
Noise	• Clearing of vegetation and topsoil / overburden ahead of the extraction activity. • Stripping and stockpiling of topsoil, subsoils and overburden. • Extraction and handling of materials (e.g., transfer of materials, stockpiling, transportation). • Screening and processing of the materials. • Vehicle movements on unsealed roads and access tracks. • Plant and equipment use, including reverse beepers. • Radio / UHF use.	Noise nuisance for nearby noise sensitive receptors.	4 x 3 = 12 (**High**)	In the absence of any noise management measures, the site activities have the potential to influence the noise EVs of the locality. Due to the presence of nearby sensitive receptors the inherent risk is scored high due to the proximity of sensitive receptors to the site, particular the haul road / access. **Section 4.5 - Noise Management Plan** contains the above measures as well as additional controls to minimise noise emissions from the site activities. An assessment of the potential noise impacts was undertaken by AE (2022b), who confirmed	2 x 3 = 6 (**Medium**)

Environmental Aspect	Potential Environmental Impact	Source Activity	Inherent Risk Rating [a]	Evaluation and Risk Treatment	Residual Risk Rating [b]
Table notes: (a) "Inherent risk" is the level of risk that exists if the impacts go unmitigated. (b) "Residual risk" is the risk that remains after implementation of the proposed control / management measures.					
	• Alarms.			that no additional mitigation measures were required to mitigate potential noise impacts to nearby sensitive receptors. Provided that Midgee Quarry implement control measures for potential noise impacts as outlined in the SBMP, and observe the EA requirements, the residual risk is reduced to medium as the likelihood and consequence of an incident involving noise nuisance is reduced through the implementation of the above measures.	
		Air blast overpressure and vibration nuisance for nearby sensitive receptors.	3 x 4 = 12 (**High**)	Blasting activities at the site inherently have the potential to cause air-blast overpressure and vibration impacts for sensitive receptors. The **Section 4.6 - Blasting Management Plan** includes measures for management of blasting activities at the site. A key measure is that only suitably experienced and qualified blasting personnel shall be employed or contracted to provide blasting services. An assessment of the potential vibration nuisance was undertaken by AE, who confirmed that no additional mitigation measures were required to potential vibration nuisance to nearby sensitive receptors.	2 x 3 = 6 (**Medium**)

Environmental Aspect	Potential Environmental Impact	Source Activity	Inherent Risk Rating [a]	Evaluation and Risk Treatment	Residual Risk Rating [b]
Table notes: (a) "Inherent risk" is the level of risk that exists if the impacts go unmitigated. (b) "Residual risk" is the risk that remains after implementation of the proposed control / management measures.					
				Provided that the Blasting Management Plan is implemented, and only suitably qualified persons are engaged to undertake blasting activities at the site, the residual risk is reduced to a lower level as the likelihood of an incident occurring is reduced. The residual risk rating is scored medium, which will require ongoing management measure to be applied as outlined in this SBMP.	
Waste	• Vegetation clearing. • Storage and disposal of residual waste (i.e., general, and regulated waste).	Improper disposal of wastes.	3 x 4 = 12 (**High**)	Types of waste that may be generated at the quarry include, but are not necessarily limited to, the following: • Regulated wastes (e.g., batteries, oil filters, waste oil/hydrocarbons and containers, oil/water emulsions and tyres). • Scrap metal and used or faulty parts and equipment. • General waste such as food waste, packaging, and consumables. • Green waste. In the absence of control measures, potential for impacts associated with improper disposal of wastes is inherently scored high.	2 x 2 = 4 (**Low**)

Environmental Aspect	Potential Environmental Impact	Source Activity	Inherent Risk Rating [a]	Evaluation and Risk Treatment	Residual Risk Rating [b]
Table notes: (a) "Inherent risk" is the level of risk that exists if the impacts go unmitigated. (b) "Residual risk" is the risk that remains after implementation of the proposed control / management measures.					
				Section 4.7 - Waste Management Plan details measures for management of waste at the site, with reference to the requirements of the *Waste Reduction and Recycling Act 2011* (WRR Act). Provided Midgee Quarry implement the measures outlined in the SBMP, and comply with the requirements of the EA, the residual risk of a potential incident involving waste is reduced, and the environmental objective for 'Waste' is likely to be achieved.	
Land	Handling of chemicals and fuels on-site.	Release of hydrocarbons and fuels to land.	3 x 4 = 12 (**High**)	In the absence of controls the inherent risk of handling fuels and chemicals is high due to an increased likelihood of potential release if handling and storage activities are unmanaged. **Section 4.4 - Hydrocarbons and Chemical Management Plan** provides management measures for handling and storage of hydrocarbons and chemicals to reduce the potential impacts to land associated with spills and/or leaks. Provided Midgee Quarry implements the measures outlined in the SBMP, the residual risk is reduced to a lower level as the likelihood and consequence of an incident occurring is reduced	2 x 3 = 6 (**Medium**)

Environmental Aspect	Potential Environmental Impact	Source Activity	Inherent Risk Rating [a]	Evaluation and Risk Treatment	Residual Risk Rating [b]
Table notes: (a) "Inherent risk" is the level of risk that exists if the impacts go unmitigated. (b) "Residual risk" is the risk that remains after implementation of the proposed control / management measures.					
				through the implementation of the management measures outlined in the SBMP. The residual risk is scored medium, and ongoing management in accordance with the SBMP will be required to ensure risk is as low as reasonably possible.	
	Clearing of vegetation ahead of extraction.	Unauthorised impacts to protected species as a result of site activities.	2 x 2 = 4 (**Low**)	There are areas of mapped regulated vegetation within the site and proposed development areas. To mitigate potential impacts to mapped features at the site, the footprint of the has been designed so as to reduce the level of impact. Under the NC Act, any project activities that are required to tamper with a confirmed native animal breeding place in order to complete the scope of works must be undertaken in accordance with a Species Management	2 x 2 = 4 (**Low**)

Environmental Aspect	Potential Environmental Impact	Source Activity	Inherent Risk Rating [a]	Evaluation and Risk Treatment	Residual Risk Rating [b]
Table notes: (a) "Inherent risk" is the level of risk that exists if the impacts go unmitigated. (b) "Residual risk" is the risk that remains after implementation of the proposed control / management measures.					
				Program approved by DES. DES provides two Species Management Program templates, depending on the identified protected animals. The "low risk of impacts" relates to protected animals classed as Least Concern under NC Act where the impacts are unlikely to affect broader population. The "high risk of impacts" relates to protected animals identified as EVNT, Special Least Concern or Least Concern Colonial Breeder species, where the broader population is at a greater risk from impacts. As breeding places for native fauna may be impacted, subject to the timing of works, it is recommended all wet areas and trees to be removed are inspected prior to removal to determine if any active animal breeding places are present and any necessary Species Management Program is obtained prior to works, as advised by DES. Inherent risks of impacts to protected species are scored low due to the proposed location of the activities in low value vegetation. To mitigate potential impacts to adjacent areas of mapped remnant vegetation, the extraction areas are to be demarcated prior to clearing. To assist with further mitigating risks to flora and fauna,	

Environmental Aspect	Potential Environmental Impact	Source Activity	Inherent Risk Rating [a]	Evaluation and Risk Treatment	Residual Risk Rating [b]
Table notes: (a) "Inherent risk" is the level of risk that exists if the impacts go unmitigated. (b) "Residual risk" is the risk that remains after implementation of the proposed control / management measures.					
				Section 4.8 - Flora and Fauna Management Plan has been prepared with additional control measures. Provided that all clearing occurs within the designated extraction limits, direct impacts to adjacent areas of remnant vegetation will be avoided.	
Land	Post-closure implementation and management of the site rehabilitation.	Failure to achieve rehabilitation milestones in disturbance areas at the cessation of the activities.	3 x 4 = 12 (**High**)	**Section 4.9 – Rehabilitation Management Plan** outlines general rehabilitation requirements for the site. The life of the operation is anticipated to extend into the foreseeable future; therefore, a more detailed rehabilitation and closure plan may be required prior to cessation of the extractive industry use to reflect a land use relevant to the planning scheme in place at the time. Residual risk is reduced to a lower level as the likelihood of failure of progressive and/or final rehabilitated landforms is reduced through the implementation of the EMP and compliance with the EA conditions. With future planning and implementation of successful rehabilitation, the likelihood of failure is reduced; however, the consequence remains	2 x 3 = 6 (**Medium**)

Environmental Aspect	Potential Environmental Impact	Source Activity	Inherent Risk Rating [a]	Evaluation and Risk Treatment	Residual Risk Rating [b]
Table notes: (a) "Inherent risk" is the level of risk that exists if the impacts go unmitigated. (b) "Residual risk" is the risk that remains after implementation of the proposed control / management measures.					
				the same, which result in a residual risk rating of medium.	
Land	Bushfires	Vegetated areas within the site.	3 x 4 = 12 (**High**)	The potential for bushfires is a constant threat for all landholdings, with this risk elevated during periods of dry climatic conditions. Portions of the site are identified as being subject to very high, high, and medium potential bushfire hazard in accordance with the Bushfire Hazard Overlay mapping noted by the Rockhampton Region Planning Scheme as well as high and medium potential bushfire intensity per Queensland Spatial Catalogue data. Quarrying activities generally have available a broad range of plant and equipment that can assist in preventing and reducing potential impacts associated with bushfire events (e.g., heavy machinery, water trucks). To assist in managing potential risks associate with bushfires, **Section 4.10 – Bushfire Management Plan** of the EMP has been prepared to provide bushfire management measures for the site.	2 x 3 = 6 (**Medium**)

4 Environmental Management Plans

4.1 Air Quality Management Plan

Objective

The activity will be operated in a way that protects the environmental values of air.

Purpose

This Air Quality Management Plan has been prepared to control potential air quality impacts occurring as a result of land disturbance necessary for the site operations. The *Environmental Protection Act 1994* and the associated *Environmental Protection (Air) Policy 2019* provide the legislation and regulatory controls for management of emissions to the atmosphere.

Performance Targets

- No environmental nuisance complaints in relation to air quality impacts (i.e., unmitigated emissions of dust, odours or light) associated with the site activities.
- Dust and particulate matter emissions generated by the activities must not cause exceedances of Dust and particulate matter not exceeding the levels shown in **Table 6 – Air Quality Parameters** when measured at the sensitive receptor.

Table 6 – Air Quality Parameters

Contaminant	Measure	Target Upper Limit
Dust Deposition	Deposition rate	120 mg/m^2/day
PM_{10}	Concentration	150 µg/m^3 averaged over 24 hours
PM2.5	Concentration	50 µg/m^3 averaged over 24 hours

Management Strategies

General

- Ensure sufficient on-site water supply is available for dust suppression.
- Apply good housekeeping practices.

Work Areas / Trafficable Areas

- Limit high dust generating activities (e.g., removal of topsoil/overburden and blasting) to periods of favourable weather conditions.
- Dampen down (approx. rate of 2 litres/m^2/hour) work areas, stockpiles, access roads and other hardstand areas by water spraying when visual surveillance indicates excessive dust generation.
- Restrict vehicle movements to designated routes to the extent practicable.
- Enforce speed limits on internal roads.
- Maintain road surfaces in good condition.
- Prevent and clean up any raw material / product spillages or dust accumulation on driveways or sealed roads.
- Use dust extraction systems on drill rigs where possible, or wet down drilling via water sprays.

Processing Plant

- Use water sprays and/or dust collection systems at transfer points.
- Use shielding and/or windbreaks where possible.

4.1 Air Quality Management Plan

	• Maintain equipment in accordance with the original equipment manufacturers' specifications. • Dampen materials prior to transport/handling. **Stockpiles** • Limit the height of any stockpiles to <6m, where practicable. • Regularly water stockpiles to keep down dust emissions. • Apply additional water sprays to stockpiles during high wind conditions. **Transport of Materials** • Ensure that incoming and outgoing truckloads of materials are covered during transport. • Ensure that truck bodies and trailers leaving the premises are clean, focusing on draw bars and tail gates, to prevent material spillages causing dust nuisance and being tracked onto external roads. AE (2022a) recommend the following addition measures: • Paving the main haul road should the activity exceed any of the below: o When the quarry production reached 1.2mtpa without the asphalt plant operating; or o When the quarry production reaches 500,000 tpa with the asphalt plant at maximum daily capacity; or o When the quarry production reaches 800,000 tpa and the asphalt plant is operating at 50% capacity.
Monitoring	Daily visual surveillance must be undertaken by all employees to ensure dust generation on-site is controlled appropriately. Dust and particulate monitoring must be undertaken at the request of the administering authority in accordance with the relevant conditions of the EA. Dust and particulate monitoring must be undertaken to investigate any complaint of environmental nuisance caused by dust and/or particulate matter. When requested to undertake monitoring, monitoring results are to be provided to the administering authority following completion of the monitoring event. Monitoring shall be carried out at a place(s) relevant to the potentially affected dust sensitive place and must include: • For a complaint alleging dust nuisance, dust deposition. • For a complaint alleging adverse health effects caused by dust, the concentration per cubic metre of particulate matter with an aerodynamic diameter of less than 10 micrometre (µm) (PM10) suspended in the atmosphere over a 24hr averaging time.

4.1 Air Quality Management Plan

	The monitoring must determine the extent to which the air quality achieves the performance targets specified in **Table 6 – Air Quality Parameters**. Methods of monitoring for the specified parameters are as follows: Dust Deposition • *Australian Standard ('AS') 3580.10.1 Methods for sampling and analysis of ambient air – Determination of particulates – Deposited matter – Gravimetric method* (Standards Australia 2016). PM_{10} • *AS 3580.9.6 Determination of Suspended Particulate Matter-PM_{10} High Volume Sampler with Size Selective Inlet-Gravimetric Method* (Standards Australia 2015). • *AS 3580.9.9 Methods for sampling and analysis of ambient air Determination of suspended particulate matter – PM_{10} low volume sampler– Gravimetric method* (Standards Australia 2017). • Any alternative method of monitoring PM_{10} which may be permitted by the *Air Quality Sampling Manual* (EPA 1997) as published from time to time by the administering authority. The monitoring results must be provided within 10 business days to the administering authority upon its request. With regard to monitoring impacts associated with the haul road, specific advice will be required from a suitably qualified person relating to monitoring standards and program to assess air quality impacts arising from haul road activities.
Contingency Plan	Any complaint received in relation to dust impacts is to be managed by the Quarry Manager in accordance with **Section 2.3 - Complaint Recording and Response**. Any exceedance of the approved limits is to be reported to the administering authority in accordance with **Section 2.4 – Incident Response Procedure**, and corrective action is to be identified and undertaken in consultation with the administering authority. In the event that air quality monitoring (dust and/or particulate matter) determines an exceedance of the approved limits (noted under *Performance Targets*), the Quarry Manager may engage the services of a suitably qualified person to determine additional management strategies to mitigate impacts. Additional air quality monitoring should be undertaken as necessary to determine the effectiveness of any additional management strategies employed in response to exceedance of approved limits.

4.2 Water Quality Management Plan

Objective

The activity will be operated in a way that protects the environmental values of water.

Purpose

This Water Quality Management Plan has been prepared to control potential environmental impacts occurring as a result of land disturbance necessary for the site operation.

Performance Targets

- To ensure all prescribed water contaminants (Schedule 10 EP Reg) including sand, suspended solids, turbid waters, chemicals, lubricants, or fuels are not released from the site.
- Stormwater runoff from disturbed areas of the site, generated by (up to and including) a 24-hour storm event with an average recurrence interval of 1 in 5 years must be retained on site or managed to remove contaminants prior to release.
- An **uncontrolled release** from site should only occur under exceptional circumstances such as the site receiving a rainfall event larger than a 24-hour storm event with an ARI of 1 in 5 years.
- Water that is **controlled released** from the site is to comply with conditions of the EA.
- The only contaminants to be released to waters are treated stormwater runoff waters in accordance with the water quality criteria specified in the EA, extracted in **Table 7** for reference.

Table 7 – Contaminants Release Limits to Water

Discharge Location Monitoring Point	Measure	Minimum Release Limit	Maximum Release Limit	Monitoring Frequency
Outlet point of settling pond	pH	6.0	8.5	On release from the settling pond and weekly for a continuous release event.
	Suspended Solids (mg/L)	-	50	

Management Strategies

Stormwater management devices and controls at the site are to be implemented in accordance with the following Stormwater Management Plan.

The following provides additional management measures which are to be applied at the site.

Sediment Basins

- Sediment basins are to be constructed to contain runoff from disturbed areas, generated by (up to and including) a 24-hour storm event with an ARI (Average Recurrence Interval) of 1 in 5 years.

4.2 Water Quality Management Plan

- Sediment basins must be designed to capture sediment up to a depth of 0.5 m within the base of the pit. An indicator marker is to be installed at the base of the pit to identify the level of sediment accumulated.
- Sediment is to be removed to return the sediment basins to full capacity on a periodic basis or when the sediment level is approaching the sediment storage capacity. This material is to be excavated and managed in line with the management measures detailed in **Erosion and Sediment Control** (section below).
- Sediment must not be disposed of in a manner that will create an erosion or pollution hazard.
- Sediment basins are to be inspected during the following periods:
  - Quarterly as a minimum.
  - After each rain event, particularly focusing on the entry and exit points, if damage has occurred then make necessary repairs.
  - Prior to or immediately after periods of sustained shut down (i.e., greater than 30 days).

Erosion and Sediment Control

Site Management

- Allow stormwater to pass through the site in a controlled manner and at non-erosive flow velocities up to the specified design storm discharge.
- Minimise soil erosion resulting from rain, water flow and/or wind.
- Minimise adverse effects of sediment runoff, including safety issues.
- Prevent, or at least minimise, environmental harm resulting from work-related soil erosion and sediment runoff.
- Ensure that use of land/properties adjacent to the development are not diminished as a result of the adopted ESC measures.

Land Clearing

- Land clearing is to be undertaken in conjunction with development of each stage of the quarry and must be within the approved extraction limits.
- Bulk tree clearing must occur in a manner that minimises disturbance to existing ground cover (organic or inorganic).
- No land clearing is to be undertaken unless preceded by the installation of adequate drainage and sediment control measures, unless such clearing is required for the purpose of installing such measures, in which case, only the minimum clearing required to install such measures is to occur.
- Prior to land clearing, areas of protected vegetation, and significant areas of retained vegetation must be clearly identified for the purposes of minimising the risk of unnecessary land clearing.
- All reasonable and practicable measures must be taken to minimise the removal of, or disturbance to, those trees, shrubs and ground covers (organic or inorganic) that are intended to be retained.
- All land clearing must be undertaken in accordance with the Development Approval and applicable legislation.

4.2 Water Quality Management Plan

- Land clearing is limited to the minimum practicable extent during those periods when soil erosion due to wind, rain or surface water is possible.

Site Access

- Site exit points must be appropriately managed to minimise the risk of sediment being tracked onto sealed, public roadways.

Stockpile Management

- Adequately protect stockpiles from wind, rain, concentrated surface flow and excessive upslope stormwater surface flows.
- Located at least 5 m from any hazardous area, retained vegetation or concentrated drainage line.
- Located up-slope of an appropriate sediment control system.
- A suitable flow diversion system must be established immediately up-slope of a stockpile.
- Prior to wet season (generally from December to March) overburden / soil stockpiles should be revegetated with temporary groundcover and/or located out of concentrated stormwater flow paths.

Drainage Control

- Wherever reasonable and practicable, stormwater runoff entering the site from external areas, and non-sediment laden (clean) stormwater runoff entering a work area or area of soil disturbance, must be diverted around or through that area in a manner that minimises soil erosion and the contamination of that water for all discharges up to the specified design storm discharge.
- All reasonable and practicable measures must be implemented to control flow velocities in such a manner than prevents soil erosion along drainage paths and at the entrance and exit.
- Wherever reasonable and practicable, "clean" surface waters must be diverted away from sediment control devices and any untreated, sediment-laden waters.
- The internal drainage channel is to be constructed with silt traps. Any silt traps are to be cleared at regular intervals.

Sediment Control

- Efforts are to be employed to trap sediment within the site, and as close as practicable to its source.
- Sediment traps must be installed and operated to both collect and retain sediment.
- The potential safety risk of proposed sediment control devices to site workers, visitors and the public must be given appropriate consideration, especially those devices located within commonly accessible areas.
- All reasonable and practicable measures must be taken to prevent, or at least minimise, the release of sediment from the site.
- Suitable all-weather maintenance access must be provided to all sediment control devices.
- Sediment control devices must be de-silted and made fully operational as soon as reasonable and practicable after a sediment-producing event, whether

4.2 Water Quality Management Plan

	natural or artificial, if the device's sediment retention capacity falls below 75% of its retention capacity. • Materials, whether liquid or solid, removed from sediment control devices during maintenance or decommissioning, must be disposed of in a manner that does not cause ongoing soil erosion or environmental harm. Site Maintenance • All erosion and sediment control measures, including drainage control measures, must be maintained in proper working order at all times during their operational lives. • Sediment removed from sediment traps and places of sediment deposition must be disposed of in a lawful manner that does not cause ongoing soil erosion or environmental harm.
Monitoring	**Visual Inspections** • A summary schedule of the various inspections, performance criteria and responses that are to be performed on site is shown in **Table 8 – Inspection and Maintenance of Stormwater Control Devices.** **Water Quality Monitoring** • Prior to, and daily during, site water releases, water quality monitoring is to be carried out in accordance with the parameters of the EA. • Water quality monitoring must be in accordance with the methods prescribed in the current edition of the administering authority's *Monitoring and Sampling Manual* (DES 2018). • Water and sediment samples must be representative of the general condition of the water body or sediments. • All determinations must employ analytical practical quantification limits of sufficient sensitivity to enable comparisons to be made against water quality objectives/triggers/limits relevant to the particular water or sediment quality characteristic. • All monitoring devices must be calibrated and maintained according to the manufacturer's instruction manual.
Contingency Plan	Non-compliances may be identified by the visual inspection and through water quality monitoring. After any identification of incident or failure, the source/cause is to be immediately located and the following measures implemented (IECA (Australasia) n.d.): • Excessive sediment build-up on-site – collect and dispose of material, then amend up-slope drainage and/or erosion control measures as appropriate to reduce further occurrence. • Severe or excessive rill erosion – investigate cause, control up-slope water movement, re-profile surface, cover dispersive soils with a minimum 100 mm layer of non-dispersive soil, and stabilise with erosion control measures and vegetation as necessary. • Poor vegetation growth or soil coverage – plant new vegetation and/or mulch as required.

4.2 Water Quality Management Plan

- Sediment control failure – replace and monitor more frequently. Regular failures may mean that the sediment control location, alignment or installation may need to be amended.
- Scour / erosion of bunds will be required to be stabilised.

In the event that groundwater monitoring identifies a significant variation from baseline groundwater quality or levels, a suitably qualified person is to be engaged to determine additional management measures to be applied.

If a discharge of contaminants occurs to water or groundwater as a result of on-site operations, the administering authority must be notified, and an investigation conducted to identify appropriate action to resolve the issue to the fullest practicable extent. Refer to **Section 2.4 – Incident Response Procedure** of this SBMP for details regarding reporting of incidents.

Table 8 – Inspection and Maintenance of Stormwater Control Devices

Inspection	Minimum Frequency	Performance Criteria	Response
Drainage lines including catch drains, contour drains and diversions.	Quarterly, and prior to and following rainfall events.	• Erosion in areas adjacent to water conveyancing structures.	• Eroded areas are to be rip rapped as soon as practicable.
		• Overtopping of water conveyancing structures (identified by the scouring of the drain batters perpendicular to the direction of flow).	• The drain is to be cleaned of sediments and rip rap replaced to the original design specifications. • Rehabilitation with grasses in the catchment of the drain may be required to reduce sediment loadings of runoff.
Potential sediment storage capacity of grit traps, sediment traps and water storage areas.	Quarterly or following major rainfall events.	• Storage capacity maintained at >75%.	• Sediment/grit is to be removed from the structure.
			• Recycle excavation pit water to ensure that adequate free storage is maintained for the collection and holding of runoff.
Waste containers.	Quarterly.	• Waste is stored in appropriate containers. • Waste receptacles labelled.	• Ensure waste material is stored and disposed of properly.
Spill response stations.	Quarterly and following use.	• Equipment is properly maintained.	• Maintain equipment. • Replace used equipment.
Maintenance / refuelling area.	Quarterly.	• Fuel, oil spills.	• Clean up fuel spills and investigate source.
		• Contractor maintenance.	• Maintain contractor maintenance records.
		• Fuel storage integrity maintained.	• Investigate and repair potential leaks.

4.3 Acid Sulfate Soils Management Plan

Relevance	Acid Sulfate Soils ('ASS') are coastal and near-coastal soils, sediments or other materials containing iron sulfides. They are environmentally benign when left undisturbed in an aqueous, anoxic environment, but when exposed to oxygen the iron sulfides break down, releasing sulfuric acid and soluble iron. There are two types of ASS: **Potential Acid Sulfate Soils ('PASS')** PASS contain iron sulfides or sulfidic material which has not been exposed to air and oxidised. These soils are located in an oxygen deficient environment, typically below the water table. The field pH of these soils is typically 4 or higher, sometimes ranging into the alkaline. The sulfides/sulfidic materials oxidise once exposed to air with the potential to generate sulfuric acid, and hence pose risks to the surrounding environment through acid run-off. **Actual Acid Sulfate Soils ('ASS')** ASS are soils that contain highly acidic layers, this high acidity is a result of the oxidation of soil materials that are rich in iron sulfides. ASS soils can have field pH measurements of 4 or less in dry conditions and are typically characterised as possessing pale yellow mottling. This mottling is caused by the presence of the mineral Jarosite, a product of the oxidation of iron sulfides which generally requires a pH. ASS occur naturally over extensive areas of low-lying coastal land, predominantly below 5 metres Australian Height Datum ('AHD'). ASS has not been confirmed or identified within the extraction footprint, however a risk still exists for them to be present given the project locality.
Objective	The primary objective of this Acid Sulfate Soils Management Plan ('ASSMP') is to provide a framework to manage impacts regards to ASS and to prevent environmental harm both on and off site.
Purpose	This has been prepared to reduce the potential for risk of environmental damage caused by acidic leachate from ASS or PASS.
Performance Targets	• No release of ASS impacted site waters to the receiving environment. • Successful neutralisation of ASS material.

Strategies	**<u>Staff Awareness</u>**
	• Staff are to be made aware of the potential presence of PASS material at the site. If working in an area of ASS and PASS, it is important to be able to recognise indicators of actual acid sulfate soils to prevent further acidification of land and waterways. These indicators include:
	  o cloudy green-blue water
	  o excessively clear water
	  o iron stains
	  o poor pasture
	  o scalded soil
	  o yellow jarosite

4.3 Acid Sulfate Soils Management Plan

- 'rotten egg' smell
- waterlogged soil
- corrosion of concrete and/or steel structures
- oily-looking surface iron bacterial scum
- dark grey soils.

During Extraction (Pit 1 Only)

- Regular surveillance during earthworks to detect ASS should be undertaken.
- Regular sampling during earthworks should be undertaken for pHf / pHfox should be undertaken at a NATA accredited laboratory.
- If field test results indicate that PASS / ASS may be present, then undertake SPOCAS testing to confirm PASS / ASS and to calculate the applicable liming rate.

Stockpiling

- Testing of material stockpiled should be undertaken to determine its ASS status.
- Suspected or confirmed ASS material is to be stockpiled separately to other material and limed at the nominal liming rate.
- Suspected or confirmed ASS material is to be stockpiled at the designated stockpile area within a bunded area.
- Once stockpiled the material is to be tested to verify the ASS and liming rate requirements.

Treatment Area

A designated treatment area within the stockpiled area is to be prepared:

- The base of the pad is to be graded such that all surface water flows to one or multiple collection sumps.
- Appropriate sedimentation controls are to be constructed around each collection sump.
- The base of the treatment pad will be constructed with a low permeable base.
- A bund wall is to be constructed surrounding the treatment pad such the storm water flow outside the treatment pad is restricted from flowing into the treatment pad and storm water within the treatment pad is restricted from flowing beyond the collection sump/s.

Stormwater

- Stormwater interacting with confirmed ASS is to be retained on site.

Validation

- Following treatment, soils are to be retested to confirm they have been successfully neutralised.

Reuse

- Once stockpile validation results confirm the criteria described above has been complied with, reuse of the material on site is permitted.

4.3 Acid Sulfate Soils Management Plan

Monitoring	Where surface water and/or leachate collects within bunded treatment areas or excavations in ASS or PASS areas, the water shall be tested. Regular visual monitoring of PASS/ASS areas and surrounds shall be undertaken to identify signs of ASS oxidation. This monitoring should include detecting: • Unexplained scalding, degradation or death of surrounding vegetation. • Formation of the mineral jarosite and other acidic salts in exposed or excavated soils. • Areas of green-blue water or extremely clear water indicating high concentrations of aluminium. • Rust coloured deposits on plants and on the banks of drains, water bodies and watercourses indicating iron precipitates. • Black to very dark coloured waters indicating de-oxygenation.

4.4 Hydrocarbons and Chemical Management Plan

Objective	The activity is operated in a way that protects the environmental values of land, air and water including soils, subsoils, landforms and associated flora and fauna.
Purpose	The Hydrocarbons and Chemicals Management Plan has been prepared to control the potential for spills or leaks from chemicals and hydrocarbons associated with the site activities.
Performance Targets	• No land contamination from the site activity that would require registration on the Contaminated Land Register ('CLR'). • No serious spills of oils, greases, fuels, or other hazardous chemicals. • No preventable release of hydrocarbons and chemicals to the environment.
Management Strategies	**General** • Any chemical handling and storage must be designed and installed in accordance with the most recent edition of *AS 1940 - The storage and handling of flammable and combustible liquids* (Standards Australia 2017), as a minimum. • Safety Data Sheets ('SDS') of chemicals used on site shall be kept in a register at the site office. • Spills are to be cleaned up immediately with appropriate spill kits. Spillages must not be cleaned up in a way that releases wastes, contaminants or other materials to any stormwater drainage systems, roadside gutters or waters. • All new employees are to be inducted on the use of handling of chemicals used on-site. **Spill Kits** • Maintain appropriate spill kits and personal protective equipment at locations known to all employees (e.g., refuelling locations, mobile equipment). • Ensure employees are familiar with, and trained in, the use of proper spill clean-up procedures and always maintain a copy of the procedures at the site. • Undertake regular spill kit inventory checks to ensure sufficient materials and supplies are available in the event of a spill. **Disposal** • Hydrocarbon contaminated materials are to be appropriately disposed of at a licensed facility. • If the material is a Regulated Waste (as defined under the legislation) it must be transported and disposed of by a licensed contractor. • Oily waste materials, including liquid hydrocarbons, should be segregated from general wastes for disposal off-site by a licensed contractor. • Records are to be kept on disposal of waste for all regulated waste materials.

4.4 Hydrocarbons and Chemical Management Plan

Monitoring	Areas where handling of hydrocarbons and chemicals occur (e.g., refuelling or minor on-site servicing) shall be regularly inspected by the Quarry Manager. All employees will be responsible for the safe day to day handling, use and temporary storage of chemicals being used on-site.
Contingency Plan	In the event of any spill, implement the steps outlined in **Diagram 3 – Spill Response Procedure**. Remediation of land contamination may be required in the event of more serious incidents; however, Hopkins Brothers is to consult with a suitably qualified person to determine the nature and extent of any contamination remediation process.

SPILL RESPONSE PROCEDURE

1. INITIAL ASSESSMENT



For emergencies call 000

Advise the Site Supervisor immediately.

Assess the following:

- What is the type and volume of the spill
- What is the source?
- What PPE is required according to the SDS?
- Are third parties needed to contain and manage the spill?

2. ISOLATE



Cease work in the area immediately.

Declare the area a no go zone and cordoned off where possible.

Avoid movement of plant/equipment into the area.

3. STOP THE SOURCE

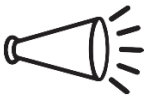


Locate and contain the source of the spill.

Stop the spill (e.g. close valves / taps, rotate damaged / punctured drums, plug leaks or gaps).

Protect water (e.g. block drains and outlets, apply drain covers, divert spills via spill berms, sandbag or similar).
Contain the spill use temporary bunds and spill kits, or absorbent materials (e.g., clay, rags).

4. NOTIFY



If a spill threatens or causes environmental harm, Council and EPA must be notified. Refer to **Section 2.4 – Incident Response Procedure** of the EMP.

Spills within waterways pose a risk of environmental harm. Council and DES must be notified, and professional assistance sought regarding clean-up operations.

5. CLEAN UP / REMOVAL



- Remove the spill by shovels and / or earthmoving equipment.
- Move plant and equipment to allow removal of the spill.
- Dispose contaminated soils / materials off-site via an approved regulated waste transporter to a licenced disposal facility.
- Do NOT dispose of any contaminated materials on-site.
- Do NOT use water or liquids to wash the spill area.

Spills within a waterway are to be cleaned up in accordance with advice provided by third parties, including Council and DES.

6. INVESTIGATE



Investigate the cause of the spill and conduct a review of the on-site management measures to prevent a recurrence.

Carry any further notification or reporting requirements if directed to do so by DES or Council.

Diagram 3 – Spill Response Procedure

4.5 Noise Management Plan

Objective	The activity will be operated in a way that protects the environmental values of the acoustic environment.
Purpose	This Noise Management Plan has been prepared to control potential nuisance impacts that may occur as a result of noise associated with the site operations.
Performance Targets	• No environmental nuisance complaints relating to the site operations. • Noise at the site must not exceed the noise limits specified in the EA.
Management Strategies	• Mobile plant (e.g., front-end loaders, dozers, haul trucks, excavators) is to be fitted with broadband reversing alarms where possible to mitigate potential nuisance from tonal characteristics. • Stockpile areas should be designed to allow forward-in, forward-out movement of road haulage trucks to avoid a requirement for external trucks to reverse on-site. • Ensure a site layout that enables product delivery and handling in such a way that reduces the need for reversing. • Fixed engines, pumps and compressors are to be enclosed where practicable. • Ensure all site equipment, machinery and vehicles are serviced in accordance with the original equipment manufacturers' specifications as a minimum. • Ensure all modern mobile plant (e.g., front-end loaders, excavators, off-road trucks) is fitted with effective exhaust silencers. • Equipment and machinery are to be shut down when not in use. • Unnecessary revving of mobile or stationary motors and engines is to be avoided. • Ensure that equipment at the site is used for the intended purpose. • Ensure that any extraneous noises are rectified. • Maintain haul roads and hardstand surfaces in good condition (e.g., free of potholes, rills and product spillages) and with suitable grades. • Avoid the use of compression braking on product delivery trucks entering the site.
Monitoring	The Quarry Manager must: • ensure regular surveillance of the site to qualitatively assess noise generation from the operations. • initiate a noise survey when requested by the administering authority, or as otherwise deemed necessary, to investigate a noise complaint. Any monitoring must be in accordance with the most recent version of the administering authority's *Noise Measurement Manual* (DES 2020a). When required by the administering authority, noise monitoring must be undertaken, and the results notified within 14 days to the administering authority. Monitoring must include: • background noise level; • $L_{A\ 10,\ adj,\ 10\ mins}$;

4.5 Noise Management Plan

	• $L_{A\ 1,\ adj,\ 10\ mins}$; • $L_{A\ max\ adj\ T,\ 10\ mins}$; • the level and frequency of occurrence of impulsive or tonal noise; • atmospheric conditions including wind speed and direction; • effects due to extraneous factors such as traffic noise; and • location, date and time of recording.
Contingency Plan	Any compliant received regarding noise nuisance at a sensitive receptor must be recorded and investigated by the Quarry Manager in accordance with **Section 2.3 – Complaint Recording and Response**. In the event that noise monitoring determines an exceedance of the approved limits, the Quarry Manager is to notify the administering authority in accordance with **Section 2.4 – Incident Response Procedure**. Advice should be sought from a suitably qualified person as to whether additional management measures are required to minimise noise. Additional noise monitoring must be undertaken where necessary to determine the effectiveness of the additional management strategies.

4.6 Blasting Management Plan

Objective

The activity will be operated in a way that protects the environmental values of the acoustic environment.

Purpose

Blasting will be required to fragment rock to a manageable size that can be transported and fed into the on-site crushing and screening plant.

Blasting practice has the potential to generate excessive noise and vibration impacts that may cause nuisance for sensitive receptors.

Section 440ZB of the *Environmental Protection Act 1994* provides the legislation for blasting.

Performance Targets

Blasting activities must not exceed the limits for peak particle velocity and air blast specified in the EA, refer to **Table 9 - Blasting Limits,** when measured at any sensitive place or commercial place.

Table 9 – Blasting limits

Blasting criteria	Blasting limits
Airblast overpressure	115 dB (Linear) Peak for 9 out of 10 consecutive blasts initiated and not greater than 120 dB (Linear) Peak at any time.
Ground vibration peak particle velocity	5 mm/s peak particle velocity for 9 out of 10 consecutive blasts and not greater than 10 mm/s peak particle velocity at any time.

Management Strategies

- Only suitably experienced and qualified blasting personnel are to be employed or contracted to provide blasting services.
- Blasting must be carried out in accordance with the current edition of the administering authority's *Guideline: Noise and vibration from blasting* (DES 2020b) and with *AS 2187.2-2006 Explosives - Storage and use - Use of explosives* (Standards Australia 2006).
- Unless prior approval is obtained from the administering authority; blasting is only permitted during the hours of:
    - 8am to 3pm Monday to Saturday.
    - Blasting is not permitted at any time on Sundays, or public holidays.
- Handling, transport and use of explosives is to be carried out in accordance with the requirements of *AS 2187.2-2006 Explosives - Storage and use - Use of explosives* (Standards Australia 2006), and the *Mining and Quarrying Safety and Health Act 1999* ('MQSH Act') and associated Regulation.
- The maximum instantaneous charge or charge mass per delay is to be limited to the lowest possible level.
- A blast plan is to be prepared for each blast, containing blast hole layout, initiation sequence, charging, stemming type and height, charge weight and any other design element, required to inform good blasting practice.
- Blast areas are to be dampened down prior to blasting to minimise dispersion of dry and fine materials where practicable, or where it is identified as a source of potential dust nuisance.

4.6 Blasting Management Plan

Monitoring	Monitoring of blasting activities must be undertaken by a suitably qualified person in accordance with the administering authority's guideline *Noise and Vibration from Blasting* (DES 2020b) and the relevant *AS 2187.2-2006 Explosives - Storage and use - Use of explosives* (or most recent version) (Standards Australia 2006). **<u>Frequency and Location</u>** Monitoring is to be conducted around the quarry to confirm that the airblast and ground vibration levels do not exceed the criteria specified. Blasts are to be randomly selected or monitored on a fixed schedule (e.g., five continuous blasts). The method of measurement and reporting of vibration levels must comply with Appendix J of *AS 2187.2-2006 Explosives – Storage and use – Use of explosives*· (Standards Australia 2006). Measurements are to be conducted by suitably trained personnel using appropriate equipment. Equipment is to be calibrated on a regular basis in accordance with the manufacturer's recommendations or other appropriate standards. Where a nuisance complaint regarding air blast overpressure or ground vibration is received, consideration is to be given to available monitoring results and locations, and if required or advantageous, a monitor is to be installed at an appropriate location for the next five blasts to assess compliance, or when requested by the administering authority. All monitoring and reporting is to be undertaken by a person or body possessing both the qualifications and the experience appropriate to perform the required measurements.
Contingency Plan	Any compliant received regarding nuisance associated with blasting at a sensitive receptor must be recorded and investigated by the Quarry Manager in accordance with **Section 2.3 – Complaint Recording and Response**. In the event that blast monitoring determines an exceedance of the approved limits, the Quarry Manager is to notify the administering authority in accordance with **Section 2.4 – Incident Response Procedure**. Advice should be sought from a suitably qualified person as to whether additional management measures are required to minimise impacts from blast. Subsequent blasts are to be monitored to ensure effectiveness of any additional measures implemented.

4.7 Waste Management Plan

Objective	Any waste generated, transported, or received as part of carrying out the activity is managed in a way that protects all environmental values.
Purpose	This Waste Management Plan has been prepared with reference to the conditions of approval to ensure wastes produced on-site are appropriately managed. The type of wastes that may be generated at the site may include, but are not necessarily limited to the following: • Regulated wastes (e.g., batteries, oil filters, waste oil/hydrocarbons and containers, oil/water emulsions and tyres). • Scrap metal and used or faulty parts and equipment. • General waste such as food waste, packaging and consumables. • Green waste. The amount of waste generated will fluctuate over the life of the operation, therefore a record of wastes generated must be maintained in an on-site inventory. The *Waste Reduction and Recycling Act 2011* ('WRR Act') nominates a waste management hierarchy in a preferred order of adoption. The hierarchy is as follows: *(a) AVOID unnecessary resource consumption* *(b) REDUCE waste generation and disposal* *(c) RE-USE waste resources without further manufacturing* *(d) RECYCLE waste resources to make the same or different products* *(e) RECOVER waste resources, including the recovery of energy* *(f) TREAT waste before disposal, including reducing the hazardous nature of waste* *(g) DISPOSE of waste only if there is no viable alternative.*
Performance Targets	• Implement the WRR Act waste management hierarchy. • Maintain a record of any disposal of trackable wastes in accordance with the EP Reg. • No unlawful disposal of wastes on or off-site.
Management Strategies	**<u>Waste Avoidance</u>** Waste avoidance relates to preventing the generation of waste or reducing the amount of waste generated. Reasonable and practicable measures for achieving waste avoidance may include, but are not necessarily limited to: • Input substitution (using recyclable materials instead of disposable materials, for example using oil delivered in recyclable steel drums instead of non-recyclable plastic containers). • Increased efficiency in the use of raw materials, energy, water, or land (purchasing consumables in bulk (large containers) rather than in small quantities). • Improved maintenance and operation of equipment (keep equipment in good working order to reduce wear and overhaul). • Undertaking an assessment of waste minimisation opportunities from time to time.

4.7 Waste Management Plan

Waste Reuse

Waste re-use refers to re-using waste, without first substantially changing its form. Reasonable and practicable measures for reusing waste may include, but are not necessarily limited to:

- Recovering and separating solvents, metals, oil, or components or contaminants and reusing separated solvents for degreasing plant and equipment.
- Applying waste processing fines to land in a way that gives agricultural and ecological benefits (using fine sediments in rehabilitation activities).
- Using overburden for constructing bunds and landforming.
- Reusing silt/sediment on-site to the maximum practicable extent.

Waste Recycling

Waste recycling refers to treating waste that is no longer useable in its present form and using it to produce new products. Reasonable and practicable measures may include, but are not necessarily limited to:

- Recovering oils, greases, and lubricants for collection by a licensed oil recycling contractor, recovering, separating, and recycling packaging (including paper, cardboard, steel and recyclable plastics).
- Recycling used plant and equipment to the maximum practicable extent.
- Finding alternatives to disposal of non-recyclable materials (using conveyor belts for noise attenuation, mudflaps, ute tray liners).
- Providing suitable receptacles and storage areas for collection of materials for recycling.

Waste Disposal

This refers to disposing of waste which cannot otherwise be reused, recycled or used for energy recovery. Reasonable and practicable measures may include, but are not necessarily limited to:

- Regulated wastes must be transported and disposed of in accordance with the *Environmental Protection Regulation 2019*.
- Disposal to a licensed waste disposal facility (i.e., landfill or transfer station).
- Approved on-site disposal.

Waste Storage

- Waste storage containers or areas are to be provided and located at safe and convenient locations at the site.
- Each container is to be identified with the type of wastes which may be disposed of in each container.
- Each container or area is to be designed to prevent the escape of materials.

Regulated Waste

Regulated Wastes are defined in the EP Reg. Waste management areas must include a dedicated section for regulated wastes, which must be stored within sealed containers within a bunded area in accordance with Australian Standards and the following minimum requirements:

4.7 Waste Management Plan

	• All regulated wastes will be transported off-site by a suitably licensed commercial transporter with an ERA 57 Regulated Waste Transport (or equivalent) approval. • To assist in the collection and transfer of regulated wastes, designated regulated waste bins, drums and skips must be used. Where possible these regulated waste storage containers should be located at the work location where the waste is being generated and then returned to the designated regulated waste storage areas for storage prior to offsite disposal or recycling. • Dedicated regulated waste storage areas must be provided to prevent the mixing of regulated wastes with other stored material or with incompatible hazard classes. Wastes must only be deposited into designated areas within the applicable storage area. • Storage areas for regulated wastes must be constructed in accordance with AS 1940-2004 or an equivalent Australian Standard. • An inventory must be kept and maintained of all regulated waste stored. • Where possible, regulated waste stores must be lockable to prevent access by unauthorised persons. • As soon as practicable, remove and dispose of all regulated waste to a licensed waste disposal facility or recycling facility using a licenced contractor. • Medical wastes must be stored in yellow and black biohazard waste bins. Clinical waste must be bagged in yellow bags with biohazard symbols and stored in rigid-walled, leak-proof secondary containers, in a bunded area with an impervious surface. Clinical waste should be kept in a secure storage area inaccessible to unauthorised people and animals. **<u>Trackable Waste</u>** Certain regulated wastes as defined under Schedule 9 of the EP Reg are to be tracked in accordance with the requirements of Section 11 of the EP Reg. **Diagram 4 – Waste Tracking Requirements (Paper Based System)** provides an overview of the waste tracking requirements for each stakeholder in the transport and handling of trackable waste chain.
Monitoring	The Quarry Manager must undertake a monthly visual inspection to ensure the waste management hierarchy is being effectively implemented. All site personnel shall be responsible for ensuring wastes are stored and removed from the site on a regular basis (e.g., daily or weekly). The Quarry Manager shall ensure that waste treatment measures are implemented at the site. The Quarry Manager shall ensure waste receptacles are provided and the waste type identified and that temporary waste storage areas are signed; recycling bins are emptied when full and materials which may cause land contamination are not disposed of on the site. The Quarry Manager shall keep a record of regulated waste generated at the site, treatment and disposal methods, approved contractors for transporting and disposing of waste and the location of the facility for accepting the waste.
Contingency Plan	Where a non-compliance is identified, a review of the Waste Management Plan is to be undertaken to determine areas for improvement and additional staff training on waste management procedures and waste handling is to be undertaken.

4.7 Waste Management Plan

Where Hopkins Brothers becomes aware that any wastes have been inappropriately disposed of, the incident must be notified to the administering authority in accordance with **Section 2.4 – Incident Response Procedure**. If a release of contaminants occurs as a result of on-site operations and it is likely to cause serious or material environmental harm, the administering authority must be notified, and an investigation conducted to identify appropriate action to resolve the issue to the fullest practicable extent.

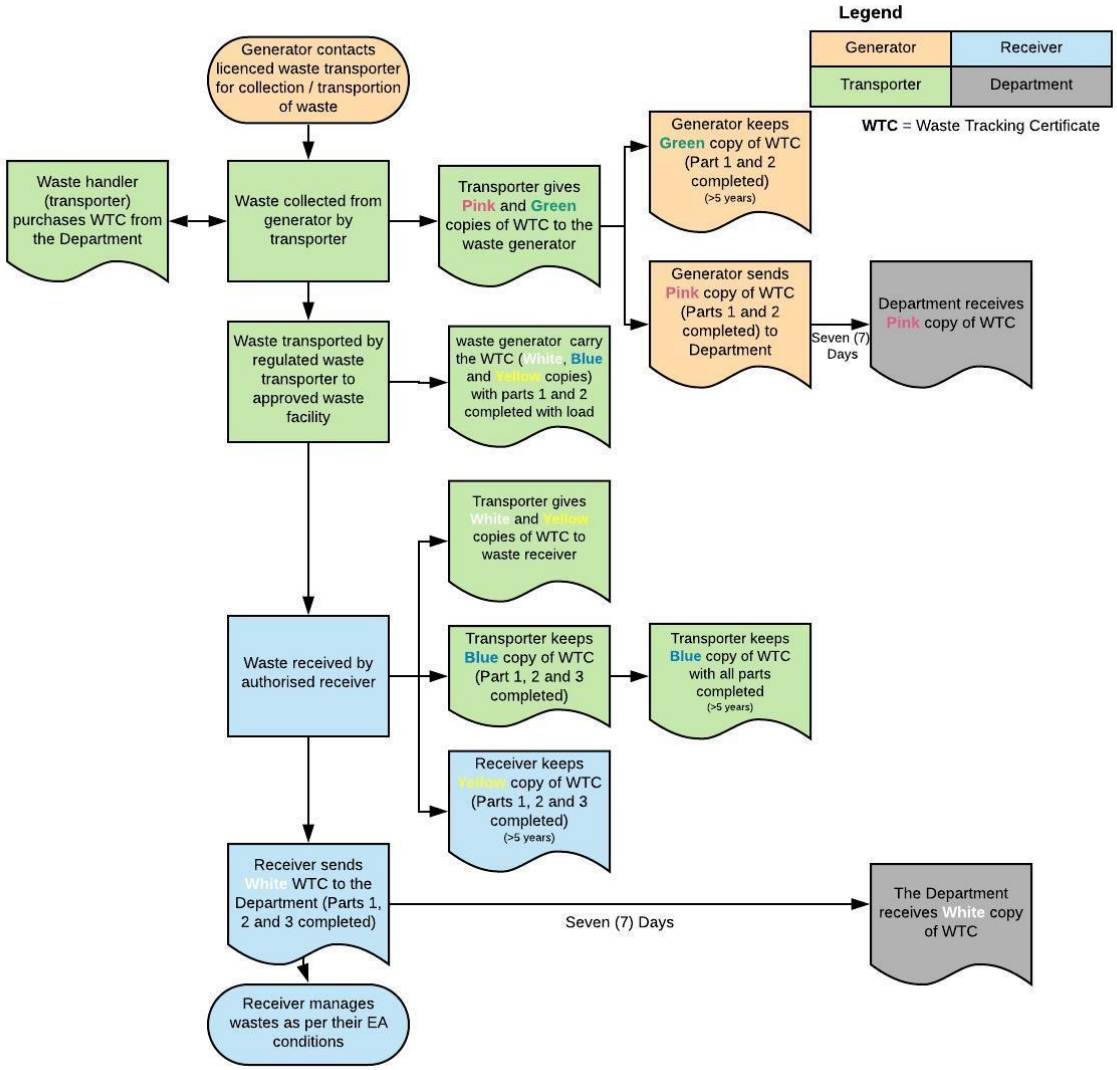


Diagram 4 – Waste Tracking Requirements (Paper Based System)

4.8 Flora Fauna Management Plan

Purpose	This Flora and Fauna Management Plan has been prepared to detail the necessary mitigation measures when undertaking this activity to prevent impacts to flora and fauna not already approved for the project.
Performance Targets	• No unapproved loss in biodiversity values over and above those impacts permitted through project approvals and implementation of Offset requirements. • No vegetation clearing outside the specified, pre-approved boundaries. • Final searches for fauna and their relocation as appropriate is to be carried out prior to all vegetation clearance. • Minimise injury or death of wildlife. • Appropriate signage to keep construction activities outside retained habitat areas. • No increase in level of weed and pest infestation as a result of construction activities. • Downstream habitats are not degraded by sediment deposition, scouring or water quality degradation. • Downstream flow changes remain within natural fluctuations.
Management Strategies	**Flora** • Prior to clearing of remnant vegetation, it is recommended that an assessment of the area is undertaken prior to work commencing to determine the presence of weed outbreaks, hollow baring trees, threatened species, communities or their habitat. Any significant areas are to be mapped, and areas not approved for clearing are to be delineated with exclusion fencing or flagging to prevent over clearing occurring. • Survey pegs or bunting flags are to be established around the full extent of each vegetation clearing stage and the total approved vegetation clearing area to ensure no over clearing or encroachment occurs. • All machinery operators are to be briefed in a toolbox talk about site specific vegetation clearing to unsure the task and associated risks are well understood. This may include the use of GPS guidance to verify clearing limits. • All machinery to be used during land clearing operations is required to be weed free prior to arriving at site. • Significant features of the landscape that could be reused on site during rehabilitation to create habitat structures are to be identified and salvaged prior to land clearing operations. • Undertake vegetation clearing in stages. • Implement measures to avoid the spill of earth and rock downslope of the development footprint into areas of retained vegetation. • Design and install temporary erosion control measures to avoid impacts on retained vegetation downslope of the development footprint. • Leave ground layer vegetation (grasses and herbs) in situ wherever possible to assist soil stability. Mulching of heavily disturbed areas can assist in reducing soil erosion. Where necessary, temporary interception devices such as hay bales or geotextile fabric fencing can be employed to slow stormwater and intercept sediment. • Non-millable vegetation can be mulched and used in rehabilitation or soil stabilisation works, provided that no weeds are incorporated into the mulch.

- Undertake regular monitoring of the health and condition of retained vegetation and habitat, and the health of significant plant specimens.

Fauna

- Limit activities to daylight hours as far as practicable, and any lighting within outdoor areas should comply with relevant Australian Standards and be of low spillage, with no or limited upward spillage.
- Vegetation clearing must be undertaken in a staged manner to allow ground dwelling and avian fauna to disperse away from areas being cleared on their own accord.
- For any approved clearing of areas that include habitat features, a spotter-catcher is to be used to assess hollows are relocate any species that are identified to be at risk during clearing operations.
- Prior to the commencement of clearing operations, the nearest wildlife carer is to be identified, and all workers made aware of native wildlife can be taken to in the unlikely event of injury.
- Habitat features such as hollows and log piles are to be salvaged, where possible, and placed in nearby (retained) habitat areas and used in the rehabilitation of the site.
- Work areas are to be checked regularly for fauna that may have entered the work area or become trapped. The sediment dam should remain fenced to exclude native fauna from watering from this area where they could potentially become trapped.
- If fauna must be relocated, a qualified spotter catcher who holds a rehabilitation permit must be engaged to handle, capture and or relocate native fauna.
- All waste receptacles are to remain sealed and covered at all times to prevent attaching native wildlife into the operational areas of the site.
- No pet animals are allowed to be brought onto the site.
- Educate the workforce on the location of significant/sensitive communities and species and potential impacts from unauthorised activities.

4.9 Rehabilitation Management Plans

Objective

The activity is operated in a way that protects the environmental values of land including soils, subsoils, landforms and associated flora and fauna.

Purpose

This Rehabilitation Management Plan has been prepared to assist with site rehabilitation.

Performance Outcomes

- Limit land disturbance to that which is necessary at any one time.
- Identify any land contamination and implement appropriate remediation or management where necessary.
- Land that has been disturbed for activities must be rehabilitated in a manner such that:
  - suitable native species of vegetation for the location are established and sustained for earthen surfaces.
  - potential for erosion is minimised.
  - the quality of water released from the site, including seepage, does not cause environmental harm.
  - potential for environmental nuisance caused by dust is minimised.
  - the water quality of any residual water body does not have potential to cause environmental harm.
  - the final landform is stable and protects public safety.
- Rehabilitation of disturbed areas must take place progressively as works are staged and new extraction areas are commenced.

Strategies

Post Quarry Land Use and Final Landform Design

The post-quarrying land use of the site must consider the Rockhampton Regional Council Planning Scheme at the time a post-quarrying land use is established. Currently, the rehabilitation plan for the site focuses on making the site safe, sustainable, and non-polluting.

Rehabilitation Activities

The following measures are to be implemented for rehabilitation activities at the site:

- Using earthmoving equipment to progressively shape and trim disturbed areas.
- Rounding or marrying the contours into the natural ground surface.
- Topsoiling and revegetating re-profiled surfaces.
- Providing access to the rehabilitated areas to allow ongoing maintenance.
- Designing landform and drainage to control erosion for the particular hydrological regime, ensuring the hydrological regime that existed prior to the development of the site is reinstated.

4.9 Rehabilitation Management Plans

- Revegetating the banks with a combination of natural regeneration, hydro-mulching, seed broadcasting, seedling planting and direct seeding.
- Undertaking appropriate weed control to prevent rehabilitated areas from being overrun with weed species.
- All compacted surfaces are to be ripped along contour lines where ground conditions and hydrology allow.

The Key Performance Indicators ('KPIs') summarised in **Table 10 – Key Performance Indicators for Rehabilitation** have been established to provide quantifiable measures for achieving the performance targets for rehabilitation. Each of the KPIs are assigned to Hopkins Brothers for completion; however, should the Hopkins Brothers require assistance to measure the achievement of these KPIs, they may engage a suitably qualified person.

Progressive Rehabilitation

Rehabilitation is to be undertaken progressively throughout the life of the operations and is to commence in each area as soon as practicable after it is no longer required for operational purposes. Progressive rehabilitation will be deemed complete when the Key Performance Indicators are achieved (refer to **Table 10 – Key Performance Indicators for Rehabilitation**).

Topsoil and Subsoil Management

The following measures should be implemented for topsoil and subsoil stripping:

- Materials should not be stripped when too wet or too dry.
- When stripped, materials should be used directly for rehabilitation to the maximum practicable extent or stockpiled and preserved for future use.
- Stockpiling of materials should not exceed a height of 2 m and should be shaped and revegetated to protect the soil from erosion and weed infestation.
- Stockpiles should be maintained in a free draining condition and long-term soil saturation should be avoided.
- Runoff waters external to the areas to be stripped should be diverted away from the working area.
- Stripping of topsoil should be limited to the minimum area necessary.

The following measures should be implemented for topsoil and subsoil spreading:

- Whenever possible, stripped materials should be directly placed on an area undergoing rehabilitation.

4.9 Rehabilitation Management Plans

- Areas to be re-spread should be shaped prior to placing materials over the re-profiled surface.
- Equipment used to spread materials should be scheduled to avoid compaction.
- Before respreading the materials, loosen the underlying substrate to break up any compacted or surface sealing and to enable keying of the two (2) materials.
- On slopes less than 3(H):1(V), loosen lightly compacted substrate, ensuring all ripping operations occur along the contour.
- Materials are to be removed from stockpiles in a manner that avoids vehicles travelling over the stockpiles.
- Materials are to be respread in the reverse sequence to its removal so that the original upper soil layer is returned to the surface to re-establish the entrapped seed content of the soil.
- Ensure all exposed substrates are covered with a minimum 150mm of suitable topsoil / subsoil to enable success of revegetation.
- After spreading materials, ensure the surface is left in a roughened state to assist moisture infiltration and inhibit soil erosion.
- Prior to any revegetation, cultivate any compacted or crusted topsoil surfaces (to a depth no greater than the depth of the materials to be spread).
- Spreading is to be immediately followed by revegetating wherever possible.
- If erosion occurs on treated surfaces, the area is to be re-spread with additional materials and revegetated.

Species Selection

The species used will need to be endemic to the surrounding areas and should be selected at the time of revegetation based on availability at local suppliers.

Weed and Pest Control

- Any materials (e.g., soil, mulch, straw) brought onto site for rehabilitation are to be inspected to ensure they are free from weeds and pests.
- Prior to the establishment of vegetation, a spraying campaign may be required to control weeds to prevent migration of weed species into areas under rehabilitation.
- Alternative methods for controlling both grass and weeds include manual weeding, burning, slashing, weed matting and mulching.
- Predation (e.g., grazing animals, birds and insects) are risks for revegetation. Depending on the situation, specific measures may be required to protect the works from predation such as fencing.

Water Bodies

Water bodies are likely to remain within the final landform, created through the final extraction void and sediment basins utilised for stormwater management during the operational phase of the quarry.

4.9 Rehabilitation Management Plans

Water bodies are to be converted to clean water storages where they are to be retained in the final landform. This can be achieved by:

- Cleaning sediment from the base of water storages.
- Battering slopes to achieve grades of no more than 3(H):1(V) where practicable.
- Ensuring that the water quality within these water storages is suitable for future use.

Hopkins Brothers is to engage a suitably qualified person to assess water quality of any residual water bodies at the site to ensure that the release parameters specified by the EA conditions, or other water quality objectives agreed with the administering authority.

Land Contamination

Prior to site closure, a contaminated land assessment by a suitably qualified person may be required. Assessment of site contamination, if required, is to be undertaken and managed in accordance with the following:

- *National Environment Protection (Assessment of Site Contamination) Measure 1999 (amended 2013)*
- *AS 4482.1-2005 - Guide to the sampling and investigation of potentially contaminated soil. Part 1 – Non-volatile and Semi-volatile compounds.*
- *AS 4482.2-2005 - Guide to the sampling and investigation of potentially contaminated soil. Part 2 – Volatile Compounds.*

Should it be identified that areas of the site have been contaminated through the operational activities, these areas are to be remediated, and validated as contaminant free, prior to site closure.

Infrastructure

Infrastructure that is to remain on-site after the surrender of the approvals may only be retained where a landowner agreement has been provided to the administering authority which clearly itemises the infrastructure that will remain, and detail the condition it is to remain in. It is anticipated that the following infrastructure would be suitable for retention:

- Utilises and services (e.g. water, electricity, telecommunications, gas).
- Access tracks and roads.

4.9 Rehabilitation Management Plans

	Plant, equipment, and buildings (including demountable and mobile infrastructure) should be removed from the final landform. A landowner's agreement is to be obtained at cessation of the rehabilitation to confirm satisfaction with the rehabilitation site and for retention of any infrastructure within the landform.
Monitoring	Hopkins Brothers must undertake a monitoring and maintenance period following the rehabilitation phase and action any remedial measures to ensure the rehabilitated landform transition to a self-sustaining state. The Quarry Manager or delegate must conduct regular inspections of any rehabilitated areas to ensure maintenance and repairs are carried out as necessary. Maintenance works may include fertilising, watering, repairs to barriers, guards and plant failure replacements, refer to **Table 11 – Maintenance Schedule for Revegetation Works**. The monitoring and management program will review the ongoing success of the rehabilitation treatment. The Quarry Manager or delegate may engage a consultant to assist with any detailed monitoring or management of rehabilitation. The key parameters to be measured as part of the rehabilitation monitoring and management program will include: • Landform stability. • Erosion and sedimentation. • Groundcover success (<70% desirable). • Vegetation species composition and density. • Water quality. • Weed presence. Final rehabilitated areas are to be visually monitored by the Quarry Manager or delegate and, where relevant, assessed by suitably qualified persons to determine the effectiveness of measures implemented.
Contingency Plan	In the event that monitoring identifies failures in the rehabilitation implementation, the following contingency measures may be used, however; these will be adapted to the particular failure identified:

4.9 Rehabilitation Management Plans

- Replacement of failed plantings to increase establishment / success rates.
- Use of fertilisers and soil ameliorants where necessary.
- Reprofiling or eroded or failed landforms.
- Application of additional topsoil where necessary to support vegetation growth.
- Impletion of additional erosion and sediment controls.
- Water quality improvements where necessary.

Table 10 – Key Performance Indicators for Rehabilitation

KPI Description	Measure(s)	Critical Timeframe
Total land disturbance at any one time is limited to that necessary to advance the quarry development.	Demarcation of limits.	Continuous review in accordance with development of the site.
Sufficient topsoil for rehabilitation has been retained.	Volume (m^3) of topsoil and subsoil retained for rehabilitation.	At implementation and completion of each development stage.
The final landform demonstrates consideration for the surrounding undisturbed areas and land zoning.	True / False.	Prior to lodgement of application for surrender.
Groundcover achieves a suitable density to protect surface soils from rain-induced erosion (DES 2014).	Groundcover at a minimum of 70% (DES 2014).	• Assessment prior to any stormwater management device reduction or removal; and, • Final assessment prior to surrender application.
Erosion rates of soil / sediment from disturbed areas associated with the extractive industry activities does not exceed natural rates experience for the locality.	Local erosion rate calculated and compared against actual site erosion rates.	Within three months of an area of the quarry no longer required for quarrying / disturbance activities (including at final stage).
Evidence that water quality of any residual water bodies complies with the water quality objectives of the EA or other agreed release parameters. Alternatively, water bodies are to be filled and stabilised with vegetation to create a clean, free-draining catchment.	Water quality objectives of EA conditions or other agreed Water Quality Objectives (e.g., Livestock Watering Guidelines).	Prior to lodgement of a surrender application for the EA.
Air quality of the final landform achieves levels consistent with adjacent undisturbed areas through establishment of the final landform.	Visual surveillance and complaints register review.	Prior to lodgement of a surrender application for the EA.

	If monitoring is required, refer to **Section 4.1 - Air Quality Management Plan** contained in the SBMP.	
Assessment confirms the slope stability of final landforms.	Slope ratio, degree, or percentage.	Prior to lodgement of application for surrender.
Landowner statement(s) obtained for: a) any retained items of extractive industry-related infrastructure; and b) satisfaction with the rehabilitated final landform.	True / False.	Prior to lodgement of application for surrender.

Table 11 – Maintenance Schedule for Revegetation

Activity	**Frequency**
Weed Control	
Site Preparation (where necessary)	One (1) treatment at least two (2) weeks prior to seeding / planting.
Ongoing weed management	Biannually or as required.
Revegetation	
Monitor performance and conduct any necessary maintenance.	• One (1) month after seeding / seedling planting. • Three (3) months after seeding / seeding planting. • Six (6) months after seeding / seedling planting. • 12 months after seeding / seedling planting. **OR** • Following significant rainfall events (e.g., >25 mm).
Replace diseased or dead plants.	As necessary following maintenance inspections.
Fertilise (if applicable)	Two (2) months after topsoil spreading or seeding.
Apply mulch (if available)	One-off around tube stock plantings
Pasture management	
Slashing and fertilising	As required.

4.10 Bushfire Management Plan

Objective	The activity will be operated in a way that minimises the risk of bushfires.
Purpose	Portions of the site are identified as being subject to very high, high, and medium potential bushfire hazard in accordance with the Bushfire Hazard Overlay mapping noted by the *Rockhampton Region Planning Scheme* as well as high and medium potential bushfire intensity per Queensland Spatial Catalogue data. This Bushfire Management Plan has been prepared to identify and manage potential impacts occurring as a result of bushfires. • The attached figure **Bushfire – Bushfire Intensity (Figure 3)** provides general guidance for potential bushfire intensity and thus areas of high concern for flammable materials.

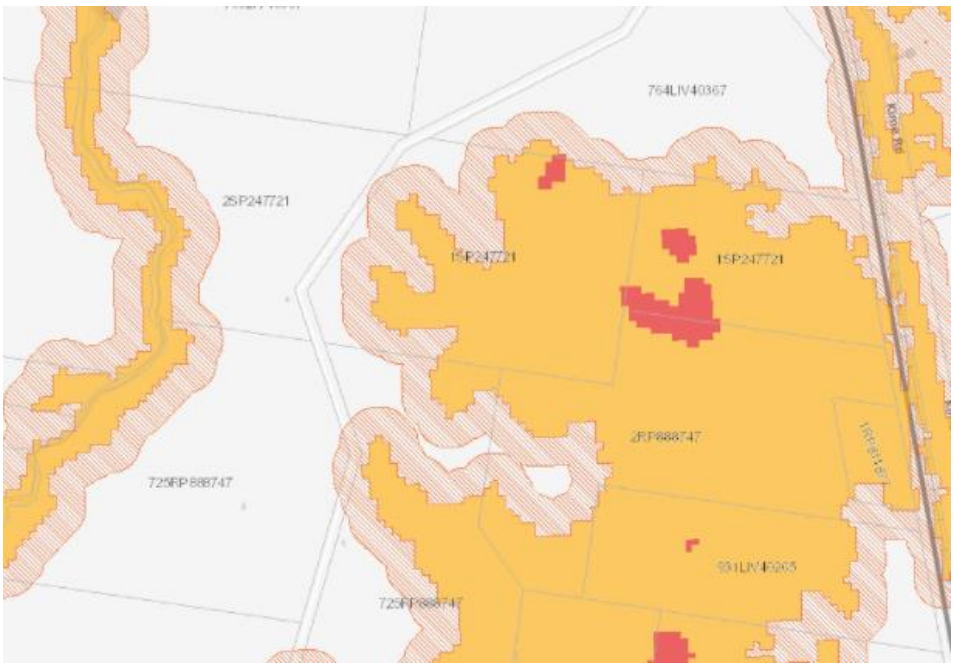


Diagram 5 – Potential Bushfire Intensity
(Figure created DAMS mapping)

Performance Outcomes	• Minimise the potential for spread of bushfires on site. • Protect the people and property from bushfire impacts. • Minimise potential impacts from bushfires on local flora and fauna.
Strategies	**<u>Risk Control</u>** • Ensure all staff on-site and other personnel are aware of evacuation procedures and the location and the use of firefighting equipment.

4.10 Bushfire Management Plan

- Ensure there is an adequate water supply on-site in the event of a fire. Water supply sources that could be used include:
    - Pit sumps and sediment basins / water storages.
    - Water truck (when on-site).
- Keep the operational areas tidy and not storing any material around the edges of the site that would increase bushfire risk.
- Maintain a site attendance register.
- Maintain a communications system with all on-site personnel.
- Maintain firebreaks in accordance with the allowable widths prescribed under the relevant legislation (in accordance with the *Planning Regulation 2017, t*he clearing is limited to the establishment and/or maintenance of necessary firebreaks to protect buildings and structures (other than fences, roads and tracks) and must be a maximum width of 20 m or 1.5 times the height of the tallest adjacent tree (whichever is the greater)).
- Ensure availability of heavy earthmoving machinery and water trucks used in quarry operations to assist in the event of major bushfires, if required.
- Consult with adjacent landowners and fire services for implementing fire control management on-site in accordance with district/area fire control plans.
- Keep relevant agencies contact numbers in the event of a fire, namely the Rockhampton Fire Station and the Gracemere No 1 or Bouldercombe Fire Warden.

Ignition Source

- Appropriate signage is to be erected near flammable and combustible areas e.g. 'No smoking, stop engine', hazard symbols (explosive, flammable, combustible).
- Any cigarette butts must be free of embers and discarded into site bins.
- Smoking is only permitted in designated smoking areas and is not allowed in work vehicles.
- Vehicles and/or plant must be turned off during refuelling.
- Refuelling is to occur only in a designated area.
- Mobile phones must be switched off when refuelling.
- Ensure welding and other hot works is undertaken in controlled areas where potential for starting a fire is minimised.

Fire Protection

- Ensure that extinguishers, fire hoses, fire blankets, sand buckets and other such equipment is regularly inspected and maintained in accordance with AS 1851-2005 (A4), Maintenance of Fire Protection Systems and Equipment (Standards Australia 2005).
- All vehicles and plant must be provided with fire protection equipment (e.g., fire extinguisher, fire blanket) that meets applicable Australian Standards.
- Staff should be trained in the correct use of fire protection equipment.
- All fire extinguishers must be clearly signed and their purpose clearly visible for the user.

4.10 Bushfire Management Plan

	Fuel Storage Areas • Fuel storage areas must be located away from vegetation and office areas as per *AS 1940 - The storage and handling of flammable and combustible liquids (*Standards Australia 2017c). • Aboveground bulk tanks and package stores are to be separated from each other as per *AS 1940 - The storage and handling of flammable and combustible liquids (*Standards Australia 2017c). • Firefighting equipment must be located within proximity to these areas. **Site Preparation and Maintenance** • Plan, create and/or maintain strategic firebreaks in order to implement hazard reduction works where necessary. • Construct and maintain perimeter fencing to prevent unauthorised access where necessary. • Incorporate fire safety management system for chemical fires for temporary buildings and on-site vehicles. • Consult with the local fire station and council prior to each bushfire season in order to re-assess the situation, site conditions and predicted bushfire conditions for the bushfire danger period ahead. • Maintain a line of contact with the fire station throughout the bushfire season. **Reduce the Hazards** • Assess fire risk each day and evacuate where necessary. • Ensure no fuel load is available around work sites. • Plan and organise for hazard reduction burns to be undertaken by the Rockhampton or Gracemere Fire Stations where necessary. • Obtain a 'Permit to Light Fire' from the local Rockhampton/Gracemere Fire Stations as required. • Preferable burn season is summer to winter and aim for a low to moderate intensity burn. • Create firebreaks around all temporary facilities and infrastructure on site.
Monitoring	• Regularly review and update the site evacuation procedures. • Ensure regular surveillance of the site, to ensure access roads, fire trails and the edges of the operational area are maintained. • All employees will be responsible for the identification and giving alarm of fires on-site or adjacent bush fires off-site. • Monitor the site, conditions, and situation in order to evaluate changes occurring on or off site, e.g., changes in infrastructure, risks and hazards, legislative and environmental changes.
Contingency Plan	Should emergency fire services be required, dial '000' or '112' from a mobile cellular device.

4.10 Bushfire Management Plan

	Contact details for the local fire station, Rockhampton Rural Fire Service, and the Nankin Fire Warden are as follows: Gracemere Fire Station 34 Bland Street Gracemere QLD 4702 Phone: 07 4927 1277 Rockhampton Rural Fire Service (volunteers) 174 Alexandra Street Kawana, North Rockhampton QLD 4701 Phone: 07 4932 8129 Gracemere No 1 Fire Warden Phone: 0400 140 672 Bouldercombe Fire Warden Phone: 0429 340 204
Monitoring	• A fauna mortality register is to be maintained to document the location and frequency of mortality and the fauna species most susceptible to injury and death, to enable on-going modifications to fauna conservation management strategies where necessary. • The condition of all site fencing is to be inspected regularly to determine maintenance requirements. • Operational areas are to be inspected daily prior to commencement of work to determine if fauna are present. If fauna are present, they are to be relocated or moved on as appropriate.
Contingency Plan	The Site Manager is to be notified immediately of any incident resulting in the harm, injury or death of a fauna species. Where a non-compliance is identified, a review of these measures is to be undertaken to determine areas for improvement. Where necessary, additional staff training or engaging an appropriately qualified third party to undertake an audit of these controls. Where an unapproved impact to flora or impacts to native fauna is identified, the incident must be notified to the relevant authorities in accordance with **Section 2.4 – Incident Response Procedure**.

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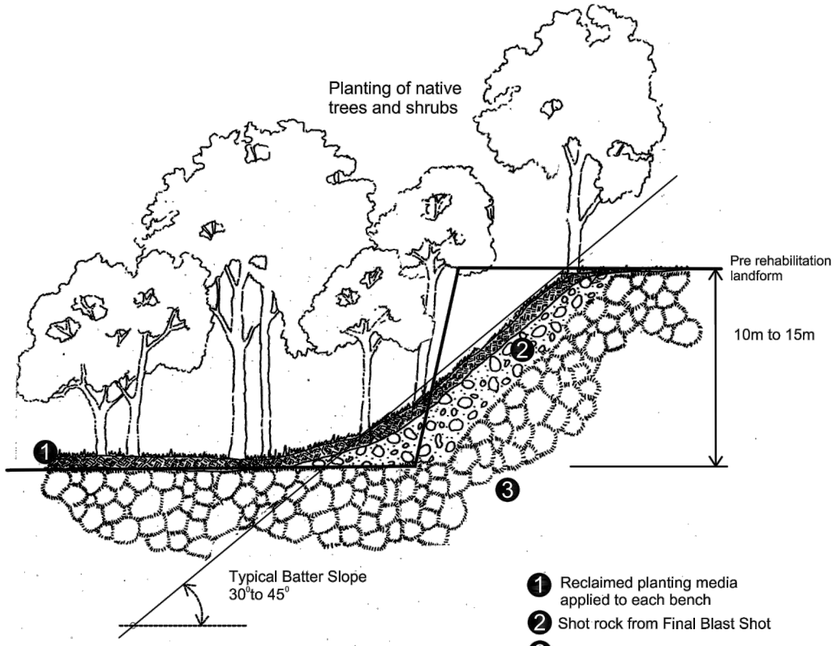
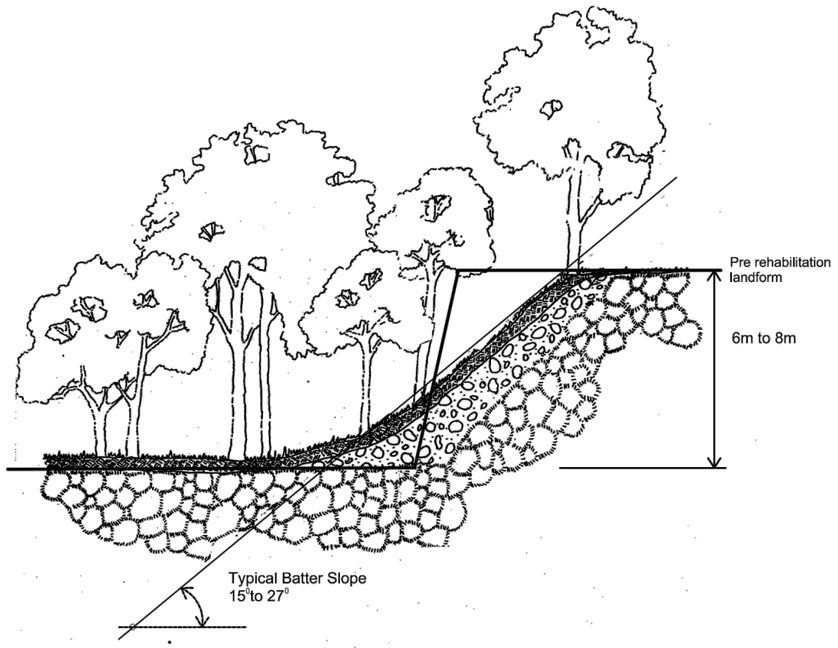
FIGURES



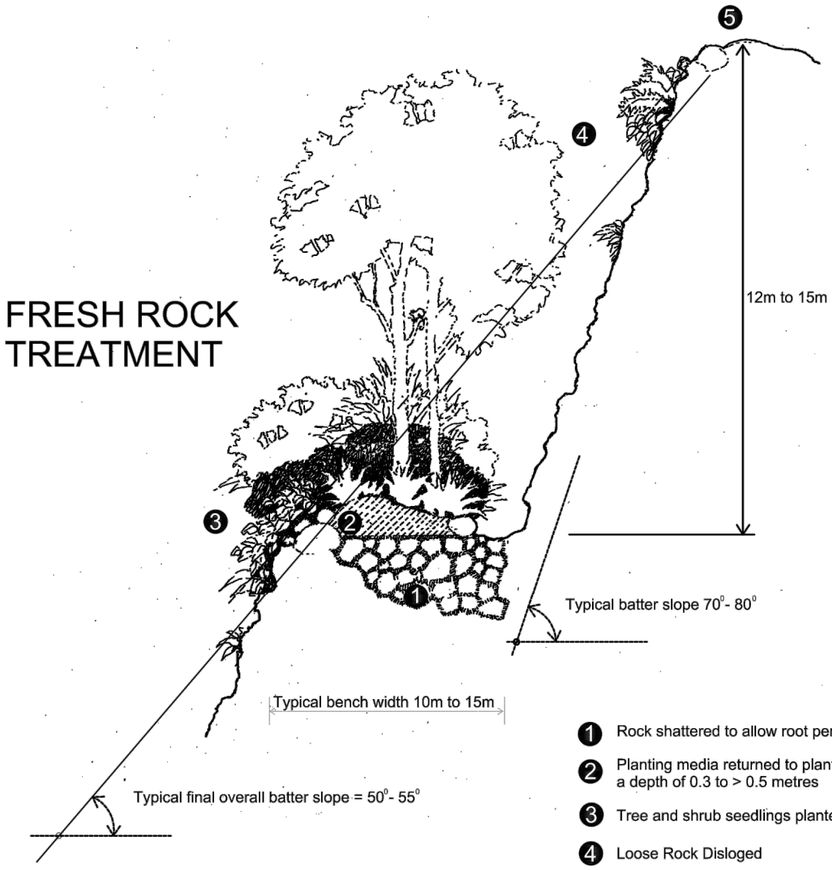
1 Reclaimed planting media applied to each bench
2 Shot rock from Final Blast Shot
3 Pre-existing sub-strata

HIGHLY TO MODERATELY WEATHERED ROCK TREATMENT



COMPLETELY WEATHERED ROCK

FRESH ROCK TREATMENT



1 Rock shattered to allow root penetration
2 Planting media returned to plant sites to a depth of 0.3 to > 0.5 metres
3 Tree and shrub seedlings planted
4 Loose Rock Disloged
5 Edge rounded with Hydraulic pick

CREATED: 7 February 2022 JOB SUB #: FILE NAME: Z:\Shared\Data\Jobs\2600\2607 - Hopkins Bros - Midgee Quarry\Drawings\Drawings\2607.DRG.009 - Batter Treatments Schematic.dwg

REV	DESCRIPTION	DATE	BY

Data Sources:
Photography:
Topography:
Cadastre:
Ecosystem:
Other:

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Legend:

PROJECT: Midgee Quarry

CLIENT: Hopkins Brothers

TITLE: Batter Treatments Schematic

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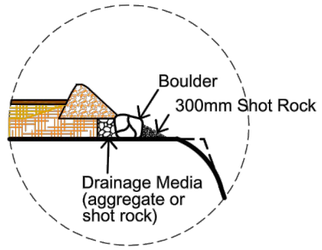
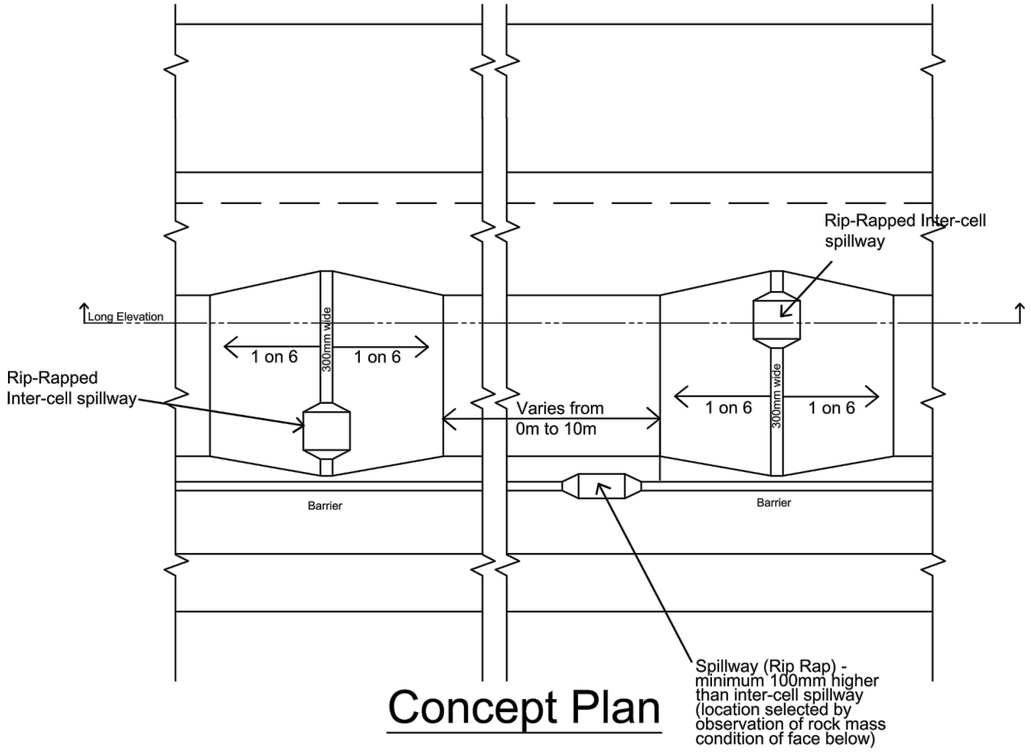
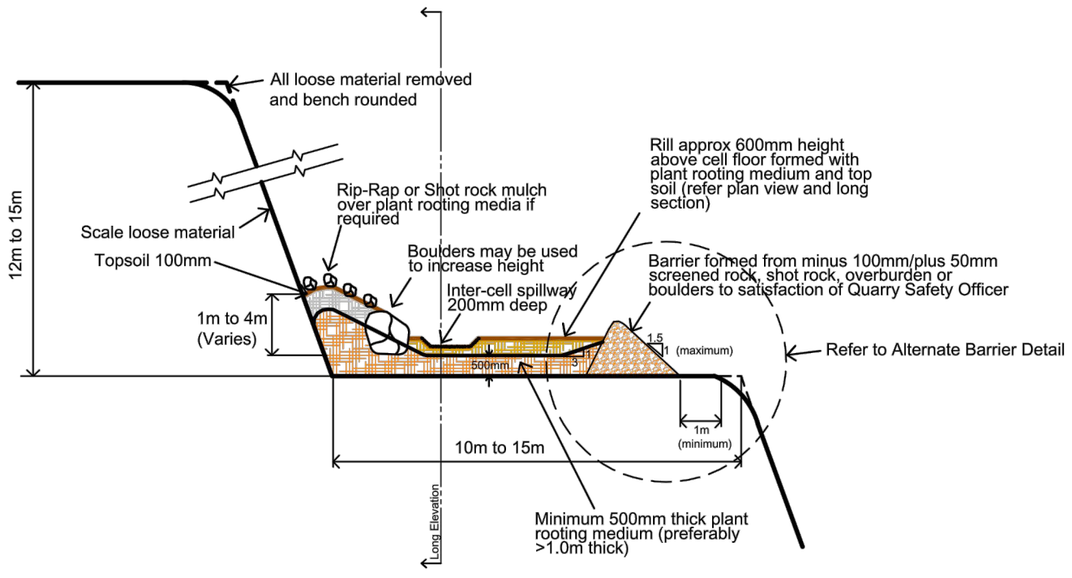
DRAWING NUMBER: 2607.DRG.009
REVISION:
DATE: 7 February 2022 DRAWN: MR
PRINTED: 7 February 2022 CHECKED: YD
DATUM: HORIZONTAL / VERTICAL / ZONE / /



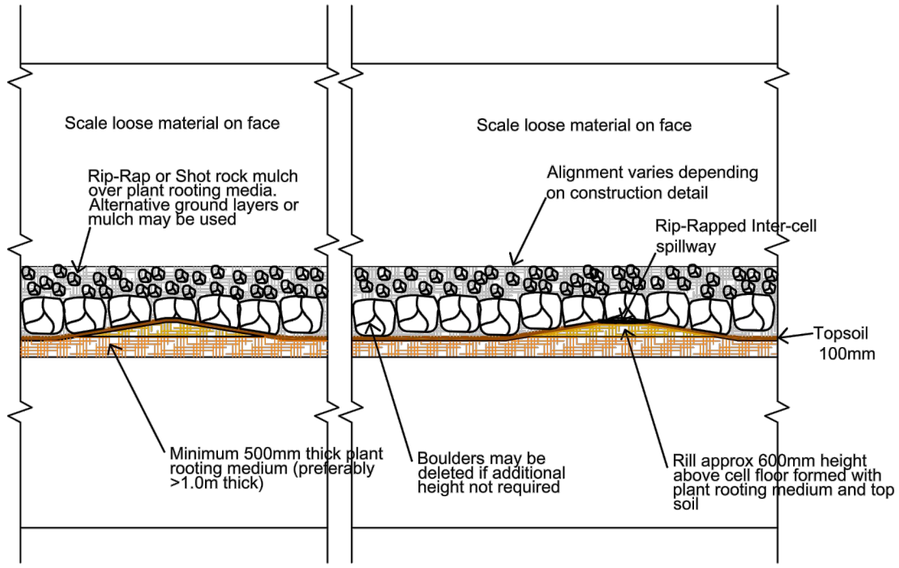
Alternate Barrier Detail



Concept Plan



Concept Cross Elevation



Concept Long Elevation

REV	DESCRIPTION	DATE	BY

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Topography:
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TITLE: Bench Treatments Schematic

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CREATED: 19 October 2021 JOB SUB #: FILE NAME: Z:\Shared\Data\Jobs\2600\2607 - Hopkins Bros - Midgee Quarry\Drawings\Drawings\2607.DRG.010 - Bench Treatments Schematic.dwg

ATTACHMENTS

GROUNDWORK plus

Attachment 1

Annual Environmental Performance Review

Annual Environmental Performance Review

Site:

Date:

Reviewer:

Approvals

1. Have there been any changes to the site approvals?

   Note: consider the Environmental Authority, Development Permit, etc.

   Yes ☐ No ☐

   If yes, provide details of the change (e.g. change to Environmental Authority condition, or Development Permit condition). Include the date / reference number of the current approvals relevant to the site activities.

   _____
   _____
   _____
   _____
   _____

Environmental Monitoring

2. Has all monitoring required under the Environmental Authority been carried out?

   Yes ☐ No ☐

   If no, provide details

   _____
   _____
   _____
   _____
   _____

3. Has all monitoring required under the Site Based Management Plan (SBMP) been carried out?

   Note: Refer to Section 4. Environmental Management Plans for monitoring requirements.

Yes ☐ No ☐

If no, provide details

_____
_____
_____
_____
_____
_____

4. Were any exceedances of the approval limits recorded?

Yes ☐ No ☐

If yes, provide details.

_____
_____
_____
_____
_____
_____

5. Was the exceedance reported to the administering authority?

Yes ☐ No ☐

Provide details of any notifications to the administering authority and actions taken to address the exceedance (if any).

_____
_____
_____
_____
_____
_____

Complaints / Incidents

6. Have any complaints been received, or environmental incidents reported, over the previous 12 months?

Note: An environmental incident generally relates to an event which has caused, or threatens, serious or material environmental harm, consistent with the duty to notify of environmental harm under Division 2 of the *Environmental Protection Act 1994*.

Yes ☐ No ☐

If yes, briefly summarise the nature of the complaint and/or incident and any action taken to resolve the matter.

_____
_____
_____
_____
_____
_____

Site Operations

7. Have there been any changes to the site operations over the previous 12 months?

Yes ☐ No ☐

If yes, provide details and determine if any change to the SBMP or associated management documents are required.

_____
_____
_____
_____
_____
_____

Proposed Measures for Improved Environmental Performance

8. Are any measures proposed to be implemented over the coming 12 months to improve the environmental performance of the site?

Note: Examples of measures may include; revised stormwater management measures, changes to fuel / chemical storage, etc.

Yes ☐ No ☐

If yes, provide details and determine if any change to the SBMP or associated management documents are required.

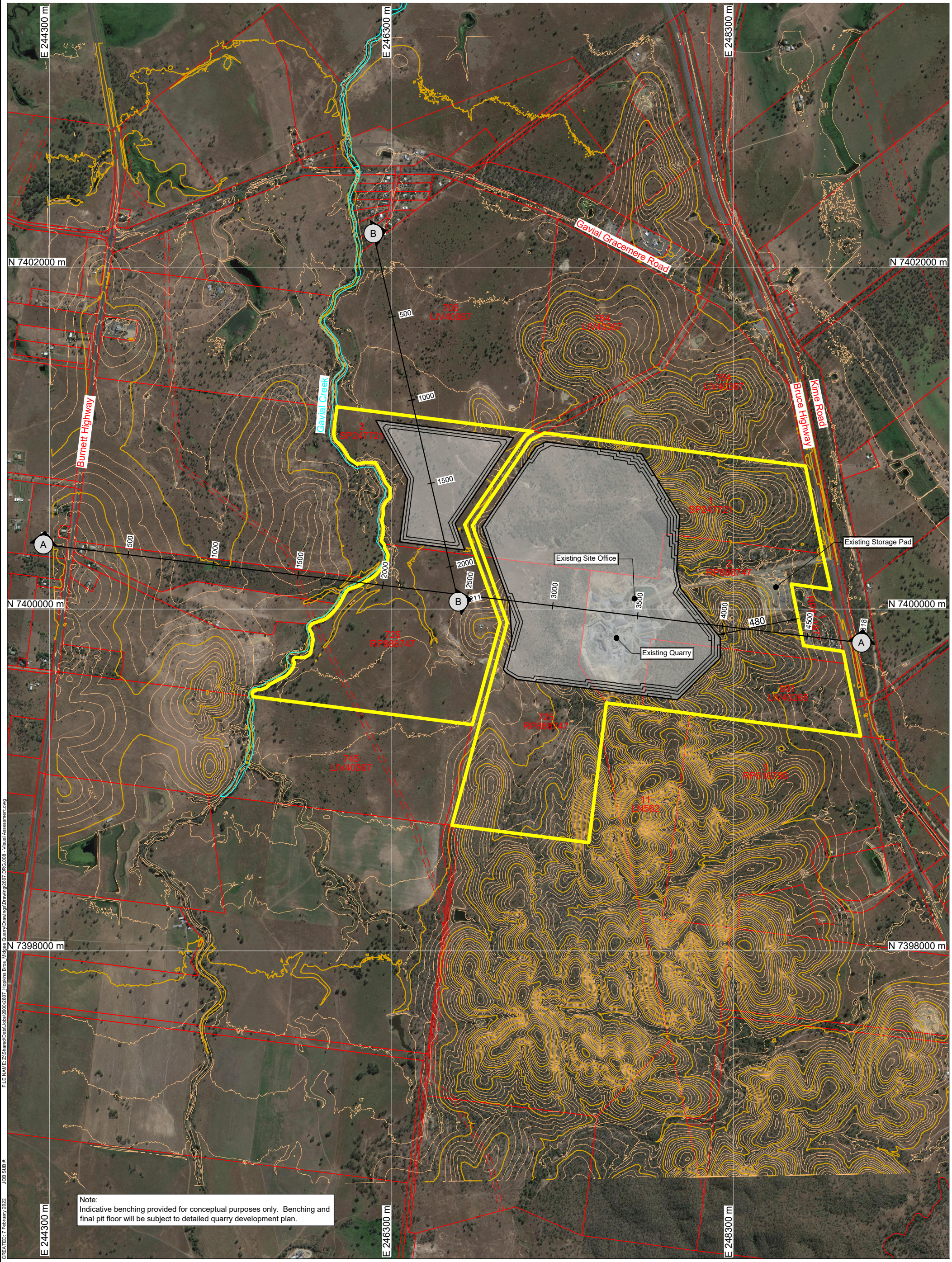
_____

_____

_____

_____

_____



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JOB SUB #:
CREATED: 7 February 2022

REV	DESCRIPTION	DATE	BY

Data Sources:
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Topography: © Commonwealth of Australia (Geoscience Australia) 2015, LiDAR 5m
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Legend:
- Site Boundary
- Cadastral Boundary
- Easement Boundary
- Watercourse Boundary

PROJECT: Midgee Quarry

CLIENT: Hopkins Brothers

TITLE: Visual Assessment Cross Section Plan

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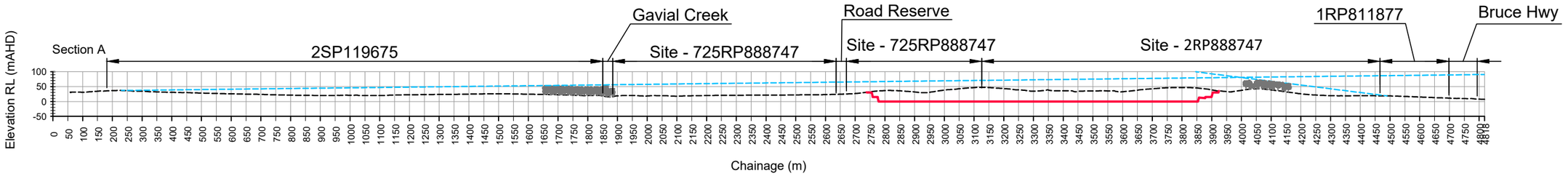
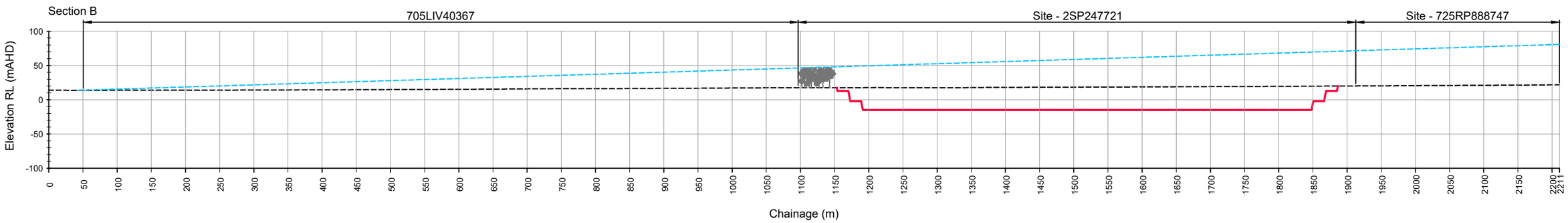
SCALE: 1:20,000 When Printed On A3 (0 m)
DRAWING NUMBER: 2607.DRG.008
REVISION:
DATE: 8 February 2022
DRAWN: JHV
DATUM: HORIZONTAL / VERTICAL / ZONE
PRINTED: 8 February 2022
CHECKED: MB
GDA94 / MGA / AHD / 56





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LiDAR:

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Legend:
- Existing Ground Surface
- Concept Pit Design
- Line of Sight

PROJECT: Midgee Quarry

CLIENT: Hopkins Brothers

TITLE: Visual Assessment Cross Section

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SCALE: When Printed On A3 — 0 0
DRAWING NUMBER: 2607.DRG.008A
REVISION:
DATE: 7 February 2022 | DRAWN: JHV
PRINTED: 7 February 2022 | CHECKED: MB
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GDA94 / MGA / AHD / 56

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CREATED: 7 February 2022 JOB SUB #

State code 1: Development in a state-controlled road environment

Table 1.2.1: Development in a state-controlled road environment

Performance outcomes	Acceptable outcomes	Response
Buildings and structures		
PO1 The location of buildings, structures, infrastructure, services and utilities does not create a safety hazard in a state-controlled road, or cause damage to, or obstruct road transport infrastructure.	**AO1.1** Buildings, structures, infrastructure, services and utilities are not located in a state-controlled road. AND	Complies AO1.1 No infrastructure is proposed in the state-controlled road.
	AO1.2 Buildings, structures, infrastructure, services and utilities can be maintained without requiring access to a state-controlled road.	Complies AO1.2 No maintenance within the state-controlled road is required to facilitate the development.
PO2 The design and construction of buildings and structures does not create a safety hazard by distracting users of a state-controlled road.	**AO2.1** Facades of buildings and structures facing a state-controlled road are made of non-reflective materials. OR	Not applicable. No buildings or structures are proposed to be located within 1km of the Bruce Highway.
	AO2.2 Facades of buildings and structures do not reflect point light sources into the face of oncoming traffic on a state-controlled road. AND	
	AO2.3 External lighting of buildings and structures is not directed into the face of oncoming traffic on a state-controlled road and does not involve flashing or laser lights. AND	
	AO2.4 Advertising devices visible from a state-controlled road are located and designed in accordance with the Roadside Advertising Guide, 2nd Edition, Department of Transport and Main Roads, 2017.	
PO3 Road, pedestrian and bikeway bridges over a state-controlled road are designed and constructed to prevent projectiles from being thrown onto a state-controlled road.	**AO3.1** Road, pedestrian and bikeway bridges over a state-controlled road include throw protection screens in accordance with section 4.9.3 of the Design Criteria for Bridges and Other Structures Manual, Department of Transport and Main Roads, 2018.	Not applicable No infrastructure is proposed over a state-controlled road.

Performance outcomes	Acceptable outcomes	Response
Filling, excavation and retaining structures		
PO4 Filling and excavation does not interfere with, or result in damage to, infrastructure or services in a state-controlled road. Note: Information on the location of services and public utility plants in a state-controlled road can be obtained from the Dial Before You Dig service. Where development will impact on an existing or future service or public utility plant in a state-controlled road such that the service or public utility plant will need to be relocated, the alternative alignment must comply with the standards and design specifications of the relevant service or public utility provider, and any costs of relocation are to be borne by the developer. Refer to the SDAP Supporting Information: Filling, excavation and retaining structures in a state-controlled road environment, Department of Transport and Main Roads, 2017, for further guidance on how to comply with this performance outcome.	No acceptable outcome is prescribed.	Not applicable. No filling or excavation is proposed within 1km of the state-controlled road.
PO5 Filling, excavation, building foundations and retaining structures do not undermine, or cause subsidence of, a state-controlled road. Note: To demonstrate compliance with this performance outcome, it is recommended an RPEQ certified geotechnical assessment, prepared in accordance with the Road Planning and Design Manual 2nd Edition: Volume 3, Department of Transport and Main Roads, 2016, is provided. Refer to the SDAP Supporting Information: Filling, excavation and retaining structures in a state-controlled road environment, Department of Transport and Main Roads, 2017, for further guidance on how to comply with this performance outcome and prepare a geotechnical assessment.	No acceptable outcome is prescribed.	Not applicable. No filling or excavation is proposed within 1km of the state-controlled road.

Performance outcomes	Acceptable outcomes	Response
PO6 Filling, excavation, building foundations and retaining structures do not cause ground water disturbance in a state-controlled road. Note: To demonstrate compliance with this performance outcome, it is recommended an RPEQ certified geotechnical assessment, prepared in accordance with the Road Planning and Design manual 2nd Edition: Volume 3, Department of Transport and Main Roads, 2016, is provided. Refer to the SDAP Supporting Information: Filling, excavation and retaining structures in a state-controlled road environment, Department of Transport and Main Roads, 2017, for further guidance on how to comply with this performance outcome and prepare a geotechnical assessment.	No acceptable outcome is prescribed.	Not applicable. No filling or excavation is proposed within 1km of the state-controlled road.
PO7 Excavation, boring, piling, blasting or fill compaction during construction of a development does not result in ground movement or vibration impacts that would cause damage or nuisance to a state-controlled road, road transport infrastructure or road works. Note: To demonstrate compliance with this performance outcome, it is recommended an RPEQ certified geotechnical assessment, prepared in accordance with Road Planning and Design Manual 2nd Edition: Volume 3, Department of Transport and Main Roads, 2016, is provided. Refer to the SDAP Supporting Information: Filling, excavation and retaining structures in a state-controlled road environment, Department of Transport and Main Roads, 2017, for further guidance on how to comply with this performance outcome and prepare a geotechnical assessment.	No acceptable outcome is prescribed.	Not applicable. No filling or excavation is proposed within 1km of the state-controlled road.
PO8 Development involving the haulage of fill, extracted material or excavated spoil material exceeding 10,000 tonnes per year does not damage the pavement of a state-controlled road.	**AO8.1** Fill, extracted material and spoil material is not transported to or from the development site on a state-controlled road.	Complies PO8 A pavement contribution is already required as a condition of development for extraction volumes up to 1 million tonnes per year. A pavement

Performance outcomes	Acceptable outcomes	Response
Note: It is recommended a pavement impact assessment is provided. Refer to the SDAP Supporting Information: Filling, excavation and retaining structures in a state-controlled road environment, Department of Transport and Main Roads, 2017, and the Guide to Traffic Impact Assessment, Department of Transport and Main Roads, 2017, for further guidance on how to comply with this performance outcome and prepare a pavement impact assessment.		contribution assessment for extraction volumes over 1 million tonnes per year has been undertaken and a contribution rate calculated in accordance with the Guide to Traffic Impact Assessment (refer **Attachment 4 – Traffic and Pavement Impact Assessment**).
PO9 Filling and excavation associated with the construction of vehicular access to a development does not compromise the operation or capacity of existing drainage infrastructure for a state-controlled road. Note: Refer to the SDAP Supporting Information: Filling, excavation and retaining structures in a state-controlled road environment, Department of Transport and Main Roads, 2017, for further guidance on how to comply with this performance outcome.	No acceptable outcome is prescribed.	Complies PO9 Detailed design of the site access works will ensure compliance with this performance outcome.
PO10 Fill material used on a development site does not result in contamination of a state-controlled road. Note: Refer to the SDAP Supporting Information: Filling, excavation and retaining structures in a state-controlled road environment, Department of Transport and Main Roads, 2017, for further guidance on how to comply with this performance outcome.	**AO10.1** Fill material is free of contaminants including acid sulfate content. Note: Soils and rocks should be tested in accordance with AS 1289.0 – Methods of testing soils for engineering purposes and AS 4133.0-2005 – Methods of testing rocks for engineering purposes. AND **AO10.2** Compaction of fill is carried out in accordance with the requirements of AS 1289.0 2000 – Methods of testing soils for engineering purposes.	Not applicable.
PO11 Filling and excavation does not cause wind-blown dust nuisance in a state-controlled road. Note: Refer to the SDAP Supporting Information: Filling, excavation and retaining structures in a state-	**AO11.1** Compaction of fill is carried out in accordance with the requirements of AS 1289.0 2000 – Methods of testing soils for engineering purposes. AND	Not applicable

Performance outcomes	Acceptable outcomes	Response
controlled road environment, Department of Transport and Main Roads, 2017, for further guidance on how to comply with this performance outcome.	**AO11.2** Dust suppression measures are used during filling and excavation activities such as wind breaks or barriers and dampening of ground surfaces.	
Stormwater and drainage		
PO12 Development does not result in an actionable nuisance, or worsening of, stormwater, flooding or drainage impacts in a state-controlled road. Note: Refer to the SDAP Supporting Information: Stormwater and drainage in a state-controlled road environment, Department of Transport and Main Roads, 2017, for further guidance on how to comply with this performance outcome.	No acceptable outcome is prescribed.	Complies PO12 A stormwater management plan has been prepared which demonstrates that the proposed changes will not result in an impact to state transport corridors or state transport infrastructure (refer **Attachment 6 – Stormwater Management Plan**).
PO13 Run-off from the development site is not unlawfully discharged to a state-controlled road. Note: Refer to the SDAP Supporting Information: Stormwater and drainage in a state-controlled road environment, Department of Transport and Main Roads, 2017, for further guidance on how to comply with this performance outcome.	**AO13.1** Development does not create any new points of discharge to a state-controlled road. AND	Complies AO13.1 No change is proposed to the existing points of stormwater discharge.
	AO13.2 Stormwater run-off is discharged to a lawful point of discharge. Note: Section 3.9 of the Queensland Urban Drainage Manual, Institute of Public Works Engineering Australasia (Queensland Division) Fourth Edition, 2016, provides further information on lawful points of discharge. AND	Complies AO13.2 No change is proposed to the existing points of stormwater discharge.
	AO13.3 Development does not worsen the condition of an existing lawful point of discharge to the state-controlled road.	Complies AO13.3 No change is proposed to the existing points of stormwater discharge.
PO14 Run-off from the development site during construction does not cause siltation of stormwater infrastructure affecting a state-controlled road. Note: Refer to the SDAP Supporting Information: Stormwater and drainage in a state-controlled road environment, Department of Transport and Main Roads, 2017, for further guidance on how to comply with this performance outcome.	**AO14.1** Run-off from the development site during construction is not discharged to stormwater infrastructure for a state-controlled road.	Complies AO14.1 A stormwater management plan has been prepared which demonstrates that the proposed changes will not result in any further impact to state transport corridors or state transport infrastructure (refer **Attachment 6 – Stormwater Management Plan**).
Vehicular access to a state-controlled road		

Performance outcomes	Acceptable outcomes	Response
PO15 Vehicular access to a state-controlled road that is a limited access road is consistent with government policy for the management of limited access roads. Note: Refer to the SDAP Supporting Information: Vehicular access to a state-controlled road, Department of Transport and Main Roads, 2017, for further guidance on how to comply with this performance outcome.	**AO15.1** Development does not require new or changed access to a limited access road. Note: Limited access roads are declared by the transport chief executive under section 54 of the Transport Infrastructure Act 1994 and are identified in the DA mapping system. OR	Not applicable.
	AO15.2 A new or changed access to a limited access road is consistent with the limited access policy for the state-controlled road. Note: Limited access policies for limited access roads declared under the Transport Infrastructure Act 1994 can be obtained by contacting the relevant Department of Transport and Main Roads regional office. AND	
	AO15.3 Where a new or changed access is for a service centre, access is consistent with the Service centre policy, Department of Transport and Main Roads, 2013 and the Access policy for roadside service centre facilities on limited access roads, Department of Transport and Main Roads, 2013, and the Service centre strategy for the state-controlled road. Note: The Service centre policy, Department of Transport and Main Roads, 2013, Access policy for roadside service centre facilities, Department of Transport and Main Roads, 2013 and the relevant Service centre strategy for a state-controlled road can be accessed by contacting the relevant Department of Transport and Main Roads regional office.	
PO16 The location and design of vehicular access to a state-controlled road (including access to a limited	**AO16.1** Vehicular access is provided from a local road.	Not applicable.

Performance outcomes	Acceptable outcomes	Response
access road) does not create a safety hazard for users of a state-controlled road or result in a worsening of operating conditions on a state-controlled road. Note: Where a new or changed access between the premises and a state-controlled road is proposed, the Department of Transport and Main Roads will need to assess the proposal to determine if the vehicular access for the development is safe. An assessment can be made by Department of Transport and Main Roads as part of the development assessment process and a decision under section 62 of Transport Infrastructure Act 1994 issued. Refer to the SDAP Supporting Information: Vehicular access to a state-controlled road, Department of Transport and Main Roads, 2017, for further guidance on how to comply with this performance outcome.	OR all of the following acceptable outcomes apply: **AO16.2** Vehicular access for the development is consistent with the function and design of the state-controlled road. AND **AO16.3** Development does not require new or changed access between the premises and the state-controlled road. Note: A decision under section 62 of the Transport Infrastructure Act 1994 outlines the approved conditions for use of an existing vehicular access to a state-controlled road. Current section 62 decisions can be obtained from the relevant Department of Transport and Main Roads regional office. AND **AO16.4** Use of any existing vehicular access to the development is consistent with a decision under section 62 of the *Transport Infrastructure Act 1994*. Note: The development which is the subject of the application must be of an equivalent use and intensity for which the section 62 approval was issued and the section 62 approval must have been granted no more than 5 years prior to the lodgement of the application. AND **AO16.5** On-site vehicle circulation is designed to give priority to entering vehicles at all times so vehicles do not queue in a road intersection or on the state-controlled road.	Complies PO16 The proposal seeks to extend the quarry footprint and increase the threshold to enable the operations to produce up to 2 million tonnes per year, although it should be noted that this maximum annual production volume is not likely to represent the average production rate. The existing approval requires an AUL(S) to be constructed for the approved development. The construction of the AUL(S) turn treatment has not yet been required. A traffic and pavement impact assessment undertaken to support the application identifies that a CHR turn treatment is warranted once the operation transports more than 1 million tonnes per annum (refer **Attachment 3 – Traffic and Pavement Impact Assessment**). Access has been designed to give priority to entering vehicles at all times to avoid queuing on the state-controlled road.
Vehicular access to local roads within 100 metres of an intersection with a state-controlled road		
PO17 The location and design of vehicular access to a local road within 100 metres of an intersection with	**AO17.1** Vehicular access is located as far as possible from the state-controlled road intersection. AND	Not applicable.

Performance outcomes	Acceptable outcomes	Response
a state-controlled road does not create a safety hazard for users of a state-controlled road. Note: Refer to the SDAP Supporting Information: Vehicular access to a state-controlled road, Department of Transport and Main Roads, 2017, for further guidance on how to comply with this performance outcome.	**AO17.2** Vehicular access is in accordance with parts, 3, 4 and 4A of the Road Planning and Design Manual, 2nd Edition: Volume 3, Department of Transport and Main Roads, 2016. AND	
	AO17.3 On-site vehicle circulation is designed to give priority to entering vehicles at all times so vehicles do not queue in the intersection or on the state-controlled road.	
Public passenger transport infrastructure on state-controlled roads		
PO18 Development does not damage or interfere with public passenger transport infrastructure, public passenger services or pedestrian or cycle access to public passenger transport infrastructure and public passenger services. Note: Refer to the SDAP Supporting Information: Vehicular access to a state-controlled road, Department of Transport and Main Roads, 2017, for further guidance on how to comply with this performance outcome.	**AO18.1** Vehicular access and associated road access works are not located within 5 metres of existing public passenger transport infrastructure. AND	Not applicable.
	AO18.2 Development does not necessitate the relocation of existing public passenger transport infrastructure. AND	
	AO18.3 On-site vehicle circulation is designed to give priority to entering vehicles at all times so vehicles using a vehicular access do not obstruct public passenger transport infrastructure and public passenger services or obstruct pedestrian or cycle access to public passenger transport infrastructure and public passenger services. AND	
	AO18.4 The normal operation of public passenger transport infrastructure or public passenger services is not interrupted during construction of the development.	
Planned upgrades		
PO19 Development does not impede delivery of planned upgrades of state-controlled roads.	**AO19.1** Development is not located on land identified by the Department of Transport and Main Roads as land required for the planned upgrade of a state-controlled road.	Not applicable.

Performance outcomes	Acceptable outcomes	Response
	Note: Land required for the planned upgrade of a state-controlled road is identified in the DA mapping system. OR	
	AO19.2 Development is sited and designed so that permanent buildings, structures, infrastructure, services or utilities are not located on land identified by the Department of Transport and Main Roads as land required for the planned upgrade of a state-controlled road.	
	OR all of the following acceptable outcomes apply: **AO19.3** Structures and infrastructure located on land identified by the Department of Transport and Main Roads as land required for the planned upgrade of a state-controlled road are able to be readily relocated or removed without materially affecting the viability or functionality of the development. AND	
	AO19.4 Vehicular access for the development is consistent with the function and design of the planned upgrade of the state-controlled road. AND	
	AO19.5 Development does not involve filling and excavation of, or material changes to, land required for a planned upgrade to a state-controlled road. AND	
	AO19.6 Land is able to be reinstated to the pre-development condition at the completion of the use.	
Network impacts		
PO20 Development does not result in a worsening of operating conditions on the state-controlled road network.	No acceptable outcome is prescribed.	Complies PO20 The proposal seeks to extend the quarry footprint and increase the production threshold to up to 2 million tonnes per year. A traffic and pavement

Performance outcomes	Acceptable outcomes	Response
Note: To demonstrate compliance with this performance outcome, it is recommended that an RPEQ certified traffic impact assessment is provided. Please refer to the Guide to Traffic Impact Assessment, Department of Transport and Main Roads, 2017, for further guidance on how to comply with this performance outcome.		impact assessment has been undertaken which confirmed that the changes proposed will not materially impact the safety of the state-controlled road network (refer **Attachment 3 – Traffic and Pavement Impact Assessment**).
PO21 Development does not impose traffic loadings on a state-controlled road which could be accommodated on the local road network.	**AO21.1** The layout and design of the development directs traffic generated by the development to the **local road** network.	Complies PO21 The proposal makes use of an existing site access. Due to the site location, use of the local road network is not able to be achieved.
PO22 Upgrade works on, or associated with, a state-controlled road are built in accordance with Queensland road design standards.	**AO22.1** Upgrade works required as a result of the development are designed and constructed in accordance with the *Road Planning and Design Manual*, 2nd edition, Department of Transport and Main Roads, 2016. Note: Road works in a state-controlled road require approval under section 33 of the Transport Infrastructure Act 1994 before the works commence.	Complies AO22.1 Turn treatments required at the Bruce Highway access to the site will be undertaken in accordance with the relevant design standards.

Table 1.2.2: Environmental emissions –
Not applicable. The proposal does not include a sensitive land use.

Table 1.2.3: Development in a future state-controlled road environment
Not applicable. The site is not within a future state-controlled road environment.

State code 6: Protection of state transport networks

Table 6.2.2: All development

Performance outcomes	Acceptable outcomes	Response
Network impacts		
PO1 Development does not result in a worsening of the safety of a state-controlled road. Note: To demonstrate compliance with this performance outcome, it is recommended that a Registered Professional Engineer of Queensland (RPEQ) certified road safety audit or road safety assessment (as applicable) is provided. Further information on determining whether a road safety audit or road safety assessment is required is provided in section 9 of the Guide to Traffic Impact Assessment, Department of Transport and Main Roads, 2017.	No acceptable outcome is prescribed.	Complies PO1 The proposal seeks to extend the quarry footprint and increase the threshold to up to 2 million tonnes per year. A traffic and pavement impact assessment has been undertaken which confirmed that the changes proposed will not materially impact the safety of the state-controlled road network (refer **Attachment 3 – Traffic and Pavement Impact Assessment**).
PO2 Development does not result in a worsening of the infrastructure condition of a state-controlled road or road transport infrastructure. Note: To demonstrate compliance with this performance outcome, it is recommended that a RPEQ certified traffic impact assessment and pavement impact assessment are provided. Further information on how to prepare a traffic impact assessment and pavement impact assessment is provided in the Guide to Traffic Impact Assessment, Department of Transport and Main Roads, 2017.	No acceptable outcome is prescribed.	Complies PO2 Refer to response to PO1.
PO3 Development does not result in a worsening of operating conditions on a state-controlled road or the surrounding road network. Note: To demonstrate compliance with this performance outcome,	No acceptable outcome is prescribed.	Complies PO3 Refer to response to PO1.

Performance outcomes	Acceptable outcomes	Response
it is recommended that an RPEQ certified traffic impact assessment is provided. Further information on how to prepare a traffic impact assessment is provided in the Guide to Traffic Impact Assessment, Department of Transport and Main Roads, 2017.		
PO4 Development does not impose traffic loadings on a state-controlled road which could be accommodated on the local road network.	AO4.1 The layout and design of the development directs traffic generated by the development to the local road network.	Complies PO4 It is proposed to utilise the existing access from the Bruce Highway. There is not ability to direct traffic to the local road network.
PO5 Upgrade works on, or associated with, a state-controlled road are built in accordance with relevant design standards.	AO5.1 Upgrade works on a state-controlled road are designed and constructed in accordance with the Road Planning and Design Manual, 2nd edition, Department of Transport and Main Roads, 2016.	Complies PO5 Turn treatments required at the Bruce Highway access to the site will be undertaken in accordance with the relevant design standards.
PO6 Development involving the haulage of fill, extracted material or excavated spoil material exceeding 10,000 tonnes per year does not damage the pavement of a state-controlled road. Note: It is recommended that a transport infrastructure impact assessment and pavement impact assessment are provided. Further information on how to prepare a traffic impact assessment is provided in the Guide to Traffic Impact Assessment, Department of Transport and Main Roads, 2017.	AO6.1 Fill, extracted material and spoil material is not transported to or from the development site on a state-controlled road.	Complies PO6 A pavement contribution is already required as a condition of development for extraction volumes up to 1 million tonnes per year. A pavement contribution assessment for extraction volumes over 1 million tonnes per year has been undertaken and a contribution rate calculated in accordance with the Guide to Traffic Impact Assessment (refer **Attachment 4 – Traffic and Pavement Impact Assessment**).
PO7 Development does not adversely impact on the safety of a railway crossing. Note: It is recommended that a traffic impact assessment be prepared to demonstrate compliance with this performance outcome. An impact on a level crossing may require an Australian Level Crossing Assessment Model (ALCAM) assessment to be undertaken. Section 2.2 – Railway crossing safety of the Guide to Development in a Transport	**AO7.1** Development does not require a new railway crossing. OR **AO7.2** A new railway crossing is grade separated. OR all of the following acceptable outcomes apply: **AO7.3** Upgrades to a level crossing are designed and constructed in accordance with AS1742.7 – Manual of	Not applicable.

Performance outcomes	Acceptable outcomes	Response
Environment: Rail, Department of Transport and Main Roads, 2015, provides guidance on how to comply with this performance outcome.	uniform traffic control devices, Part 7: Railway crossings and applicable rail manager standard drawings. Note: It is recommended a traffic impact assessment be prepared to demonstrate compliance with this acceptable outcome. An impact on a level crossing may require an Australian Level Crossing Assessment Model (ALCAM) assessment to be undertaken. Section 2.2 – Railway crossing safety of the Guide to Development in a Transport Environment: Rail, Department of Transport and Main Roads, 2015, provides guidance on how to comply with this acceptable outcome AND	
	AO7.4 Access points achieve sufficient clearance from a level crossing in accordance with AS1742.7 – Manual of uniform traffic control devices, Part 7: Railway crossings by providing a minimum clearance of 5 metres from the edge running rail (outer rail) plus the length of the largest vehicle anticipated on-site. Note: Section 2.2 of the Guide to Development in a Transport Environment: Rail, Department of Transport and Main Roads, 2015, provides guidance on how to comply with this acceptable outcome. AND	
	AO7.5 On-site vehicle circulation is designed to give priority to entering vehicles at all times.	
PO8 Development does not result in a worsening of the infrastructure condition of a railway or rail transport infrastructure.	No acceptable outcome is prescribed.	Not applicable.
PO9 Development does not result in a worsening of operating conditions of a railway	No acceptable outcome is prescribed.	Not applicable.
Stormwater and drainage		
PO10 Development does not result in an actionable nuisance, or worsening of, stormwater, flooding or	No acceptable outcome is prescribed.	Complies PO10

Performance outcomes	Acceptable outcomes	Response
drainage impacts in a state transport corridor or state transport infrastructure.		A stormwater management plan has been prepared which demonstrates that the proposed changes will not result in any further impacts to state transport corridors or state transport infrastructure (refer **Attachment 6 – Stormwater Management Plan**).
PO11 Run-off from the development site is not unlawfully discharged to a state transport corridor or state transport infrastructure.	**AO11.1** Development does not create any new points of discharge to a state transport corridor. AND	Complies AO11.1 No change is proposed to the existing points of discharge.
	AO11.2 Stormwater run-off is discharged to a lawful point of discharge. Note: Section 3.49 of the Queensland Urban Drainage Manual, Institute of Public Works Engineering Australasia (Queensland Division) Fourth Edition, 2016, provides further information on lawful points of discharge. AND	Complies AO11.2 No change is proposed to the existing points of discharge.
	AO11.3 Development does not worsen the condition of an existing lawful point of discharge to a state transport corridor.	Complies AO11.3 No change is proposed to the existing points of discharge.
PO12 Run-off from the development site does not cause siltation of stormwater infrastructure affecting a state transport corridor or state transport infrastructure.	**AO12.1** Run-off from the development site is not discharged to stormwater infrastructure for a state transport corridor.	Complies AO12.1 A stormwater management plan has been prepared which demonstrates that the proposed changes will not result in any further impacts to state transport corridors or state transport infrastructure (refer **Attachment 6 – Stormwater Management Plan**).
Planned upgrades		
PO13 Development does not impede delivery of planned upgrades of state transport infrastructure.	**AO13.1** Development is not located on land identified by the Department of Transport and Main Roads as land required for the planned upgrade of state transport infrastructure. Note: Land required for the planned upgrade of state transport infrastructure is identified in the DA mapping system. OR	Not applicable.

Performance outcomes	Acceptable outcomes	Response
	AO13.2 Development is sited and designed so that permanent buildings, structures, infrastructure, services or utilities are not located on land identified by the Department of Transport and Main Roads as land required for the planned upgrade of state transport infrastructure.	
	OR all of the following acceptable outcomes apply: AO13.3 Structures and infrastructure located on land identified by the Department of Transport and Main Roads as land required for the planned upgrade of state transport infrastructure are able to be readily relocated or removed without materially affecting the viability or functionality of the development. AND	
	AO13.4 Vehicular access for the development is consistent with the function and design of the planned upgrade of state transport infrastructure. AND	
	AO13.5 Development does not involve filling and excavation of, or material changes to, land required for a planned upgrade to a state transport infrastructure. AND	
	AO13.6 Land is able to be reinstated to the predevelopment condition at the completion of the use.	

Table 6.2.3: Public passenger transport infrastructure – table not applicable

State code 22: Environmentally relevant activities

Table 22.2.2: Material change of use

Performance outcomes	Acceptable outcomes	Response
All ERAs		
PO1 Development is suitably located and designed to avoid or mitigate environmental harm to the acoustic environment.	AO1.1 Development meets the acoustic quality objectives for sensitive receptors identified in the Environmental Protection (Noise) Policy 2019.	Complies AO1.1 A Noise Assessment has been undertaken to support this application (refer **Attachment 6 – Noise Assessment**). This assessment confirms that the operation can continue to meet the acoustic objectives identified in the *Environmental Protection (Noise) Policy 2019*. Standard management measures have been included in the Site Based Management Plan (refer **Attachment 11 – Site Based Management Plan**).
PO2 Development is suitably located and designed to avoid or mitigate environmental harm to the air environment.	AO2.1 Development meets the air quality objectives of the Environmental Protection (Air) Policy 2019.	Complies AO2.1 An Air Quality Assessment has been undertaken to support this application (refer **Attachment 7 – Air Quality Assessment**). The assessment confirms that, subject to mitigation measures relating to the management of the site access road, the operation will continue to meet the air quality objectives identified in the *Environmental Protection (Air) Policy 2019*. Standard management measures have been included in the Site Based Management Plan (refer **Attachment 11 – Site Based Management Plan**).
PO3 Development, other than intensive animal industry for poultry farming, is suitably located and designed to avoid or mitigate environmental harm on adjacent sensitive land uses caused by odour.	No acceptable outcome is prescribed.	Complies PO3 The activity will not produce odour emissions.
PO4 Development is suitably located and designed to avoid or mitigate environmental harm to the receiving waters environment.	AO4.1 Development meets the management intent, water quality guidelines and objectives of the Environmental Protection (Water and Wetland Biodiversity) Policy 2019.	Complies AO4.1 The Site Based Management Plan includes management measures to ensure the quarry continues to meet the water quality guidelines and

Performance outcomes	Acceptable outcomes	Response
		objectives in the *Environmental Protection (Water and Wetland Biodiversity) Policy 2019* (refer **Attachment 11 – Site Based Management Plan**).
PO5 Development is designed to include elements which: 1. prevent or minimise the production of hazardous contaminants and waste as by-products; or 2. contain and treat hazardous contaminants on-site rather than releasing them into the environment; and 3. provide secondary containment to prevent the accidental release of hazardous contaminants to the environment from spillage or leaks.	No acceptable outcome is prescribed.	Complies PO5 A Hydrocarbons and Chemical Management Plan is included in the Site Based Management Plan (refer **Attachment 11 – Site Based Management Plan**). The purpose of this management plan is to ensure the activity is operated in a way that protects the environmental values of land, air and water including soils, subsoils, landforms and associated flora and fauna.
PO6 Environmentally hazardous materials located on site are stored to avoid or minimise their release into the environment due to inundation during flood events.	No acceptable outcome is prescribed.	Complies PO6 Refer to response to PO5 above.
All development – matters of environmental significance		
PO7 Development: 1. avoids impacts on matters of state environmental significance; or 2. minimises and mitigates impacts on matters of state environmental significance after demonstrating avoidance is not reasonably possible; and 3. provides an offset if, after demonstrating all reasonable avoidance, minimisation and mitigation measures are undertaken, the development results in an acceptable significant residual impact on a matter of state environmental significance. Statutory note: For Brisbane core port land, an offset may only be applied to development on land identified as E1 Conservation/Buffer, E2 Open Space	No acceptable outcome is prescribed.	Complies PO7 Extractive resources are both finite in extent and fixed in location as a result of fortuitous geological events. Disturbance of the area cannot be avoided by virtue of deposit location, however clearing can be minimised. Permanent site infrastructure and access road for the quarry exist on site and are proposed to remain unchanged as a result of the extension to the quarry footprint. The extension to the quarry footprint is necessary to extract the suitable quarry rock material. An ecological assessment was undertaken to identify whether any significant residual impact to matters of state environmental significance occur as a result of the proposed Extractive Industry operation (refer **Attachment 9 – Ecological Assessment**). The report

Performance outcomes	Acceptable outcomes	Response
or Buffer/Investigation in the Brisbane Port LUP precinct plan. For the Brisbane Port LUP, see www.portbris.com.au. Note: Guidance for determining if the development will have a significant residual impact on a matter of state environmental significance is provided in the Significant Residual Impact Guideline, Department of State Development, Infrastructure and Planning, 2014. Where the significant residual impact is considered an acceptable impact on the matter of state environmental significance and an offset is considered appropriate, the offset should be delivered in accordance with the Environmental Offsets Act 2014.		identifies that three (3) matters for state consideration are: - Clearing within proximity to a mapped watercourse; - Connectivity; and - Squatter Pigeon With regards to clearing within proximity of a mapped watercourse and connectivity, this is regulated by the Department of Resources (**DoR**), who indicated in the pre-lodgement meeting that revegetation works could be appropriate prevent or reduce overall environmental harm and degradation, and the likelihood of an SRI to MSES. This would involve the rehabilitation and legal security of an appropriately sized and located area of vegetation, under the guidance of an approved management plan in further consultation with DoR. With regard to potential impacts to the Squatter Pigeon, it is noted that none of the protect wildlife habitat mapped by the State will be impacted. However, the Squatter Pigeon was confirmed to occur on the site, such that protected wildlife habitat for this species is confirmed as occurring on the site. In this instance, the lower-lying areas of the site have been historically cleared for grazing ad current comprise mainly regrowth and no-remnant vegetation with sparser canopy cover, which has in turn resulted in the remnant vegetation areas providing cover for sheltering purposes. Given the long project life of the Extractive Industry operation, it is proposed that further confirmation of the extent of the impact to the Squatter Pigeon be undertaken prior to the impact occurring.

Performance outcomes	Acceptable outcomes	Response
		Revegetation work undertaken to prevent or reduce overall environmental harm and degradation, and the likelihood of an SRI to MSES, including protected wildlife habitat for Squatter pigeon, will be undertaken in accordance with an approved management plan in consultation with DES. Progressive clearing and management of retained vegetation will occur as set out in the Site Based Management Plan (refer **Attachment 11 – Site Based Management Plan**). Stormwater and sediment controls will limit impacts outside of the quarry footprint, in particular in the context of the ongoing agricultural activities.
Category C areas and category R areas of vegetation		
PO8 Development: 1. avoids impacts on category C areas of vegetation and category R areas of vegetation; or 2. minimises and mitigates impacts on category C areas and category R areas of vegetation after demonstrating avoidance is not reasonably possible.	No acceptable outcome is prescribed.	Complies PO8 Pit 2 includes areas mapped as regrowth vegetation under the Vegetation Management Act. Clearing of these areas is prohibited under the Planning Act, unless clearing occurs in accordance with an exemption or a relevant Accepted Development Vegetation Clearing Code (**ADVCC**). Detailed quarry development will ensure any clearing of regrowth vegetation achieves a relevant exemption or compliance with the requirements of the ADVCC.
Intensive animal industry – poultry farming (ERA 4(2))		
PO9 Poultry farming development (where farming more than 200,000 birds) is suitably located and designed to avoid or mitigate environmental harm on adjacent sensitive land uses caused by odour.	AO9.1 For poultry farming involving 300,000 birds or less, development meets the separation distances as determined using the S-factor methodology to: 1. a sensitive land use in a rural zone; and 2. boundary of a non-rural zone. OR	Not Applicable The application does not involve intensive animal industry.
	AO9.2 Development meets the separation distances as determined by odour modelling using the following criteria: 1. 2.5 odour units, 99.5 percent, 1 hour average for a sensitive land use in a rural zone; or	

Performance outcomes	Acceptable outcomes	Response
	2. 1.0 odour units, 99.5 percent, 1 hour average for the boundary of a non-rural zone. Statutory note: Guidance for determining if the development will cause environmental harm caused by odour is provided in the Development of Meat Chicken Farms in Queensland, Department of Agriculture and Fisheries, 2016 and the Guideline – Odour Impact Assessment from Developments, Department of Environment and Heritage Protection, 2013.	

Author: David Lin
Ref number: 2021/004311

Queensland Government

Department of **Resources**

23 December 2021

Hopkins Brothers Group Pty Ltd
C/- Megan Benham
Groundwork Plus Pty Ltd
PO Box 1779
Milton BC QLD 4064

Dear Ms Benham

Application for a Relevant Purpose determination under section 22A of the *Vegetation Management Act 1999* for the clearing of native vegetation on lot/s 931 LIV40265 & 705 LIV40367 & 2,725 RP888747 & 1,2 SP247721 - Rockhampton Regional Council.

I refer to your application submitted to the Department of Resources (the department) on 19 November 2021.

As delegate for the Chief Executive, I have considered your request and am satisfied that the proposed development to clear vegetation for the purpose of Extractive Industry meets the relevant requirements of section 22A of the *Vegetation Management Act 1999*. The area determined to be for a relevant purpose is shown as *Proposed Extraction Area* on the attached submitted plan *Proposed Quarry 2607.DRG.004 Rev 2 by Groundwork Plus dated 19/11/2021*.

Should your proposal change (eg. development footprint) or circumstances associated with your proposal change (eg. legislation changes, regional ecosystem mapping changes), you will need to request another section 22A relevant purpose determination.

This relevant purpose determination is valid for two years and will expire on 22 December 2023.

Please note that this letter is not a development approval to carry out vegetation clearing. You will need to apply for a development approval from the Department of State Development, Infrastructure, Local Government and Planning (DSDILGP) under the *Planning Act 2016.*

Please note, clearing vegetation to the extent the clearing is in any category C areas or category R areas is not for a relevant purpose under the *Vegetation Management Act 1999*. Accordingly clearing of vegetation in these areas cannot be approved under a development approval. If your proposed development includes clearing vegetation in any category C areas or category R areas you should ensure this clearing can be undertaken as exempt clearing work or in accordance with an Accepted Development Vegetation Clearing Code (ADVCC). Clearing vegetation in any category C areas or category R areas that is not exempt or in accordance with an ADVCC is prohibited development. Information on exempt clearing work or ADVCCs is available online at www.qld.gov.au (search ‘exempt clearing work’ or ‘accepted development vegetation clearing codes’).

Other relevant Commonwealth or State approvals may also be required to undertake vegetation clearing. An indicative list of other legislation is provided in Attachment 1.

Should you require any additional information please contact your local SARA office as below:

SARA Fitzroy and Central Queensland Office

Location:	Level 2, 209 Bolsover Street, Rockhampton
Postal address:	PO Box 113, Rockhampton Qld 4700
Telephone:	07 4924 2913
Email:	RockhamptonSARA@dsdilgp.qld.gov.au

Should you have any enquiries or require assistance regarding this request, please do not hesitate to contact Mr. David Lin, Natural Resource Management Officer of the department on telephone 07 4999 6981 quoting the above reference number.

Yours sincerely



Andrew Collins
Senior Natural Resource Management Officer

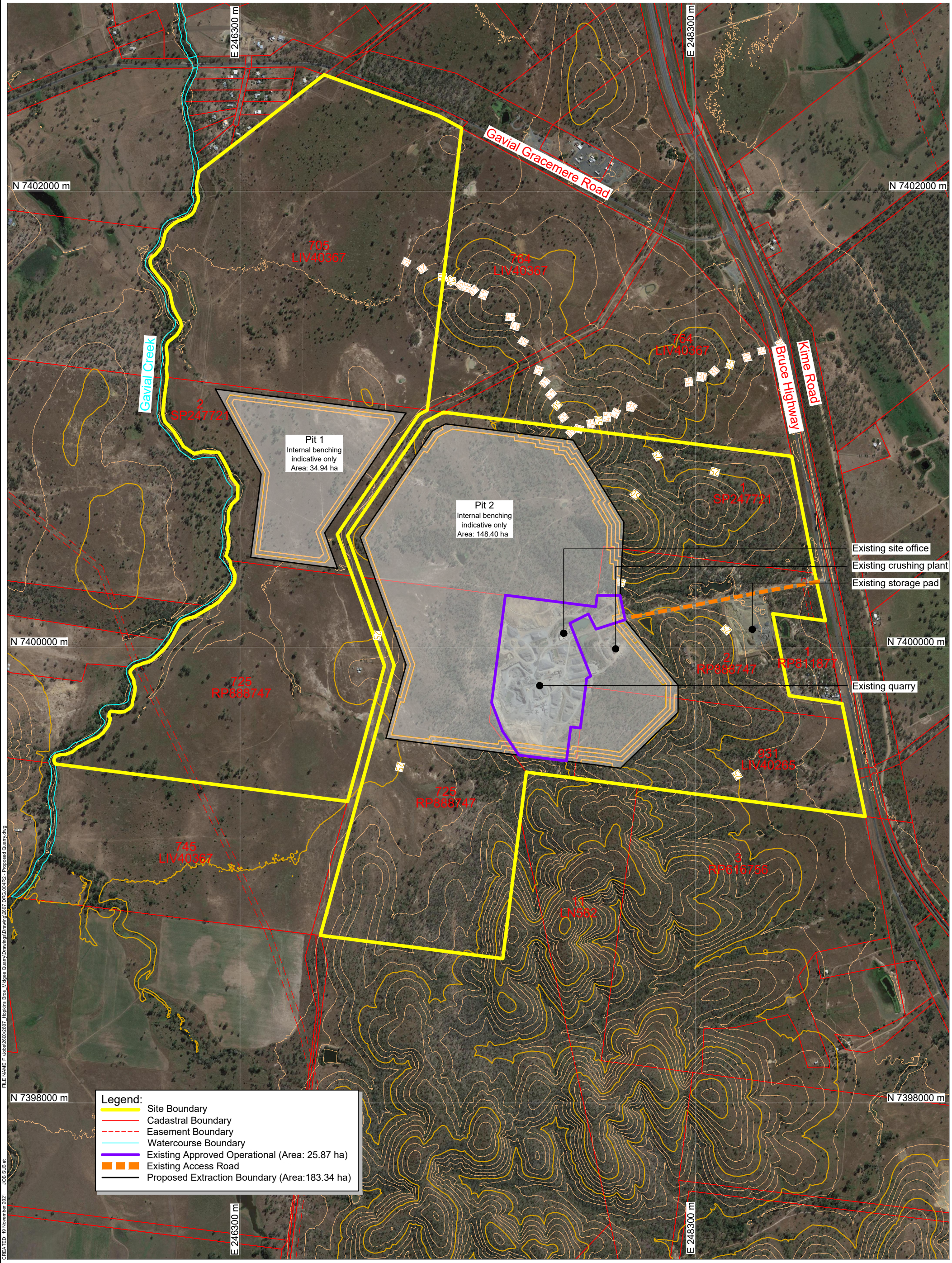
Attachment 1 - Legislation and Acts

Activity	Legislation	Agency	Contact details
Interference with overland flow	*Water Act 2000*	Department of Regional Development, Manufacturing and Water (Queensland Government)	Ph: 13 QGOV (13 74 68) www.dnrme.qld.gov.au
Earthworks, significant disturbance	*Soil Conservation Act 1986*	Department of Resources (Queensland Government)	Ph: 13 QGOV (13 74 68) www.resources.qld.gov.au
Indigenous Cultural Heritage	*Aboriginal Cultural Heritage Act 2003* *Torres Strait Islander Cultural Heritage Act 2003*	Department of Seniors, Disability Services and Aboriginal and Torres Strait Islander Partnerships (Queensland Government)	Ph. 13 QGOV (13 74 68) www.datsip.qld.gov.au
Mining and environmentally relevant activities Infrastructure development (coastal) Heritage issues Protected plants and protected areas[1]	*Environmental Protection Act 1994* *Coastal Protection and Management Act 1995* *Queensland Heritage Act 1992* *Nature Conservation Act 1992*	Department of Environment and Science (Queensland Government)	Ph: 13 QGOV (13 74 68) www.des.qld.gov.au
Interference with fish passage in a watercourse, mangroves Forest activities	*Fisheries Act 1994* *Forestry Act 1959*[2]	Department of Agriculture and Fisheries (Queensland Government)	Ph: 13 25 23 www.daf.qld.gov.au
Matters of National Environmental Significance including listed threatened species & ecological communities	*Environment Protection and Biodiversity Conservation Act 1999*	Department of the Environment, (Australian Government)	Ph: 1800 803 772 www.environment.gov.au
Development and planning processes	*Planning Act 2016* *State Development and Public Works Organisation Act 1971*	Department of State Development, Infrastructure, Local Government and Planning (Queensland Government)	Ph: 13 QGOV (13 74 68) www.dsdmip.qld.gov.au
Local government requirements	*Local Government Act 2009* *Planning Act 2016*	Your relevant local government office	

[1] In Queensland, all plants that are native to Australia are protected plants under the *Nature Conservation Act 1992,* which endeavours to ensure that protected plants (whether whole plants or protected plants parts) are not illegally removed from the wild, or illegally traded. Prior to ***clearing***, you should check the flora survey trigger map to determine if the ***clearing*** is within a high-risk area by visiting For further information or assistance on the protected plants flora survey trigger map for your property, contact the Department of Environment and Science on 13QGOV (13 74 68) or email palm@des.qld.gov.au

[2] Contact the Department of Agriculture and Fisheries before ***clearing:***

- Any sandalwood on state-owned land (including leasehold land)
- On freehold land in a 'forest consent area'
- More than five hectares on state-owned land (including leasehold land) containing commercial timber species listed in parts 2 or 3 of Schedule 6 of the Vegetation Management Regulation 2012 and located within any of the following local government management areas–Banana, Bundaberg Regional, Fraser Coast Regional, Gladstone Regional, Isaac Regional, North Burnett Regional, Somerset Regional, South Burnett Regional, Southern Downs Regional, Tablelands Regional, Toowoomba Regional, Western Downs Regional.



FILE NAME: F:\Jobs\2600\2607 Hopkins Bros_Midgee Quarry\Drawings\Drawing\2607.DRG.004R2 - Proposed Quarry.dwg
JOB SUB #:
CREATED: 19 November 2021

REV	DESCRIPTION	DATE	BY
1	Extend Footprint East	16-09-2021	JHV
2	Site Access Road deleted	19-11-2021	MR

Data Sources:
Photography: © 2021 Microsoft Corporation; © 2021 Maxar; © CNES (2021) Distribution Airbus DS
Topography: © Commonwealth of Australia (Geoscience Australia) 2015, LiDAR 5m
Cadastre: © The State of Queensland (Department of Resources) 2021
Ecosystem:
Other:

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PROJECT: Midgee Quarry

CLIENT: Hopkins Brothers

TITLE: Proposed Quarry

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SCALE: 1:15,000 When Printed On A3 — 0 — 300m
DRAWING NUMBER: 2607.DRG.004
REVISION: 2
DATE: 19 November 2021 | DRAWN: JHV
PRINTED: 19 November 2021 | CHECKED: JT
DATUM: HORIZONTAL / VERTICAL / ZONE
GDA94 / MGA / AHD / 56

Proposed Clearing Area Setout Points		
ID	Latitude	Longitude
1	S23° 29' 33.81"	E150° 32' 04.78"
2	S23° 29' 35.76"	E150° 32' 04.75"
3	S23° 29' 43.59"	E150° 31' 55.73"
4	S23° 29' 42.65"	E150° 31' 48.85"
5	S23° 29' 44.86"	E150° 31' 48.50"
6	S23° 29' 43.93"	E150° 31' 41.15"
7	S23° 29' 41.36"	E150° 31' 39.17"
8	S23° 29' 39.75"	E150° 31' 27.16"
9	S23° 29' 37.60"	E150° 31' 24.81"
10	S23° 29' 34.29"	E150° 31' 22.27"
11	S23° 29' 27.76"	E150° 31' 21.92"
12	S23° 29' 26.46"	E150° 31' 22.89"
13	S23° 29' 26.92"	E150° 31' 24.30"
14	S23° 29' 30.80"	E150° 31' 25.39"
15	S23° 29' 31.78"	E150° 31' 27.42"
16	S23° 29' 34.63"	E150° 31' 30.52"
17	S23° 29' 32.93"	E150° 31' 35.64"
18	S23° 29' 31.94"	E150° 31' 39.14"

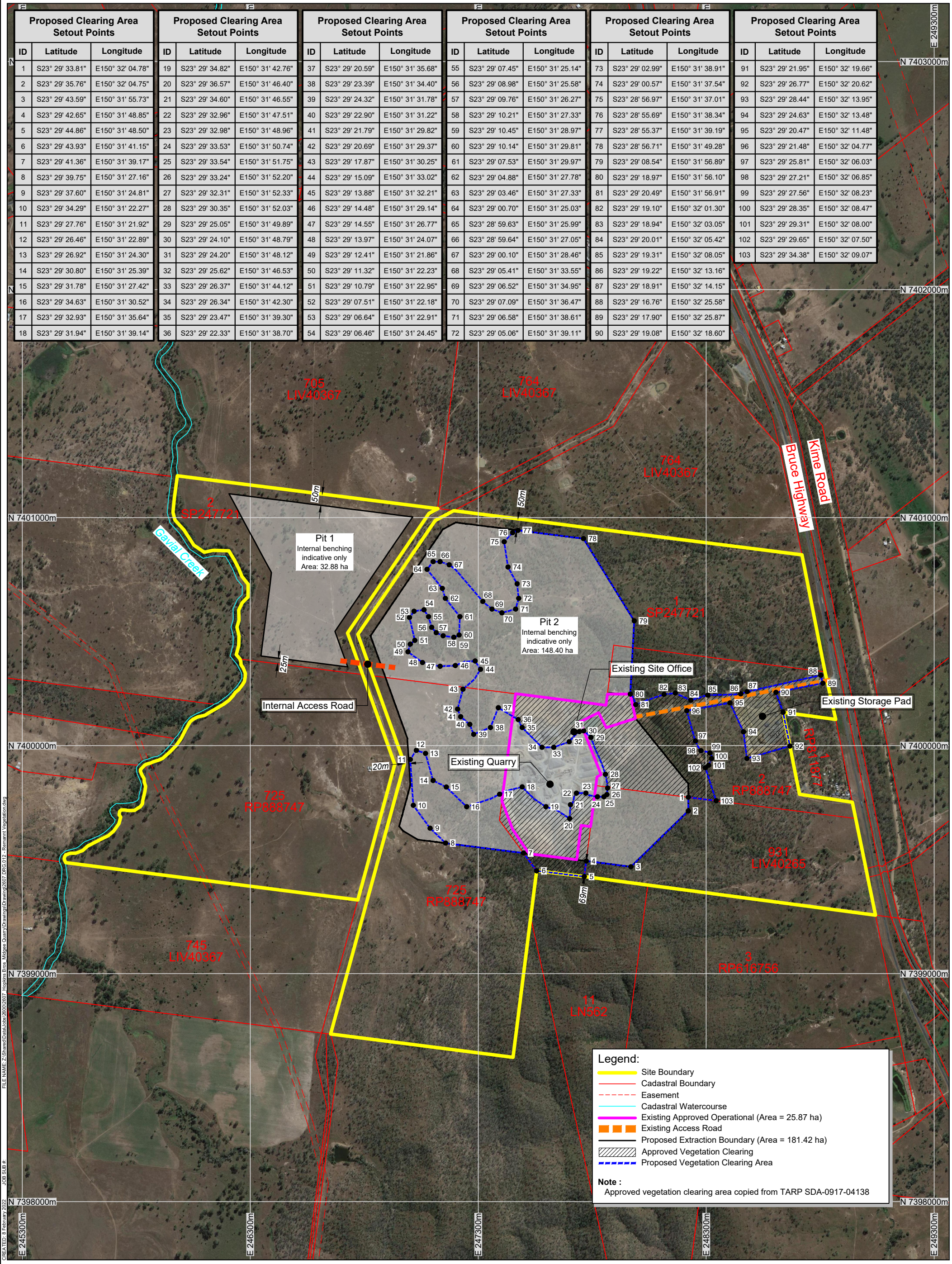
Proposed Clearing Area Setout Points		
ID	Latitude	Longitude
19	S23° 29' 34.82"	E150° 31' 42.76"
20	S23° 29' 36.57"	E150° 31' 46.40"
21	S23° 29' 34.60"	E150° 31' 46.55"
22	S23° 29' 32.96"	E150° 31' 47.51"
23	S23° 29' 32.98"	E150° 31' 48.96"
24	S23° 29' 33.53"	E150° 31' 50.74"
25	S23° 29' 33.54"	E150° 31' 51.75"
26	S23° 29' 33.24"	E150° 31' 52.20"
27	S23° 29' 32.31"	E150° 31' 52.33"
28	S23° 29' 30.35"	E150° 31' 52.03"
29	S23° 29' 25.05"	E150° 31' 49.89"
30	S23° 29' 24.10"	E150° 31' 48.79"
31	S23° 29' 24.20"	E150° 31' 48.12"
32	S23° 29' 25.62"	E150° 31' 46.53"
33	S23° 29' 26.37"	E150° 31' 44.12"
34	S23° 29' 26.34"	E150° 31' 42.30"
35	S23° 29' 23.47"	E150° 31' 39.30"
36	S23° 29' 22.33"	E150° 31' 38.70"

Proposed Clearing Area Setout Points		
ID	Latitude	Longitude
37	S23° 29' 20.59"	E150° 31' 35.68"
38	S23° 29' 23.39"	E150° 31' 34.40"
39	S23° 29' 24.32"	E150° 31' 31.78"
40	S23° 29' 22.90"	E150° 31' 31.22"
41	S23° 29' 21.79"	E150° 31' 29.82"
42	S23° 29' 20.69"	E150° 31' 29.37"
43	S23° 29' 17.87"	E150° 31' 30.25"
44	S23° 29' 15.09"	E150° 31' 33.02"
45	S23° 29' 13.88"	E150° 31' 32.21"
46	S23° 29' 14.48"	E150° 31' 29.14"
47	S23° 29' 14.55"	E150° 31' 26.77"
48	S23° 29' 13.97"	E150° 31' 24.07"
49	S23° 29' 12.41"	E150° 31' 21.86"
50	S23° 29' 11.32"	E150° 31' 22.23"
51	S23° 29' 10.79"	E150° 31' 22.95"
52	S23° 29' 07.51"	E150° 31' 22.18"
53	S23° 29' 06.64"	E150° 31' 22.91"
54	S23° 29' 06.46"	E150° 31' 24.45"

Proposed Clearing Area Setout Points		
ID	Latitude	Longitude
55	S23° 29' 07.45"	E150° 31' 25.14"
56	S23° 29' 08.98"	E150° 31' 25.58"
57	S23° 29' 09.76"	E150° 31' 26.27"
58	S23° 29' 10.21"	E150° 31' 27.33"
59	S23° 29' 10.45"	E150° 31' 28.97"
60	S23° 29' 10.14"	E150° 31' 29.81"
61	S23° 29' 07.53"	E150° 31' 29.97"
62	S23° 29' 04.88"	E150° 31' 27.78"
63	S23° 29' 03.46"	E150° 31' 27.33"
64	S23° 29' 00.70"	E150° 31' 25.03"
65	S23° 28' 59.63"	E150° 31' 25.99"
66	S23° 28' 59.64"	E150° 31' 27.05"
67	S23° 29' 00.10"	E150° 31' 28.46"
68	S23° 29' 05.41"	E150° 31' 33.55"
69	S23° 29' 06.52"	E150° 31' 34.95"
70	S23° 29' 07.09"	E150° 31' 36.47"
71	S23° 29' 06.58"	E150° 31' 38.61"
72	S23° 29' 05.06"	E150° 31' 39.11"

Proposed Clearing Area Setout Points		
ID	Latitude	Longitude
73	S23° 29' 02.99"	E150° 31' 38.91"
74	S23° 29' 00.57"	E150° 31' 37.54"
75	S23° 28' 56.97"	E150° 31' 37.01"
76	S23° 28' 55.69"	E150° 31' 38.34"
77	S23° 28' 55.37"	E150° 31' 39.19"
78	S23° 28' 56.71"	E150° 31' 49.28"
79	S23° 29' 08.54"	E150° 31' 56.89"
80	S23° 29' 18.97"	E150° 31' 56.10"
81	S23° 29' 20.49"	E150° 31' 56.91"
82	S23° 29' 19.10"	E150° 32' 01.30"
83	S23° 29' 18.94"	E150° 32' 03.05"
84	S23° 29' 20.01"	E150° 32' 05.42"
85	S23° 29' 19.31"	E150° 32' 08.05"
86	S23° 29' 19.22"	E150° 32' 13.16"
87	S23° 29' 18.91"	E150° 32' 14.15"
88	S23° 29' 16.76"	E150° 32' 25.58"
89	S23° 29' 17.90"	E150° 32' 25.87"
90	S23° 29' 19.08"	E150° 32' 18.60"

Proposed Clearing Area Setout Points		
ID	Latitude	Longitude
91	S23° 29' 21.95"	E150° 32' 19.66"
92	S23° 29' 26.77"	E150° 32' 20.62"
93	S23° 29' 28.44"	E150° 32' 13.95"
94	S23° 29' 24.63"	E150° 32' 13.48"
95	S23° 29' 20.47"	E150° 32' 11.48"
96	S23° 29' 21.48"	E150° 32' 04.77"
97	S23° 29' 25.81"	E150° 32' 06.03"
98	S23° 29' 27.21"	E150° 32' 06.85"
99	S23° 29' 27.56"	E150° 32' 08.23"
100	S23° 29' 28.35"	E150° 32' 08.47"
101	S23° 29' 29.31"	E150° 32' 08.00"
102	S23° 29' 29.65"	E150° 32' 07.50"
103	S23° 29' 34.38"	E150° 32' 09.07"



Legend:

- Site Boundary
- Cadastral Boundary
- Easement
- Cadastral Watercourse
- Existing Approved Operational (Area = 25.87 ha)
- Existing Access Road
- Proposed Extraction Boundary (Area = 181.42 ha)
- Approved Vegetation Clearing
- Proposed Vegetation Clearing Area

Note :
Approved vegetation clearing area copied from TARP SDA-0917-04138

FILE NAME: Z:\Shared\Data\Jobs\2600\2607 Hopkins Bros Midgee Quarry\Drawings\Drawings\2607.DRG.012 - Remnant Vegetation.dwg
JOB SUB #:
CREATED: 8 February 2022

REV	DESCRIPTION	DATE	BY

Data Sources:
Photography: © 2021 Microsoft Corporation; © 2021 Maxar; © CNES (2021) Distribution Airbus DS
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PROJECT: Midgee Quarry

CLIENT: Hopkins Brothers

TITLE: Remnant Vegatation

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SCALE: 1:15,000 When Printed On A3 — 0 — 300m

DRAWING NUMBER: 2607.DRG.012

REVISION:

DATE: 8 February 2022 | DRAWN: JHV | DATUM: HORIZONTAL / VERTICAL / ZONE

PRINTED: 8 February 2022 | CHECKED: JT | GDA94 / MGA / AHD / 56

Queensland Government

SARA reference: 2112-26488 SPL
Applicant reference: 2607.300.001

20 December 2021

Hopkins Brothers Group Pty Ltd
c/o Groundwork Plus Pty Ltd
6 Mayneview Street
MILTON QLD 4064
planning@groundwork.com.au

Attention: Megan Benham

Dear Madam

SARA Pre-lodgement advice - 1 Bruce Highway, Midgee; Bruce Highway, Bouldercombe

I refer to your pre-lodgement request received on 13 December 2021 in which you sought pre-lodgement advice from the State Assessment and Referral Agency (SARA) regarding the proposed development at the above address. This notice provides advice on aspects of the proposal that are of relevance to SARA.

SARA's understanding of the project

The applicant has requested the removal of a green (low impact) waterway, which traverses Lot 1 on SP247721 and Lot 725 on RP888747, from the *Queensland waterways for waterway barrier works* spatial data layer. An assessment of the physical and hydrological attributes of the mapped attribute has confirmed that the waterway does not have the corresponding features that define a waterway to support fish passage.

Supporting information

The advice in this letter is based on the following documentation that was submitted with the pre-lodgement request.

Drawing/report title	Prepared by	Date
Request to Amend Department of Agriculture and Fisheries Waterway map for Waterway Barrier	Groundwork Plus Pty Ltd	13 December 2021

Fitzroy/Central regional office
Level 2, 209 Bolsover Street,
Rockhampton
PO Box 113, Rockhampton QLD 4700

Works by removing a green (low impact waterway on land described as Lot 1 on SP247721 and Lot 725 on RP888747		

Pre-lodgement advice

The following advice outlines the aspects of the proposal that are of relevance to SARA.

Key matters and action items	
1.	*Waterway determination* • The green (low impact) waterway traversing Lot 1 on SP247721 and Lot 725 on RP888747 (the subject site) is not considered to be a waterway providing for fish passage, based on the following reasons: - no evidence of continuous defined bed and banks - no evidence of an extended period of flow - no evidence of flow adequacy - limited evidence of fish habitat within (small dam) and no evidence of fish habitat up or downstream along the waterway - lack of connectivity throughout the feature. • Schedule 10, Part 6, Division 4, Subdivision 2 of the Planning Regulation 2017, relating to operational work that is constructing or raising waterway barrier works (the trigger) will not apply to works occurring in the green (low impact) waterway traversing the subject site. • An amendment to the Queensland waterways for waterway barrier works spatial data layer will be considered in any future updates to reflect this determination. • The trigger will apply for works within other waterways providing for fish passage located within the subject site.

This advice outlines aspects of the proposed development that are relevant from the jurisdiction of SARA. This advice is provided in good faith and is:

- based on the material and information provided to SARA
- current at the time of issue
- not applicable if the proposal is changed from that which formed the basis of this advice.

This advice does not constitute an approval or an endorsement that SARA supports the development proposal. Additional information may be required to allow SARA to properly assess the development proposal when a formal application has been lodged.

If you require further information please contact Thomas Gardiner, Principal Planning Officer, on (07) 4924 2916 or via email RockhamptonSARA@dsdilgp.qld.gov.au who will be pleased to assist.

Yours sincerely



Anthony Walsh
Manager Planning

Development details	
Proposal:	Removal of a green (low impact) waterway
Street address:	1 Bruce Highway, Midgee; Bruce Highway, Bouldercombe
Real property description:	Lot 1 on SP247721 and Lot 725 on RP888747
SARA role:	Not applicable
Assessment Manager:	Not applicable
Assessment criteria:	Nil
Existing use:	Nil
Relevant site history:	Nil

Megan Benham

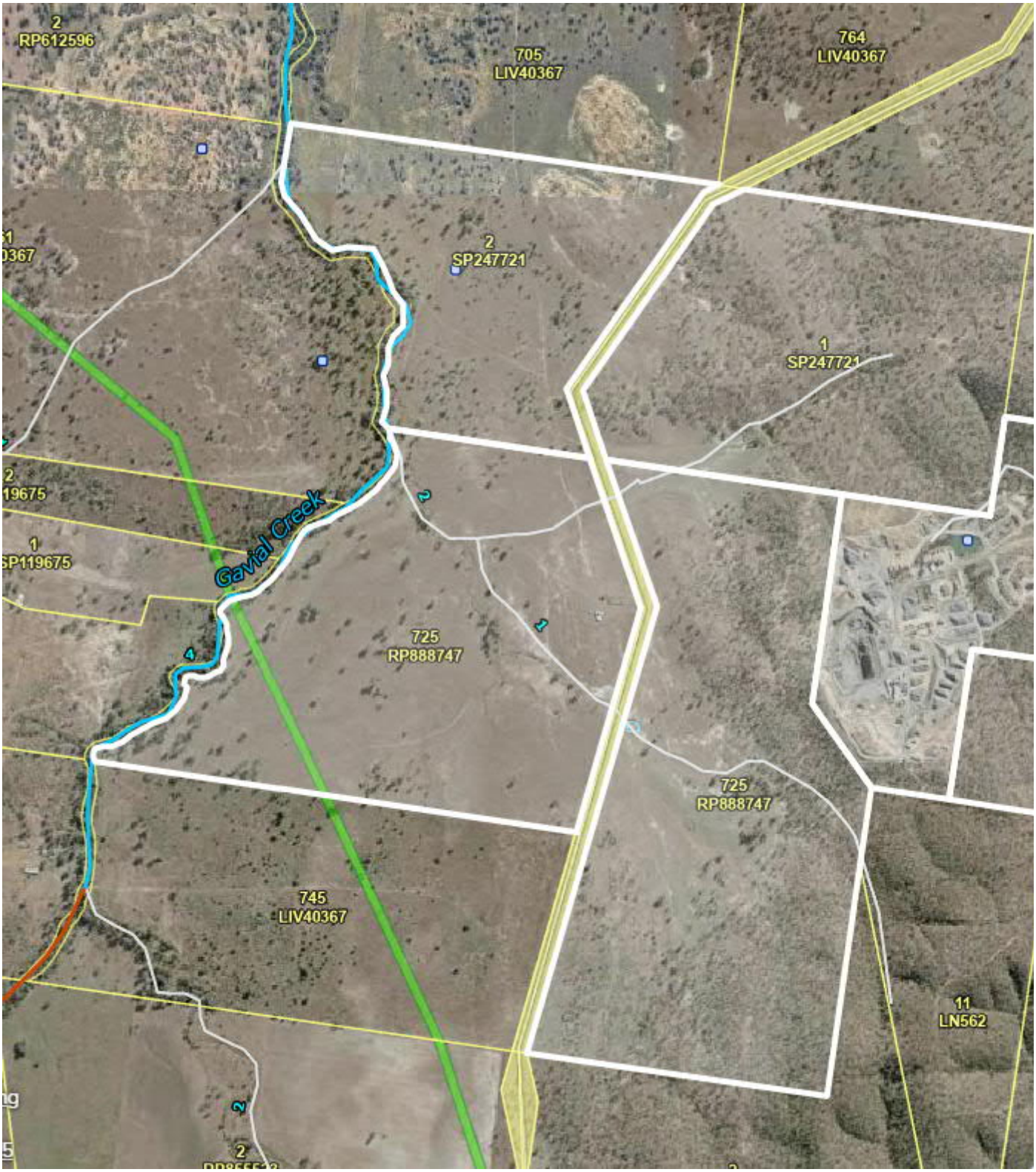
From: Tammy Kennedy <Tammy.Kennedy@rdmw.qld.gov.au>
Sent: Wednesday, 1 December 2021 4:51 PM
To: Megan Benham
Subject: 2607_EMI_211201_Tammy Kennedy_Watercourse Determination Request - Midgee, Rockhampton

Categories: Email saved

Hi Megan

Thanks for your request for a watercourse determination on Unnamed Tributaries of Gavial Creek (Lots 725RP888747 and 1SP247721) and Serpentine Creek (Lots 1SP247721 and 2RP888747).

I can confirm the features as indicated in the map provided in your email exhibit characteristics of a drainage feature as defined in the *Water Act 2000* (the Act) and are therefore determined to be drainage features for the purposes of the Act.



If you require any further information please don't hesitate to contact me.

Kind regards

From: Water Services South <WaterServicesSouth@rdmw.qld.gov.au>
Sent: Friday, 12 November 2021 1:03 PM
To: Central Water Services
Cc: mbenham@groundwork.com.au
Subject: FW: Watercourse Determination Request - Midgee, Rockhampton

Good afternoon Central

The Below Request Is within your area of management.

Regards

Deborah Muller
Water Officer
Water Service South | South Region
Department of Regional Development, Manufacturing & Water

P: 1800 994 188
E: waterservicessouth@rdmw.qld.gov.au
A: GPO Box 2247, Brisbane, Qld 4001
W: www.rdmw.qld.gov.au

From: Megan Benham <mbenham@groundwork.com.au>
Sent: Friday, 12 November 2021 12:58 PM
To: Water Services South
Cc: John Taylor
Subject: Watercourse Determination Request - Midgee, Rockhampton

GW+ Ref: 2607

Good afternoon,

We are seeking a Watercourse Determination to determine the value of the mapped features on Lot 2 RP888747, Lot 931 LIV40265, Lot 725 RP888747, Lot 1 SP247721 and Lot 2 SP247721.

With the exception of Gavial Creek, a number of 'yet to be mapped' features are identified on the Watercourse Identification Map (refer attached).

We are of the view that the yet to be mapped features achieve the definition of a 'drainage features' under the *Water Act 2000*, being natural landscape features, including a gullies, drains, drainage depressions or other erosion features.

We would appreciate if you could please confirm this position?

Please contact me on the details below should you require any further information.

Kind regards,
Megan

Megan Benham | Senior Town Planning Consultant

GROUNDWORK plus

P:1800 GW PLUS (1800 497 587) F: +61 7 3367 3317
E: mbenham@groundwork.com.au W: groundwork.com.au
6 Mayneview St, Milton QLD 4064 | PO Box 1779, Milton Qld 4064
We're working with you Australia-wide: QLD/NSW | SA/WA/NT | VIC/TAS

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Rural Zone Code

Performance outcomes	Acceptable outcomes	Compliance	Comments
Where involving a new building or expansion to an existing building			
Built form			
PO1 Development does not adversely impact on the rural character of the locality, having regard to the scale and visibility of buildings.	**AO1.1** The height of new buildings and structures does not exceed two (2) storeys and ten (10) metres above ground level, excluding silos, windmills and similar structures ancillary to rural uses. Note—Building heights on the airport obstacle limitation surface map OM-2A prevail over building heights detailed in the zone codes.	**NA**	No new buildings or structures are proposed.
Aquaculture			
PO2 Aquaculture that is low impact in nature is located and designed on sites of sufficient size and dimension, to minimise adverse impacts on the amenity, water quality and ecological values.	**AO2.2**1 Aquaculture activities using ponds or tanks that are less than or equal to ten (10) hectares in total water surface area are carried out in accordance with the Department of Agriculture and Fisheries accepted development requirements for material change of use that is aquaculture, as updated from time to time.	**NA**	The proposed development is not for aquaculture.
Dwelling house and dwelling unit			
PO3 Development does not compromise the continued operation of an intensive animal industry, extractive industry, or a similar potential use on neighbouring rural land.	**AO3.1** Development: (a) is set back a minimum of twenty (20) metres from all site boundaries; and (b) is separated from an existing or approved: (i) intensive animal industry by a minimum of 1,000 metres; and (ii) extractive industry operation as	**NA**	The proposed development is not for a dwelling house or dwelling unit.

<table>
<tr><th>Performance outcomes</th><th>Acceptable outcomes</th><th>Compliance</th><th>Comments</th></tr>
<tr><td></td><td>follows:<table><tr><th>Operation</th><th>Separation distance</th></tr><tr><td>Extractive industry operation involving blasting</td><td>1,000 metres</td></tr><tr><td>A hard rock extractive industry</td><td>500 metres</td></tr><tr><td>A sand and gravel extractive industry</td><td>200 metres</td></tr><tr><td>A designated haul route</td><td>100 metres</td></tr></table></td><td></td><td></td></tr>
<tr><td></td><td>AND

AO3.2
Where a secondary dwelling is proposed, that dwelling:
(a) is contained within the same lot; and
(b) is no more than eighty (80) square metres gross floor area.</td><td>NA</td><td>Refer to response AO3.1 above.</td></tr>
<tr><td>PO4
Dwellings have adequate access to services to ensure the safety and well-being of residents and the water supply is adequate for the current and future needs of the development.</td><td>AO4.1
A dwelling:
(a) has a legal access to a constructed road; and
(b) where within a water supply area has a legal connection to Council's reticulated water supply.

Editor's note—A constructed road can be sealed, graded or gravel.</td><td>NA</td><td>Refer to response AO3.1 above.</td></tr>
</table>

Performance outcomes	Acceptable outcomes	Compliance	Comments
	Editor's note—Where development is located outside of the water supply area refer to the requirements under the Plumbing Code of Australia.		
Caretaker's accommodation			
PO5 The development does not compromise the productivity of the use.	**AO5.1** No more than one (1) caretaker's accommodation is established on the site.	**NA**	No caretaker's accommodation is proposed.
PO6 A caretaker's accommodation has adequate access to services to ensure the safety and well-being of residents and the water supply is adequate for the current and future needs of the development.	**AO6.1** A caretaker's accommodation: (a) has a legal access to a constructed road; and (b) where within a water supply area has a legal connection to Council's reticulated water supply. Editor's note—A constructed road can be sealed, graded or gravel. Editor's note—Where development is located outside of the water supply area refer to the requirements under the Plumbing Code of Australia.	**NA**	Refer to response AO5.1 above.
Home-based business			
PO7 Development for a home-based business is operated, designed and sited in a manner that: (a) is an appropriate scale and intensity; (b) is integrated with the primary use of the site for a dwelling house; (c) does not adversely affect the safety and private recreation needs of adjoining premises; (d) does not adversely affect	**AO7.1** The home-based business has a maximum gross floor area of 100 square metres. **AND**	**NA**	The proposed development does not include a home-based business.
	AO7.2 The home-based business is carried out within an existing building or structure. Note—This does not include the parking of vehicles.	**NA**	Refer to response AO7.1 above.

Performance outcomes	Acceptable outcomes	Compliance	Comments
the streetscape and street function; and (e) does not compromise the character and amenity of the surrounding area by way of noise, light, dust, fumes, vibration, odour or storage of potentially hazardous materials.	**AND**		
	AO7.3 Hours of operation are between the hours of 07:00 and 19:00 Monday to Saturday and 08:00 and 19:00 Sunday and public holidays (except for a bed and breakfast accommodation or home-based child care). **AND**	**NA**	Refer to response AO7.1 above.
	AO7.4 The home-based business involves a minimum of one (1) resident of the dwelling. **AND**	**NA**	Refer to response AO7.1 above.
	AO7.5 A maximum of one (1) worker, not residing in the dwelling house, is employed in the home-based business. **AND**	**NA**	Refer to response AO7.1 above.
	AO7.6 The home-based business contains visitor parking within the site. **AND**	**NA**	Refer to response AO7.1 above.
	AO7.7 The home-based business where for bed and breakfast accommodation: 1. the combined total number of guests and permanent residents	**NA**	Refer to response AO7.1 above.

Performance outcomes	Acceptable outcomes	Compliance	Comments
	does not exceed twelve (12) persons at any one time; and 2. guests stay a maximum of fourteen (14) consecutive nights. **AND**		
	AO7.8 Goods or services for sale or hire are not displayed where they are visible from the street frontage or an adjoining residential premise. **AND**	**NA**	Refer to response AO7.1 above.
	AO7.9 No more than one (1) commercial vehicle is associated with the business and the vehicle does not exceed a gross vehicle mass of 4.5 tonnes tare weight unless associated with a home-based business involving heavy vehicles. Editor's note—Refer to provisions under additional outcomes for home-based business involving heavy vehicles. **AND**	**NA**	Refer to response AO7.1 above.
	AO7.10 The home-based business does not generate traffic exceeding ten (10) vehicle trips per day and the trips are not by a vehicle exceeding a gross vehicle mass of 4.5 tonnes tare weight. **AND**	**NA**	Refer to response AO7.1 above.

Performance outcomes	Acceptable outcomes	Compliance	Comments
	AO7.11 Noise levels do not exceed acoustic quality objectives under the *Environmental Protection (Noise) Policy 2008,* as updated from time to time.	**NA**	Refer to response AO7.1 above.
Additional outcomes for home-based business involving heavy vehicles			
PO8 Development does not compromise the character and amenity of the surrounding area by way of noise, light, dust, fumes, vibration, odour or storage of potentially hazardous materials.	**AO8.1** A maximum of two (2) heavy vehicles and two (2) heavy trailers are stored on site at any one time. **AND**	**NA**	Refer to response AO7.1 above.
	AO8.2 Heavy vehicles and heavy trailers: (a) each heavy vehicle or heavy trailer does not exceed a gross vehicle mass of more than 4.5 tonnes; (b) are not started or manoeuvred on site between the hours of 22:00 and 06:00, or left running unattended for any period up to five (5) minutes; (c) if used for the transport of cattle or waste disposal, are stored a minimum of 100 metres away from an adjoining dwelling; and (d) do not have a refrigeration unit running while on-site if within 100 metres of a sensitive land use on an adjoining lot. **AND**	**NA**	Refer to response AO7.1 above.
	AO8.3 The business does not include the loading or unloading of vehicles or storage of goods.	**NA**	Refer to response AO7.1 above.

Performance outcomes	Acceptable outcomes	Compliance	Comments
	AND		
	AO8.4 The site has direct access to a minor urban collector road or higher order road, but not to a state controlled road. **AND**	**NA**	Refer to response AO7.1 above.
	AO8.5 Heavy vehicles are stored onsite and located a minimum distance of: (a) twenty (20) metres from the frontage; and (b) fifteen (15) metres from side and rear boundaries. **AND**	**NA**	Refer to response AO7.1 above.
	AO8.6 Only minor maintenance is carried out on the property and does not involve major body work and mechanical repairs.	**NA**	Refer to response AO7.1 above.
Roadside stall			
PO9 A roadside stall: (a) does not impact on the amenity of adjoining land uses and the surrounding area; (b) does not adversely affect the safety and efficiency of the road network; (c) is ancillary to the farming use conducted on the same site; and (d) sells only fresh produce grown locally.	**AO9.1** Any structure used for a roadside stall: (a) has a maximum floor area of twenty (20) square metres; (b) is located entirely within the property and not on the road reserve; and (c) is set back from any boundary adjoining residential premises a minimum of six (6) metres. **AND**	**NA**	No roadside stalls are proposed.

Performance outcomes	Acceptable outcomes	Compliance	Comments
	AO9.2 Site **access, car parking and storage areas:** (a) are located entirely within the property and not on the road reserve; and (b) use the same driveway as the primary property access. **AND**	**NA**	Refer to response AO9.1 above.
	AO9.3 The roadside stall is associated with a rural use conducted on the same site.	**NA**	Refer to response AO9.1 above.
Rural workers' accommodation			
PO10 The amenity of the rural workers' accommodation is not adversely impacted upon and appropriately separated from intensive rural and industrial uses.	**AO10.1** On-site cabins or dwellings housing workers are sited no closer than 250 metres to intensive rural uses and industrial uses.	**NA**	No rural worker's accommodation is proposed.
PO11 The rural workers' accommodation has adequate access to services to ensure the safety and well-being of occupants and the water supply is adequate for the current and future needs of the development.	**AO11.1** Rural workers' accommodation: (a) has a legal access to a constructed road; and (b) where within a water supply area has a legal connection to Council's reticulated water supply. Editor's note—A constructed road can be sealed, graded or gravel. Editor's note—Where development is located outside of the water supply area refer to the requirements under the Plumbing Code of Australia.	**NA**	Refer to response AO10.1
Effects of development			

Performance outcomes	Acceptable outcomes	Compliance	Comments
PO12 Outdoor lighting maintains the amenity of any adjoining residential zoned premises and does not adversely impact the safety of vehicles or pedestrians on the adjoining streets as a result of light emissions, either directly or by reflection.	**AO12.1** Outdoor lighting is designed, installed and maintained in accordance with the parameters and requirements of the Australian Standard AS 4282 — Control of the obtrusive effects of outdoor lighting, as updated from time to time.	**Complies**	Lighting will be installed and maintained in accordance with the relevant Australian Standards. No objection is held to this being imposed as a condition of development.
Where in the Alton Downs precinct Note—Where acceptable outcomes in this section vary from this code, the precinct based acceptable outcomes take precedence.			
PO13 Residential uses are sufficiently separated from road frontages in order to protect the amenity of residents and to ensure the character of the area is maintained.	**AO13.1** A dwelling house is setback a minimum of six (6) metres from front boundaries. Note—There is no specific setback to any other boundary.	**NA**	The site is not located in the Alton Downs precinct.
General			
PO14 Development that does not involve rural uses: (a) is located on the least productive parts of a site and not on land identified on the agricultural land classification (ALC) overlay maps; (b) does not restrict the ongoing safe and efficient use of nearby rural uses; and (c) is adequately separated or buffered where it is likely to be sensitive to the operational characteristics associated with rural uses, rural industries or extractive industries. Editor's note—Agricultural land classified as Class A or Class B is shown on the agricultural land classification	No acceptable outcome is nominated.	**PO**	This application seeks to extend an existing Extractive Industry operation, securing the businesses' ongoing access to a known hard rock resource. Proposed Pit 1 and a small portion of proposed Pit 2, which is an extension of the existing operation, is identified as ALC. Extraction within proposed Pit 1 is not reliant on proposed Pit 2. An existing internal access/haul road exists between the existing operation and proposed Pit 1. This route will be maintained to transport material from proposed Pit 1 to proposed Pit 2, before being transported via the Bruce Highway access. The quarry footprint will be developed

Performance outcomes	Acceptable outcomes	Compliance	Comments
overlay map OM-13. Editor's note—Applicants should have regard to the State Planning Policy - State Interest Guideline - Agriculture.			progressively, in line with operational needs. Agricultural activities will continue to occur across the site in areas which are not subject to quarry activities. Progressive rehabilitation will also occur to ensure areas are returned to a safe, stable and self-draining state to support a return to agricultural activities. Noise, vibration and air quality assessments have confirmed that the operation can continue to achieve relevant operational criteria, thereby avoiding potential impacts to nearby land. Standard management measures, as detailed in the Site Based Management Plan, will ensure the operation appropriately manages potential impacts to the adjoining land uses (refer **Attachment 11 – Site Based Management Plan**). The internal haulage road will be sealed, in a staged manner, as discussed in the Air Quality Assessment (refer **Attachment 7 – Air Quality Assessment**).
PO15 Uses that require isolation from urban areas are accommodated only where: (a) they cannot be more appropriately located in an industrial or other relevant zone; (b) they can be adequately separated from sensitive land use(s) (whether or not in the rural zone); and (c) potential impacts can be	No acceptable outcome is nominated.	**PO**	Extractive resources are site specific, limited in occurrence by geological conditions and are finite. Extractive industry is not generally appropriate within any other industrial zone and new extractive industry zones are not generally identified in a local government planning scheme. This application seeks to extend an existing

Performance outcomes	Acceptable outcomes	Compliance	Comments
appropriately managed. Editor's note—Applicants seeking approval for intensive animal industries are to refer to State Planning Policy – State Interest Guideline – Agriculture and consult with the relevant state government department prior to the lodgement of a development application. Council may require a study that, amongst other matters, identifies how the development is in accordance with Environmental Protection (Air) Policy 2008 or Environmental Protection (Noise) Policy 2008.			quarry, securing the businesses ongoing access to a known resource. The Site Based Management Plan includes management measures which will ensure the operation continues to operate in a manner which suitably manages any potential impacts to sensitive land uses. The Air Quality Assessment recommends the internal haulage road be sealed where specific limits are exceeded (refer **Attachment 7 – Air Quality Assessment**). As the matters of noise, dust and blasting are regulated by Department of Environment and Science (**DES**) under the Environmental Authority (**EA**) conditions, it is suggested that the 2018 Approval conditions remain appropriate.
PO16 Ecological values, habitat corridors and soil and water quality are protected, having regard to: (a) maximisation of vegetation retention and protection of vegetation from the impacts of development; (b) avoidance of potential for erosion and minimisation of earthworks; (c) retention and protection of natural drainage lines and hydrological regimes; and (d) avoidance of leeching by nutrients,	No acceptable outcome is nominated.	**PO**	Extractive resources are site specific, limited in occurrence by geological conditions and are finite. In this instance, it is not possible to avoid or minimise clearing required while accessing the resource. Revegetation will be undertaken to prevent or reduce loss of environmental values identified a state government level. It is expected that these revegetation outcomes would also mitigate loss of environmental values identified a local level. Vegetation clearing will occur in line with the operational needs and will be confined only to that area necessary to facilitate a working quarry

Performance outcomes	Acceptable outcomes	Compliance	Comments
pesticides or other contaminants, or potential for salinity.			pit. Rehabilitation activities will also occur progressively, returning the land to a safe, stable and self-sustaining landform which can support rural pursuits, or similar. As the matters of water quality and land management are regulated by DES under the EA conditions, it is suggested that the 2018 Approval conditions remain appropriate.
Animal keeping – kennels or catteries			
PO17 Animal keeping (being kennels or catteries) is sited, constructed and managed such that: (a) animals are securely housed; (b) the use does not create a nuisance beyond the site boundaries; and (c) the use does not create adverse environmental impacts.	**AO17.1** Animal keeping (being kennels or catteries) is located on a site having a minimum site area of three (3) hectares. **AND**	**NA**	The proposed development does not involve animal keeping.
	AO17.2 Animal enclosures are set back a minimum of 250 metres from any sensitive land use. **AND**	**NA**	Refer to response AO17.1 above.
	AO17.3 Buildings used for animal keeping are: (a) constructed with impervious reinforced concrete floors; and (b) gravity drained to the effluent collection/treatment point. **AND**	**NA**	Refer to response AO17.1 above.
	AO17.4 Animals are kept in fenced enclosures that are located inside buildings at all times between the	**NA**	Refer to response AO17.1 above.

Performance outcomes	Acceptable outcomes		Compliance	Comments
	hours of 18:00 and 07:00. **AND**			
	AO17.5 A person who is responsible for the supervision of the operation of the development is accommodated on the premises at all times. **AND**		**NA**	Refer to response AO17.1 above.
	AO17.6 Animal enclosures are set back to roads, streets and water resources as follows:		**NA**	Refer to response AO17.1 above.
	Location	Setback		
	Road frontages	50 metres		
	Top bank of creek, river, stream, wetland, edge of well, bore, dam, weir, intake or the like which provides potable water supply to the site or surrounds	100 metres		
	Top bank of dry or perennial gully	30 metres		
Aquaculture				
PO18 Aquaculture is located and designed on sites of sufficient size and dimension, to minimise adverse impacts on the amenity, water quality and ecological values and existing fish habits.	**AO18.1** Aquaculture activities using ponds or tanks that are greater than ten (10) hectares in total water surface area are carried out in accordance with State Planning Policy – State Interest Guideline – Agriculture, as updated from time to time.		**NA**	The proposed development is not for aquaculture.

Performance outcomes	Acceptable outcomes	Compliance	Comments
Bulk landscape supplies, rural industry or wholesale nursery			
PO19 Development is located on sites: (a) of sufficient size, to minimise adverse impacts on the amenity of adjoining land, in particular noise, odour, light and dust emissions; (b) where the operation is within the safe and effective design capacity of the road system; and (c) where the operation does not impact upon water quality.	**AO19.1** A minimum site area of two (2) hectares is required with at least fifteen (15) metre setback from any adjoining premises. **AND**	**NA**	The proposed development is not for bulk landscape supplies, rural industry or a wholesale nursery.
	AO19.2 Sales, storage, handling, packaging and production areas are set back a minimum of: (a) 100 metres from any dwelling on surrounding land; (b) fifty (50) metres from state controlled roads and twenty (20) metres from all other roads; and (c) thirty (30) metres from top bank of creek, river, stream or wetland edge of well, bore, dam, weir, or intake that provides potable water. **AND**	**NA**	Refer to response AO19.1 above.
	AO19.3 Infrastructure and material storage areas are confined to free draining areas and sites on slopes not exceeding ten (10) per cent. **AND**	**NA**	Refer to response AO19.1 above.
	AO19.4 There is direct access to a minor urban collector or higher order road.	**NA**	Refer to response AO19.1 above.

Performance outcomes	Acceptable outcomes	Compliance	Comments
Intensive animal industry			
PO20 Intensive animal industry uses are sited, constructed and managed such that: (a) animals are securely housed; (b) the use does not create a nuisance on adjoining sensitive land use(s); (c) buildings used for intensive animal industry are constructed with floors, that are gravity drained to the effluent collection/treatment point; (d) animal proof fencing or other appropriate barrier feature is provided of an appropriate height within the site to prevent the escape of animals; and (e) a person who is responsible for the supervision of the operation of the development is accommodated on the premises at all times. Editor's note—Applicants seeking approval for intensive animal industries are to refer to State Planning Policy – State Interest Guideline – Agriculture and consult with the relevant State government department prior to the lodgement of a development application. Council may require a study that, amongst other matters, identifies how the development is in accordance with Environmental Protection (Air) Policy 2008 or Environmental Protection (Noise) Policy 2008.	No acceptable outcome is nominated.	**NA**	The proposed development is not for intensive animal industry.
PO21 Intensive animal industry does do not detract from the amenity of a nearby sensitive land use and community	No acceptable outcome is nominated.	**NA**	Refer to response PO20 above.

Performance outcomes	Acceptable outcomes	Compliance	Comments
related activities and are not visible from any road or other public view point.			
PO22 Intensive animal industry is not located within: (a) a declared catchment area; or (b) a declared groundwater area.	No acceptable outcome is nominated.	**NA**	Refer to response PO20 above.
PO23 Intensive animal industry has suitable access to road or rail infrastructure via a sealed road to an access point with a state controlled road.	No acceptable outcome is nominated.	**NA**	Refer to response PO20 above.
Intensive horticulture			
PO24 The region's water quality is protected from the inflow of waste water or run-off from intensive horticulture activities. Waste water or run-off from intensive horticulture: (a) is contained and treated so that nutrients and sediments can be removed from the water; (b) where possible, treated water is re-used; and (c) waste water is only disposed of when acceptable nutrient levels are achieved. Editor's note—Applicants should have regard to the State Planning Policy Guideline – State Interest – Agriculture. Editor's note—The Environmental Protection (Water) Policy 2009 applies to intensive horticultural uses.	No acceptable outcome is nominated.	**NA**	The proposed development is not for intensive horticulture.

Performance outcomes	Acceptable outcomes	Compliance	Comments
PO25 Intensive horticulture activities are not located within: (a) a declared catchment area; or (b) a declared groundwater area.	No acceptable outcome is nominated.	**NA**	Refer to response PO24 above.
Outdoor sport and recreation or community use			
PO26 Development is provided primarily to service the needs of the surrounding rural area or is inappropriate in urban areas (as a result of amenity impacts or land area requirements). The development is located and designed to: (a) minimise adverse impacts on the agricultural productive capacity of the site and the locality; (b) minimise impacts on the amenity of the locality, in particular noise (including limiting the hours of operation), odour, light and dust emissions; and (c) operate within the safe and effective design capacity of the region's road system.	No acceptable outcome is nominated.	**NA**	The proposed development is not for an outdoor sport or recreation and community use.
Renewable energy facility – wind farms			
PO27 Wind farms are located, designed and operated to minimise impacts on the environment and residential amenity, having regard to such matters as shadow	No acceptable outcome is nominated.	**NA**	The proposed development is not for a renewable energy facility.

Performance outcomes	Acceptable outcomes	Compliance	Comments
flicker, noise (including low frequency noise), avifauna, separation from dwellings and site boundaries and scenic amenity.			
Rural workers' accommodation, farm stay and tourism uses			
PO28 Tourism, short-term accommodation (farm stay), and rural workers' accommodation uses are: (a) associated with and compatible with rural production, natural resources and scenic landscape features in the immediate vicinity; and (b) not located in areas identified on the agricultural land classification (ALC) overlay maps.	No acceptable outcome is nominated.	**NA**	The proposed development is not for a rural workers' accommodation, farm stay or tourism use.
Transport and freight uses			
PO29 Transport and freight uses, which do not meet the definition of a home based business involving (heavy vehicles), are not established in the rural zone.	No acceptable outcome is nominated.	**NA**	The proposed development is not a transport and freight use.
Effects of development			
PO30 Effective separation distances are provided to minimise conflicts with sensitive land use(s). Editor's note—Where potential conflicts between agricultural and sensitive land uses may occur, applicants should refer to State Planning Policy – State Interest Guideline – Agriculture. Applicants should consult with the relevant state government department prior to the lodgement of a development	No acceptable outcome is nominated.	**PO**	This application seeks to secure long term access to a known extractive resource and also to increase the extraction volume, to allow the operation to service major projects within the region. The nearest receptors are located to the east, directly adjoining the Bruce Highway. Noise, air quality and vibration assessments have confirmed these receptors will not be adversely

Performance outcomes	Acceptable outcomes	Compliance	Comments
application.			impacted by operation, subject to implementing the standard quarry management measures and sealing the main haulage road where certain limits are exceeded (refer **Attachment 6 – Noise Assessment** and **Attachment 7 – Air Quality Assessment**). It is proposed to extend the quarry footprint on adjoining land, which will reduce separation distances to land to the north and west. The noise, vibration and air quality assessments have confirmed that standard site management measures will ensure that the activity does not conflict with sensitive land uses.
PO31 Development does not unduly impact on the existing amenity and character of the locality having regard to: (a) the scale, siting and design of buildings and structures; (b) visibility of buildings and structures when viewed from roads and other public view points; and (c) any heritage places.	No acceptable outcome is nominated.	**PO**	The site does not contain any known heritage places. Existing buildings and structures are not visible from the roads or other public viewpoints. The topography varies across the site providing vegetated ridgelines in the east and low-lying land adjoining Gavial Creek. The proposed changes seek to extend the quarry footprint primarily to the north and west. No change is proposed to the site access or approved storage area adjoining the Bruce Highway. Having considered the current views of the site, the distance between residences and the operation and the progressive nature of the operation, it is considered that the activity will result in a negligible change to the visual environment. The vegetation along Gavial Creek

Performance outcomes	Acceptable outcomes	Compliance	Comments
			will be managed to ensure the vegetation buffer adjoining the creek continues to provide a visual buffer, to alleviate the visual appearance of the quarry operation where workers are participating in agricultural pursuits on land to the west of Gavial Creek. The operation will not be visible from the east, being screened from view by retained vegetation on the higher topography. There may be short periods of time when site establishment works (i.e. stripping and overburden removal of the top bench) may be visible from the east. Once site establishment works are complete, the operation will return to being unnoticed in the landscape. While the extended operation will remove the existing topography buffers, which shield the operation from residences to the west, the visual environment will have a negligible change due to distance, wide field of view and speed environment.
PO32 Development responds sensitively to on-site and surrounding topography, drainage patterns, utility services, access, vegetation and adjoining land uses, such that: (a) any hazards to people or property are avoided; (b) any earthworks are minimised; (c) the retention of natural drainage	No acceptable outcome is nominated.	**PO**	The quarry will be development progressively, in line with operational needs. A Site Based Management Plan has been prepared to detail the operational controls and measures that will be employed to ensure that potential environmental impacts are managed to required standards (refer **Attachment 11 – Site Based Management Plan**).

Performance outcomes	Acceptable outcomes	Compliance	Comments
lines is maximised; (d) the retention of existing vegetation is maximised; (e) leeching by nutrients, pesticides or other contaminants, or potential for salinity is minimised; (f) damage or disruption to sewer, stormwater and water infrastructure is avoided; and (g) there is adequate buffering, screening or separation to adjoining development.			The SBMP provides mitigation measures for air quality, water quality, hydrocarbons and chemicals, noise, blasting, waste management, rehabilitation, bushfire management, flora and fauna and acid sulfate soils. The existing operation operates in a way which protects the environmental values of these items. A review of the existing measures has been undertaken to ensure the proposed changes continue to protect environment values. Extractive resources are site specific, limited in occurrence by geological conditions and are finite. In this instance, it is not possible to avoid or minimise clearing required while accessing the resource. Revegetation will be undertaken to prevent or reduce loss of environmental values identified a state government level. It is expected that these revegetation outcomes would also mitigate loss of environmental values identified a local level. DES has developed model operating conditions which regulate noise, dust, blasting, water quality, land management and rehabilitation of quarry activities. As such, these matters will be conditioned as part of the new EA for the quarry operation and subsequently regulated by DES. It is therefore considered unnecessary for Council to further regulate these environmental matters during their assessment.
PO33 Development is designed and managed so	No acceptable outcome is nominated.	**PO**	The Site Based Management Plan includes management measures which will ensure that

Performance outcomes	Acceptable outcomes	Compliance	Comments
that it provides appropriate protection for community safety and health and avoids unacceptable risk to life and property.			the operation occurs in a manner which avoids unacceptable risk to life and property (refer **Attachment 11 – Site Based Management Plan**).
Reconfiguring a lot			
PO34 The further subdivision of land is limited to reflect the suitability of the land for primarily grazing purposes and to protect water quality, environmental and landscape values.	**AO34.1** Unless otherwise stated in a precinct the minimum lot size is 100 hectares.	**NA**	Subdivision is not proposed.
Where in the Alton Downs precinct Note—Where outcomes in this section vary from this code, the precinct based outcomes take precedence.			
PO35 Development: (a) is compatible with the residential amenity of the area and avoids impacts on surrounding dwellings; and (b) has adequate water supply and sewerage treatment and disposal.	No acceptable outcome is nominated.	**NA**	The site is not located in the Alton Downs precinct.
PO36 The subdivision of land reflects the desired character of the area being smaller rural lots for primarily residential purposes.	**AO36.1** The minimum lot size in the precinct is eight (8) hectares. **AND**	**NA**	Refer to response PO35 above.
	AO36.2 Newly created lots must have access to a sealed road where sequential connection or integration with an existing sealed road can be achieved.	**NA**	Refer to response PO35 above.

Performance outcomes	Acceptable outcomes	Compliance	Comments
Where in the cropping and intensive horticulture precinct **Note—Where outcomes in this section vary from this code, the precinct based outcomes take precedence.**			
PO37 Rural industries are established only where associated with rural production in the immediate vicinity.	No acceptable outcome is nominated.	**NA**	The site is not located in the cropping and intensive horticulture precinct.
PO38 The subdivision of land is limited to protect the ongoing viability and productivity of existing and potential cropping and horticulture uses.	**AO38.1** The minimum lot size in the precinct is forty (40) hectares.	**NA**	Refer to response PO37 above.

Extractive Industry Code

<table>
<tr><th>Performance outcomes</th><th colspan="3">Acceptable outcomes</th><th>Compliance</th><th>Comments</th></tr>
<tr><td colspan="6">Scale of use</td></tr>
<tr><td rowspan="6">PO1
Extractive industries are appropriately separated from urban areas and sensitive land uses to minimise visual and noise impacts.</td><td colspan="3">AO1.1
The extractive industry use is separated by the following distances from the nearest sensitive land use and residential zone, rural residential zone, emerging community zone:</td><td>PO</td><td rowspan="6">The operation maintains a separation distance of 1km to sensitive land uses in the north, south and west. Any changes to the visual environment will be negligible due to distance, wide field of view, variation in landscape detail (i.e. colours, textures etc) and speed environment.

An existing storage area is located adjacent to the Kangaroo Country Caravan Park (Caravan Park). Bunds have been constructed around this storage area, mitigating potential impacts to the Caravan Park. The internal haulage road runs to the north of the Caravan Park. To mitigate potential dust impacts, the haulage road will be sealed once specific production limits are exceeded (refer Attachment 7 – Air Quality Assessment). The appearance of the site access will remain unchanged.

The ongoing operation will not be visible from the east, being screened from view by retained vegetation on the higher topography. There may be short periods of time when site establishment works (i.e. stripping and overburden removal of the top bench) may be visible from the east. Once site establishment works are complete, the operation will return to being unnoticed in the landscape.</td></tr>
<tr><td>Operation</td><td>Separation distance</td><td></td></tr>
<tr><td>Extractive industry operation involving blasting</td><td>1,000 metres</td><td></td></tr>
<tr><td>A hard rock extractive industry</td><td>500 metres</td><td></td></tr>
<tr><td>A sand and gravel extractive industry</td><td>200 metres</td><td></td></tr>
<tr><td>A designated onsite haul route</td><td>100 metres</td><td>AO</td></tr>
</table>

Performance outcomes	Acceptable outcomes	Compliance	Comments
PO2 Where practical the extractive industry is to be screened from nearby sensitive land use(s) or residential zoned areas and from state controlled roads.	**AO2.1** A vegetated buffer, having a minimum width of thirty (30) metres, is to be provided along all boundaries of the site. **AND**	**AO**	A buffer of 50 metres is provided along all perimeter boundaries of the site, all vegetation within the buffer area will be managed to maintain a visual buffer.
	AO2.2 No vegetation is cleared outside the resource/processing area (includes future approved stages) or haulage routes.	**AO**	Vegetation clearing will occur progressively, in line with operational needs. Vegetation clearing will be limited to what is absolutely necessary to facilitate the managed and incremental extensions to the extraction footprint.
Effects of development			
PO3 The operation of the extractive industry ensures that noise impacts are minimised on the surrounding area.	**AO3.1** Blasting operations are limited to Monday to Friday between the hours of 09:00 to 17:00. **AND**	**PO3**	Noise, vibration and air quality assessments confirm that all extractive industry activities can occur 24 hours a day, 7 days a week, without exceeding relevant criteria, subject to standard site management measures and the sealing of the main haul road where certain limits are exceeded (refer **Attachment 6 – Noise Assessment** and **Attachment 7 – Air Quality Assessment**). Notwithstanding this, drilling and blasting will be limited to 9am to 3pm, Monday to Saturday. No drilling or blasting will occur on Sundays or public holidays.
	AO3.2 Extraction, crushing, screening, loading, operation of plant equipment, ancillary activities and haulage are limited to Monday to Saturday between the hours of 06:00 and 18:00. **AND**	**PO3**	
	AO3.3 Operations do not occur on Sunday or public holidays. **AND**	**PO**	
	AO3.4 Maintenance of equipment and vehicles outside of normal operating hours is carried out so as not to cause nuisance to nearby sensitive land use(s). **AND**	**AO**	Maintenance activities were considered in the noise and air quality assessments. All maintenance activities will not cause nuisance to nearby sensitive land uses.
	AO3.5	**AO**	A vibration assessment confirms that the

Performance outcomes	Acceptable outcomes	Compliance	Comments
	Vibration levels do not exceed the acoustic quality objectives contained in the *Environmental Protection (Noise) Policy 2008*.		vibration levels will not exceed the acoustic quality objectives contained int he *Environmental Protection (Noise) Policy 2008* (refer **Attachment 6 – Noise Assessment**).
PO4 The development minimises dust impacts upon adjoining properties.	**AO4.1** Internal roads are sealed and dust impacts are contained onsite. **AND**	**PO**	An air quality assessment confirms that the operation will continue to meet the air quality objectives contained in the *Environmental Protection (Air) Policy 2008* (refer **Attachment 11 – Air Quality Assessment**). Standard site management measures will be implemented, including watering of stockpiles and haulage roads. The air quality assessment recommends sealing the main haul road once the operation exceeds certain production limits (e.g. extraction over 1.2 million tonnes in a 12 month period).
	AO4.2 Materials carried by heavy vehicles are covered. **AND**	**AO**	Loaded vehicles will be covered.
	AO4.3 Air pollution levels do not exceed the air quality objectives contained in the *Environmental Protection (Air) Policy 2008*.	**AO**	An air quality assessment confirms that the operation will continue to meet the air quality objectives contained in the *Environmental Protection (Air) Policy 2008* (refer **Attachment 11 – Air Quality Assessment**).
PO5 The development does not compromise public safety.	**AO5.1** Security fencing is provided for the full length of the perimeter of the site and around extractive industry stockpiles and operations.	**PO**	The site is currently fenced, limiting unauthorised access to the site. Given the site location, it is considered that the existing fencing is suitable and will not compromise public safety.
PO6 On-site drainage is designed, constructed and maintained to:	**AO6.1** Banks and channels are constructed to divert stormwater runoff away from excavated areas.	**PO**	A stormwater management plan has been prepared which addresses management of stormwater runoff and location and size of

Performance outcomes	Acceptable outcomes	Compliance	Comments
(a) prevent ponding in excavated areas; (b) avoid erosion; (c) prevent pollution of groundwater and surface water; and (d) provide opportunities to conserve and reuse water on the site.	**AND** **AO6.2** Sediment basins are provided as required to detain stormwater runoff from disturbed areas such that there is no offsite discharge likely to cause environmental harm. **AND** **AO6.3** Bunding, treatment and disposal of wastes is carried out such that no environmental harm is caused. **AND** **AO6.4** Lining or other suitable treatment of erosion prone areas is established and maintained at discharge points.		sediment basins (refer **Attachment 5 – Stormwater Management Plan**). Stormwater management will be reviewed and updated on an ongoing basis to ensure relevant to the operational needs of the site. Best practice and contemporary conditions require reviews of environmental performance to be undertaken periodically.
PO7 Extraction works and rehabilitation are to be carried out to minimise the potential for impacts on the environment (such as from stormwater run-off and erosion) and to retain the basic natural qualities and appearance of the site.	**AO7.1** Disused buildings and structures are removed from the site after extraction is completed. **AND**	**AO**	A rehabilitation management plan has been prepared and is included in section 4.9 of the SBMP (refer **Attachment 11 – Site Based Management Plan**). The land will be returned to a safe, stable and free draining landform which is capable of being used for rural purposes, or similar, consistent with the local and state planning outcomes. It is noted that model operating conditions, imposed by DES, will likely be applied to the EA to regulate rehabilitation objectives, including progressive rehabilitation.
	AO7.2 The site is rehabilitated once operations have ceased in accordance with an approved rehabilitation plan.	**AO**	
Parking, access and transport			

Performance outcomes	Acceptable outcomes	Compliance	Comments
PO8 The transportation of materials from the site does not significantly impact upon the road system or sensitive areas.	**AO8.1** The haul route is along roads that are sealed. **AND**	**PO**	The main haul road, connecting the site access to the pit, will be sealed once specific limits are exceeded (refer **Attachment 7 – Air Quality Assessment**).
	AO8.2 Haul routes, except when located on a state controlled road, are more than 100 metres from any sensitive land use or land in a residential zone. **AND**	**AO**	The site has direct access to the Bruce Highway, which is a state controlled road.
	AO8.3 Road access is of a standard sufficient to carry traffic generated by the extractive industry. The applicant is to cover ongoing costs on Council's road networks that are generated by the extractive industry during the life of the operation.	**NA**	Upgrade work to the Bruce Highway will be assessed by the Department of Transport and Main Roads.

Access, Parking and Transport Code

Performance outcomes	Acceptable outcomes	Compliance	Comments
Access driveways			
PO1 Access driveways are located to avoid conflicts and designed to operate efficiently and safely, taking into account: (a) the size of the parking area; (b) the volume, frequency and type of vehicle traffic; (c) the need for some land uses (for example hospitals) to accommodate emergency vehicle access; (d) the type of use and the implications on parking and circulation, for example long-term or short-term car parking; (e) frontage road function and conditions; and (f) the capacity and function of the adjoining street system.	**AO1.1** Access driveways are not located within: (a) twenty–five (25) metres of a signalised road intersection; (b) twenty (20) metres of an un-signalised road intersection in an industrial or centres zone or ten (10) metres otherwise; and (c) one (1) metre of any street signage, power poles, street lights, manholes, stormwater gully pits or other Council asset.	**NA**	The site has direct access to a state controlled road.
PO2 Access driveways do not disrupt existing road or footpath infrastructure.	**AO2.1** Access driveways: (a) do not require the modification, relocation or removal of any infrastructure including street trees, fire hydrants, water meters and street signs; (b) do not front a traffic island, speed control device, car parking bay, bus stop or other infrastructure within the road carriageway;	**NA**	The site has direct access to a state controlled road.

Performance outcomes	Acceptable outcomes	Compliance	Comments
	(c) must be sealed and to a formed road; (d) are not constructed over an access point to equipment under the control of a regulatory authority, including storm water pits, water meters, hydrants and telephone pits; and (e) are raised or lowered to match the surface level of the driveway, where an access chamber is to be incorporated within the driveway.		
PO3 Access driveways are designed and constructed so as to: (a) enable safe and functional vehicular access from the street to the property; and (b) not cause a change in the level of a footpath.	**AO3.1** Access driveways are constructed in compliance with the Capricorn Municipal Development Guidelines.	**NA**	The site has direct access to a state controlled road.
PO4 A driveway does not allow water to pond adjacent to any buildings or cause water to enter a building.	**AO4.1** A driveway has a minimum cross fall of one (1) metre (vertical) to 100 metres (horizontal) away from all adjoining buildings.	**NA**	The site has direct access to a state controlled road.
Parking			
PO5 Provision is made for on-site vehicle parking: (a) to meet the demand likely to be generated by the development; and (b) to avoid on-street parking where that would adversely impact on the	**AO5.1** AO5.1.1 On-site car parking is provided at the rates set out in Table 9.3.1.3.2 of the access, parking and transport code. OR AO5.1.2 Where a change of use of existing premises is	**AO**	Table 9.3.1.2 states that for extractive industry, sufficient spaces are provided to accommodate the amount of vehicular traffic likely to be generated by the particular use. The existing number of car parking spaces is considered appropriate.

Performance outcomes	Acceptable outcomes	Compliance	Comments
safety or capacity of the road network or unduly impact on local amenity. Editor's note—SC6.6 — Car parking contributions planning scheme policy prescribes circumstances under which an applicant can satisfy PO5.	proposed and there is no increase in the gross floor area, the existing number of on-site car parks is retained or increased. **AND**		No driveways or parking areas are within fifty (50) metres of an existing dwelling.
	AO5.2 All parking, loading and manoeuvring facilities for visitors and employees to be located on-site. **AND**	**AO**	All parking, loading and manoeuvring facilities are located on the site.
	AO5.3 Manoeuvring facilities to be of adequate dimensions to prevent any queuing in a roadway.	**AO**	Manoeuvring facilities prevent queuing in the roadway.
PO6 Parking and servicing facilities are designed to meet user requirements.	**AO6.1** Parking spaces, access and manoeuvring facilities, loading facilities and connections to the transport network are sealed and designed in accordance with Australian Standard AS 2890.	**PO**	No change to the existing parking facilities is proposed.
PO7 Sites with more than one (1) road frontage (excluding laneways) gain access only from the lower order road, except if it will introduce traffic generated by a non–residential use into a street that is in a residential zone.	No acceptable outcome is nominated.	**NA**	The site has direct access to a state controlled road.
PO8 Parking areas are illuminated in a manner that maximises user safety but minimises the impacts on adjoining residents.	**AO8.1** Parking areas for uses that operate at night are illuminated in accordance with the requirements of Australian Standard AS 1158. **AND**	**AO**	Lighting will be provided in accordance with the relevant Australian Standards.

Performance outcomes	Acceptable outcomes	Compliance	Comments
	AO8.2 Lighting used in parking areas does not cause an environmental nuisance and complies with Australian Standard AS 4282.	**AO**	Lighting will be provided in accordance with the relevant Australian Standards.
PO9 Car parking areas, pathways and other elements of the transport network are designed to enhance public safety by discouraging crime and antisocial behaviour, having regard to: (a) provision of opportunities for casual surveillance; (b) the use of fencing to define public and private spaces, whilst allowing for appropriate sightlines; (c) minimising potential concealment points and assault locations; (d) minimising opportunities for graffiti and other vandalism; and (e) restricting unlawful access to buildings and between buildings.	No acceptable outcome is nominated. Editor's note—Refer to Crime Prevention Through Environmental Design (CPTED) guidelines for Queensland for guidance.	**NA**	The site is not accessible by the general public.
PO10 Parking and servicing areas are kept accessible and available for their intended use at all times during the normal business hours of the activity.	No acceptable outcome is nominated.	**PO**	No change to the existing car parking areas is proposed. These areas will remain accessible and available at all times.
Transport impact Editor's note—Applicants should note that the Department of Transport and Main Roads may have additional requirements.			
PO11 Development contributes to the creation of a transport network which is designed to:	No acceptable outcome is nominated. Editor's note—Refer to SC6.19 – Structure plan	**NA**	The proposal does not create additional transportation networks.

Performance outcomes	Acceptable outcomes	Compliance	Comments
(a) achieve a high level of permeability and connectivity for all modes of transport, including pedestrians and cyclists, within the development and to the surrounding area; and (b) encourage people to walk, cycle or use public transport to and from the site instead of using a car.	planning scheme policy for guidance.		
PO12 Development is located on roads that are appropriate for the nature of traffic (including vehicles, pedestrians and cyclists) generated, having regard to the safety and efficiency of the transport network.	**AO12.1** Traffic generated by the development is safely accommodated within the design capacity of roads as provided in SC6.15 — Road infrastructure and hierarchy planning scheme policy. **AND**	**AO**	A Traffic and Pavement Impact Assessment has been undertaken (refer **Attachment 4 – Traffic and Pavement Impact Assessment**). This report confirms that the traffic generated by the development can be safely accommodated within the council road capacity.
	AO12.2 A road or street does not connect with another road or street that is more than two (2) levels higher or lower in the road hierarchy. **AND**	**NA**	No new roads are proposed.
	AO12.3 The existing infrastructure fronting the proposed development is upgraded in accordance with SC6.15 — Road infrastructure and hierarchy planning scheme policy and Capricorn Municipal Development Guidelines.	**NA**	The site fronts a state-controlled road.
PO13 Where the nature of the development creates a demand, provision is made for set	No acceptable outcome is nominated.	**NA**	The development does not create demand for set down or pick up areas.

Performance outcomes	Acceptable outcomes	Compliance	Comments
down and pick-up facilities by bus, taxis or private vehicle, which: (a) are safe for pedestrians and vehicles; (b) are conveniently connected to the main component of the development by pedestrian pathway; and (c) provide for pedestrian priority and clear sightlines.			
Site access			
PO14 Development does not impact on the safety, operation or function of the road network or system.	**AO14.1** Vehicle manoeuvring into and from the site for all vehicles is designed in accordance with the Australian Standard AS 2890, as updated from time to time. **AND**	**NA**	The site has access to a state controlled road.
	AO14.2 No direct property access is gained to a highway, main road, urban arterial or sub arterial road as defined in SC6.15 — Road infrastructure and hierarchy planning scheme policy other than via a service road or a joint access arrangement with other sites. **AND**	**NA**	The site has access to a state controlled road.

Performance outcomes	Acceptable outcomes	Compliance	Comments
	AO14.3 Development that generates greater than 100 vehicle movements per day does not gain access to or from an urban access place or urban access streets as defined in SC6.15 — Road infrastructure and hierarchy planning scheme policy.	**NA**	The site has access to a state controlled road.
PO15 Development facilitates the orderly provision and upgrading of the transport network or contributes to the construction of transport network improvements.	No acceptable outcome is nominated.	**NA**	The site has access to a state controlled road.
PO16 On-site transport network infrastructure integrates safely and effectively with surrounding networks.	**AO16.1** Intersections, connections and access arrangements are designed in accordance with the Capricorn Municipal Development Guidelines and Australian Standard AS 2890.	**NA**	No new intersections, connections or access arrangements are proposed.
Pedestrian and cyclist facilities			
PO17 Development provides safe and convenient pedestrian and cycle movement to the site and within the site having regard to desire lines, users' needs, safety and legibility.	**AO17.1** Pedestrian and cyclist movement are designed in compliance with the Capricorn Municipal Development Guidelines and Australian Standard AS 2890 — Parking facilities.	**NA**	Due to the location of the site, and nature of the use, pedestrian and cyclist movements will not occur.
PO18 Provision is made for adequate bicycle parking and end of trip facilities, to meet the likely needs of users and encourage cycle travel.	No acceptable outcome is nominated. Editor's note—Provisions are made for parking and end of trip facilities in accordance with the SC6.4 — Bicycle network planning scheme policy.	**NA**	Refer response to PO17 above.
Servicing			
PO19	**AO19.1**	**AO**	Refuse collection will continue to occur via

Performance outcomes	Acceptable outcomes	Compliance	Comments
Refuse collection vehicles are able to safely access on-site refuse collection facilities.	Refuse collection areas are provided and designed in accordance with the waste management code and Australian Standard AS 2890.		private contractor.

Stormwater Management Code

Performance outcomes	Acceptable outcomes	Compliance	Comments
Stormwater management – General			
PO1 Development provides a stormwater management system which achieves the integrated management of stormwater to: (a) ensure that flooding impacts do not increase, including upstream or downstream of the development site; (b) avoid net worsening of stormwater peak discharges and runoff volumes; (c) utilises the use of water sensitive urban design principles; and (d) ensure the site maximizes opportunities for capture and reuse. Editor's note—A stormwater management plan may be required to demonstrate compliance with the performance outcome.	**AO1.1** Development provides a stormwater management system which is designed in compliance with SC6.18— Stormwater management planning scheme policy, SC6.10 — Flood hazard planning scheme policy, Queensland Urban Drainage Manual, Capricorn Municipal Development Guidelines and Australian Rainfall and Runoff. **AND**	**PO**	A stormwater management plan has been prepared which addresses management of stormwater runoff and location and size of sediment basins (refer **Attachment 5 – Stormwater Management Plan**). Stormwater management will be reviewed and updated on an ongoing basis to ensure relevant to the operational needs of the site. Best practice and contemporary conditions require reviews of environmental performance to be undertaken periodically. As the matters of water quality and land management are regulated by DES under the EA conditions, it is suggested that the 2018 Approval conditions remain appropriate and that the Council defer to DES for regulation and compliance of this matter.
	AO1.2 Stormwater is conveyed to a lawful point of discharge in accordance with the Queensland Urban Drainage Manual.	**AO**	Stormwater will continue to be conveyed to existing lawful points of discharge.
PO2 Development provides a stormwater management system which: (a) has sufficient capacity to safely convey run-off taking into account increased run-off from impervious	**AO2.1** Development provides a stormwater management system which is designed in compliance with SC6.18 — Stormwater management planning scheme policy, Queensland Urban Drainage Manual, Capricorn Municipal Development Guidelines	**PO**	Refer response to PO1 above.

Performance outcomes	Acceptable outcomes	Compliance	Comments
surfaces and flooding in local catchments; (b) maximises the use of natural waterway corridors and natural channel design principles; and (c) efficiently integrates with existing stormwater treatments upstream and downstream.	and Australian Rainfall and Runoff.		
PO3 Development ensures that the location and design of stormwater detention and water quality treatment facilities: (a) minimise risk to people and property; (b) provide for safe access and maintenance; and (c) provide for the safe recreational use of stormwater management features.	**AO3.1** Development provides for stormwater detention and water quality treatment facilities which are located outside of a waterway. **AND**	**AO**	Stormwater detention and water quality treatment facilities will be located outside waterways.
	AO3.2 Development provides for stormwater detention in accordance with SC6.18 — Stormwater management planning scheme policy, Queensland Urban Drainage Manual, Capricorn Municipal Development Guidelines and Australian Rainfall and Runoff. **AND**	**PO**	Refer response to PO1 above.
	AO3.3 Development provides a stormwater quality treatment system which is designed in accordance with State Planning Policy – Water Quality.	**NA**	State Planning Policy – Water Quality applies to urban developments. A stormwater management plan has been prepared which applies best practice outcomes for Extractive Industry (refer **Attachment 5 – Stormwater Management Plan**).
Environmental values			

Performance outcomes	Acceptable outcomes	Compliance	Comments
PO4 Development and drainage works including stormwater channels, creek modification works, bridges, culverts and major drains, protect and enhance the environmental values of the waterway corridors and drainage paths and permit terrestrial and aquatic fauna movement. Editor's note—Compliance with the performance outcomes and acceptable outcomes should be demonstrated by the submission of a site-based stormwater management plan for development.	**AO4.1** Development ensures natural waterway corridors and drainage paths are retained. **AND**	**PO**	There is an existing waterway mapped within the approved quarry footprint. It is apparent that the mapped feature has been historically disturbed by site activities. The proposed quarry footprint does not extend any further east than the historical disturbance of the mapped feature. Therefore, no new impact to the mapped feature is proposed. A drainage feature intersects proposed Pit 2, on Lot 1 on SP247721 and Lot 725 on RP888747. The feature does not have discernible bed and banks. Stormwater management will be reviewed and updated on an ongoing basis to ensure relevant to the operational needs of the site. Best practice and contemporary conditions require reviews of environmental performance to be undertaken periodically.
	AO4.2 Development incorporates the use of natural channel design principles in constructed components to maximise environmental benefits and waterway stability in accordance with the Queensland Urban Drainage Manual, Capricorn Municipal Development Guidelines and Australian Rainfall and Runoff. **AND**	**NA**	Refer response to PO1 above.
	AO4.3 Development provides stormwater outlets into waterways, creeks, wetlands and overland flow paths with energy dissipation to minimise scour	**NA**	No change to existing discharge points are proposed.

Performance outcomes	Acceptable outcomes	Compliance	Comments
	in accordance with the Queensland Urban Drainage Manual, Capricorn Municipal Development Guidelines and Australian Rainfall and Runoff.		
PO5 Development protects and enhances the environmental and water quality values of waterways, creeks and estuaries within or external to the site. Editor's note—The State Planning Policy – Guideline – Water Quality and Section 9 of the *Environmental Protection Act 1994* define environmental values as 'a quality or physical characteristic of the environment that is conducive to ecological health or public amenity or safety.'	No acceptable outcome is nominated.	**PO**	DES has developed model operating conditions which regulate water quality. As such, these matters will be conditioned as part of the new EA for the quarry operation and subsequently regulated by DES. It is therefore considered unnecessary for Council to further regulate these environmental matters during their assessment.
Overland flow path tenure			
PO6 All overland flow paths are maintained under tenure arrangements that facilitate efficient infrastructure and enhance environmental sustainability. Editor's note—As a guide, Council prefers that the location of Council owned assets are contained within a road reserve, drainage system is contained within a road reserve, drainage easement, drainage reserve, public reserve, public pathway, park or waterway corridor.	No acceptable outcome is nominated.	**NA**	No Council owned assets are proposed.
Detention Systems			
PO7 Detention basins are designed, located and	**AO7.1** Detention basins are designed in accordance	**NA**	No Council owned assets are proposed.

Performance outcomes	Acceptable outcomes	Compliance	Comments
constructed on land solely dedicated for stormwater management.	with SC6.18 Stormwater management planning scheme policy.		
PO8 Development ensures that location and design of stormwater detention and water quality treatment: (a) minimises risk to people and property; (b) provides for safe access and maintenance; and (c) minimises ecological impacts to creeks and waterways.	**AO8.1** Development provides a stormwater management system designed in accordance with SC6.10 Flood hazard planning scheme policy and SC6.18 Stormwater management planning scheme policy.	**PO**	Stormwater detention and water quality treatment will not be located in flood prone areas.
PO9 Flood plain storage and function, and detention system functions are maintained. This shall include ensuring that: (a) detention system design does not remove floodplain storage; and (b) detention systems continue to operate effectively during a major storm event.	No acceptable outcome is nominated.	**PO**	A small section of the site is mapped as being subject to flood hazard (investigation area). This area is the lower portion of the mapped drainage feature intersection the western site of proposed Pit 2. The proposed quarry will not alter flood plain storage and function.
PO10 Detention basins shall not be provided in locations that prevent easy access to or maintenance of the detention basin.	**AO10.1** The location of detention basins are in accordance with SC6.18 Stormwater management planning scheme policy.	**PO**	Refer response to PO1 above.
Efficiency and whole of life cycle cost			
PO11 Development ensures that there is sufficient site area to accommodate an effective stormwater management system.	No acceptable outcome is nominated.	**PO**	Refer response to PO1 above.

Performance outcomes	Acceptable outcomes	Compliance	Comments
Editor's note—Compliance with the performance outcome should be demonstrated by the submission of a site-based stormwater management plan for development.			
PO12 Development provides for the orderly development of stormwater infrastructure within a catchment, having regard to the: (a) existing capacity of stormwater infrastructure within and external to the site, and any planned stormwater infrastructure upgrades; (b) safe management of stormwater discharge from existing and future upslope development; and (c) implications for adjacent and down-slope development.	No acceptable outcome is nominated.	**NA**	Stormwater management will be self-contained within the site. No Council assets are proposed.
PO13 Development provides proposed stormwater infrastructure which: (a) remains fit for purpose for the life of the development and maintains full functionality in the design storm event; and (b) can be safely accessed and maintained in a cost effective way.	No acceptable outcome is nominated.	**NA**	Stormwater management will be self-contained within the site. No Council assets are proposed.
Erosion and sediment control			
PO14 Development ensures that all reasonable and practicable measures are taken to manage the impacts of erosion, turbidity	**AO14.1** Erosion and sediment control plan is to be designed and implemented in accordance with the Capricorn Municipal Development	**PO**	Erosion and sediment control will be managed in accordance with section 4.2 of the Site Based Management Plan (refer **Attachment 11 – Site Based Management Plan**).

Performance outcomes	Acceptable outcomes	Compliance	Comments
and sedimentation, both within and external to the development site from construction activities, including vegetation clearing, earthworks, civil construction, installation of services, rehabilitation, revegetation and landscaping to protect: (a) the environmental values and water quality objectives of waters; (b) waterway hydrology; and (c) the maintenance and serviceability of stormwater infrastructure.	Guidelines.		
Water quality within catchment areas			
PO15 For development proposals within the Fitzroy River sub-basin, relevant environmental values are recognised and enhanced, and relevant water quality objectives are addressed. Editor's note—Section 3.2 of Queensland Water Quality Guidelines 2009 identifies values for water quality for waters in the Central Coast Queensland region.	**AO15.1** Development complies with the provisions of the State Planning Policy – Guideline – Water Quality. **AND**	**NA**	State Planning Policy – Water Quality applies to urban developments. A stormwater management plan has been prepared which applies best practice outcomes for extractive industry (refer **Attachment 5 – Stormwater Management Plan**).
	AO15.2 Development adjoining the full supply height above the Fitzroy River Barrage includes the provision of an effective buffer that assists in filtering runoff, including: (a) a buffer distance of 100 metres to the water supply height of the barrage which excludes cropping or grazing of a low intensity nature; and (b) fencing and water troughs installed on the land to prevent encroachment of animals within 100 metres of the full supply height	**NA**	The site is not in the Fitzroy River sub-basin.

Performance outcomes	Acceptable outcomes	Compliance	Comments
	above the barrage.		
Protecting water quality			
PO16 The development is compatible with the land use constraints of the site for: (a) achieving stormwater design objectives; and (b) avoiding or minimising the entry of contaminants into, and transport of contaminants in stormwater.	**AO16.1** Development is undertaken in accordance with a stormwater management plan that: (a) incorporates stormwater quality control measures to achieve the design objectives set out in the State Planning Policy – Guideline – Water Quality; (b) provides for achievable stormwater quality treatment measures reflecting land use constraints, such as soil type, landscape features (including landform), nutrient hazardous areas, acid sulfate soil and rainfall erosion potential; and (c) accounts for development type, construction phase, local landscape, climatic conditions and design objectives. Editor's note—A stormwater management plan includes the design, construction, operation, maintenance of the stormwater system. Editor's note—SC6.18 — Stormwater management planning scheme policy provides guidance on preparing a stormwater quality management plan.	**PO**	A stormwater management plan has been prepared which applies best practice outcomes for extractive industry (refer **Attachment 5 – Stormwater Management Plan**). The stormwater management plan incorporates stormwater quality controls which are best practice for extractive industry. This is due to State Planning Policy – Water Quality being applicable to urban developments. Water quality management measures are also provided in the Site Based Management Plan (refer **Attachment 11 – Site Based Management Plan**). Water quality and land management for the site are currently regulated by DES under the EA conditions.
Protecting water quality in existing natural waterways			
PO17 The waterway is designed for stormwater flow management, stormwater quality management and the following end use purposes:	No acceptable outcome is nominated.	**PO**	The approved stormwater management system includes discharge to a drainage feature, which discharges towards the Bruce Highway. No change is proposed to the type or nature of stormwater management to this drainage

Performance outcomes	Acceptable outcomes	Compliance	Comments
(a) amenity including aesthetics, (b) landscaping and recreation; (c) flood management; (d) stormwater harvesting as part of an integrated water cycle management plan; (e) as a sustainable aquatic habitat; and (f) the protection of water environmental values.			feature.
PO18 The waterway is located in a way that is compatible with existing tidal waterways.	**AO18.1** Where the waterway is located adjacent to, or connected to, a tidal waterway by means of a weir, lock, pumping system or similar: (a) there is sufficient flushing or a tidal range of more than 0.3 metres; or (b) any tidal flow alteration does not adversely impact on the tidal waterway; or (c) there is no introduction of salt water into freshwater environments.	**NA**	No tidal waterways are located within the site.
PO19 The construction phase for the waterway is compatible with protecting water environmental values in existing natural waterways.	**AO19.1** Erosion and sediment control measures are incorporated during construction to achieve design objectives set out in State Planning Policy – Guideline – Water Quality. Editor's note—Erosion and sediment control is to be designed and implemented in accordance with the International Erosion Control Association Best Practice Erosion and Sediment Control Guidelines.	**PO**	The existing operation manages erosion and sediment control measures using standard quarry management practices. Erosion and sediment control management measures have been included in the Site Based Management Plan (refer **Attachment 11 – Site Based Management Plan**).
PO20 Stormwater overflows from the waterway do not result in lower water quality objectives in existing natural	**AO20.1** Stormwater run-off entering non-tidal waterways is pre-treated prior to release in accordance with the guideline design objectives, water quality	**AO**	The approved stormwater management system includes discharge to a drainage feature, which discharges towards the Bruce Highway.

Performance outcomes	Acceptable outcomes	Compliance	Comments
waterways.	objectives of local waterways, and any relevant local area stormwater management plan.		No change is proposed to the type or nature of stormwater management to this drainage feature.

Waste Management Code

Performance outcomes	Acceptable outcomes	Compliance	Comments
Design of waste storage areas			
PO1 For on-site waste collection, waste storage areas are located and designed so that: (a) they are easily accessed and convenient to use; (b) sufficient space is provided for safe entry and exit and servicing by service vehicles without the need for manual handling; (c) sufficient height clearance is provided for the safe operation of both front and side bin lifting operations; (d) they are clear of car parking bays, loading bays and similar areas; and (e) they are clear of footpaths and pedestrian access.	**AO1.1** Waste storage areas are designed and maintained in accordance with SC6.20 — Waste management planning scheme policy.	**AO**	No change is proposed to the existing waste storage area. A waste management plan has been included in the Site Based Management Plan (refer **Attachment 11 – Site Based Management Plan**).
Kerbside waste servicing			
PO2 Kerbside collection of waste containers ensures the safety and amenity of road and footpath users.	**AO2.1** Waste bins are located on the footpath so that: (a) bins are located one (1) metre apart from other bins and obstructions; (b) all bins are accommodated within the street frontage of the site; (c) a clear pedestrian access way two (2) metres wide is retained; and (d) bins are capable of being serviced by the collection vehicle travelling forward,	**NA**	Kerb site servicing is not proposed.

Performance outcomes	Acceptable outcomes	Compliance	Comments
	without having to reverse the vehicle.		
PO3 Waste storage minimises adverse impacts on adjoining properties.	**AO3.1** Waste storage areas are: (a) integrated with the building design; or (b) set back a minimum of two (2) metres from any boundary; and (c) screened from neighbouring properties and the street by a fence of 1.8 metres minimum height; and (d) not located directly adjoining dwelling units on the site and on neighbouring properties. **AND**	**NA**	Kerb site servicing is not proposed.
	AO3.2 Waste bins are fitted with lids.		
PO4 Waste storage areas: (a) have a level area on impermeable, durable materials so that they are easily cleaned; and (b) have adequate clearance between and around waste storage bins to allow for manoeuvring and washing of bins.	No acceptable outcome is nominated.	**NA**	Kerb site servicing is not proposed.
Water management			
PO5 Waste storage areas are designed to separate stormwater and wash-down water.	**AO5.1** Wash-down water drains to either the reticulated sewerage system or an on-site sewerage facility if not in a sewer area. **AND**	**PO**	No change is proposed to the existing waste storage areas.

Performance outcomes	Acceptable outcomes	Compliance	Comments
	AO5.2 Wash-down areas are: (a) provided with a tap and water supply; and (b) provided with a stormwater diversion valve and arrestor trap.		

Works Code

Performance outcomes	Acceptable outcomes	Compliance	Comments
Access driveways			
PO1 Access driveways are located to avoid conflicts and designed to operate efficiently and safely, taking into account: (a) the size of the parking area; (b) the volume, frequency and type of vehicle traffic; (c) the need for some land uses (for example hospitals) to accommodate emergency vehicle access; (d) the type of use and the implications on parking and circulation for example long-term or short-term car parking; (e) frontage road function and conditions; and (f) the capacity and function of the adjoining street system.	**AO1.1** New access driveways are not located within: (a) twenty–five (25) metres of a signalised road intersection; (b) twenty (20) metres of an un-signalised road intersection in an industrial or centres zone or ten (10) metres otherwise; and (c) one (1) metre of any street signage, power poles, street lights, manholes, stormwater gully pits or other Council asset.	**NA**	The main haul road will continue to provide access between the site and the Bruce Highway.
PO2 Access driveways do not disrupt existing road or footpath infrastructure.	**AO2.1** New access driveways: (a) do not require the modification, relocation or removal of any infrastructure including street trees, fire hydrants, water meters and street signs; (b) do not front a traffic island, speed control device, car parking bay, bus stop or other infrastructure within the	**NA**	The site has direct access to a state controlled road.

Performance outcomes	Acceptable outcomes	Compliance	Comments
	road carriageway; must be sealed and to a formed road; (c) are not constructed over an access point to equipment under the control of a regulatory authority, including stormwater pits, water meters, hydrants and telephone pits; and (d) where an access chamber is to be incorporated within the driveway, are raised or lowered to match the surface level of the driveway are provided with a trafficable lid.		
PO3 Access driveways and cross-falls within the verge are designed and constructed so as to: (a) enable safe and functional vehicular access from the street to the property; and (b) not cause a change in the level of a footpath.	**AO3.1** New access driveways and cross-falls within the verge are constructed in compliance with the Capricorn Municipal Development Guidelines.	**NA**	The site has direct access to a state controlled road.
PO4 An access driveway does not allow water to pond adjacent to any buildings or cause water to enter a building.	**AO4.1** New access driveways have a minimum cross fall of one (1) metre (vertical) to 100 metres (horizontal) away from all adjoining buildings.	**NA**	There are no adjacent buildings.
Parking, access and transport			
PO5 Provision is made for on-site vehicle parking: (a) to meet the demand likely to be generated by the development; and	**AO5.1** AO5.1.1 On-site car parking is provided at the rates set out in Table 9.3.1.3.2 of the access, parking and transport code.	**AO**	Table 9.3.1.2 states that for extractive industry, sufficient spaces are provided to accommodate the amount of vehicular traffic likely to be generated by the particular use.

Performance outcomes	Acceptable outcomes	Compliance	Comments
(b) to avoid on-street parking where that would adversely impact on the safety or capacity of the road network or unduly impact on local amenity. Editor's note—SC6.6 — Car parking contributions planning scheme policy prescribes circumstances under which an applicant can satisfy PO5.	OR AO5.1.2 Where a change of use of existing premises is proposed and involves not more than minor building work, the existing number of on-site car parks is retained or increased.		The proposed changes will not see an increase in car parking demand on site. As such, no additional car parking spaces are necessary. No driveways or parking areas are within fifty (50) metres of an existing dwelling.
PO6 Car parking areas are designed to: (a) be clearly defined, marked and signed; (b) be convenient and accessible; (c) be safe for vehicles, pedestrians and cyclists; and (d) provide spaces which meet the needs of people with disabilities.	**AO6.1** AO6.1.1 The car parking areas are sealed and designed in accordance with Australian Standard AS 2890, as updated from time to time. OR AO6.1.2 Where a change of use of existing premises is proposed and involves not more than minor building work, the existing standard of on-site car parks is maintained or improved.	**PO**	No change to car parking areas is proposed.
PO7 Parking access arrangements are appropriate for: (a) the capacity of the parking area; (b) the volume, frequency and type of vehicle usage; and (c) the function and characteristics of the access road and adjoining road network.	**AO7.1** Parking access is provided in accordance with Australian Standard AS 2890, as updated from time to time. **OR** **AO7.1.2** Where a change of use of existing premises is proposed and involves not more than minor building work, the existing parking access is maintained or improved.	**PO**	No change to car parking areas is proposed.

Performance outcomes	Acceptable outcomes	Compliance	Comments
PO8 Landscaping is provided to soften the visual impact of car parking areas and to provide shading.	**AO8.1** AO8.1.1 Shade trees with a minimum height of two (2) metres are provided within car parking areas at the following rate: (a) in single sided, angle or parallel bays — one (1) tree per three (3) car parks; and (b) in double sided, angle or parallel bays — one (1) tree per six (6) car parks. Editor's note—SC6.12 — Landscaping design and street trees planning scheme policy provides sources for determining appropriate species and planting standards. OR AO8.1.2 Where a change of use of existing premises is proposed and involves not more than minor building work, the existing standard of landscaping is maintained or improved.	**NA**	Existing car parking areas are located centrally on the site, over 1 kilometre from the Bruce Highway frontage. The car parking areas are not visible from the nearest sensitive receptor, or Bruce Highway. No landscaping is therefore warranted in this instance.
PO9 Provision is made for the on-site loading, unloading, manoeuvring and access by service vehicles that: (a) is adequate to meet the demands generated by the development; (b) is designed to accommodate service vehicle requirements; (c) is wholly contained within the site; and	**AO9.1** AO9.1.1 New development is designed to ensure service vehicles do not perform reversing movements onto public roads. **AND** AO9.1.2 Access and manoeuvring facilities, loading facilities and connections to the transport	**AO**	All vehicles will exit the site in a forward motion. The site gains access to a state-controlled road. Therefore, the type of access required from the site will be determined by the Department of Transport and Main Roads.

Performance outcomes	Acceptable outcomes	Compliance	Comments
(d) does not unduly impede vehicular, cyclist and pedestrian safety and convenience within the site.	network are sealed and designed in accordance with Australian Standard AS 2890. **OR**		
	AO9.2 Where a change of use of existing premises is proposed and involves not more than minor building work, the existing provision for service vehicles is maintained or improved.	**NA**	
PO10 Development is located on roads that are appropriate for the nature of traffic (including vehicles, pedestrians and cyclists) generated, having regard to the safety and efficiency of the transport network.	**AO10.1** AO10.1.1 The existing infrastructure fronting the proposed development is upgraded in accordance with SC6.15 — Road infrastructure and hierarchy planning scheme policy and Capricorn Municipal Development Guidelines. OR AO10.1.2 Where a change of use of existing premises is proposed and involves not more than minor building work, the existing infrastructure fronting the proposed development is maintained or improved.	**NA**	The site gains access from a state-controlled road.
Infrastructure			
PO11 A water supply is provided that is adequate for the current and future needs of the development.	**AO11.1** Where within a water supply planning area, the development is connected to Council's reticulated water supply system in accordance with SC6.21 — Water supply infrastructure	**NA**	The site is not within a water supply planning area.

Performance outcomes	Acceptable outcomes	Compliance	Comments
	planning scheme policy and the Capricorn Municipal Development Guidelines. Editor's note—A network analysis may be required to demonstrate compliance with this acceptable outcome. Editor's note—Where development is located outside of the water supply planning area to refer to the requirements under the Plumbing Code of Australia.		
PO12 Reticulated water supply networks ensure that the installation is sustainable and minimises whole of life cycle costs.	**AO12.1** Where within a water supply planning area, water supply systems and connections are designed and constructed in accordance with SC6.21 — Water supply infrastructure planning scheme policy and the Capricorn Municipal Development Guidelines. Editor's note—A network analysis may be required to demonstrate compliance with this acceptable outcome. **AND**	**NA**	The site is not within a water supply planning area.
	AO12.2 Where within a water supply planning area, staged developments are connected to the water supply network and operational, prior to the commencement of the use or endorsement of the survey plan.		
PO13 Sewerage treatment and disposal is provided that is appropriate for the level of demand generated, protects public health and avoids environmental harm.	**AO13.1** Where within a sewer planning area, the development is connected to Council's reticulated waste water system in accordance with SC6.17 — Sewerage infrastructure planning scheme policy and the Capricorn Municipal Development Guidelines.	**NA**	The site is not within a sewer planning area.

Performance outcomes	Acceptable outcomes	Compliance	Comments
	Editor's note—A network analysis may be required to demonstrate compliance with this acceptable outcome. Editor's note—Where development is located outside of the sewer planning area to refer to the requirements under the Plumbing Code of Australia.		
PO14 Reticulated sewer networks ensure that the installation of infrastructure assets is sustainable and minimises whole of life cycle costs.	**AO14.1** Where within a sewer planning area, waste water systems and connections are designed and constructed in accordance with SC6.17 — Sewerage infrastructure planning scheme policy and the Capricorn Municipal Development Guidelines. Editor's note—A network analysis may be required to demonstrate compliance with this acceptable outcome. **AND**	**NA**	The site is not within a sewer planning area.
	AO14.2 Where within a sewer planning area, staged developments are connected to the waste water network and operational prior to the commencement of the use or endorsement of the survey plan.		
PO15 Development is located and designed in a manner that does not result in adverse flood affects to the site and on adjoining properties.	**AO15.1** The development does not result in an increase in flood level, flood water velocity or flood duration on upstream, downstream or adjacent properties. **AND**	**AO**	A stormwater management plan has been prepared which discusses the management of water (refer **Attachment 11 – Stormwater Management Plan**). There will be no change to the flood levels across the site, or impacts to upstream, downstream or adjacent properties.
	AO15.2 Roof and surface water is conveyed to the kerb and channel or an inter-allotment drainage	**NA**	No water will be conveyed to the council network.

Performance outcomes	Acceptable outcomes	Compliance	Comments
	system in accordance with Australian Standard AS/NZ 3500.3.2, and the Queensland Urban Drainage Manual as updated from time to time.		
Waste management			
PO16 Provision is made for waste management that is appropriate to the use, protects the health and safety of people and the environment. Editor's note—Applicants should also be aware that any provision for disposal of any trade waste is to be made in accordance Council's Trade Waste Policy supporting the Water Act 2000, Water Supply (Safety and Reliability) Act 2008 and the Plumbing and Drainage Act 2002.	**AO16.1** The development provides a bin container storage area that has a sealed pad and is screened to the height of the bins. **AND**	**NA**	Waste will continue to be collected by a private contractor.
	AO16.2 On sites in an industrial zone that are greater than 2,000 square metres in area, provision is made for refuse collection vehicles to access the collection area and to enter and leave the site in a forward direction without having to make more than a three-point turn.	**NA**	The site is not in an industrial zone.
Erosion and sediment control			
PO17 Development ensures that all reasonable and practical measures are taken to manage the impact of erosion, turbidity and sedimentation, both within and external to the development site from construction activities, including vegetation clearing, earthworks, to protect water quality and environmental values.	**AO17.1** AO17.1.1 Erosion and sediment control plan is to be designed and implemented in accordance with the Capricorn Municipal Development Guidelines. OR AO17.1.2 No filling or excavation is occurring on the site.	**PO**	A stormwater management plan has been prepared which discusses the management of water (refer **Attachment 5 – Stormwater Management Plan**). There will be no change to the flood levels across the site, or impacts to upstream, downstream or adjacent properties.

Acid Sulfate Soils Overlay Code

Performance outcomes	Acceptable outcomes	Compliance	Comments
PO1 Development: (a) avoids the disturbance of acid sulfate soils; or (b) where the disturbance of acid sulfate soils is unavoidable the release of acid sulfate soils is managed to minimise the release of acid and metal contaminants. Editor's note—Confirmation of the presence of acid soils can be completed by undertaking an acid sulfate soils investigation conforming to the Queensland Acid Sulfate Soil Technical Manual: Soil Management Guidelines and soil analysis according to the Laboratory Methods Guideline or Australian Standard 4969 Analysis of acid sulfate soil.	**AO1.1** AO1.1.1 The disturbance of acid sulfate soils is avoided by: (a) not excavating or otherwise removing soil or sediment containing acid sulfate soils; (b) not permanently or temporarily extracting groundwater that results in the aeration of previously saturated acid sulfate soils; and (c) not undertaking filling on land at or below five (5) metres Australian Height Datum that results in: (i) actual acid sulfate being moved below the water table; or (ii) previously saturated acid sulfate soils being aerated. OR AO1.1.2 The disturbance of acid sulfate soils avoids the release of acid and metal contaminants by: (a) neutralising existing acidity and preventing the generation of acid and metal contaminants using strategies documented in the Soil Management Guidelines; and (b) preventing the release of surface or groundwater flows containing acid and metal contaminants into the	**PO**	Management of acid sulfate soils is discussed in the Site Based Management Plan (refer **Attachment 11 – Site Based Management Plan**).

Performance outcomes	Acceptable outcomes	Compliance	Comments
	environment. AND		
	AO1.2 Where potential or actual acid sulfate soils are identified they are managed in accordance with an acid sulfate soils management plan. Editor's note—Guidelines for sampling and analysis of lowland acid sulfate soils and Queensland acid sulfate soil technical manual: laboratory methods guidelines and Queensland acid sulfate soil technical manual: soil management guidelines are available from the Department of Environment and Heritage Protection.		

Airport Environs Overlay Code

Performance outcomes	Acceptable outcomes	Compliance	Comments
Operational airspace (obstacle limitation surface)			
PO1 Development does not involve permanent, temporary or transient physical obstruction (natural or man-made) of operational airspace.	**AO1.1** Development does not allow the following to penetrate the airport's operational airspace as identified on overlay map OM-2A: (a) buildings or structures (including antennae and any cranes or construction equipment used); or (b) wind farms or wind monitoring equipment; or (c) landscaping that at maturity would infringe on the operational airspace; or (d) recreational or sporting activities that include parachuting, hot air-ballooning and hang-gliding. Note—Building heights on the airport obstacle limitation surface overlay map OM-2A prevail over building heights detailed in zone codes. Editor's note—Development which includes a building, structure or landscaping which will exceed the heights identified on airport obstacle limitation surface overlay map OM-2A may be referred by Council to the airport operator whose advice and decision on the proposal may be adopted by Council.	**AO**	No new buildings or structures are proposed. The proposed development will not result anything penetrating the airport's operational airspace.
PO2 Emissions do not materially increase air turbulence, reduce visibility or compromise the operation of aircraft engines in the airport's operational airspace.	**AO2.1** Development does not generate: (a) a gaseous plume of a velocity exceeding 4.3 metres per second; or (b) smoke, dust, ash or steam that will penetrate an operational airspace.	**AO**	The proposed development will not generate a gaseous plume or any smoke, dust, ash or steam that will penetrate an operational airspace. Dust will be managed on site in accordance with the Site Based Management Plan (refer **Attachment 11 – Site Based Management Plan**).

Performance outcomes	Acceptable outcomes	Compliance	Comments
Airport noise			
PO3 Development involving a sensitive land use is appropriately located and designed to prevent adverse impacts from aircraft noise. Editor's note—Where the associated acceptable outcomes can not be met, a Noise Assessment Report prepared by an appropriately qualified acoustic consultant may be prepared to demonstrate compliance with this performance outcome.	**AO3.1** Development within the twenty (20) to thirty-five (35) Australian noise exposure forecast (ANEF) contours is designed and constructed to attenuate aircraft noise by achieving the indoor design sound levels specified in Table 8.2.2.3.4 — Desirable indoor design sound levels for building type and activity. AND	**NA**	No sensitive land uses are proposed.
	AO3.2 Development within the twenty (20) to thirty-five (35) Australian noise exposure forecast (ANEF) contours is consistent with Table 8.2.2.3.5 — Compatible and incompatible land uses within Australian noise exposure forecast (ANEF) contours. AND	**NA**	Refer to response AO3.1 above.
	AO3.3 Creating an additional lot or lots does not occur within the twenty (20) to thirty-five (35) Australian noise exposure forecast (ANEF) contours.	**NA**	Refer to response AO3.1 above.
Wildlife hazards			
PO4 Development does not materially increase the risk of wildlife hazards including but not limited to flying vertebrates, such as birds and bats, intruding into the airport's operational airspace.	**AO4.1** Development located within three (3) kilometres of an airport runway does not include uses identified in column 1 of Table 8.2.2.3.3 — Uses associated with increases in wildlife strikes and hazards.	**NA**	The site is over 13km from the airport runway.

Performance outcomes	Acceptable outcomes	Compliance	Comments
Editor's note—Where the relevant acceptable outcomes can not be met, a wildlife management plan may need to be prepared in order to demonstrate compliance with this performance outcome. The applicant will need to include measures which reduce the potential to attract birds and bats.	AND		
	AO4.2 Development located between three (3) and eight (8) kilometres of an airport runway that includes uses identified in column 1 or column 2 of Table 8.2.2.3.3 — Uses associated with increases in wildlife strikes and hazards ensures that waste is covered and collected so that it is inaccessible to birds and bats.	**NA**	Refer to response AO4.1 above.
Aviation facilities			
PO5 Development within the Rockhampton Airport transmitter or non-directional beacon (NDB) site building restricted area does not adversely affect the functioning of the equipment.	No acceptable outcome is nominated. Editor's note—Development is referred to the airport operator if it is located: (a) in Zone A on overlay map OM-2D; or (b) between 60-300 metres (Zone B on overlay map OM-2D reflects the outer limit of 300 metres) from the NDB antenna and the development will cross the zone boundary (defined as an elevation angle of five (5) degrees from ground level at the centre of the NDB antenna).	**NA**	The site is not located within the Aviation Facilities overlay map.
PO6 Development within the Rockhampton Airport distance measuring equipment (DME) site building restricted area does not adversely affect the functioning of the equipment.	No acceptable outcome is nominated. Editor's note—Development is referred to the airport operator if it is located: (a) in Zone A on overlay map OM-2D; or (b) between 100 – 1,500 metres (Zone B on overlay map OM-2D reflects the outer limit of 1500	**NA**	Refer to response PO5 above.

Performance outcomes	Acceptable outcomes	Compliance	Comments
	metres) from the DME antenna and the development will cross the zone boundary (defined as an elevation angle of two (2) degrees, measured from the above horizontal plane beneath the DME antenna).		
PO7 Development within the Rockhampton Airport very high frequency (VHF) omnidirectional radio range (VOR) site sensitive area does not adversely affect the functioning of the equipment.	No acceptable outcome is nominated. Editor's note—Development is referred to the airport operator if it is located: (a) in Zone A on overlay map OM-2D; or (b) between 150 – 1,500 metres (Zone B on overlay map OM-2D reflects the outer limit of 1500 metres) from the centre of the VOR antenna and the development will cross the zone boundary (defined as the elevation angle of 1.5 degrees from ground level at the centre of the VOR antenna).	**NA**	Refer to response PO5 above.
PO8 Development within the Rockhampton Airport communication site sensitive area does not adversely affect the functioning of the equipment.	No acceptable outcome is nominated. Editor's note—Development is referred to the airport operator if it is located: (a) in Zone A on overlay map OM-2D; or (b) between 100 – 600 metres (Zone B on overlay map OM-2D reflects the outer limit of 600 metres) from the centre of the VHF antenna and the development will cross the zone boundary (defined as the elevation angle of 2 degrees starting at ten (10) metres above ground height);. Or (c) if development involves large obstructions that will be located in Zone B on overlay map OM-2D or the area of interest it is referred to the airport operator.	**NA**	Refer to response PO5 above.
Runways			
PO9 Development located at the end of runways does not increase the risk to public safety.	**AO9.1** Within a public safety area identified on overlay map OM-2E development does not involve the following:	**NA**	The site is not located within a public safety area.

Performance outcomes	Acceptable outcomes	Compliance	Comments
	(a) residential uses; or (b) a new building or expansion to an existing building accommodating a non-residential use; or (c) uses involving the manufacture or depot storage of hazardous materials.		
Artificial lighting			
PO10 Development does not include or create external lighting or reflective surfaces that could distract or confuse pilots. Editor's note—The standards specified in Civil Aviation Safety Authority (CASA) Guidelines: Lighting in the vicinity of aerodromes: Advice to lighting designers may be used to demonstrate compliance with this performance outcome.	**AO10.1** Development within the light restriction zones (Zone A, B, C or D on overlay map OM-2F) does not involve: (a) straight parallel lines of lighting 500 metres to 1,000 metres long; or (b) flare plumes; or (c) reflective surfaces; or (d) buildings with reflective cladding; or (e) upward shining lights; or (f) laser lights; or (g) flashing lights; or (h) sodium lights.	**AO**	The site is not within light restriction zones.

Biodiversity Overlay Code

Performance outcomes	Acceptable outcomes	Compliance	Comments
Matters of state or local (high) environmental significance Editor's note—Refer to overlay map overlay map OM-3A			
PO1 Development is located, designed and operated to retain and protect significant natural assets, habitat and values to the greatest extent possible. Where this is not possible, impacts are minimised by: (a) retaining native vegetation; (b) allowing for the regeneration of native vegetation to the area, or rehabilitating with locally endemic plants in non-vegetated areas of the site; (c) landscaping with locally native plants; (d) locating and designing public access to avoid disturbance of ecological values; (e) ensuring alterations to natural landforms, hydrology and drainage patterns do not significantly affect ecological values; and (f) incorporating measures that avoid the disruption of threatened wildlife and their habitat by allowing for their safe movement through the site. Note—In areas where environmental values have been mapped but are no longer present a report certified by	No acceptable outcome is nominated.	**PO**	The site is not mapped as containing matters of local (high) environmental significance. The drainage feature within the approved quarry footprint is mapped as a matter of state environmental significance. No change is proposed to the approved impact on this waterway. The waterway intersecting with the north-western portion of proposed Pit 2 is mapped as a matter of state environmental significance. This mapping replicates regrowth mapping under the Vegetation Management Act. Clearing of regrowth vegetation occurs pursuant to exemptions, under the Planning Regulation, or an Accepted Development Vegetation Clearing Code. Extractive resources are site specific, limited in occurrence by geological conditions and are finite. Therefore, it is not possible to avoid or minimise clearing required while accessing the resource. Revegetation will be undertaken to prevent or reduce loss of environmental values identified a state government level. It is expected that these revegetation outcomes would also mitigate loss of environmental values identified a local level.

Performance outcomes	Acceptable outcomes	Compliance	Comments
an appropriately qualified person that the development site does not contain any matters of environmental significance will be required. Note—An environmental offset is provided for any permanent, irreversible loss or reduction in matters of local (high) environmental significance caused by the development. An environmental offset is carried out as per the requirements of the Queensland Government's Environmental Offsets Policy, as amended from time to time.			
PO2 Development ensures native vegetation is retained, regenerated and rehabilitated in such a way as to: (a) ensure protection of areas of vegetation within biodiversity corridors and wildlife habitats; (b) maintain vegetation that is in patches of greatest size and smallest possible edge-to-area ratio; (c) maximise the linkages between vegetation located on the subject site; (d) maximise linkages between vegetation located on adjacent properties within the biodiversity network; (e) allow the dispersal or movement through biodiversity corridors; and (f) protect riparian vegetation in and adjacent to watercourses.	No acceptable outcome is nominated.	**PO**	Refer response to PO1 above.
Matters of local (general) environmental significance Editor's note—Refer to overlay map overlay map OM-3A			

Performance outcomes	Acceptable outcomes	Compliance	Comments
PO3 Development minimises impacts on biodiversity values by ensuring they are retained to the greatest extent possible. Editor's note—minimising the impacts on biodiversity values can be achieved by: (a) retaining native vegetation; (b) allowing for the regeneration of native vegetation; (c) landscaping with native local plants; (d) locating and designing public access (for example roads, bushfire separation areas etcetera) to avoid disturbance of ecological values; (e) accommodating the safe movement of wildlife through the site; and (f) limiting alterations to natural landforms and avoiding disturbance to natural waterways and drainage paths.	No acceptable outcome is nominated.	**PO**	Proposed Pit 2 is mapped as containing matters of local (general) environmental significance. This mapping reflects remnant vegetation (least concern) mapping under the Vegetation Management Act. Revegetation will be undertaken to prevent or reduce loss of environmental values identified a state government level. It is expected that these revegetation outcomes would also mitigate loss of environmental values identified a local level.
Biodiversity corridors and wildlife habitats Editor's note—Refer to overlay map overlay map OM-3B			
PO4 Development maintains unimpeded movement of terrestrial and aquatic fauna that are associated with or are likely to use the biodiversity corridor as part of their normal life cycle by: (a) ensuring development, including roads, pedestrian access and in-stream structures, do not create	No acceptable outcome is nominated.	**NA**	The proposed quarry footprint does not encroach into areas mapped as containing biodiversity corridors and wildlife habitats.

Performance outcomes	Acceptable outcomes	Compliance	Comments
barriers to the movement of fauna (including fish passage) along or within biodiversity corridors; (b) providing effective wildlife movement infrastructure in accordance with best practice and directing fauna to locations where wildlife movement infrastructure has been provided to enable fauna to safely negotiate a development area; and (c) separating fauna from potential hazards through the use of appropriate fencing. Note—In areas where environmental values have been mapped but are no longer present a report certified by an appropriately qualified person that the development site does not contain any matters of environmental significance will be required. Editor's note—Biodiversity corridors have been mapped based on a minimum width of 500 metres.			
PO5 Development: (a) retains and protects areas of wildlife habitat that support a critical life stage ecological process such as feeding, breeding or roosting for identified species; and (b) incorporates measures as part of siting and design to protect and retain identified ecological values and underlying ecosystem processes within or adjacent to the	AO5.1 Development retains and protects native fauna feeding areas, nesting, breeding and roosting sites within the identified wildlife habitats. Editor's note—Development applications lodged with Council must identify all species listed that are present within or adjoining premises and habitats that may be affected by the proposal. In particular applications are to identify and describe how the development protects or enhances wildlife habitat at any critical life stage ecological processes within or adjacent to the development area. This should be reflected in an ecological assessment report prepared in accordance with the SC6.8 — Ecological assessment planning scheme policy.	**NA**	The proposed quarry footprint does not encroach into areas mapped as containing biodiversity corridors and wildlife habitats.

Performance outcomes	Acceptable outcomes	Compliance	Comments
development site.			
Wetlands and waterways Editor's note—Refer to overlay maps OM-3C and OM-3D			
PO6 Development has no adverse impacts on: (a) native vegetation; (b) habitat; (c) ecological functions; (d) water quality; and (e) nature conservation values. Editor's note—Waterway buffers (aside from MSES-Waterways) have been mapped based on the following minimum widths: fifty (50) metres buffer (twenty-five (25) metres either side of the waterway) for stream orders 1 and 2; 100 metres (fifty (50) metres either side of the waterway) for stream orders 3 and 4; 200 metres for stream order 5 and above, except for the Fitzroy River; and for the Fitzroy River: 350 metres buffer (175 metres either side of the waterway) upstream of the Fitzroy River Barrage, and 450 metres (225 metres either side of the waterway) downstream of the Fitzroy River Barrage. Editor's note—Wetland buffers have a minimum width of: fifty (50) metres buffer (twenty-five (25) metres either side of the waterway) in urban areas; and 200 metres buffer (100 metres either side of the waterway) in non-urban areas. Editor's note—Vegetation clearing undertaken as a consequence of development occurs in compliance with the Vegetation Management Act 1999 and Nature Conservation Act 1992.	No acceptable outcome is nominated.	**NA**	A waterway, mapped within the approved quarry footprint, is mapped as a matter of state environmental significance. No change is proposed to the approved impact on this waterway. An assessment of the waterway mapped in the north-west of proposed Pit 2 has been confirmed to not provide any notable ecological values in terms of fish passage or other aquatic or riparian habitat functions (refer **Attachment 9 – Ecological Assessment**).
PO7 Development does not cause land	**AO7.1** Excavation and filling is not undertaken in	**NA**	Refer response to PO6 above.

Performance outcomes	Acceptable outcomes	Compliance	Comments
degradation near a waterway or wetland, including: (a) mass movement, gully erosion, rill erosion, sheet erosion, tunnel erosion, stream bank erosion, wind erosion, or scalding; and (b) loss or modification of chemical, physical or biological properties or functions of soil.	waterways or wetlands.		
Hydrology			
PO8 Development: (a) enhances or maintains the existing groundwater hydrological regime of all areas of environmental significance; and (b) ensures that the water table and hydrostatic pressure in the area of environmental significance is returning to its natural state.	No acceptable outcome is nominated.	**PO**	No groundwater has been intercepted by the existing operation. Water management is regulated by DES under the EA conditions, it is therefore suggested that the 2018 Approval conditions remain appropriate.
Non-native pest management			
PO9 Development avoids the introduction of non-native pest species (plant or animal) that pose a risk to ecological integrity.	**AO9.1** Development does not introduce non-native pest species.	**AO**	Non-native pest species will continue to be monitored and controlled, where necessary.
Ongoing management, construction and operation			
PO10 During construction and operation of development, ongoing management, monitoring and maintenance is undertaken to ensure impacts on environmentally	No acceptable outcome is nominated.	**PO**	The operation will continue to be undertaken in accordance with standard site based management measures as detailed in the Site Based Management Plan (refer **Attachment 11 – Site Based Management Plan**).

Performance outcomes	Acceptable outcomes	Compliance	Comments
significant areas, biodiversity values and ecological processes, including water quality and hydrology, are avoided or minimised. Editor's note—Construction and operation related to a development are carried out in accordance with an operational management plan where appropriate. This plan can form an amendment to an existing approved management plan for the site.			
PO11 Development adjoining a national park or other land in a protected area estate: (a) maintains and where appropriate, improves access to a protected area estate; and (b) maintains a buffer to a protected area estate in accordance with minimum best practice standards and includes characteristics to avoid development impacts. Editor's note—Protected area estate includes the following classes, as defined in the Nature Conservation Act 1992: national park (scientific); national parks; national parks (Aboriginal land); national parks (Torres Strait Islander); national parks (Cape York Peninsula Aboriginal land); national parks (recovery); conservation parks; resource reserves; nature refuges; coordinated conservation area; wilderness areas; World Heritage management areas; and	No acceptable outcome is nominated.	**NA**	The site does not adjoin a national park or other land in a protected area estate.

Performance outcomes	Acceptable outcomes	Compliance	Comments
international agreement areas.			
PO12 Management arrangements facilitate the effective conservation and protection of matters of national, state or local environmental significance, ecological processes and biodiversity values.	**AO12.1** Areas supporting matters of national, state or local significance features, biodiversity values or ecological processes are: (a) transferred into public ownership where the land is required for public access or for some other public purpose consistent with its ecological, open space or recreation functions, including: (i) access for maintenance; (ii) linking core and remnant habitat areas; (iii) protecting water quality and ecological processes; and (iv) other public benefit; or (b) incorporated within private open space and included within a voluntary statutory covenant that is registered under the *Land Title Act 1994*. Editor's note—Matters of national, state or local environmental significance include all areas shown on all biodiversity overlay maps.	**NA**	No management arrangements are proposed for matters of local environmental significance. Revegetation measures required to mitigate potential significant residual impacts to matters of state or national significance will be secured accordingly.
Rehabilitation			
PO13 Areas degraded as a result of development are rehabilitated by the proponent as near as is practical to the naturally occurring suite of native plant species and ecological communities.	No acceptable outcome is nominated.	**PO**	Site rehabilitation is regulated by DES under the EA conditions. It is suggested the 2018 Approval conditions remain appropriate.

Performance outcomes	Acceptable outcomes	Compliance	Comments
Editor's note—A rehabilitation plan supported by expert ecological advice prepared in accordance with SC6.8 — Ecological assessment planning scheme policy as well as reference to SC6.12 — Landscape design and street trees planning scheme policy will assist in demonstrating achievement of this performance outcome.			
Reconfiguring a lot			
PO14 The ecological function and biodiversity values of existing habitat are maintained by ensuring that reconfiguring a lot does not result in the fragmentation of habitat.	**AO14.1** Reconfiguring a lot does not result in any additional lots where the entire site is subject to: (a) matters of state or local (high) environmental significance; or (b) biodiversity corridors and wildlife habitats; or (c) waterways and wetlands. **AND**	**NA**	Subdivision is not proposed.
	AO14.2 Roads created as the result of reconfiguring a lot are located between the riparian corridor and any additional lots created.		

Bushfire Hazard Overlay

Performance outcomes	Acceptable outcomes	Compliance	Comments
Access			
PO1 Development ensures that the location, siting, and design of development and associated driveways and access routes: (a) avoid potential for entrapment during a bushfire; (b) facilitate safe and efficient emergency services to access and egress the site during a bushfire; and (c) enables safe evacuation of the site during a bushfire for site occupants.	**AO1.1** AO1.1.1 Where the development is located in an urban area, the development: (a) has direct access to a constructed, all-weather, public road capable of carrying emergency service vehicles; (b) has a maximum single access driveway length of sixty (60) metres from the street to the development; and (c) access driveways have a maximum gradient of 12.5 per cent. OR	**NA**	The site is not within an urban area.
	AO1.1.2 Where the development is located in a non-urban area, the development: (a) has direct access to a constructed, all-weather, public road capable of carrying emergency service vehicles; (b) is separated from hazardous vegetation by a public road or fire trail with a minimum width of four (4) metres and at least six (6) metres clear of vegetation, with a minimum of 4.8 metres vertical clearance and a maximum gradient of 12.5 per cent; and (c) has: (i) a maximum single access	**PO**	Quarry activities generally have a broad range of plant and equipment available to assist in preventing and reducing potential impacts associated with a bushfire event (e.g. heavy machinery, water trucks). The existing operation had direct access to the Bruce Highway, which is capable of carrying emergency service vehicles. The quarry will continue to manage bushfire hazards in a manner which ensures safe and efficient emergency access and egress to the site during a bushfire, enabling safe evacuation of the site during a bushfire for site employees. Bushfire management is discussed in the Site Based Management Plan (refer **Attachment 11 –**

Performance outcomes	Acceptable outcomes	Compliance	Comments
	driveway length of sixty (60) metres from the street to the development; or (ii) access driveways that are greater than sixty (60) metres from the street to the dwelling provide a turning circle with a minimum radius of eight (8) metres every sixty (60) metres.		**Site Based Management Plan**).
Water supply for fire fighting purposes			
PO2 Development provides adequate and accessible water supply for fire fighting purposes which is safely located and freely accessible for fire fighting.	**AO2.1** AO2.1.1 In a reticulated water supply area fire hydrants in: (a) residential areas are above ground single outlet fire hydrants and provided at not less than eighty (80) metre intervals and at each street intersection; and Editor's note—To remove any doubt, these intervals also apply to common access ways within a common private title. (b) commercial and industrial areas are above or below ground fire hydrants and provided at not less than ninety (90) metre intervals and at each street intersection. Above ground fire hydrants are to be fitted with dual valve outlets in these areas.	**NA**	The site is not connected to reticulated water.

Performance outcomes	Acceptable outcomes	Compliance	Comments
	Editor's note—Fire hydrants are designed and installed in accordance with Australian Standard 2419.1 Fire hydrant installations – system design, installation and commissioning, unless specified by the relevant water entity. OR		
	AO2.1.2 Where a reticulated water supply is not available or the development is not within eighty (80) metres of a hydrant, a water tank is provided within ten (10) metres of the building or structure, and the water tank has: (a) a take-off connection from the building to the tank which is at a level that provides on-site water storage of not less than the water requirement outlined in Table 8.2.4.3.3; (b) a hardstand area allowing heavy rigid fire appliance access within six (6) metres of a tank; and (c) fire brigade tank fittings consisting of: (i) for above ground tanks, (A) fifty (50) millimetre ball valve and male camlock coupling; and (B) above ground water pipe fittings that are metal; or (ii) for underground tanks, an access hole of 200 millimetre diameter (minimum) to allow access for suction lines.	**PO**	The quarry has existing, adequate and accessible water supply for fire fighting purposes. Bushfire management is discussed in the Site Based Management Plan (refer **Attachment 11 – Site Based Management Plan**).

Performance outcomes	Acceptable outcomes	Compliance	Comments
	Note—Plastic tanks are not recommended, however if they are fully submerged with above ground access points they are acceptable. Note—Where water tanks are required, swimming pools, creeks and dams should not be used as a substitute for a dedicated static supply as these sources of water are not reliable during drought conditions.		
Activities involving hazardous materials			
PO3 Public safety and the environment are not adversely affected by the impacts of bushfire on hazardous materials.	**AO3.1** Development does not involve the manufacture or storage of hazardous materials within a bushfire hazard area. Editor's note—Refer to the Work Health and Safety Act 2011 and associated regulation, the Environmental Protection Act 1994 and the relevant building assessment provisions under the Building Act 1975 for requirements related to the manufacture and storage of hazardous substances.	**PO**	Fuel storage areas will continue to be located away from vegetation and office areas and stored and handled in accordance with the relevant Australian Standard. Firefighting equipment will be located within proximity to these areas. Bushfire management is discussed in the Site Based Management Plan (refer **Attachment 11 – Site Based Management Plan**).
Development within the high and very high bushfire hazard areas			
Avoiding the hazard			
PO4 The development is compatible with the level of risk associated with the bushfire hazard.	**AO4.1** The development has a Bushfire Attack Level of less than 12.5. Editor's note—The Bushfire Attack Level is calculated in accordance with the methodology described in the Australian Standard AS 3959 — Construction of buildings in bushfire prone areas.	**NA**	No additional buildings are proposed.
Land use			
PO5 Essential community infrastructure and community facilities are highly vulnerable	**AO5.1** The following uses are not located in high or very high bushfire hazard areas:	**NA**	Essential community infrastructure is not proposed as part of this application.

Performance outcomes	Acceptable outcomes	Compliance	Comments
development are located, designed and sited to: (a) protect the safety of people during a bushfire; (b) not increase the exposure of people to the risk from a bushfire event; (c) minimise the risk to vulnerable populations; and (d) ensure essential community infrastructure can function effectively during and immediately after bushfire events.	(a) childcare centre; (b) detention facility; (c) educational establishment; (d) emergency services; (e) hospital; (f) industrial use involving manufacture or storage of hazardous materials; (g) multiple dwelling; (h) outstation; (i) relocatable home park; (j) residential care facility; (k) retirement facility; (l) rooming accommodation; (m) shopping centre; (n) short-term accommodation; (o) telecommunications facility; (p) tourist park; (q) tourist attraction; (r) transport depot; and (s) utility installation.		
Reconfiguring a lot			
General			
PO6 Where reconfiguration is undertaken a separation distance from hazardous vegetation is provided. Editor's note—The preparation of a bushfire management plan in accordance with SC6.5 — Bushfire management planning scheme policy can assist in demonstrating compliance with this performance outcome.	**AO6.1** In urban areas lots are separated from hazardous vegetation by a distance: (a) that achieves a Bushfire Attack Level of twenty-nine (29) or less at all boundaries; and (b) is contained wholly within the development site.	**NA**	Subdivision is not proposed.

Performance outcomes	Acceptable outcomes	Compliance	Comments
	OR **AO6.2** In non-urban areas a building envelope of reasonable dimensions is provided on each lot which achieves a Bushfire Attack Level of twenty-nine (29) or less at all boundaries Editor's note—Where a separation distance is proposed to be achieved by utilising existing cleared developed areas external to the site, certainty must be established (through tenure or other means) that the land will remain cleared of hazardous vegetation. For staged developments, temporary separation distances, perimeter roads or fire trails may be absorbed as part of subsequent stages.		
PO7 In urban areas development includes a constructed perimeter road between the lots and hazardous vegetation with reticulated water supply. The access is available for both fire fighting and maintenance works.	**AO7.1** In urban areas lot boundaries are separated from hazardous vegetation by a public road which: (a) has a two lane sealed carriageway; (b) contains a reticulated water supply; (c) is connected to other public roads at both ends and at intervals of no more than 500 metres; (d) accommodates geometry and turning radii in accordance with Queensland Fire and Emergency Services' Fire Hydrant and Vehicle Access Guidelines; (e) has a minimum of 4.8 metres vertical clearance above the road; (f) is designed to ensure hydrants and water access points are not located	**NA**	Subdivision is not proposed.

Performance outcomes	Acceptable outcomes	Compliance	Comments
	within parking bay allocations; and (g) incorporates roll-over kerbing.		
PO8 In non-urban areas development includes a perimeter road or an all-weather fire access trail which is available for both fire fighting and maintenance/hazard reduction works.	**AO8.1** In non-urban areas the development includes a perimeter road or an all-weather fire access trail which: (a) separates the development from the hazardous vegetation with a width of at least twenty (20) metres; (b) with a minimum formed width of four (4) metres; (c) a minimum of 4.8 metres vertical clearance above the road; (d) has a turning circle with a minimum radius of eight (8) metres every sixty (60) metres; (e) has adequate drainage and erosion control devices; (f) has a gradient no greater than 12.5 per cent and a cross fall of no greater than ten (10) degrees; (g) has access at each end of the perimeter road or the fire trail from a public road; (h) has the access point signed and direction of travel identified; and (i) has a suitable arrangement in place to ensure maintenance in perpetuity.	**NA**	Subdivision is not proposed.
PO9 Road widths and construction within the development are adequate for fire emergency vehicles.	No acceptable outcome is nominated.	**NA**	Subdivision is not proposed.

Performance outcomes	Acceptable outcomes	Compliance	Comments
Emergency services access			
PO10 Development facilitates the safe and efficient access and egress of emergency services during a bushfire event.	**AO10.1** The development includes a perimeter road or a fire access trail which: (a) separates the development from the hazardous vegetation; (b) is a minimum of ten (10) metres in width, with a minimum formed width of four (4) metres; (c) is a minimum of six (6) metres clear of standing flammable vegetation; (d) has passing bays twenty (20) metres long by three (3) metres extra trail width, or turning facilities every 200 metres; (e) has adequate drainage and erosion control devices; (f) has a gradient no greater than 12.5 per cent and a cross fall of no greater than ten (10) degrees; (g) has access at each end of the perimeter road or the fire trail from a public road; (h) has the access point signed and direction of travel identified; and (i) has suitable arrangements in place to ensure maintenance in perpetuity.	**NA**	Subdivision is not proposed.
Avoiding the hazard			
PO11 Road widths and construction within the development are adequate for fire emergency vehicles to gain access to a safe working area close to dwellings and near	**AO11.1** Road access minimum clearances of 3.5 metres wide and 4.8 metres high are provided for safe passage of emergency vehicles.	**NA**	Subdivision is not proposed.

Performance outcomes	Acceptable outcomes	Compliance	Comments
water supplies whether or not on-street parking spaces are occupied.	Editor's note—For further information on how to address the above criteria please see Queensland Fire and Emergency Service: Fire hydrant and vehicle access guidelines for residential, commercial and industrial lots.		
PO12 Hydrants are suitably identified so that fire services can locate them at all hours.	**AO12.1** Hydrants are identified as specified in Queensland Fire and Emergency Service: Fire hydrant and vehicle access guidelines for residential, commercial and industrial lots. Editor's note—Fire hydrants are designed and installed in accordance with Australian Standard 2419.1 Fire hydrant installations – system design, installation and commissioning, unless specified by the relevant water entity.	**NA**	Subdivision is not proposed.

Flood Hazard Overlay Code

Performance outcomes	Acceptable outcomes	Compliance	Comments
Development in Fitzroy River flood areas – H1 (low hazard area) or H2 (medium hazard area) or North Rockhampton flood management area or Creek catchment flood – planning area 2			
PO1 Development (including extensions) for non-residential purposes is able to provide a safe refuge for people and for the storage of goods during times of flood inundation.	**AO1.1** For non-residential development, at least thirty (30) per cent of the gross floor area of all new buildings and structures is located a minimum of 500 millimetres above the defined flood level. Editor's note—Areas less than those nominated above may be supported where accompanied by a flood impact report in accordance with SC6.10— Flood hazard planning scheme policy. AND	**NA**	The site is not located in the H1, H2, North Rockhampton flood management area or the Creek catchment flood – planning area 2.
	AO1.2 A report from a registered professional engineer of Queensland certifies that the development in the flood area will not result in a material increase in flood level or flood hazard on upstream, downstream or adjacent properties.		
PO2 Development is located to minimise susceptibility to and potential impacts of flooding.	**AO2.1** For residential uses the finished floor levels of all habitable rooms shall be constructed a minimum of 500 millimetres above the defined flood level. AND	**NA**	The site is not located in the H1, H2, North Rockhampton flood management area or the Creek catchment flood – planning area 2.
	AO2.2		

Performance outcomes	Acceptable outcomes	Compliance	Comments
	A report from a registered professional engineer of Queensland certifies that the development in the flood area will not result in a material increase in flood level or flood hazard on upstream, downstream or adjacent properties. Editor's note—Report to be prepared in accordance with SC6.10—Flood hazard planning scheme policy.		
PO3 Development avoids the release of hazardous materials into floodwaters.	**AO3.1** All hazardous materials and hazardous manufacturing equipment and hazardous containers are located and stored a minimum of 500 millimetres above the defined flood level. Editor's note—Refer to the Work Health and Safety Act 2011 and associated regulation, the Environmental Protection Act 1994 and the relevant building assessment provisions under the Building Act 1975 for requirements related to the manufacture and storage of hazardous substances.	**NA**	The site is not located in the H1, H2, North Rockhampton flood management area or the Creek catchment flood – planning area 2.
Development in Fitzroy River flood areas – H3-H4 (high hazard areas) or H5-H6 (extreme hazard areas) or Creek catchment flood - planning area 1			
PO4 Development does not involve the further intensification of land uses and does not increase the risk to people and property. Editor's Note—Flood hazard risk assessment can be undertaken in accordance with SC6.10 — Flood hazard planning scheme policy.	**AO4.1** AO4.1.1 Development does not involve new buildings or structures. OR AO4.1.2 Where involving the replacement or alteration to an existing non-residential building or structure: there is no increase in the existing or previous buildings' gross floor area; and the	**NA**	The site is not located in the H3-H4, H5-H6 or creek catchment flood – planning area 1.

Performance outcomes	Acceptable outcomes	Compliance	Comments
	finished floor level of any replacement or alteration to an existing building is constructed a minimum of 500 millimetres above the defined flood level. OR		
	AO4.1.3 Where involving the replacement or alteration to an existing caretaker's accommodation, dwelling house or dwelling unit: (a) there is no increase in the number of dwellings; (b) there is no increase in the existing or previous buildings' gross floor area; and (c) the finished floor level of all habitable rooms shall be constructed a minimum of 500 millimetres above the defined flood level. AND		
	AO4.1.4 Where located in the rural zone, the total floor area of class 10a buildings and structures on the site do not exceed a total of fifty (50) square metres, and are set back a minimum of twenty (20) metres from all site boundaries.		
PO5 Development avoids the release of hazardous materials into floodwaters.	**AO5.1** Materials manufactured, used or stored on site are not hazardous in nature.	**NA**	The site is not located in the H3-H4, H5-H6 or creek catchment flood – planning area 1.
Development in floodplain investigation area			
PO6 Development is located to minimise susceptibility to and potential impacts of	**AO6.1** Flood resilience is optimised by ensuring new habitable rooms are located on the highest part	**AO**	No new habitable dwellings are proposed in the flood investigation area.

Performance outcomes	Acceptable outcomes	Compliance	Comments
flooding. Editor's note—The floodplain investigation area is mapping supplied by the Queensland Reconstruction Authority for possible flood affected areas, where local verification is yet to be completed. A flood hazard assessment in accordance with SC6.10 — Flood hazard planning scheme policy can be undertaken to verify the potential risk of a flood event occurring.	of the site to minimise entrance of floodwaters.		
PO7 Development avoids the release of hazardous materials into floodwaters.	**AO7.1** Materials manufactured, used or stored on site are not hazardous in nature.	**NA**	No hazardous materials will be stored in the flood investigation area.
Development in Fitzroy River flood area – all hazard areas, North Rockhampton flood management area or Creek catchment flood – all planning areas			
PO8 Development is located to minimise susceptibility to and potential impacts of flooding.	No acceptable outcome is nominated.	**NA**	The site is not located in the Fitzroy River flood area, North Rockhampton flood management area or Creek catchment flood area.
PO9 Underground car parks are designed to prevent the intrusion of floodwaters.	**AO9.1** Development with underground car parking is designed to prevent the intrusion of floodwaters by the incorporation of a bund or similar barrier a minimum of 500 millimetres above the defined flood level.	**NA**	The site is not located in the Fitzroy River flood area, North Rockhampton flood management area or Creek catchment flood area.
PO10 Development: (a) does not result in any reduction of onsite flood storage capacity; or (b) does not result in any change to depth, duration or velocity of floodwaters within the premises; and (c) does not change flood characteristics outside the premises, including but	No acceptable outcome is nominated.	**NA**	The site is not located in the Fitzroy River flood area, North Rockhampton flood management area or Creek catchment flood area.

Performance outcomes	Acceptable outcomes	Compliance	Comments
not limited to causing: (i) loss of flood storage; or (ii) loss of or changes to flow paths; or (iii) acceleration or retardation of flows; or (iv) any reduction in flood warning times elsewhere on the floodplain. Editor's note—Council may require the applicant to submit a site-based flood study that investigates the impact of the development on the floodplain and demonstrates compliance with the relevant performance outcome.			
PO11 Essential community infrastructure and community facilities are protected from, and able to function effectively during and immediately after, a defined flood event.	**AO11.1** A use for a purpose listed in Table 8.2.8.3.3: (a) is not located within the flood hazard area; and (b) has at least one (1) flood free access road.	**NA**	The site is not located in the Fitzroy River flood area, North Rockhampton flood management area or Creek catchment flood area.
PO12 Development provides safe and trafficable access to the local evacuation centres and evacuation services and have regard to: (a) evacuation time; (b) number of persons affected; (c) types of vehicles necessary for evacuation purposes; (d) the distance to flood free land; and (e) the evacuation route.	**AO12.1** Trafficable access to and from the development complies with the Capricorn Municipal Guidelines. AND	**NA**	The site is not located in the Fitzroy River flood area, North Rockhampton flood management area or Creek catchment flood area.
	AO12.2 Trafficable access to and from the development within the creek catchment planning areas are in accordance with the Queensland Urban Drainage Manual. Note—Trafficable access for emergency services or	**NA**	The site is not located in the Fitzroy River flood area, North Rockhampton flood management area or Creek catchment flood area.

Performance outcomes	Acceptable outcomes	Compliance	Comments
	community related uses is obtained from at least one (1) route (minor collector or higher) for emergency services purposes. The development is to ensure that safe access, to the road network between the development site and the closest centre zone, is provided. Editor's note—Trafficable access requirements for creek catchment planning areas has not been identified and reference has been made to the provisions under the Queensland Urban Drainage Manual. This is due to the short period that property may be isolated.		
Development in Fitzroy River flood areas – H3-H4 (high hazard areas) or H5-H6 (extreme hazard areas), North Rockhampton flood management area or Creek catchment flood – planning area 1			
PO13 Development that involves temporary or moveable residential structures (for example caravan parks and camping grounds) are not located with the Fitzroy River high and extreme hazard areas, North Rockhampton flood management area and Creek catchment planning area 1.	No acceptable outcome is nominated.	**NA**	The site is not located in the Fitzroy River flood area, North Rockhampton flood management area or Creek catchment flood area.
Reconfiguring a Lot			
Development in Fitzroy River flood area – all hazard areas, North Rockhampton flood management area or Creek catchment flood - all planning areas			
PO14 Development does not result in the creation of additional lots.	**AO14.1** Reconfiguring a lot does not result in new lots.	**NA**	Subdivision is not proposed.
Development in floodplain investigation area			
PO15 Development provides vehicle access to a road network that is sufficient to enable safe access. Editor's note—The floodplain investigation area is	No acceptable outcome is nominated.	**NA**	Refer to response AO14.1 above.

Performance outcomes	Acceptable outcomes	Compliance	Comments
mapping supplied by the Queensland Reconstruction Authority for possible flood affected areas, where local verification is yet to be completed. A flood hazard assessment in accordance with SC6.10 — Flood hazard planning scheme policy can be undertaken to verify the potential risk of a flood event occurring.			
PO16 Onsite access is provided to a building envelope or fill area in which a building is to be constructed. The access is located on land classified as a low flood hazard in the defined flood event.	**AO16.1** Onsite access to a building envelope or fill area is provided over land that is designated as a low flood hazard. Editor's note—For the purposes of the above requirements in respect of an access area or a road which provides access to the development a low flood hazard means: (a) inundation is a maximum depth of 300 millimetres during events up to and including the defined flood event; (b) inundation extends for a maximum distance of 200 metres during events up to and including the defined flood event; and (c) The product of velocities and depth does not exceed D*V=0.4m2/s.	**NA**	Refer to response AO14.1 above.
Operational work			
PO17 Development does not materially impede the flow of floodwaters through the site or worsen flood flows external to the site.	**AO17.1** Development does not involve: (a) filling with a height greater than 100 millimetres; or (b) block or solid walls or fences; or (c) garden beds or other structures with a height more than 100 millimetres; or (d) the planting of dense shrub hedges.	**NA**	The proposed development does not involve any operational work.

Steep Land Overlay Code

Performance outcomes	Acceptable outcomes	Compliance	Comments
All development			
PO1 Development incorporates design measures for the development (including ancillary buildings, structures and swimming pools) to ensure: 1. the long-term stability of the site considering the full nature and end use of the development; 2. site stability during all phases of construction and development; 3. people and property are protected from a potential landslide event; and 4. adjoining properties are not impacted by a potential landslide event.	No acceptable outcome is nominated. Editor's note—The preparation of a site specific geotechnical assessment or landslide risk assessment in accordance with SC6.11 — Geotechnical report planning scheme policy can assist in demonstrating compliance with this acceptable outcome.	**PO**	Land management is regulated by DES in conditions of the existing EA. Site stability will also be considered through the quarry development plans and the creation of safe and stable benches.
PO2 Vegetation clearing on site does not increase the risk of a landslide event occurring.	No acceptable outcome is nominated. Editor's note—The preparation of a site specific geotechnical assessment report or landslide risk assessment in accordance with SC6.11 — Geotechnical report planning scheme policy can assist in demonstrating compliance with this acceptable outcome.	**PO**	Quarry development will ensure that safe and stable benches are created.
PO3 Development involving the manufacture or storage of hazardous materials in bulk is not at risk from a landslide event.	**AO3.1** The manufacture or storage of hazardous materials in bulk does not occur within the steep land overlay area	**PO**	The storage and handling of hazardous materials will continue to occur in accordance with the relevant Australian Standards.
PO4 Emergency services and community uses are able to function effectively during and	No acceptable outcome is nominated.	**NA**	The proposal does not involve emergency services or community uses.

Performance outcomes	Acceptable outcomes	Compliance	Comments
immediately after landslide events.			
Reconfiguring a Lot			
PO5 Development ensures that on all new lots: 1. future building location is not located on part of the site subject to a potential landslide; 2. the need for excessive work or changes to the finished landform to construct a building or vehicular access route within the development envelope nominated is avoided; and 3. future building will not be adversely affected by, or be at unacceptable risk from, landslide activity originating on sloping land above the site. Editor's note—The preparation of a site specific geotechnical assessment report or landslide risk assessment in accordance with SC6.11 — Geotechnical report planning scheme policy can assist in demonstrating compliance with this performance outcome.	**AO5.1** When a development footprint has a slope of, or greater than fifteen (15) per cent, each new lot has a minimum size and road frontage in accordance with Table 8.2.11.3.2. Note—The minimum lot size and road frontage stated in Table 8.2.11.3.2 prevails over the reconfiguring a lot code to the extent of any inconsistency. **AND** **AO5.2** The development has: 1. a frontage to a formed road; and 2. any section of a driveway or road internal to a site is not steeper than twenty-five (25) per cent.	**NA**	Subdivision is not proposed.
Operational Works			
PO6 Filling and excavation does not: 1. occur on land that has a slope greater than or equal to fifteen (15) per cent; and 2. alter the existing flow of surface water or groundwater on the site.	No acceptable outcome is nominated. Editor's note—The preparation of a site specific geotechnical assessment report or landslide risk assessment in accordance with SC6.11 — Geotechnical report planning scheme policy can assist in demonstrating compliance with this acceptable outcome.	**NA**	Operational works is not proposed.

Confirmation Notice

PLANNING ACT 2016, PART 1 OF THE DEVELOPMENT ASSESSMENT RULES

Application number:	**D/79-2017**	*For further information regarding this notice, please contact:*	Amanda O'Mara
Date application properly made**:**	**25 February 2022**	Phone:	07 4936 8099

1. APPLICANT DETAILS

Name:	**Hopkins Brothers Group Pty Ltd**		
Postal address:	**C/- Groundwork Plus** **PO Box 1779** **MILTON QLD 4064**		
Contact number:	0429 735 447	Email:	mbenham@groundwork.com.au

2. PROPERTY DESCRIPTION

Street address:	59793 Bruce Highway and Lot 1 Bruce Highway, Midgee, Lot 725 Bruce Highway and 129 Gavial-Gracemere Road, Bouldercombe
Real property description:	Lot 2 and 725 on RP888747, Lot 1 and 2 on SP247721 and Lot 931 on LIV40265

3. OWNER DETAILS

Name:	Hopkins Brothers Group Pty Ltd Tte and Manyfold Pty Ltd
Postal address:	380 Alexandra Street, PARKHURST QLD 4702
Name:	D P Carroll
Postal address:	PO Box 195, Qld 4700

4. DEVELOPMENT APPROVAL SOUGHT

'Other Change' to Development Permit D/79-2017 for a Material Change of Use for an Extractive Industry, Medium Impact Industry and a Warehouse and Environmentally Relevant Activity (ERA) 16 Threshold (2)(c) and (3)(c)

5. APPLICATION TYPE

	Development Permit	Preliminary Approval
Development assessable under the planning scheme, a temporary local planning instrument, a master plan or a preliminary approval which includes a variation approval	☒	☐

6. REFERRAL AGENCIES

Based on the information accompanying the lodged application, in accordance with the *Planning Regulation 2017,* referral to the following Referral Agencies is required.

For an application involving	Name of agency	Role of Agency	Contact Details

CLEARING NATIVE VEGETATION			
Schedule 10, Part 3, Division 4, Table 3 - Material change of use that is assessable development under a local categorising instrument			
Development application for a material change of use that is assessable development under a local categorising instrument and relates to a lot that is 5ha or larger, if— (a) the application— (i) is for a preliminary approval that includes a variation request; and (ii) relates to a lot that contains native vegetation shown on the regulated vegetation management map as a category A area or category B area; and (iii) is for a material change of use, other than a non-referable material change of use; or (b) the application is not stated in paragraph (a) and all of the following apply— (i) the material change of use does not involve prescribed clearing; (ii) accepted operational work may be carried out because of the material change of use, or the material change of use involves operational work that is assessable development under section 5; (iii) the accepted operational work or assessable operational work includes development other than the clearing of regulated regrowth vegetation on freehold land, indigenous land, or land the subject of a lease given under the Land Act for agriculture or grazing purposes	The chief executive of the department in which the *Planning Act 2016* is administered: State Development, Infrastructure, Local Government and Planning (State Assessment and Referral Agency Department)	Concurrence	In person: Level 2, 209 Bolsover Street, Rockhampton City Online lodgement using MyDAS2: https://prod2.dev-assess.qld.gov.au/suite/ Email: RockhamptonSARA@dsdilgp.qd.gov.au Postal: PO Box 113 Rockhampton Qld 4700
ENVIRONMENTALLY RELEVANT ACTVITIES			
Schedule 10, Part 5, Division 4, Table 2 - Non-devolved environmentally relevant activities			
Development application for a material change of use that is assessable development under section 8, if— (a) the environmentally relevant activity the subject of the application has not been devolved to a local government under the Environmental Protection Regulation; and (b) the chief executive is not the prescribed assessment manager for the application	The chief executive of the department in which the *Planning Act 2016* is administered: State Development, Infrastructure, Local Government and Planning (State	Concurrence	In person: Level 2, 209 Bolsover Street, Rockhampton City Online lodgement using MyDAS2: https://prod2.dev-assess.qld.gov.au/suite/ Email: RockhamptonSARA@dsdilgp.qd.gov.au Postal:

	Assessment and Referral Agency Department)		PO Box 113 Rockhampton Qld 4700
STATE TRANSPORT INFRASTRUCTURE (Generally)			
Schedule 10, Part 9, Division 4, Subdivision 1, Table 1 – Aspect of development stated in schedule 20			
Development application for an aspect of development stated in schedule 20 that is assessable development under a local categorising instrument or section 21, if— (a) the development is for a purpose stated in schedule 20, column 1 for the aspect; and (b) the development meets or exceeds the threshold— (i) for development in local government area 1—stated in schedule 20, column 2 for the purpose; or (ii) for development in local government area 2—stated in schedule 20, column 3 for the purpose; and (c) for development in local government area 1—the development is not for an accommodation activity or an office at premises wholly or partly in the excluded area However, if the development is for a combination of purposes stated in the same item of schedule 20, the threshold is for the combination of purposes and not for each individual purpose.	The chief executive of the department in which the *Planning Act 2016* is administered: State Development, Infrastructure, Local Government and Planning (State Assessment and Referral Agency Department)	Concurrence	In person: Level 2, 209 Bolsover Street, Rockhampton City Online lodgement using MyDAS2: https://prod2.dev-assess.qld.gov.au/suite/ Email: RockhamptonSARA@dsdilgp.qd.gov.au Postal: PO Box 113 Rockhampton Qld 4700
STATE TRANSPORT INFRASTRUCTURE (State Transport Corridors and Future State Transport Corridors)			
Schedule 10, Part 9, Division 4, Subdivision 2, Table 4 – Material change of use of premises near a State transport corridor or that is a future State transport corridor			
Development application for a material change of use, other than an excluded material change of use, that is assessable development under a local categorising instrument, if all or part of the premises— (a) are within 25m of a State transport corridor; or (b) are a future State transport corridor; or (c) are— (i) adjacent to a road that intersects with a State-controlled road; and (ii) within 100m of the intersection	The chief executive of the department in which the *Planning Act 2016* is administered: State Development, Infrastructure, Local Government and Planning (State Assessment and Referral Agency	Concurrence	In person: Level 2, 209 Bolsover Street, Rockhampton City Online lodgement using MyDAS2: https://prod2.dev-assess.qld.gov.au/suite/ Email: RockhamptonSARA@dsdilgp.qd.gov.au Postal: PO Box 113 Rockhampton Qld

	Department)		4700

It is the responsibility of the applicant to give within 10 business days each referral agency a copy of -

- the application (including application form and supporting material);
- this confirmation notice; and
- any applicable concurrence agency application fee (refer to the *Planning Regulation* to confirm the applicable referral agencies).

The applicant must provide written advice to Council (as the Assessment Manager) of the day on which this action was completed.

7. IMPACT ASSESSMENT

Will Impact Assessment be required?	**YES**
The whole of the application must be publicly notified under the provisions of Part 4 of the Development Assessment Rules by:	
- Publishing a notice at least once in a newspaper circulating generally in the locality of the premises which are the subject of the application; and - Placing a notice on the premises which are the subject of the application. The notice must remain on the premises for the period of time up to and including the stated day; and - Giving a notice to all owners of any lots adjoining the premises which are the subject of the application.	

8. PUBLIC NOTIFICATION DETAILS

The application requires public notification which must be undertaken in accordance with Section 53 of the *Planning Act 2016* and Part 4 of the Development Assessment Rules.

9. INFORMATION REQUEST

A further information request may be made by the assessment manager. Regardless of this advice, any concurrence agency for the application may make an information request.

10. SUPERSEDED PLANNING SCHEME

Is the application to be assessed under a Superseded Planning Scheme?	**NO**

You are further advised that the truth and accuracy of the information provided in the application form and accompanying information is relied on when assessing and deciding this application. If you find an INACCURACY in any of the information provided above or have a query or seek clarification about any of these details, please contact Council's Development Assessment Unit.

11. ASSESSMENT MANAGER

Name: **Amanda O'Mara** Signature: A O'Mara Date: 11 March 2022

PRINCIPAL PLANNING OFFICER

Rockhampton Office
232 Bolsover St, Rockhampton
Gracemere Office
1 Ranger St, Gracemere
Mount Morgan Office
32 Hall St, Mount Morgan

28 April 2022

Our reference: D/79-2017
Enquiries to: Amanda O'Mara
Telephone: 07 4936 8099

Hopkins Brothers Group Pty Ltd Tte
C/- Groundwork Plus
PO Box 1779
MILTON QLD 4064

Dear Sir/Madam

FURTHER ADVICE – DEVELOPMENT APPLICATION D/79-2017 FOR AN 'OTHER CHANGE' TO A MATERIAL CHANGE OF USE FOR EXTRACTIVE INDUSTRY, MEDIUM IMPACT INDUSTRY AND A WAREHOUSE – SITUATED AT 59793 BRUCE HIGHWAY AND LOT 1 BRUCE HIGHWAY, MIDGEE, LOT 725 BRUCE HIGHWAY AND 129 GAVIAL-GRACEMERE ROAD, BOULDERCOMBE - DESCRIBED AS LOT 2 AND 725 ON RP888747, LOT 1 AND 2 ON SP247721 AND LOT 931 ON LIV40265, PARISH OF PLEWS

Council refers to your application received by Council on 18 February 2022.

Council officers have undertaken a detailed assessment of the subject development application. In accordance with section 35 of the *Development Assessment Rules,* Council gives further advice about the application, as detailed below:

1. Traffic Impact Assessment (TIA) has not addressed the worst case scenario for haulage between the extractive industry site and the Rockhampton Ring Road (RRR) project. Further information is required which identifies and addresses all local government roads potentially impacted by the proposed development and operations.

   This may include haulage involving the use of a number of Local Government roads in the South and North Rockhampton areas. Please amend the TIA to include all possible haulage routes (including council roads) that can be used to transport material from the extractive industry site to Rockhampton Ring Road (RRR) construction sites. Please provide details regarding traffic generation from the proposed development and any impact to the current traffic volumes on possible haulage routes (including council roads) from the extractive industry site to RRR construction sites.

   The traffic volume comparison must be carried out in accordance with the Guide to Traffic Impact Assessment (GTIA) requirements and the TIA must be carried out and signed by a Registered Professional Engineer of Queensland (RPEQ).

2. Pavement Impact Assessment (PIA) has not addressed the impact on any local roads for the proposed scenarios. Further information is required addressing impacts on all relevant local government roads, for an increased output of one (1) million tonnes per annum specifically for the RRR project.

   All possible haulage routes (including Council roads in North and South Rockhampton areas) must be included into the RRR project scenario. The PIA must be carried out and signed by a Registered Professional Engineer of Queensland (RPEQ).

Should you have any queries regarding the above, please contact the undersigned on 07 4936 8099.

Yours faithfully



Amanda O'Mara
Principal Planning Officer
Planning and Regulatory Services

Queensland Government

Our reference: 2203-27812 SRA

6 April 2022

Hopkins Brothers Group Pty Ltd
PO Box 1447
MILTON QLD 4064
planning@groundwork.com.au

Attention: Megan Benham

Dear Hopkins Brothers Group Pty Ltd

Referral confirmation notice
(Given under section 7 of the Development Assessment Rules)

The development application described below is taken to be properly referred to the State Assessment and Referral Agency (SARA) under Part 2: Referral of the Development Assessment Rules.

Location details

Street address:	1 Bruce Highway, Midgee; 59793 Bruce Highway, Midgee; 33 Gavial-Gracemere Road, Bouldercombe; Bruce Highway, Bouldercombe; Bruce Highway, Midgee
Real property description:	1SP247721; 2RP888747; 2SP247721; 725RP888747; 931LIV40265
Local government area:	Rockhampton Regional Council

Application details

Development permit	Other change application for Material change of use for Extension to the Midgee Quarry (extend the quarry footprint, hours of operation and ERA threshold)

The referral confirmation period ended on 6 April 2022. SARA's assessment will be under the following provisions of the Planning Regulation 2017:

- 10.3.4.3.1 Clearing native vegetation
- 10.5.4.2.1 Environmentally relevant activities (only if ERA has not been devolved to a local government)
- 10.9.4.1.1.1 Infrastructure - state transport infrastructure
- 10.9.4.2.4.1 State transport corridors and future State transport corridors

Fitzroy/Central regional office
Level 2, 209 Bolsover Street,
Rockhampton
PO Box 113, Rockhampton QLD 4700

For further information please contact Carl Porter, Principal Planning Officer, on 07 4924 2918 or via email RockhamptonSARA@dsdilgp.qld.gov.au who will be pleased to assist.

Yours sincerely



Anthony Walsh
Manager Planning

cc Rockhampton Regional Council, enquiries@rrc.qld.gov.au