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"Glen Royal" Quarry

STATEMENT OF ENVIRONMENTAL EFFECTS

Logan Smith

"Glen Royal" 16,489 Gwydir Highway, Gravesend NSW 2401

September 2024

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DOCUMENT CONTROL

Project Name	Statement of Environmental Effects
Proponent	Logan Smith
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Prepared for	Logan Smith 16,489 Gwydir Highway Gravesend NSW 2401 E: loganglenroyal@yahoo.com.au
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0	September 2024	Peter Taylor	Initial Issue

EXECUTIVE SUMMARY

This Statement of Environmental Effects (SoEE) has been prepared by SMK Consultants on behalf of Logan Smith ("the Applicant") to accompany a Development Application to Gwydir Shire Council to obtain development consent for an existing quarry on the property of "Glen Royal" in Gravesend, northern NSW.

Applicant:	Logan Smith 16,489 Gwydir Highway Gravesend NSW 2401 ABN: 16 087 013 693
Owners:	Logan Smith 16,489 Gwydir Highway Gravesend NSW 2401
Land involved:	Glen Royal Lot 106 Deposited Plan 751108
Local Government Authority:	Gwydir Shire Council
Zoning:	RU1 Primary Production, under the Gwydir Local Environmental Plan 2013
Development Type:	Local Integrated Development
Development Description:	Gravel quarry producing up to 29,900 tonnes per year
Capital Investment Value:	$15,000

Approvals and Licences

It is proposed to extract up to 29,900 tonnes per year from the existing quarry site at 'Glen Royal', Gravesend. The proposal requires Development Approval from the Gwydir Shire Council under the *Gwydir Local Environmental Plan 2013* .

The Proposed Development

The proposed development involves obtaining approval to operate a gravel quarry at the Glen Royal on lot 106, Deposited Plan 751108. This quarry is on private property, located approximately 8.5 km northwest of the village of Gravesend and 40 km east of Moree in northwest New South Wales. The quarry site is accessible using an existing property access road from the Gwydir Highway, which borders the northern boundary of the property.

The Applicant proposes to extract gravel from the proposed quarry site and supply local projects on an as-required basis. The Applicant is now applying to establish, operate and rehabilitate a gravel quarry on Glen Royal.

The Glen Royal Quarry consists of high-quality gravel suitable for rail and standard road bases. The footprint of the proposed extractive area is 1.98 ha. The proposed development involves the extraction of material within the proposed footprint to provide gravel and fill for civil works such as road widening. The quarry's extraction limit is proposed to be 29,900 tonnes/year. The operation would involve winning quarry material by using a dozer or excavator, with trucks to be loaded by a front-end loader or excavator.

Upon cessation of extractive activities at Glen Royal, the quarry will be rehabilitated.

The proposed development is considered as Local Development under the *Environmental Planning and Assessment Act 1979* (EP&A Act). The proposed development is considered permissible with the consent of the Gwydir Shire Council under the *Gwydir Local Environmental Plan 2013* (Gwydir LEP).

This SoEE concludes that the site is suitable for the proposed development with minimal impact on the environment or the amenity of the local area, provided appropriate environmental management and mitigation measures are implemented.

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1 Introduction

The Proponent is applying for approval for works associated with the development, operation and rehabilitation of the existing Glen Royal gravel quarry, located at 16,489 Gwydir Highway, Gravesend, NSW. The Proponent is seeking approval for an annual extraction limit of 29,900 tonnes/year.

1.1 Scope of Works

The scope of proposed works consists of:

- The installation of a diversion bank around the majority of the quarry footprint to prevent runoff entering the quarry.
- Extraction of material (via mechanical methods such as bulldozers and front-end loaders).
- Loading and transport (involving front-end loaders and trucks).
- Dust suppression, including haul routes, on an as required basis.
- Ongoing management of weed growth including options of herbicide control.
- Site rehabilitation

1.2 Requirements for Development Consent

A Development Application is required pursuant to Part 4 of the Environmental Planning and Assessment Act 1979 (EP&A Act). The appropriate determining authority is the Gwydir Shire Council. A SoEE is required in accordance with Section 4.15 of the EP&A Act.

This report includes an assessment of the suitability of the site for the proposed development the potential environmental impacts on both the natural and built environments, and social and economic impacts in the locality.

1.3 Permissibility

The proposed quarry is classified as an extractive industry and aligns with the objectives of the site's RU1 Primary Production zoning. It is also permissible with development consent under the provisions of the Gwydir LEP. The proposed quarry is considered a local development.

The proposal does not trigger any requirements for designated development under Schedule 3 of the Environmental Planning and Assessment Regulation 2021, such as:

- The Applicant proposes to extract less than 30,000 m^3 per year of material.
- The site area is less than 2 ha.
- There are no naturally occurring water bodies within 40 m.
- There are no wetlands within 100 m of the site.

The proposal is considered a non-designated development and to be undertaken by a private company with a capital investment of less than $20 million. There are no conditions in dispute and the application can be assessed and by Gwydir Shire Council, the local consent authority. The Applicant has also requested this.

The Applicant is seeking non-designated development approval for the operation of the quarry site.

1.4 Declaration

This report is a Statement of Environmental Effects for the proposal, assessed in accord with Section 4.15 of the EP&A Act. The report has been prepared by:

- **Biyomi Palkadapela** B.Sc. M.Sc.
- **Steve Cheal** B Nat.Res. (Hons), BE Resources (Hons)
- **Peter Taylor** B.Sc. MEIANZ CIAg LAA

2 Proposed Development Details

2.1 Development Site

The quarry is located on an 800 ha property named “Glen Royal”, identified as Lot 106 in Deposited Plan 751108. It is located 8.5 km northwest of the village of Gravesend in the Gwydir Shire (Figure 1). Access to the quarry is from the Gwydir Highway via an internal property access road. A residential dwelling is situated 170 m southeast of the quarry footprint.

The Glen Royal quarry site footprint is approximately 1.98 ha (Figure 2). The predominant land use within the vicinity is agricultural, mainly grazing and cultivation.

Figure 1: "Glen Loyal" Locality Plan

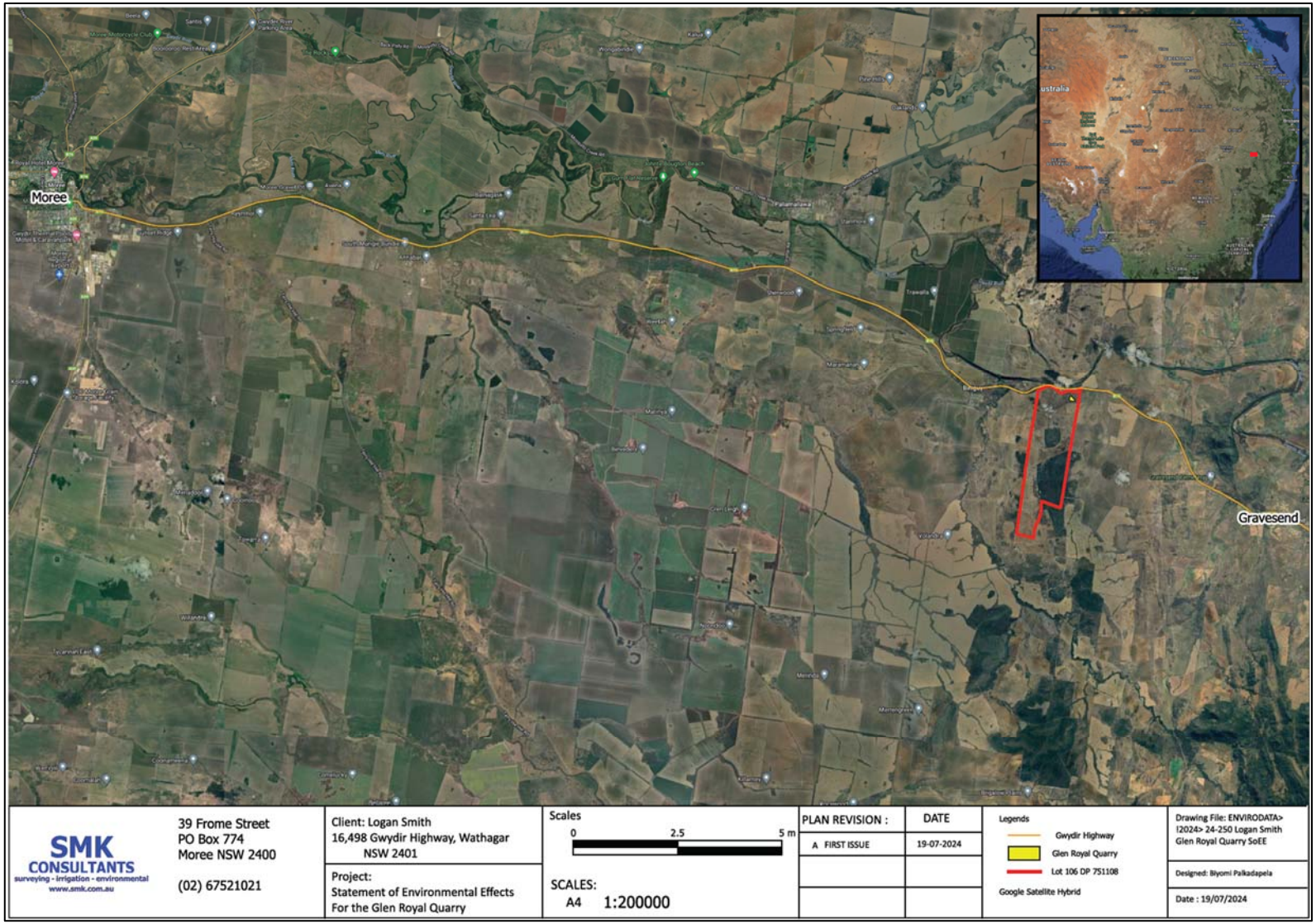
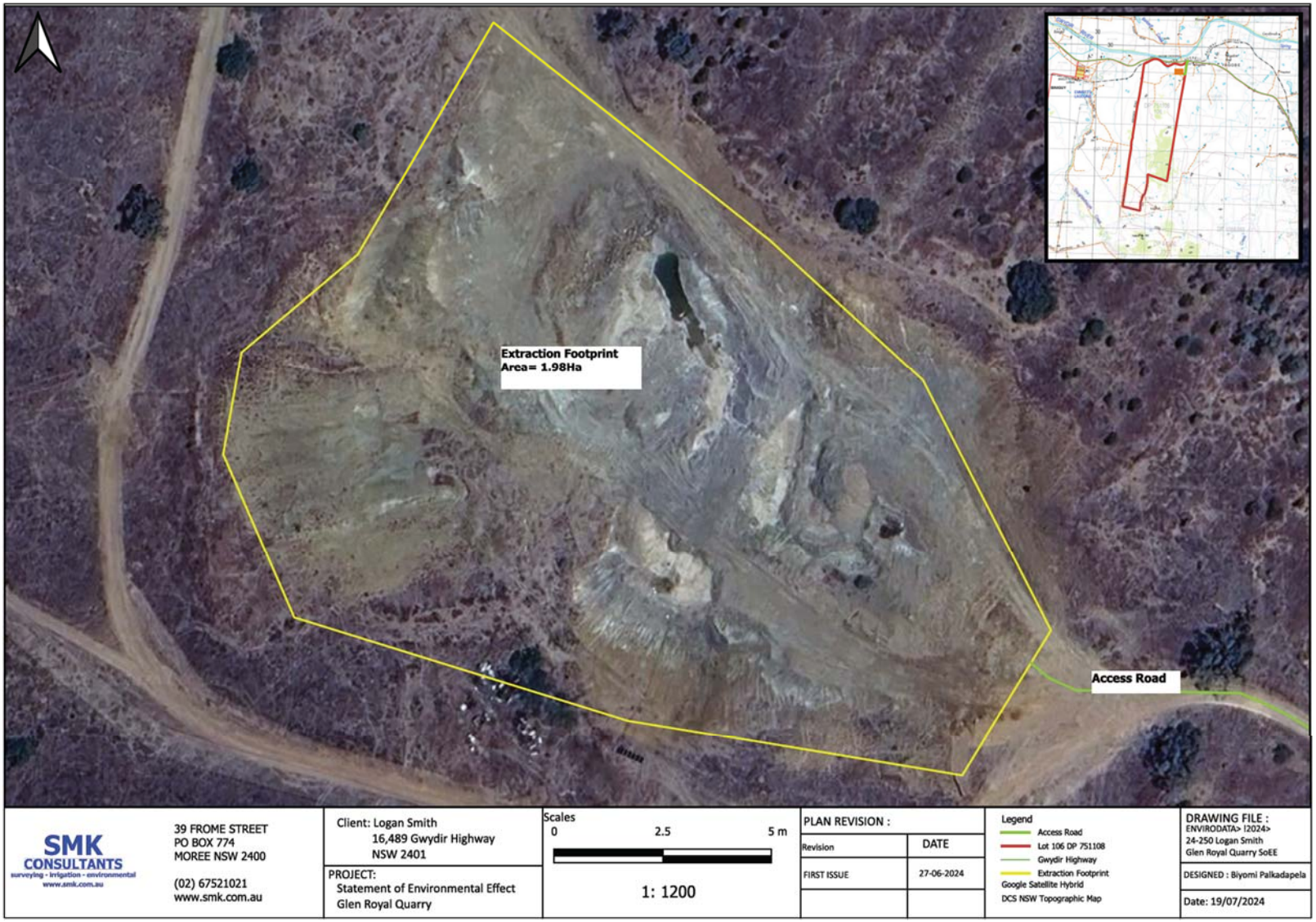


Figure 2: Proposed Development – Glen Loyal Quarry Footprint and Site Plan



2.2 Quarry Operations

The quarry has been operating since before 2013. No approval has been obtained for the operation of the quarry to date. Gwydir Shire Council have been obtaining quarry material from the site since it was developed.

The quarry site is substantially developed and operational. Proposed works for the ongoing operation of the quarry are minor: mainly focussed on establishing a controlled drainage boundary around the quarry. Gravel is extracted using a bulldozer or excavator and a front-end loader is used to load gravel directly onto dump trucks and hauled to customers.

No crushing or processing of gravel is required and gravel is not stockpiled onsite.

The proposal does not require clearing except for a small number of scattered shrubs associated with proposed drainage bank around the quarry. This does not trigger offset requirements under the *Biodiversity Conservation Act 2016*.

No fuel or other chemicals will be stored onsite. Fuel will be brought to the site to fuel equipment on an as-needed basis. No bunded fuel storage or chemical storage area is required for this development.

At the cessation of quarry operations, spoil material and topsoil will be redistributed over the disturbed areas and revegetated. The aim of rehabilitation would be the long-term re-establishment of vegetative cover comprising grass, shrubs and possible trees within the quarry floor. The area would also likely be utilised for low-level, intermittent cattle grazing in the long term.

Figure 2 presents a Quarry site plan. Figure 3, 4 and 5 present photographs of the quarry site.

Figure 3: Quarry site looking east

Figure 4: Quarry site looking west

Figure 5: Quarry site viewed from the entrance

2.3 Power, Sewage and Telecommunications

No additional telecommunications or electricity connections will be required as a result of this proposal. Mobile phone coverage is available on the site. Equipment to be utilised on the site will be diesel powered.

No permanent buildings or sewage facilities are proposed. A 'Portaloo' will be utilised, as required, for more intensive operations on the site to provide employees with toilet facilities whilst the quarry is operating.

2.4 Operating Hours

Normal operating hours are from 6 am to 6 pm Monday through Saturday. There will be no work at the site on Sundays or public holidays. Allowance for operations under exceptional circumstances for high-priority projects undertaken by instruction from TfNSW or a local Council. Some work would occur outside of these hours. This work would consist of staff arrival and general maintenance of equipment.

2.5 Water Supply

On occasions, the quarry and haulage operations will create dust and therefore require some water for dust suppression. No other water supply is required for the operations.

The main source of dust is trucks moving to and from the quarry site. On occasions where the dust is adversely impacting adjoining landowners, the Applicant proposes to undertake selective road watering to avoid such impacts.

Where water is required for dust suppression activities at any stage of the operations, municipal water will be hauled to the quarry site using water trucks. No groundwater or surface water will be extracted at Glen Royal Quarry as part of the proposal.

2.6 Water management

The proposed quarrying operations involve the excavation of gravel within the 1.98 ha of land area within the current quarry footprint (Figure 2). Vegetation within the footprint has been previously cleared at some point in history, and the soil has been stripped. The topsoil and overburden have been stockpiled and overburden will be utilised to complete a diversion bank around the quarry, segregating internal and external runoff.

The quarry is below natural surface and collects all runoff internally. Stormwater is contained and settled within the quarry pit in designated runoff ponds. Runoff ponds within the quarry were identified during the field visit. The primary function of runoff stored within the quarry will be soil conservation. On occasion as required, settled runoff water from the pond may be pumped out to maintain adequate runoff holding capacity. Pumped water will be irrigated on the property to promote pasture growth.

To facilitate the water pumping process, solar panels have been installed in the southern section of the quarry. Figure 6 and Figure 7 depict the stormwater held within the quarry premises and the pump system implemented on-site.

Figure 6: Stormwater captured in the quarry site

Figure 7: Stormwater pump out from the quarry site

2.7 Access

The quarry is accessible from the Gwydir Highway using an existing property access, which consists of a single-lane gravel road. Gwydir Highway is an all-weather, two-lane, bitumen-sealed road. Figure 8 through to Figure 11 provide views of the existing access and sight distances onto Gwydir Highway. Trucks use the existing internal access road to leave the property and enter onto the Gwydir Highway for the transport of gravel.

Figure 8: Property entrance viewed from Gwydir Highway

Figure 9: Property Access from Gwydir Highway, Viewed from International Property Road

Figure 10: View from Glen Royal property entrance Looking west along Gwydir Highway

The property entrance is located adjacent to a slight bend in the highway to the west, however oncoming vehicles will remain visible due to the absence of trees or shrubs and the flat topography. The sight distance to the west and east is over 150 m. These sight distances are considered sufficient.

Figure 11: View from Glen Royal property entrance looking east along Gwydir Highway

Figure 12: Internal property road - intersection to the dwelling and to the quarry

Figure 12 shows where the internal property road divides into the dwelling access and the quarry access. A signpost denotes quarry access to incoming vehicles.

3 Commonwealth Legislation review

In accordance with the Commonwealth *Environment Protection and Biodiversity Conservation Act, 1999* (EPBC Act) a search was undertaken using the EPBC Protected Matters Search Tool (DoAWE 2024) to generate a list of World Heritage Properties, National Heritage Sites, Ramsar wetlands, nationally threatened species and communities, and migratory species protected under international agreements that may occur on, or in, the vicinity of the project area. Findings were assessed in accordance with criteria specified in Matters of National Environmental Significance – Significant Impact Guidelines 1.1 (DoEWHA 2013). A copy of the assessment is presented in Appendix 3.

The assessment concluded that the proposed development does not pose a significant risk to Matters of National Significance identified by the EPBC Act and does not require referral to the Federal Minister.

4 NSW Legislation review

4.1 Environmental Planning and Assessment Act 1979

Section 5 of this SoEE addresses the matters for consideration outlined in Section 4.15 of the Environmental Planning and Assessment Act 1979 (EP&A Act).

The proposal does not require any other approvals listed in Section 4.46 of the EP&A Act and is therefore classified as 'Non-Integrated Development'.

4.2 Environmental Planning and Assessment Regulation 2021

The NSW *Environmental Planning and Assessment Regulation 2021* requires that certain documents must accompany a development application. This Statement of Environmental Effects and its attachments satisfy this requirement.

The proposed development is not considered designated development as the intended development does not meet and of the conditions listed in the NSW *Environmental Planning and Assessment Regulation 2021* (the extraction of more than 30,000 m^3 of extractive material per year, disturb a total surface area of more than 2 ha of land, and is not located within a pre-defined proximity of various sensitive areas).

4.3 State Environmental Planning Policies (SEPPs)

A review was undertaken of current SEPPs, with relevant SEPPs identified below.

4.3.1 SEPP (Biodiversity and Conservation) 2021

This SEPP applies to the Gwydir Shire area. The proposal site was assessed for:

- core koala habitat- an area of land with a resident population of koalas, evidenced by attributes such as breeding females, being females with young, and recent sightings of and historical records of a population.
- potential koala habitat- areas of native vegetation where trees of the types listed in Schedule 1 constitute at least 15% of the total number of trees in the upper or lower strata of the tree component.

4.3.1.1 Assessment of core Koala Habitat

The results of a NSW BioNet Atlas search show no recorded koala sightings within 10 km of the proposed development site. The nearest koala sighting to the site is 11.9 km to the north Table 1). Koala sightings in the vicinity of the quarry is shown in the following Figure 13.

Figure 13: Koala sightings in the Vicinity of the Development Footprint (Source- SEED MAP)

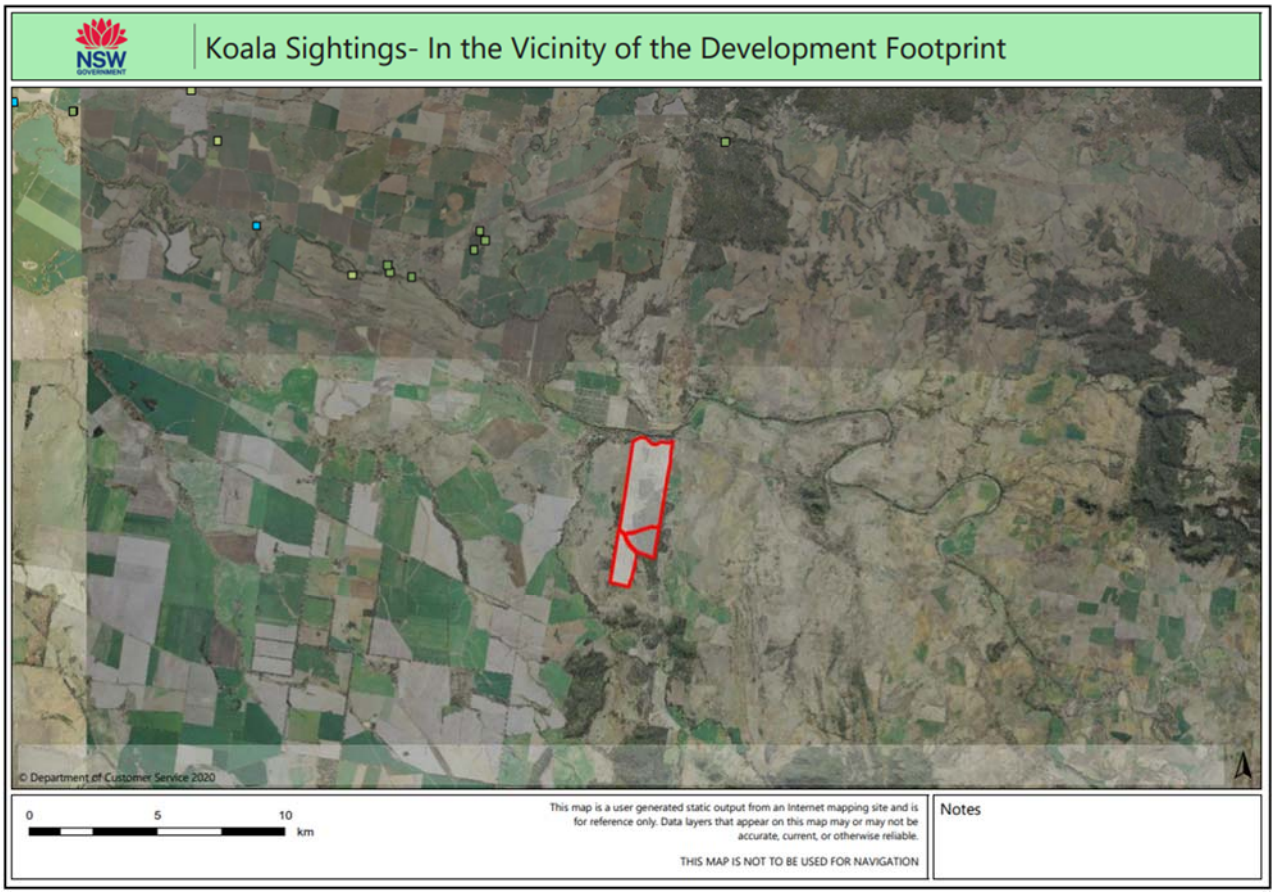


Table 1: Details of the Closest Koala sighting to the proposed site

Scientific Name	**Phascolarctos cinereus**
Observed Date	**6/10/2014 9:36:00 PM**
Observation Type	**Observed**
Description	**Mosquito Creek Travelling Stock Reserve**
Latitude	**-29.431526**
Longitude	**150.270207**
Zone	**56**

The "Glen Royal" property, including the quarry site, is not a 'core Koala habitat' as defined in the Koala Habitat Protection SEPP.

4.3.1.2 Assessment of Potential Koala Habitat

The site inspection confirmed only scattered mature trees in the vicinity of the development footprint. This area does not meet the criteria to be categorised as a potential Koala habit.

4.3.2 SEPP (Resilience and Hazards) 2021

4.3.2.1 Hazardous and Offensive Development

All fuels required will be brought to the site on a daily basis and not stored onsite. Blasting will not be required for extraction. No explosives will be required on site. No other hazardous materials will be stored onsite. The proposal does not involve activities that generate offensive odours or waste products.

According to SEPP (Resilience and Hazards) proposal is not considered to be potentially hazardous.

4.3.2.2 Remediation of land

The proposed development site has been historically cleared for agriculture use. The site has been used for low-intensity agricultural activities such as grazing.

A visual inspection of the land did not reveal any signs of chemical contamination, such as chemically affected patches of vegetation, old drums or bare or discoloured areas. No history of contaminating activity is apparent on the site, such as sheep dip or agrochemical usage. The site inspection, historical use and present activities do not indicate any contamination present rendering the site unsuitable for current and proposed uses.

4.3.3 SEPP (Transport and Infrastructure) 2021

The proposed development does not trigger the provisions set out in Schedule 3 of this SEPP, as it will generate less than 200 motor vehicle movements per day (refer to section 5.12).

4.3.4 SEPP (Resources and Energy) 2021

Part 3 of this SEPP provides a number of matters that a consent authority must consider before determining a development application. These matters are similar to, but are in different terms to, the relevant matters contained in the Gwydir Shire Local Environment Plan. These matters, addressed in section 5 of this SoEE, are:

a) Clause 13 requires that Council must consider the compatibility of development proposals on land in the vicinity of existing mines etc. or of land containing mineral or extractive resources. This provision is to ensure that these resources are not sterilised by incompatible development on surrounding land and is a matter for Council to consider.

Comment:
There are no existing mines or known mineral resources in the vicinity of the quarry. The nearest mining and exploration title is 23km to the southeast of the quarry site.

b) Clause 14 requires the consent authority to ensure that the development is undertaken in an environmentally responsible manner to avoid or minimise:
- Impacts on significant water resources;
- Impacts on threatened species and biodiversity; and
- Greenhouse gas emissions.

Comment:
Addressed in section 5.

c) Clause 15 requires that the consent authority consider whether the proposed resource recovery is efficient. Modern equipment and best practice management principles are used in the operation of the quarry to ensure that resource recovery is efficient and economically viable.

Comment:
Addressed in section 2.

d) Clause 16 (1) requires the consent authority to consider whether a consent should contain conditions to:
- Require some or all of the material to be transported by means other than by public road;
- Require the preparation and implementation of a code of conduct relating to the transport of materials on public roads.

e) Clause 16 (2) requires the consent authority to provide a copy of the development application to each road authority for the roads used and the Roads and Maritime Service within seven (7) days of receipt. This is a matter for the Council.

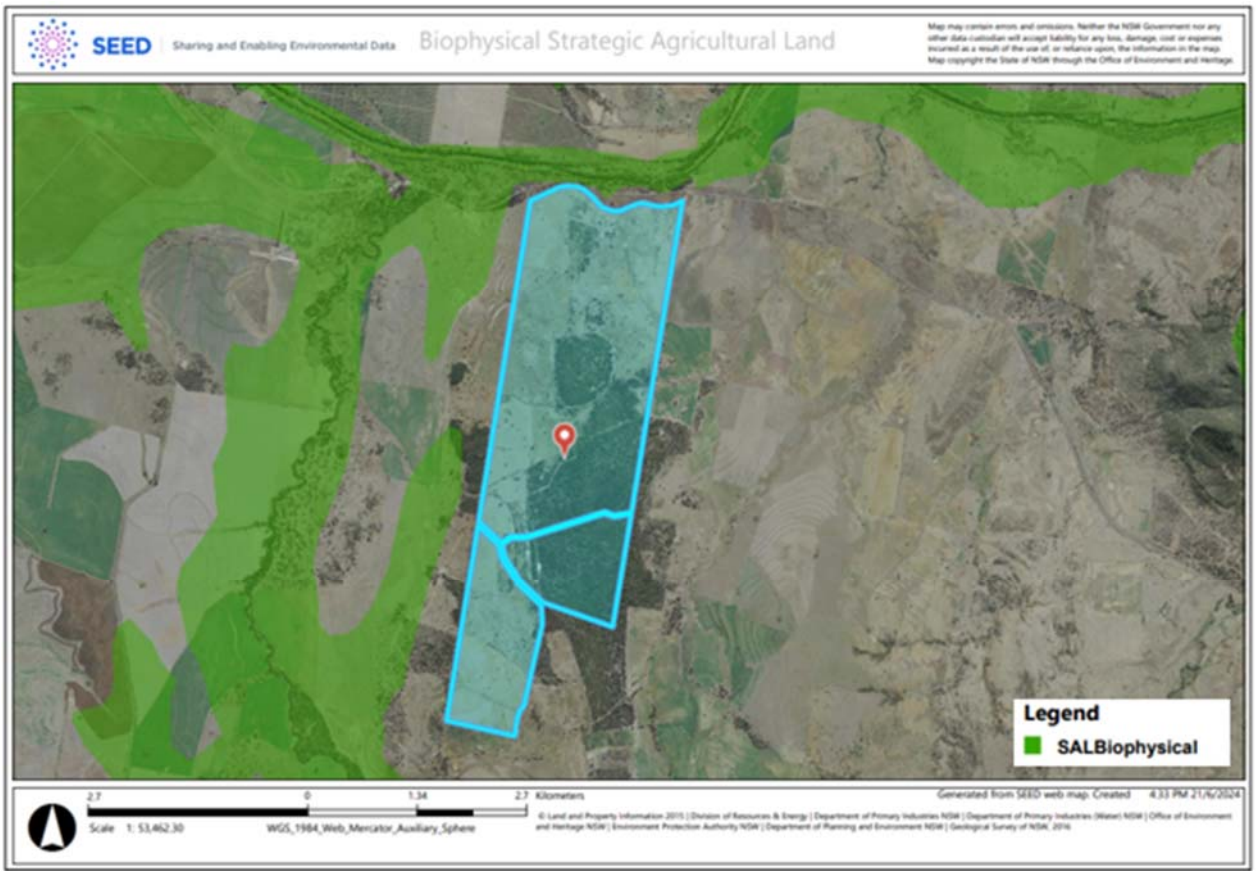
f) Clause 16 (3) provides that the consent authority must not determine the development application until it has taken into consideration any submission received from the road authorities and TfNSW within 21 days after the Authority was provided with a copy of the application and provide each of them with a copy of the determination. This is a matter for the Council.

g) Clause 17 requires that the consent authority must consider whether or not the consent should be issued subject to conditions requiring rehabilitation of the land affected by the development. The project proposal includes a rehabilitation component. This is a matter for the Council.

4.3.5 SEPP (Primary Production and Rural Development) 2019

The property and the subject site are not designated as Biophysical Strategic Agricultural Land Figure 14.

Figure 14: Biophysical Strategic Agricultural Lands in Locality



4.4 New England Northwest Regional Plan 2041

The New England Northwest Regional Plan 2041 is a high-level document outlining objectives for land-use planning across the region. The proposed development is consistent with objectives of the Plan and with priorities for the Gwydir local government area listed in the Plan.

4.5 Gwydir Local Environmental Plan 2013

The proposal is subject to the *Gwydir Local Environmental Plan 2013* (Gwydir LEP).

The aims of the Gwydir LEP are as follows:

a) to encourage the proper management, development and conservation of environmental, economic and social resources in Gwydir,
b) to facilitate economic growth and development consistent with the aim specified in paragraph (a) and that:
    i. minimises the cost to the community of fragmented and isolated development, and
    ii. facilitates the efficient and effective delivery of amenities and services, and
    iii. facilitates stimulation of demand for a range of residential, enterprise and employment opportunities promotes agricultural diversity, and
    iv. utilises, where feasible, existing infrastructure and roads for new development and future potential development,
c) to facilitate development in accordance with flood management planning,
d) to facilitate development that is compatible with adjoining and nearby uses,
e) to facilitate development that is appropriate in scale and type to the characteristics of the relevant zone,
f) to identify, protect and conserve places of European heritage significance and Aboriginal heritage and cultural significance,
g) to identify, protect, conserve and enhance natural assets.

The proposed development is considered consistent with the aims of the Gwydir LEP. The proposal will facilitate economic growth within the region by providing local materials to the construction industry. The proposal has considered protection of environment, nearby uses and heritage into consideration, ensuring that adverse impacts are avoided and/or minimised.

4.5.1 Land Use and Zoning

The subject land is zoned as RU1 Primary Production under the Gwydir LEP. The proposed land use is defined in the Gwydir LEP as extractive industry and is permissible with development consent, within this zone.

The objectives of the RU1 Primary Production zone are:

- *To encourage sustainable primary industry production by maintaining and enhancing the natural resource base.*
- *To encourage diversity in primary industry enterprises and systems appropriate for the area.*
- *To minimise the fragmentation and alienation of resource lands.*
- *To minimise conflict between land uses within this zone and land uses within adjoining zones.*

The proposal is considered compliant within the zoning under the Gwydir LEP. The following minimum buffers are recommended for the existing land use.

Table 2: Recommended Minimum Buffers

Mining, Petroleum Production & Extractive Industries		
	Normal Operations (m)	**Blasting (m)**
Residential areas & urban development	500	1000
Rural dwellings	500	1000
Education facilities & pre-schools	500	1000
Rural tourist accommodation	500	1000
Watercourses & wetlands	SSD	SSD
Bores & wells	SSD	SSD
Potable water supply/catchment	SSD	SSD
Property boundary	SSD	SSD
Roads (public)	SSD	SSD

- Source: Department of Primary Industries (2007) Living and Working in Rural Areas Handbook

The closest rural dwelling which is not associated with the development is 16,463 Gwydir Highway, Gravesend situated 570 m north-east of the proposed development, at its closest location, which exceeds the minimum buffers listed in Table 2 for quarrying activities. The proposal complies with all other fixed minimum recommended buffers listed in Table 2.

Comments

The protection of natural resources and places has been taken into consideration in the proposed development. The continued utilisation of the land will minimise fragmentation and alienation. The proposal is for a quarry development that is considered a 'non-agricultural land use' on a small portion of the property. The remaining property area will continue to be utilised for agricultural purposes. The proposed development is therefore not considered to alienate resource lands. The quarry site is isolated from adjoining properties and is not considered to have a direct physical impact on adjoining land. A quarry operation of the scale that is proposed is considered compatible with agriculture. The proposed development is therefore considered to be both compatible and consistent with the surrounding land uses

and would be considered to satisfactorily meet the objectives of the RU1 Primary Production Zone.

4.6 Development Contribution Plan

The Gwydir Shire Council S94 Contributions Plan – Traffic Generating Development applies to this proposal.

The method of calculating contribution rates is based on the reconstruction costs, average road maintenance costs and the length of road likely to be used by vehicles associated with the development. The impact is calculated on the Equivalent Standard Axle (ESA) loading on the road per vehicle as a proportion of the total loadings on the road. This is then converted to a total cost per tonne (1,000 kg) per km. The designated haulage route will form the length of road upon which the contribution will be levied. Where the designated haulage route involves the use of more than one road then each road will be treated separately in terms of the road maintenance contribution. Therefore, the total contribution payable for the development will be the sum of all the calculated contribution rates for all the individual roads on the designated haulage route/s.

The Gwydir Shire development contribution rates are as follows:

- Unsealed Roads: 0.19c/tonne/km
- Sealed Local Road: 1.29c/tonne/km

The quarry material from the site will be transported via the Gwydir Highway which is a state controlled and state funded road. The Gwydir Highway is the main haul route. The quarry material will be transported to a wide range of projects in both the Moree Plains and Gwydir Shires. The majority of the quarry material removed to date has been hauled to mainly Shire road works. A minor amount of gravel has been taken to private landowner developments.

The Gwydir Highway is a two-way bitumen-sealed road that allows for efficient transportation in both directions.

4.7 Biodiversity Conservation Act 2016

The quarry site was assessed using the online Biodiversity Offsets Scheme (BOS) Entry Tool, as outlined in the Biodiversity Conservation Act 2016 (BC Act), to determine whether the proposed development lies within an area mapped as having high biodiversity value.

According to BOS, the clearing threshold for the subject site is 1 ha or more of native vegetation. No native vegetation is proposed to be cleared. The proposed development site is not located within a declared area of outstanding biodiversity value, and the proposal does not exceed the BOS threshold.

A 'test of significance' was completed for the proposal, as outlined in Section 7.3 of the BC Act, and is attached in Appendix 4. The test concluded that the proposal is not likely to significantly affect threatened species and that further assessment under the Biodiversity Assessment Method and the preparation of a Biodiversity Development Assessment Report is not required.

5 Environmental Considerations

Environmental matters to be considered, as listed in Section 4.15 of the EP&A Act, are addressed in the following subsections.

5.1 Land Use

The proposed development is consistent with the historical land use and current zoning of the Lot. The majority of the lot will continue to be used for agricultural purposes.

5.2 Land Contamination

A review of the site history identifies that the site was not utilised for any human activities other than intermittent grazing. No previous land use has been identified that would have a potential for contamination within the quarry area. No potentially contaminating activities as listed in Appendix 1 of "Managing Land Contamination – Planning Guidelines" have been undertaken on the site.

A site inspection was undertaken to identify potential soil and/or land contamination issues that may present a risk to human and environmental health. No contamination was identified. A search of the contaminated sites register was also undertaken . No contamination was registered. The quarry site is considered to not be contaminated and suitable for the proposed land use.

5.3 Water

5.3.1 Water Requirements

The proposed development only requires water on an intermittent basis for dust suppression activities. No surface or groundwater will be extracted as part of the proposed works. Where water will be required for dust suppression activities, municipal water will be hauled to the quarry site using water trucks. The estimated water requirement for dust suppression is approximately 0.35 ML per year.

5.3.2 Surface Water

The quarry operation is internally drained, so there is little to no risk of uncontrolled discharge to surface waters. Internal draining requires the quarry to be able to safely store rainfall runoff generated within the quarry.

A water balance was calculated for the quarry area, using a monthly time step and long term rainfall data to estimate the required capacity of the quarry holding pond to safely retain and store runoff in a 90th percentile wet year (Appendix 2).

Long term rainfall and evaporation observations from the Bureau of Meteorology for Gravesend were used in water balance calculations.

Water balance calculations are based on:

- Monthly rainfall totals in the 90th percentile wet year
- A runoff coefficient for the quarry area of 0.5
- Seepage losses (hydraulic conductivity of the in-situ quarry material) assumed to be 5.0 x 10^{-7}m/s

Sediment in the quarry area will be captured in the runoff holding pond. The proposal includes an option to pump runoff water from the holding pond onto irrigation areas within the property to maintain a safe and adequate runoff storage capacity in the holding pond. Irrigation areas will be used to augment and improve existing pasture and include contour drains and sediment capture traps to minimise erosion, reduce drainage water velocity, maximise sediment settling and ensure no uncontrolled runoff.

Based on the water balance calculations, the capacity required to safely capture runoff from the quarry in a 90th percentile wet year is 1,983 m^3 (2.0 ML). This storage estimate assumes an available irrigation area of 2 ha.

The closest surface waterbody, as defined on SIX Maps, to the proposed development is an ephemeral second-order unnamed creek that traverses the property in a south-north direction and flows approximately 330 m west of the proposed development.

5.3.3 Groundwater

Bore logs were examined within the locality surrounding the proposed quarry site (Figure 15 and Table 1). These indicate the region is dominated by clay and gravel at varying depths. Groundwater is typically encountered in sand or gravel deposits from 9 m below ground level.

Figure 15: Bore Logs and Proposed Quarry in Locality

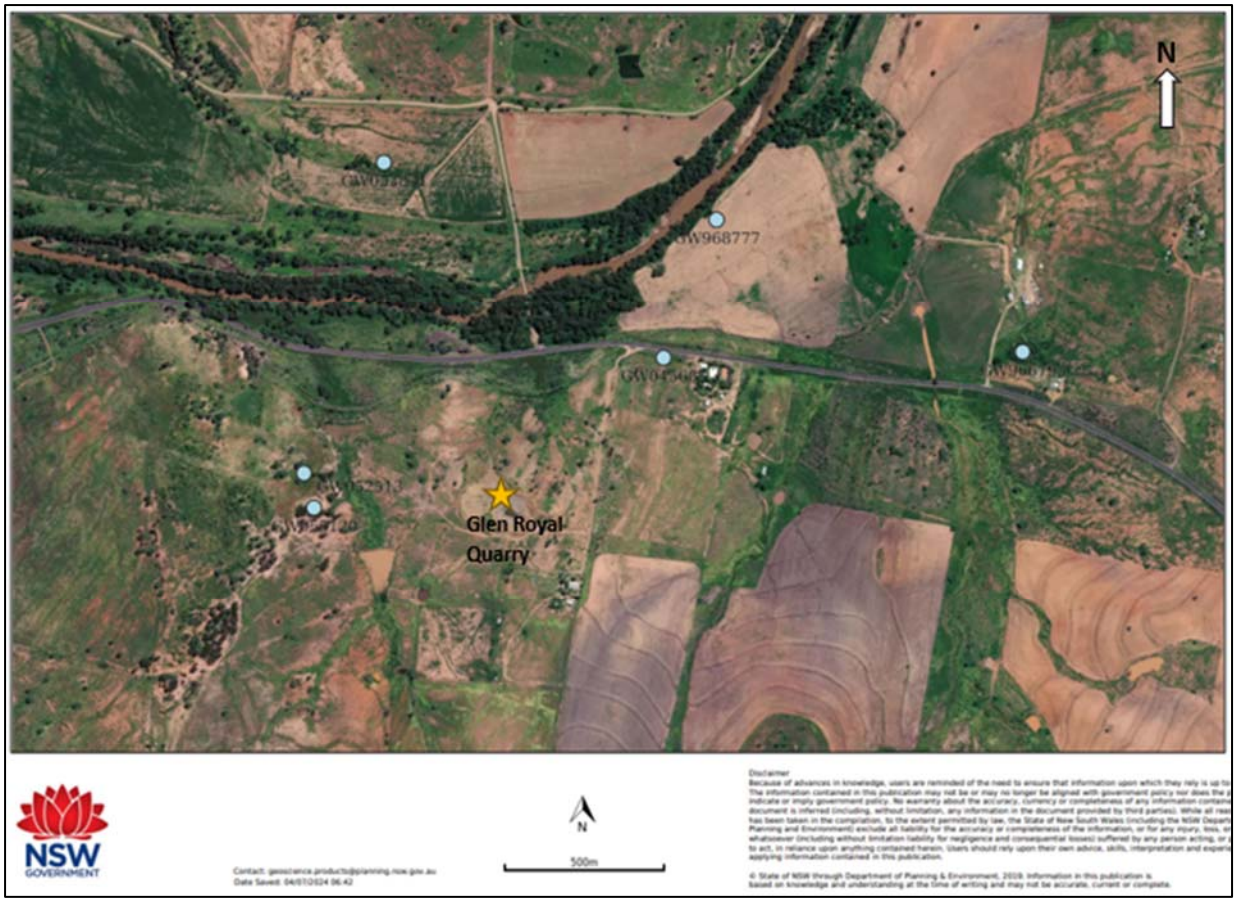


Table 3: Bore Log Data

Bore ID	Depth of Bore (m)	Dominant Soil Type	Bedrock type & Depth (m)	Standing Water level (m)	Distance to quarry (m)	Yield (L/s)
GW045685	17	N/A	N/A	N/A	570	N/A
GW055120	55	N/A	N/A	N/A	500	N/A
GW052513	45.7	clay	14.6 (shale)	ne	530	ne
GW053831	13.7	N/A	ne	ne	950	ne
GW968777	21.0	topsoil	ne	9.1	950	2.0
GW966793	60	clay	2 (shale)	10	1,450	0.2

N/A = not available

ne – not encountered

The proposed development is unlikely to intersect groundwater or have a negative impact upon surrounding groundwater bodies or nearby bores.

5.4 Flora and Fauna

"Glen Royal" was historically cleared for grazing purposes. The property contains some native plant communities approximately 1.2 km south and 600 m west of the quarry site. The remainder of the property consists of a mix of native and introduced pastures.

The proposed development footprint has been predominantly cleared over time, as extraction activities have progressed. The topsoil layer over the cleared area has been removed and stockpiled. No mature trees are present in the development footprint.

The proposed development is unlikely to impact threatened species, populations or ecological communities that may be present within the locality of the development site (refer to section 4.7 and Appendix 4).

Vegetation surrounding the quarry footprint is mapped as 'PCT 0—Non-Native' on the NSW SEED mapping portal. This was confirmed during the field inspection' where the vicinity of the development footprint was observed to consist of non-native pastures with isolated trees.

Several weed species were observed at relatively low densities across the area, particularly in disturbed soil and cleared areas. These include:

- *Sclerolaena murtica*- Black roly-poly
- *Gomphocarpus Fruticosus* – Cotton Bush
- *Vachellia farnesiana* - Mimosa bush
- *Opuntia aurantiaca* - Tiger Pear
- *Opuntia stricta* - Common Prickly Pear

Weeds management should include:

- Soil stabilisation measures to optimise the establishment of desirable ground cover vegetation.
- Ensuring all machinery, equipment and vehicles brought onto a property be free of soil, seed or plant material and any soil and organic matter removed, including under vehicles, in cabins and in trays.
- Controlling existing weeds that are present onsite which are listed under the *Biosecurity Act* 2015 and which are Weeds of National Significance, such as Common (Prickly) Pear and Tiger Pear.

5.5 Soil Erosion and Sediment Control

Soil at the quarry site consists of shallow reddish-brown clayey (approximately 200mm) underlain by basalt, which is the quarry source material. The flatter areas throughout the remainder of the property consist mainly of heavy black clays. The quarry area does not have existing salinity issues and the development proposal will not increase the risk of salinity on the property. There are no acid sulphate soils present within the region.

In an undisturbed state, soils on site are of slight erosion hazard. The potential for soil erosion may be increased through soil stripping and replacement activities, and result in reduced availability for use in rehabilitation of the project site.

Erosion is the primary risk to soil as a result of the proposed development. All reasonable and practicable measures will be undertaken to minimise erosion as a result of quarry activities including:

- Minimising the area of ground disturbance associated with the quarry site as far as is reasonably practical;
- Minimising the areas stripped of soil at any one time;
- Stripped topsoil and subsoil to be stockpiled separately within nominated stockpile areas:
    - Stockpiles should be constructed in accordance with Standard Drawing (SD) 4-1 of *Managing Urban Stormwater – Soils and Construction" V1* (Landcom, 2004) (the "Blue Book") and restricted to the nominated disturbance footprint.
    - A coverage of 70% grass (or equivalent stabilisation) would be established over stockpiles within 60 days (C-Factor of 0.05).
    - The topsoil and subsoil stockpiles would be aligned generally parallel with the contour in low mounds not exceeding 3 m in height.
- Immediately stabilising worked sections and undertaking progressive rehabilitation where possible to minimise the area of exposed soil at any given time.

Provided the above management measures are implemented; the proposal will have minimal adverse impacts on soils.

5.6 Waste

The only form of waste to be generated on these sites will consist of waste from staff meals. This and any other waste material generated on site will be removed on a 'come clean – go clean' basis.

5.7 Natural Hazards and Bushfires

The land is not subject to geological hazards such as volcanism, earthquakes, or soil instability such as subsidence, slip, or mass movement. The quarry site is considered to be flood free.

The property including the quarry site is not identified as Bushfire Prone Land. The risk of bushfire at the quarry site is minimal.

5.8 Cultural Heritage

5.8.1 Non-Indigenous Heritage

No non-indigenous heritage items have been found near the development site, nor is the development site listed under Schedule 5: Environmental Heritage of the Gwydir LEP.

5.8.2 Aboriginal Heritage

The quarry site was assessed in accordance with the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (DECCW, 2010).

A search of the AHIMS was conducted (5th of June 2024) to identify registered (known) Aboriginal sites or declared Aboriginal places within or in the vicinity of the subject area . The search revealed one (1) recorded Aboriginal site, object or place recorded within a 1 km buffer zone of the quarry site (Appendix 1).

Given the quarry site's distance from permanent water sources, it is likely that artefacts such as campsites or scarred trees would be present in the area. The closest named waterbody is the Gwydir River. The area would have been subjected to seasonal migration, and therefore, scattered artefacts such as flint could be randomly distributed throughout the locality. The rock underlying the subject site consists of hard gravel material, which would have been difficult to quarry or mine. It is unlikely that the development footprint was utilised by aboriginal groups for this purpose. Traverses across the area that may be disturbed by the proposed development did not identify any aboriginal objects or artefacts. The majority of the quarry footprint has been subject to high levels of disturbance. It is therefore considered unlikely that the proposal site would contain any items of aboriginal cultural heritage.

The following presents a summary of the site investigation:

- No archaeological sites have been recorded within the quarry site;
- One Aboriginal site has been mapped within a 1 km buffer zone;
- The majority of the quarry site has been highly modified from past extractive and soil stripping activities;
- No cultural features or artefacts were noted on the development site;
- There are no landscape features that are likely to indicate the presence of Aboriginal objects (i.e. no permanent waterways or caves);
- The potential for this site to contain sites of significance involves random scatters of artefacts that may have been dropped or discarded during hunting expeditions or whilst travelling and remains around the base of older trees. No such artefacts were identified.

The result of this investigation is that the likelihood of disturbing sites or objects of aboriginal cultural significance for the proposed development is relatively low. It is recommended that

the project proceed on the basis that if items or sites of cultural heritage are identified, all work should cease until further investigation is undertaken in accordance with the recommendations of traditional owners. NSW Environment and Heritage recommend that the following procedure is adopted:

> *If any Aboriginal object is discovered and/or harmed in, or under the land, while undertaking the proposed development activities, the proponent must:*
> - *Not further harm the object;*
> - *Immediately cease all work at the particular location;*
> - *Secure the area so as to avoid further harm to the Aboriginal object;*
> - *Notify NSW E&H as soon as possible on 131555, providing any detailed of the Aboriginal object and its location;*
> - *Not recommence any work at the particular location unless authorised in writing by NSW E&H.*

5.9 Air Quality

The potential sources of dust generated by the proposal include:

- Extracting raw materials using machinery
- Loading of raw materials in trucks
- Road transport of quarry materials

The following management and mitigation measures will help minimise the potential adverse impacts of dust, both on and offsite:

- Cover or dampen all stockpiled materials to ensure proper stabilisation
- Vehicle speed restrictions within the subject site will be imposed
- Regularly inspect and maintain all machinery to reduce the potential for excessive emissions
- During hot, dry and windy conditions, dust-generating work may need to be reduced or suspended as necessary to prevent undue dust impacts on neighbouring residences
- Any spills should be cleaned up as soon as possible
- If road dust is creating a nuisance or safety issue, road watering is to be undertaken.

Implementation of the abovementioned control measures is considered sufficient to minimise dust emissions and ensure that the proposed development has no significant adverse impact on local amenities.

5.10 Visual Impacts

No significant visual impacts are foreseen regarding the development. The quarry site is sufficiently isolated from other residences to cause minimal visual impact. No change to the existing access road is proposed.

5.11 Noise Impacts

The main noise sources for the proposed development are:

- Haulage trucks
- Excavating and loading plant
- Reverse warning devices

All of these noise sources are intermittent for the proposed development. Blasting is not required. The potential noise impacts of these activities are assessed below.

Excavation and loading activities would generally be undertaken below ground in the pit areas. According to the NSW Noise Policy for Industry 2017 (NPI), the activity would be restricted to daytime.

The typical noise levels for equipment required for the proposed operations, presented in the following table, have been obtained from:

- *AS 2436 – 2010, Guide to noise and vibration control on construction, demolition and maintenance sites.*
- *BS 5228-1, Code of practice for noise and vibration control on construction and open sites. Noise.*
- *DEFRA—Department for Environment Food and Rural Affairs (United Kingdom), Update of noise database for prediction of noise on construction and open sites-Phase 3: Noise measurement data for construction plant used on quarries, July 2006.*

Table 4: Typical Sound Levels of Construction Plant and Equipment

Plant Description	A-weighted sound power levels L_{wA} dB ref: 10^{-12} W		A-weighted sound pressure levels L_{pA} dB at 10m
	Typical Range	Typical (midpoint)	
Bulldozer	102-114	108	80
Excavator	97-117	107	79
Front end loader	110-115	113	85
Loader (wheeled)	99-111	105	77
Truck (>20 tonnes)	107	107	79
Truck (water cart)	106-108	107	79

The magnitude of off-site noise impacts associated with operation would be dependent upon a number of factors including:

- The intensity and location of activities
- The type of equipment used
- Existing local noise sources
- Intervening terrain
- The prevailing weather conditions

Machinery items at the site operate at maximum sound power levels for only brief stages. At other times, the machinery may produce lower sound levels while carrying out activities not requiring full power. It is highly unlikely that all equipment would be operating at their maximum sound power levels at any one time. Accordingly, noise estimates should be considered as conservative.

The NPI presents a methodology for determining Project Noise Trigger Levels (PNTL) for industrial development. Ambient and background noise measurements are used to determine PNTL relevant to the proposed development. Table 5 provides the NPI minimum Rating Background Noise Levels (RBL) for each period of the day, which was adopted for the site. The area is a quiet rural area with no other continuous noise sources.

Table 5: Rating Background Noise Levels

Period	RBL dB(A)
Day	35
Evening	30
Night	30

Note: Day is defined as the period from 7am to 6pm (Monday to Saturday) and 8am to 6pm (Sundays and public holidays). Evening is defined as the period from 6pm to 10pm. Night is defined as the period from 10pm to 7am (Monday to Saturday), and 10pm to 8am (Sundays and public holidays).

Table 6 provides an analysis of both the intrusiveness and amenity noise levels for the purposes of establishing a PNTL for the proposed development.

Table 6: Assessment of PNTL in adjacent receiving environment

Metric	Day dB(A)	Evening dB(A)	Night dB(A)
Rating Background Level	35	30	30
Project Intrusiveness Criteria	40	35	35
Recommended Amenity Level	50	45	40
Project Amenity Level	45	40	35
Project Trigger Noise Level	**40**	**35**	**35**

These levels are considered acceptable ambient noise levels that can be received by sensitive receptors while protecting environmental values, including health and well-being, outside a dwelling.

Noise impacts associated with the project were estimated using the distance attenuation relationship described in the following equation:

$$L_2 = L_1 - 20\text{Log}(d_1/d_2)$$

(source: Noise Guide for Local Government - epa.nsw.gov.au)

Where: d_1 = distance (m) between source and receiver

d_2 = distance (m) at which Sound Pressure (L_{pa}) measured

L_2 = sound pressure level at the distance d_1 from the source

L_1 = sound pressure level at distance d_2 from the source

Propagation calculations consider sound intensity losses due to hemispherical spreading, with additional losses such as atmospheric absorption, directivity, ground absorption and shielding ignored in the calculations.

5.11.1 Predicted Noise Levels at Receptors

The closest sensitive receptors to the proposed development are presented in Figure 16 and Table 7.

Figure 16: Sensitive receptors within 3km of the project site.

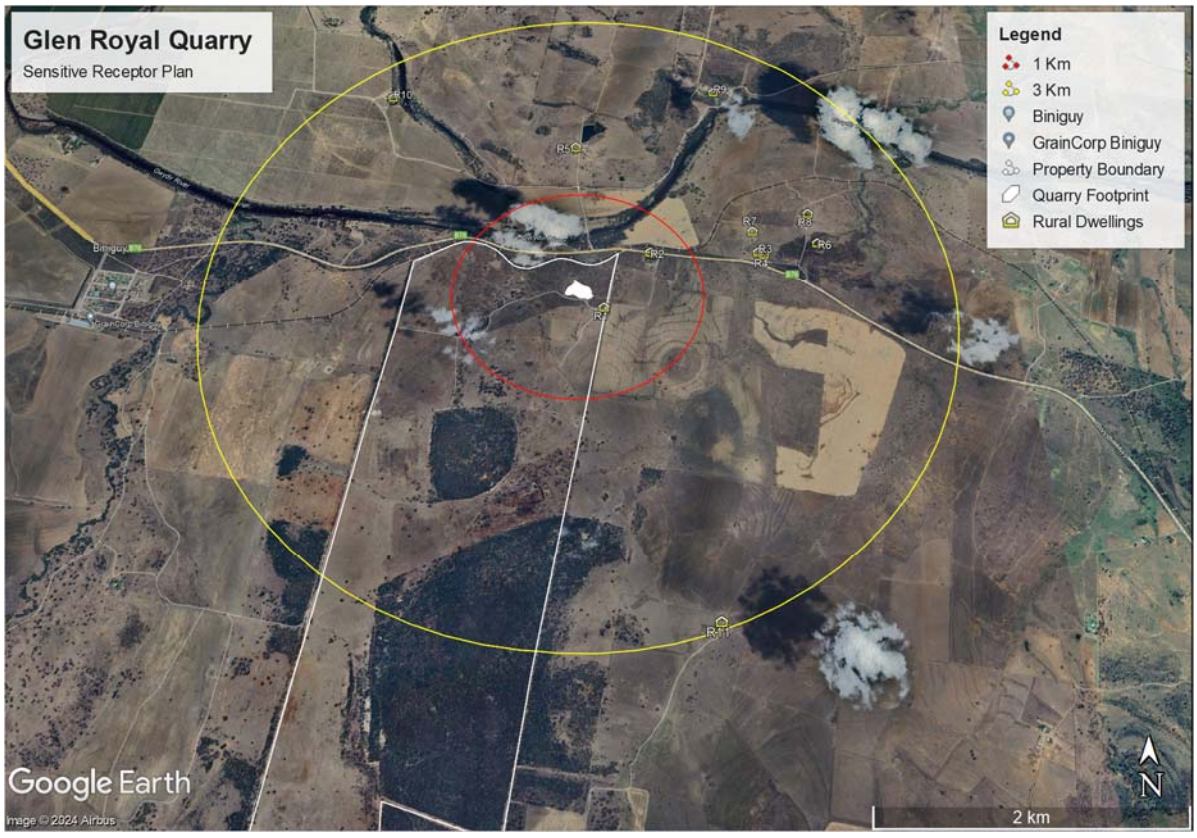


Table 7: Separation Distances from Sensitive Receptors

Receptor ID	Address	Receptor Type	Direction	Distance (m)
R1	16,489 Gwydir Highway, Gravesend	Rural Dwelling	SW	170
R2	16463 Gwydir Highway, Gravesend	Rural Dwelling	NE	580
R3	16380 Gwydir Highway Gravesend	Rural Dwelling	NE	1,400
R4	Warialda Street Gravesend	Rural Dwelling	NE	1,400
R5	1661 River Road, Pallamallawa	Rural Dwelling	N	1,445
R6	16150 Gwydir Highway Gravesend	Rural Dwelling	NE	1,890
R7	16378 Gwydir Highway Gravesend	Rural Dwelling	NE	1,900
R8	16338 Gwydir Highway Gravesend	Rural Dwelling	NE	1,920
R9	1873 River Road, Gravesend	Rural Dwelling	NE	2,350
R10	1507 River Road Pallamallawa	Rural Dwelling	NW	2,642
R11	196 Avon Downs Road Gravesend	Rural Dwelling	SE	2,900
Biniguy	Biniguy, NSW	Village	W	3,600
Gravesend	Gravesend, NSW	Village	SE	9,000

Note: Distances have been calculated based on the closest extraction area.

The closest receptor to the quarry operation is the owner's residence (R1) 170 m from the quarry site. This is not considered for the calculation. The next closest residence (R2) is approximately 580 m to the northeast of the quarry site. The loudest activity (front-end loader) is predicted to occur when a machine is working actively without any noise barrier between the front-end loader and the residence. This would only occur when the machine is outside of the below-ground quarry. The noise received at this residence can be calculated using the following equation which allows for attenuation of noise over the separation distance:

$$L_2 = 85 - 20 \log (580/10)$$
$$= 49.7 \text{ dB}$$

5.11.2 Comparison of Construction Noise to PNTL

Quarry operations are proposed to be confined to daytime hours, in which the acceptable noise threshold criteria is 40 dB. The predicted maximum noise generated by the development therefore exceeds the PNTL by 9.7 dB.

5.11.3 Residual Noise Impact

Residual noise impacts are defined as the best achievable noise level from a development when the development noise emissions still exceed the PNTL, following implementation of noise mitigation measures. The NPI notes that the PNTL should not be considered a mandatory threshold, but rather a planning tool. The NPI also notes that the above approach is intended for new or substantially modified developments, and should only be applied with

caution to existing developments. As the proposed development is existing, the estimated noise impacts shown above are for indicative purposes only.

There are limited feasible and reasonable noise mitigation measures that could be adopted for quarry machinery that would result in lowering the emitted construction noise. Therefore, the residual noise impact is considered to be equivalent to 9.7dB.

5.11.4 Determination of Significance of Residual Noise Impact

The total cumulative noise generated by the development (49.7 dB) is less than the recommended amenity noise level criteria (50 dB) according to the Table 6.

Noise generated by the existing quarry operations has not resulted in any complaints or known issues. It is therefore considered that operations associated with the proposed development will not have a significant impact upon the amenity of the surrounding location. Noise generating activities in the proposed development will be intermittent and temporary in nature and will not result in a long lasting alteration to local amenity values.

While adverse noise impacts are not expected, a precautionary approach may be to put in place to a mechanism to ensure a timely and effective response to any concerns raised by adjacent receivers. No other quarries in the area are known to be operating, so cumulative impacts are not expected.

5.12 Traffic

The quarry site is accessible via a private farm road for 800 m through the property from Gwydir Highway. Traffic generated by the proposed development includes heavy vehicles for aggregate delivery and light vehicles for employees. The proposed development will supply material to local projects within a 30 km -50 km radius of Glen Royal.

Travel routes for all material will be east or west along the Gwydir Highway, which is a designated B-double route. The Applicant may need to apply for a permit from Gwydir Shire Council to operate truck and dog combinations on the expected haulage route.

Table 10 outlines the predicted average truck movements based on:

- Up to 29,900 tonnes (approx. 18,700 m^3 at a conversion rate of 1.6 tonne/m^3) will be hauled from the site each year
- Material will be hauled using 11 axle rigid truck and 2 dog trailers (Type 1 Road Train – Class 2).
- A 35 tonne haulage capacity per trip has been assumed.
- Hours of operation for loading of trucks and hauling are 6.00 am to 6.00 pm. However, given loading times it is assumed that trucks will only be operational for 11 hours/day.

- 50 working weeks/ year.
- 5.5 working days/week.
- Movement is one-way (i.e. a truck entering and leaving is considered two movements).

Table 8: Maximum average traffic calculations

Traffic Calculations	
Tonnes processed	29,900 tonnes/ year
	600 tonnes/ week
	100 tonnes/day
One-way truck movements	855 trucks/year
	17 trucks/week
	3 trucks/day (Peak demand periods daily movements may be up to 10 trucks)
2-Way truck movements	1,710 trucks movements/year
	34 trucks movements/week
	6 trucks movements/day

At peak haulage capacity, the proposed development would generate up to 20 truck movements daily (120 truck movements weekly). This equates to less than two trucks every hour during standard operating hours.

Table 9 presents Average Daily Traffic data for the Gwydir Highway, obtained from the Traffic Volume Viewer Observed location is 940 m west of Tamboura Close, Inverell 2360.

Table 9: Traffic Data for Gwydir Highway

Road	Date of Observation	Average Daily Traffic (ADT)	Heavy Vehicles
Gwydir Highway	April 2015	1,389	324 (23.3 %)
	April 2017	1,558	372 (23.8%)
	June 2019	1,360	344 (25.2%)
	July 2020	1,347	322 (23.9%)
	July 2021	1,285	339 (26.3%)
	June 2022	1,375	356 (25.9%)
	May 2023	1,382	376 (27.2%)
	April 2024	1,480	356 (24.0%)

At peak haulage capacity twenty truck movements (one way is 10 trucks) per day represents about 6% of heavy vehicle traffic during the quietest period of the year. Average extraction capacity at 5 truck movements per day is less than 2% of heavy vehicle traffic on the Gwydir

Highway. These are not considered a significant impact that would cause a safety or amenity issue.

The overall quantity of gravel to be extracted from the quarry is considered minor. It should also be noted that some deliveries may involve roads that are impassable during wet conditions, and therefore, trucks would not move from this site after rain until local road conditions are suitable to support truck traffic.

5.13 Social and Economic Impacts

The social and economic impacts of this proposal will be minimal. Economic impacts are limited to the Proponent and a small number of local contractors. Any negative social impacts from approval of the proposed development are considered to be limited to a minor increase in regular traffic to and from the quarry on the surrounding amenity as a result of intermittent noise emissions from mainly trucks, during days of operation.

By contributing to the construction projects, the operation of the quarry would also indirectly contribute to a range of social benefits, including local job creation, reducing the transport cost of the construction materials in other surrounding areas, providing better access to and from local/regional markets, improving road safety, and reducing local traffic.

5.14 Cumulative Impacts

There are no other quarries or similar industries in the vicinity of the proposal. The proposed development is not considered to be a significant scale and operation will be intermittent. Cumulative impacts resulting from the operation of the Glen Royal Quarry with other developments in the area are negligible.

Adjoining land will be largely undisturbed by the quarrying operations, which will have no impact on current land uses. Dwellings and other sensitive receptors in the area are at a sufficient distance from the quarry so as to have little be affected by the proposal.

5.15 Site Rehabilitation

Site rehabilitation will occur once extraction activities have ceased and will include:

- Contouring of the site and smoothing of batters
- re-shaping the quarry floor with a gentle slope towards the existing internal drainage point.
- Replace overburden and topsoil
- Revegetation with appropriate species

6 Suitability of the site for development

The site is suited for the development, subject to all appropriate mitigation measures listed in this report being implemented. All planning requirements have been addressed.

6.1 Any submissions made in accordance with the EP&A Act or the regulations

At the time of preparation of this report, no written submissions have been made. Any submissions made during exhibition and/or notification will be addressed.

6.2 The public interest

The development would provide a useful supplement to the civil and construction capabilities available within the Gwydir Shire.

6.3 Conclusion

The proposal represents an acceptable use within the area and on the site and is considered worthy of planning support.

Appendix 1 – AHIMS Search Results

AHIMS Web Services (AWS)
Search Result

Your Ref/PO Number : 24/250
Client Service ID : 904303

Biyomi Palkadapela

Date: 25 June 2024

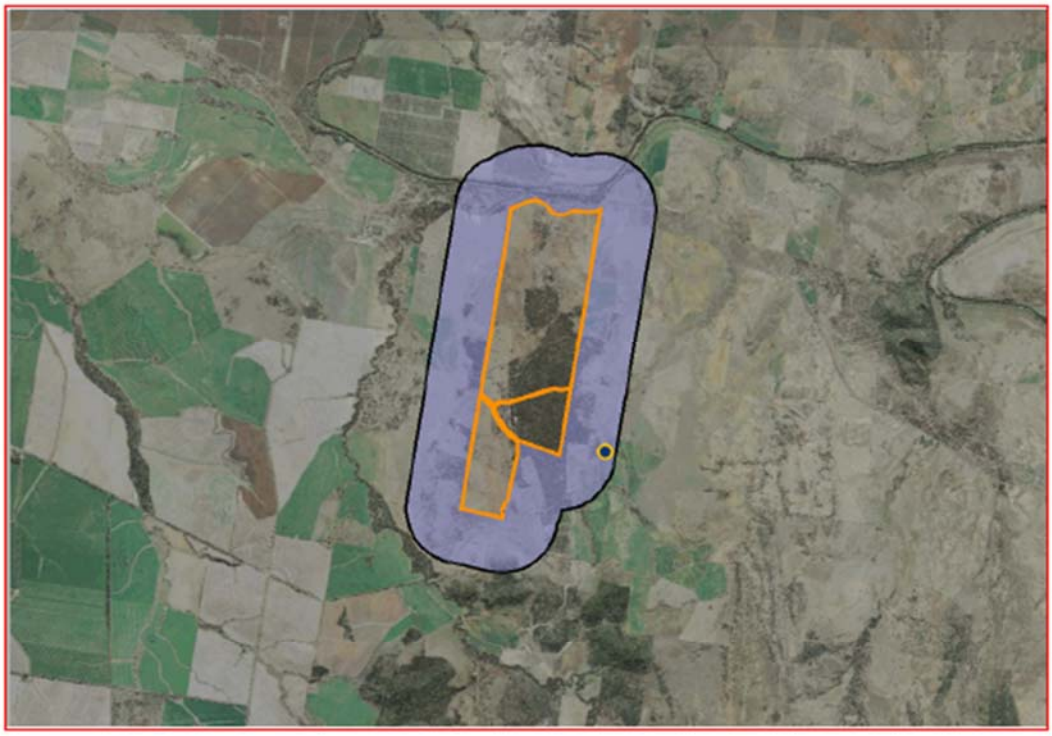
SMK Consultants, 39 Frome Street
Moree New South Wales 2400
Attention: Biyomi Palkadapela

Email: biyomi@smk.com.au

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lot : 106, DP:DP751108, Section : - with a Buffer of 1000 meters, conducted by Biyomi Palkadapela on 25 June 2024.

The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.



A search of Heritage NSW AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

1	Aboriginal sites are recorded in or near the above location.
0	Aboriginal places have been declared in or near the above location. *

Appendix 2 – Quarry monthly water balance

Monthly Water Balance for Glen Royal quarry, the 90th percentile Wet Year

Glen Royal Quarry

Sediment Pond/Drainage Sump Annual Water Balance - 90 percentile wet year

= input required

(the 90 percentile wet year for the Bureau of Meteorology Data at Gravesend PO site (1913 - 2016) is 1976

Month	Gravesend Interpolated Pan Evap*	1976 Monthly Rain* (mm)	1976 Monthly Rain* (m)	Rainfall on Sump (m3)	Quarry Drainage Area Runoff (m3)	Total capture (m^3)	Av. Evap.* (m)	Evap. Loss (m3)	Net Volume# (m3)	Net water available for irrigation (m3)	Irrigation of 10 ha - Rainfall deficit	Net Storage Required (m^3)
				a	b			c	a+b-c-d	0	Irrigation requirement over Area (m3)	
Jan	9.0	211.2	0.211	279	2,341.8	2,620.6	0.278	367	543	543	1,335	0
Feb	8.1	278.0	0.278	367	3,082.5	3,449.4	0.226	298	1,441	1,983	0	1,983
Mar	6.9	46.2	0.046	61	512.3	573.2	0.213	281	-1,418	565	3,333	0
Apr	5.1	3.2	0.003	4	35.5	39.7	0.152	201	-1,872	0	2,976	0
May	3.4	32.2	0.032	43	357.0	399.5	0.104	138	-1,449	0	1,443	0
Jun	2.4	71.0	0.071	94	787.2	881.0	0.072	95	-925	0	20	0
Jul	2.5	49.0	0.049	65	543.3	608.0	0.076	101	-1,204	0	549	0
Aug	3.5	6.3	0.006	8	69.9	78.2	0.110	145	-1,777	0	2,065	0
Sep	5.0	38.0	0.038	50	421.3	471.5	0.151	199	-1,439	0	2,260	0
Oct	6.8	41.6	0.042	55	461.3	516.2	0.212	280	-1,474	0	3,405	0
Nov	8.1	42.4	0.042	56	470.1	526.1	0.244	322	-1,507	0	4,032	0
Dec	8.7	33.8	0.034	45	374.8	419.4	0.271	357	-1,649	0	4,739	0
Total	69	853									Max. Capacity Required	1,983
												2.0 (ML)

*Interploated from Moree and Inverell RC Pan Evap. data

Assumptions

Drainage Sump Area (m3) =	1,320
Quarry Drainage Area (m3) =	18,480
Runoff Coefficient =	0.6
Required Sump Volume (m^3) =	1,983
Average Sump Depth (m) =	1.5
Sump Area for specified depth (m^2) =	1,322

Areas

Total Quarry Area (TQA) (ha) =	1.98
Total Quarry Area (TQA) (m^3) =	19,800
Drainage Sump Area (m^2) =	1,320
Quarry Drainage Area (TQA - Sump) (m2) =	18,480

#Potential seepage losses from Drainage Sump (d):

granite gravel permeability =	5.00E-07	m/s
=	1.80E-03	m/hr
=	0.04	m/day
=	1.296	m/mth
=	**1,711**	m^3/mth

*Source: Bureau of Meteorology

(b) Runoff = Controlled drainage area x rainfall x runoff coeff.

(d) Evap. Loss = Evaporation x Total Pond Area

Appendix 3: EPBC Protected Matters Assessment

Appendix 3: EPBC Protected Matters Assessment

Development Background

Overview

The proposed development involves obtaining approval to operate a gravel quarry at the Glen Royal on lot 106, Deposited Plan 751108. This quarry is on private property, located approximately 8.5 km northwest of the village of Gravesend and 40 km east of Moree in northwest New South Wales. The quarry site is accessible using an existing property access road from the Gwydir Highway, which borders the northern boundary of the property.

Glen Royal is located in a rural area characterized by extensive remnant vegetation such as shrubland, grassland, and open woodland. The predominant land use within the vicinity is agricultural, mainly for grazing and cultivation purposes.

Extracted gravel material will be primarily used for road works within the Shires of Gwydir and Moree Plains. The Proponent intends to extract resources within an existing quarry footprint area of 1.98 ha.

The proposed activities associated with the quarry will include:

- The installation of a diversion bank around the majority of the quarry footprint to prevent runoff entering the quarry.
- Extraction of material (via mechanical methods such as bulldozers and front-end loaders).
- Loading and transport (involving front-end loaders and trucks).
- Dust suppression, including haul routes, on an as required basis.
- Ongoing management of weed growth including options of herbicide control.
- Site rehabilitation

Site Description

The proposal site is located adjacent to the alluvial plains of the Gwydir River, within the Northern Basalt subregion of the Brigalow Belt South Bioregion. The locality retains extensive tracts of remnant vegetation, with agricultural production and grazing the primary land uses in the remaining areas.

“Glen Royal” was historically cleared for grazing purposes. The property contains some native plant communities approximately 1.2 km south and 600 m west of the quarry site. The remainder of the property consists of a mix of native and introduced pastures.

The proposed development footprint has been predominantly cleared over time, as extraction activities have progressed. The topsoil layer over the cleared area has been removed and stockpiled. No mature trees are present in the development footprint.

Vegetation surrounding the quarry footprint is mapped as 'PCT 0—Non-Native' on the NSW SEED mapping portal. This was confirmed during the field inspection' in July 2024 by SMK Consultants, where the vicinity of the development footprint was observed to consist of non-native pastures with isolated trees.

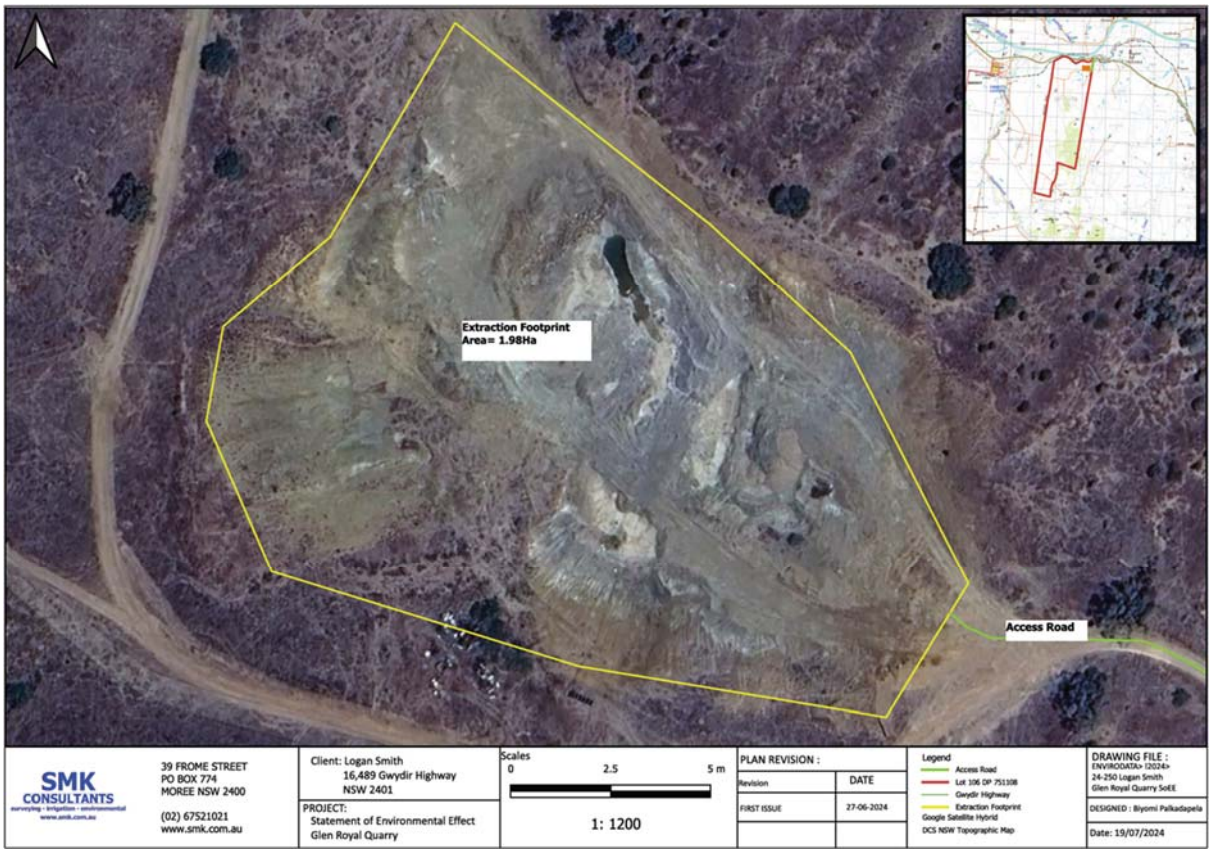
Several weed species were observed at relatively low densities across the area, particularly in disturbed soil and cleared areas. These include:

- *Sclerolaena murtica*- Black roly-poly
- *Gomphocarpus Fruticosus* – Cotton Bush
- *Vachellia farnesiana* - Mimosa bush
- *Opuntia aurantiaca* - Tiger Pear
- *Opuntia stricta* - Common Prickly Pear

The closest surface water body to the development site is the Gwydir River, approximately 180 m north of the northern boundary of the property. An unnamed second order water course weaves through the property which flows 315 m west to the western boundary of the proposed quarry footprint. Bullala National Park is situated 18 km northeast of the quarry site. The Gwydir wetlands: Gingham and Lower Gwydir(Big leather) Watercourses reserve is a RAMSAR site located 50-100 km downstream.

None of the species recorded within or adjacent to the footprint of the proposed development are classified as threatened, and no endangered ecological communities were recorded within or adjacent to the proposed development footprint. Figure 1 presents the proposed development site.

Figure 1: Layout of Proposed Development



Study Area Delineation

The potential impacts of the proposed development are predicted to be minimal. The proposed quarry footprint has been sited to minimise environmental impacts on local flora and fauna and is located on modified land which has been subject to clearing and/or grazing. The proposed works will be undertaken in accordance with best practice methods and a suite of environmental management measures will be implemented to protect environmental values, with proposed measures including weed management, minimising the footprint of site disturbance and dust/erosion and noise reduction measures.

The proposed development will not pose an environmental risk to the locality as it will not act as a source of pollutants. A weed management program will be implemented, such that the site does not become a source of weed populations which may propagate out from the development site.

Overall, works will be confined to the proposed quarry footprint and there is an existing access route to the site. The development is not predicted to interfere with habitat values adjacent to the site. Therefore, it is considered that the extent of the impact of the proposed development is limited to the proposed quarry footprint on site and is principally associated with vegetation disturbance for the purpose of extractive activities.

Matters of National Significance

The EPBC Act requires consideration of the effect of an action on the following 7 Matters of National Environmental Significance (MNES):

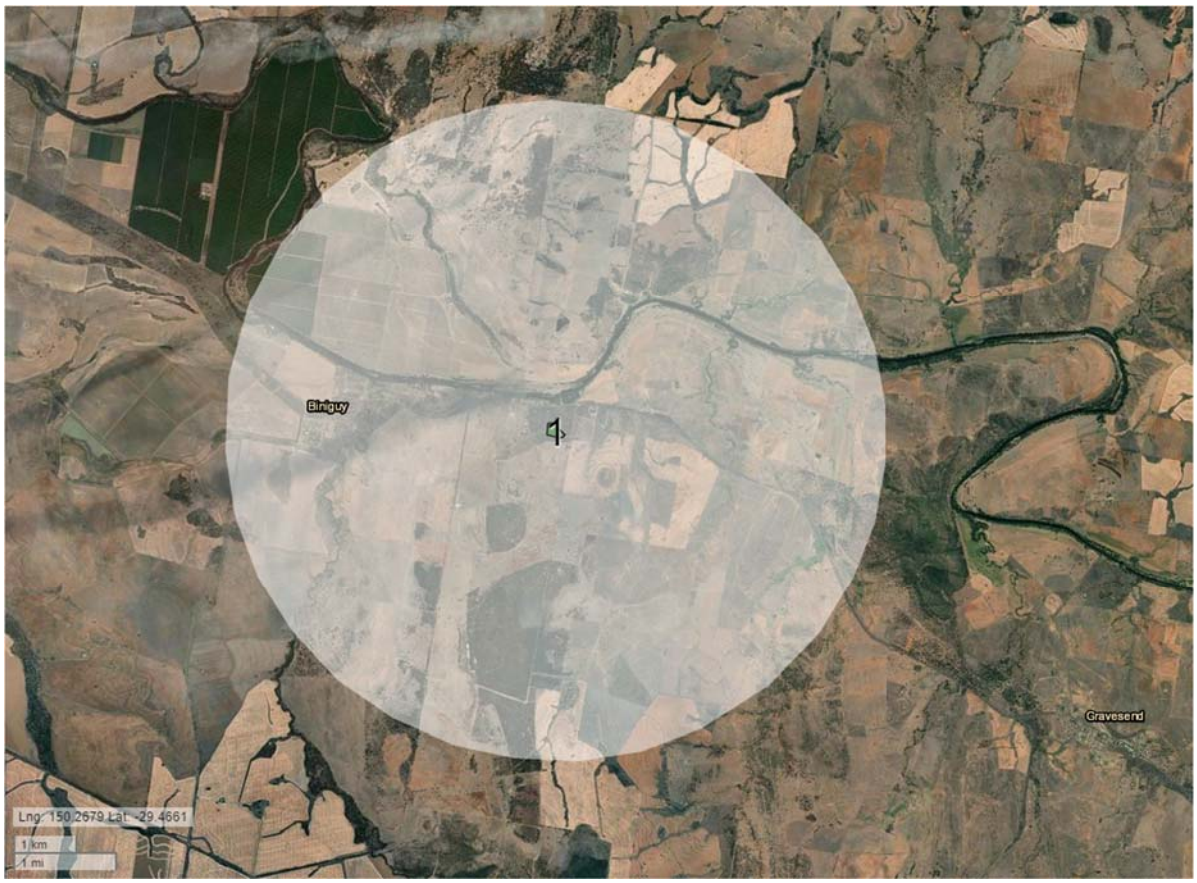
- World Heritage Properties
- National Heritage Places
- Ramsar wetlands of international importance
- Nationally threatened species and communities
- Migratory species protected under international agreements
- Nuclear actions, including uranium mining, and
- The Commonwealth marine environment.

The impact of an action on these matters is assessed under the criteria specified in: Matters of National Environmental Significance – Significant Impact Guidelines 1.1 (DoE 2013).

Consideration of EPBC Matters

A search was undertaken using the EPBC Protected Matters Search Tool (PMST) (DoEE 2018) to generate a list of World Heritage Properties, National Heritage Places, Ramsar wetlands and nationally threatened species, communities and migratory species protected under international agreements that may occur on or within a 5 km radius of the proposed development (Figure 2).

Figure 2: Area searched for MNES using the EPBC PMST



Results of Database Search

The EPBC PMST does not list any World Heritage Properties or National Heritage Places on, or within, the search area. Therefore the proposal is not considered to impact on these matters. The proposal does not involve nuclear actions or impact on the marine environment; consequently, these matters are also not relevant to this assessment.

Nationally threatened species and migratory species protected under international agreements have been initially defined within the search area outlined in Figure 2 using the PMST. These species are listed in Tables 1 and 2. These species may occur, or are known, in the quarry site or buffer area.

Table 1: Threatened species predicted or known to occur in the proposed area or Buffer

Threatened Category	*Scientific Name*	**Common Name**	**Class**
Critically Endangered	*Pedionomus torquatus*	Plains-wanderer	Bird
	Bidyanus bidyanus	Silver Perch, Bidyan	Fish
	Lathamus discolor	Swift Parrot	Bird
	Prasophyllum sp. Wybong (C.Phelps ORG 5269)	a leek-orchid	Plant
	Calidris ferruginea	Curlew Sandpiper	Bird
	Anthochaera phrygia	Regent Honeyeater	Bird
Endangered	*Lepidium monoplocoides*	Winged Pepper-cress	Plant
	Dasyurus maculatus maculatus (SE mainland population)	Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population)	Mammal
	Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)	Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory)	Mammal
	Hemiaspis damelii	Grey Snake	Reptile
	Rostratula australis	Australian Painted Snipe	Bird
	Melanodryas cucullata cucullata	South-eastern Hooded Robin, Hooded Robin (south-eastern)	Bird
	Adclarkia cameroni	Brigalow Woodland Snail	Snail
	Chalinolobus dwyeri	Large-eared Pied Bat, Large Pied Bat	Mammal
	Lophochroa leadbeateri leadbeateri	Major Mitchell's Cockatoo (eastern), Eastern Major Mitchell's Cockatoo, Pink Cockatoo (eastern)	Bird
	Vincetoxicum forsteri, Endangered (listed as Tylophora linearis)	null	Plant
Vulnerable	*Calyptorhynchus lathami lathami*	South-eastern Glossy Black-Cockatoo	Bird
	Climacteris picumnus victoriae	Brown Treecreeper (south-eastern)	Bird
	Nyctophilus corbeni	Corben's Long-eared Bat, South-eastern Long-eared Bat	Mammal
	Gallinago hardwickii	Latham's Snipe, Japanese Snipe	Bird
	Grantiella picta	Painted Honeyeater	Bird
	Maccullochella peelii	Murray Cod	Fish

	Dichanthium setosum	bluegrass	Plant
	Stagonopleura guttata	Diamond Firetail	Bird
	Geophaps scripta scripta	Squatter Pigeon (southern)	Bird
	Pteropus poliocephalus	Grey-headed Flying-fox	Mammal
	Homopholis belsonii	Belson's Panic	Plant
	Cadellia pentastylis	Ooline	Plant
	Thesium australe	Austral Toadflax, Toadflax	Plant
	Calidris acuminata	Sharp-tailed Sandpiper	Bird
	Aphelocephala leucopsis	Southern Whiteface	Bird
	Polytelis swainsonii	Superb Parrot	Bird
	Hirundapus caudacutus	White-throated Needletail	Bird
	Falco hypoleucos	Grey Falcon	Bird
	Anomalopus mackayi	Five-clawed Worm-skink, Long-legged Worm-skink	Reptile
	Swainsona murrayana	Slender Darling-pea, Slender Swainson, Murray Swainson-pea	Plant
	Aprasia parapulchella	Pink-tailed Worm-lizard, Pink-tailed Legless Lizard	Reptile
	Lepidium aschersonii	Spiny Peppercress	Plant

Table 2: Migratory species predicted to occur on the proposal area

Scientific Name	Common Name	Class	Threatened Category
Gallinago hardwickii	Latham's Snipe, Japanese Snipe	Bird	Vulnerable
Motacilla flava	Yellow Wagtail	Bird	
Apus pacificus	Fork-tailed Swift	Bird	
Myiagra cyanoleuca	Satin Flycatcher	Bird	
Rhipidura rufifrons	Rufous Fantail	Bird	
Actitis hypoleucos	Common Sandpiper	Bird	
Calidris ferruginea	Curlew Sandpiper	Bird	Critically Endangered
Calidris melanotos	Pectoral Sandpiper	Bird	
Calidris acuminata	Sharp-tailed Sandpiper	Bird	Vulnerable
Hirundapus caudacutus	White-throated Needletail	Bird	Vulnerable

The PMST also identified a range of threatened ecological communities which have the potential to be present within the study area. However, no threatened ecological communities were identified within the proposed development site during site inspection and therefore it is considered that the proposed development will not pose a risk to ecological communities protected under the EPBC Act.

The PMST identified no Ramsar wetlands downstream that will be impacted by the proposed development.

Assessment of Significance

Vulnerable Species

An action has, or will have, or is likely to have a significant impact on a vulnerable species if it does, will or is likely to:

- ***Lead to a long-term decrease in the size of an important population of species***

The proposed development will involve the clearing of small areas of regrowth on the existing 1.98 ha site, which is highly disturbed and degraded land and has been historically cleared. Part of the quarry site has also been historically utilised as grazing land.

It is considered unlikely that clearing small areas of regrowth on 1.98 ha of highly modified habitat with minimal vegetation will have a significant impact on any local populations of threatened species. Vegetation clearance has the potential to temporarily impact flora individuals through the prevention of germination, should germination occur during the proposed works. However, the germination of other individuals beyond the impact zone of the development area would likely continue to occur, ensuring the continuation of the population within the local area.

Vegetation clearance also has the potential to temporarily impact upon fauna individuals through a temporary decrease in the availability of foraging habitat. Given the low quality of the habitat to be disturbed and the availability of higher quality habitat in the vicinity, this is not considered to pose a risk to populations of vulnerable fauna in the region.

Over time, site rehabilitation would enable future recolonisation of the impact area by native flora species, including vulnerable flora species, using the surrounding protected local populations as a source of seeds. Following recolonisation, the site may once again be utilised as a foraging habitat for vulnerable fauna species. The long-term impact of the proposed development upon threatened flora and fauna species is therefore considered to be minimal, as there would be no long-term decrease in habitat availability or quality for these species.

- ***Reduce the area of occupancy of an important population***

Overall, the total area to be disturbed by the quarry development is minor, and the longevity of the disturbance will be limited. Furthermore, the existing habitat of the proposed development footprint is not considered to consist of an important habitat for any threatened species or communities. The disturbance associated with the development is, therefore, not considered to pose a risk to the long-term survival of any threatened species or ecological community within the locality.

- ***Fragment an existing important population into two or more populations***

The proposal does not contribute to further fragmentation of the area, as it has already been historically cleared. The removal of immature trees, scattered shrubs, and ground cover is not considered significant and would not fragment an existing important population.

The overall habitat value of this land for threatened species is considered low. None of the threatened species identified would breed or reside long-term within the study area and are only predicted to utilise the study area during times of duress (i.e. when food cannot be found in more suitable habitats). Further modification of this land is therefore not considered to pose a threat to habitat availability for threatened species within the region.

- ***Adversely affect habitat critical to the survival of a species***

The vegetation to be impacted by the proposal offers limited habitat value, as it has historically been cleared and regrowth is limited with extensive areas of grassland remaining. Therefore, the site is not considered to be critical habitat for any of the listed vulnerable species. Species are more likely to utilise either remnant or riparian / water-based habitat in the locality of the proposed development, rather than the development site itself.

- ***Disrupt the breeding cycle of an important population***

Given the site's highly disturbed and modified nature, it is unlikely that this area would constitute a habitat important to the life cycle of identified threatened species (such as breeding habitat). Species are more likely to utilise either remnant or riparian / water-based habitat in the vicinity of the proposed development rather than the development site itself. The proposal would, therefore, not disrupt the breeding cycle of any important populations.

- ***Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline***

The subject site is not considered to constitute a quality habitat for any threatened species. As previously mentioned, the habitat values of the proposed development site are considered low as a result of the existing quarry development. Species are more likely to utilise either remnant or riparian / water-based habitat in the vicinity of the proposed development, rather than the development site itself. The development is, therefore, not predicted to result in a decline of vulnerable species populations within the region.

- ***Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat***

Weed seeds are carried onto and distributed by trucks coming onsite to haul extracted gravel. Plant machinery may also transport weed seeds upon entry and exit of works sites. Weed management strategies (listed in the Environmental Management Plan for the project) will be implemented to minimise the risk of weed establishment and proliferation as a result of extraction, haulage and remediation activities on site. Examples of weed management

strategies include adoption of proper hygiene procedures to minimise the potential for seed transport onto and off the work site.
Weed management in Gwydir Local Government Area is conducted by Council weed officers. These officers are empowered to implement and enforce the *Biosecurity Act 2015* on behalf of the Council and the New South Wales State Government. Following the completion of the proposed works, weed management around Glen Royal Quarry will continue to be conducted by Council weed officers as part of its regular and ongoing weed management activities.

- ***Introduce disease that may cause the species to decline, or***

Extraction of raw materials at Glen Royal Quarry is not considered a disease risk.

- ***Interfere substantially with the recovery of the species***

Ensuring the recovery of a species generally involves the protection and enhancement of existing populations and habitat, by preventing further clearing and modification of native vegetation communities and protecting water quality values.

The proposed works will involve the clearing small areas of regrowth, consisting mainly of scattered groundcover and low shrubs. The removal of this habitat area constitutes minor scale modifications to available habitat in the locality and would not impact flora and fauna to the extent that the recovery of a species would be impacted.

Overall, the development is not considered to pose a risk to the recovery of vulnerable species within the region.

Critically Endangered and Endangered Species

An action is likely to have a significant impact on a critically endangered or endangered species if there is a real chance or possibility that it will:

- ***Lead to a long-term decrease in the size of a population***

The proposed development site is not considered to constitute a preferred habitat for endangered or critically endangered species. Development of this area is therefore not considered likely to result in a decrease in the size of endangered and / or critically endangered species which may be present within the region. No endangered or critically endangered flora species were observed on-site during the site inspection.

- ***Reduce the area of occupancy of the species***

The habitat of the proposed development site consists of a small area (1.98 ha) which is of limited value and is unlikely to be regularly or heavily utilised by identified species. Modification of the site as a result of the proposed development is therefore unlikely to reduce the area of occupancy of identified species.

- ***Fragment an existing population into two or more populations***

The development will not result in habitat fragmentation and is therefore not considered to pose a risk of fragmenting populations of endangered or critically endangered species which may be present within the locality.

- ***Adversely affect habitat critical to the survival of a species***

There is no critical habitat for identified endangered and critically endangered species on the proposed development site.

- ***Disrupt the breeding cycle of a population***

Given the highly disturbed and modified nature of the site, it is unlikely that this area would constitute habitat important to the life cycle of identified threatened species (such as breeding habitat). Species are more likely to utilise remnant habitat in the vicinity of the proposed development rather than the development site itself. The proposal would, therefore, not disrupt the breeding cycle of any important populations.

- ***Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline***

Whilst some modification of potential habitat may occur as a result of the proposed development, this modification will occur on a minor scale. Further, the habitat values within the zone of impact of the proposed works are considered to be low. Species are more likely to utilise remnant habitat in the vicinity of the proposed development, rather than the development site itself.

Therefore, modification of habitat on site is unlikely to result in the decline of any identified species.

- ***Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the critically endangered or endangered species' habitat***

Weed seeds are carried onto and distributed by trucks coming onsite to haul extracted gravel. Plant machinery may also transport weed seeds upon entry and exit of works sites. Weed management strategies will be implemented to minimise the risk of weed establishment and proliferation as a result of extraction, haulage and remediation activities on site.

Weed management in Gwydir Local Government Area is administered Shire weed officers. Following the completion of the proposed works, weed management around Glen Royal Quarry will continue to be conducted by Shire weed officers as part of its regular and ongoing weed management activities.

Provided these measures are implemented, the proposal is unlikely to result in the establishment or spread of invasive species.

- ***Introduce disease that may cause the species to decline, or***

Activities associated with the operation and rehabilitation of a quarry are not considered a disease risk.

- ***Interfere substantially with the recovery of the species***

Ensuring the recovery of a species generally involves the protection and enhancement of existing populations and habitat, by preventing further clearing and modification of native vegetation communities and protecting water quality values.

The proposed works will involve the clearance of immature regrowth trees, as well as some scattered ground cover and shrubs. The removal of this habitat involves minor scale modifications to available habitat in the locality and would not impact flora and fauna to the extent that the recovery of a species would be impacted.

Overall, the development is not considered to pose a risk to the recovery of endangered species within the region.

Critically Endangered and Endangered Ecological Communities

An action is likely to have a significant impact on a critically endangered or endangered ecological community if there is a real chance or possibility that it will:

- ***Reduce the extent of an ecological community***
- ***Fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines***
- ***Adversely affect habitat critical to the survival of an ecological community***
- ***Modify or destroy abiotic (non-living) factors (such as water, nutrients or soil) necessary for an ecological community's survival, including reduction of groundwater levels, or substantial alteration of surface water drainage patterns***
- ***Cause substantial change in the species composition of an occurrence of an ecological community, including causing a decline or loss of functionally important species, for example through regular burning or flora or fauna harvesting***
- ***Cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to:***
    - ***Assisting invasive species, that are harmful to the listed ecological community, to become established, or***
    - ***Causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants into the ecological community which kill or inhibit the growth of species in the ecological community, or***

- ***Interfere with the recovery of an ecological community***

The impacts of the proposed development will be limited to the proposed development footprint (as discussed above). This site has historically been cleared. It therefore has a low habitat value. As a result, the proposed development will not impact upon threatened ecological communities which may be present within the region. It is noted that no threatened ecological communities were identified within the site development footprint or in its immediate vicinity (100-200 m from the proposed development boundary).

Listed Migratory Species

An action is likely to have a significant impact on a migratory species if there is a real chance or possibility that it will:

- ***Substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles or altering hydrological cycles), destroy or isolate an area of important habitat for migratory species***

Important habitat for a migratory species is defined as habitat which is:

- Utilised by migratory species occasionally or periodically within a region that supports an ecologically significant proportion of the population of the species, and/or
- Of critical importance to the species at particular life cycle stages, and/or
- Utilised by a migratory species which is at the limit of the species range, and/or
- Within an area where the species is declining.

The definition of an ecologically significant proportion of a migratory species varies depending on the characteristics of each species. Factors that should be considered in determining an ecologically significant proportion include the species' population status, genetic distinctiveness and species-specific behavioural patterns (such as site fidelity and dispersal rates).

The proposed development site contains ground cover and scattered shrubs, which consist of common species. This habitat is highly modified and is subject to regular human disturbance. It is noted that there are higher-quality vegetation and several surface waterbodies (lakes, wetlands and rivers) within a 20 km radius of the development. In the event that migratory species are present within the locality of Glen Royal quarry, it is considered to be more likely that species will choose to utilise less disturbed habitats such as these in preference to the proposed development site.

Given the availability of alternative habitat in the locality, the proposed development site is not considered to incorporate important habitat for migratory species, as the site is unlikely to be frequently used by such species and offers limited habitat features which could be

utilised by these species during migration, when compared with surrounding available habitat.

- ***Result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species, or***

As outlined above, weed management activities will be implemented on-site to minimise the risk of weed establishment and proliferation as a result of the proposed works. Provided these measures are implemented in an appropriate manner, the proposed development is unlikely to result in the establishment of an invasive species on the site.

- ***Seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species***

The proposal is not considered a risk to the lifecycle of the listed migratory species.

Assessment of Significance Conclusions

In its current state, the proposed development site does not constitute important habitat for any identified species. Remnant vegetation is located in the vicinity of the proposed development and is likely to be preferred habitat for any listed threatened species likely in the vicinity of the proposed development site. The proposed development will not impact upon this habitat.

It is the conclusion of this assessment that there will be no significant long-term impacts on any listed ecological community, threatened or migratory species of national environmental significance as a consequence of the proposed development, providing:

- No clearing of vegetation is carried out outside of the proposed development footprint.
- The establishment, operation and rehabilitation of the proposed quarry are carried out in accordance with best management practices and relevant guidelines.
- Weed management measures are appropriately implemented throughout the project lifecycle.

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References

DoE (2013) *Matters of National Environmental – Significant Impact Guidelines 1.1 Environment Protection and Biodiversity Conservation Act 1999.* Department of the Environment

DoEE Protected Matters Search Tool (accessed 2024). Department of the Environment and Energy Website: http://www.environment.gov.au/epbc/protected-matters-search-tool

Appendix 4: NSW Biodiversity Act 2016 – Test of Significance

Appendix 4: NSW Biodiversity Act 2016 – Test of Significance

Introduction

SMK Consultants Pty Limited (trading as SMK Consultants) was engaged by Logan Smith (the Applicant), Glen Royal Quarry, to prepare a Statement of Environmental Effects (SoEE) for a Development Application for an existing quarry. This Test of Significance provides supporting information for the SoEE .

Legislative Context

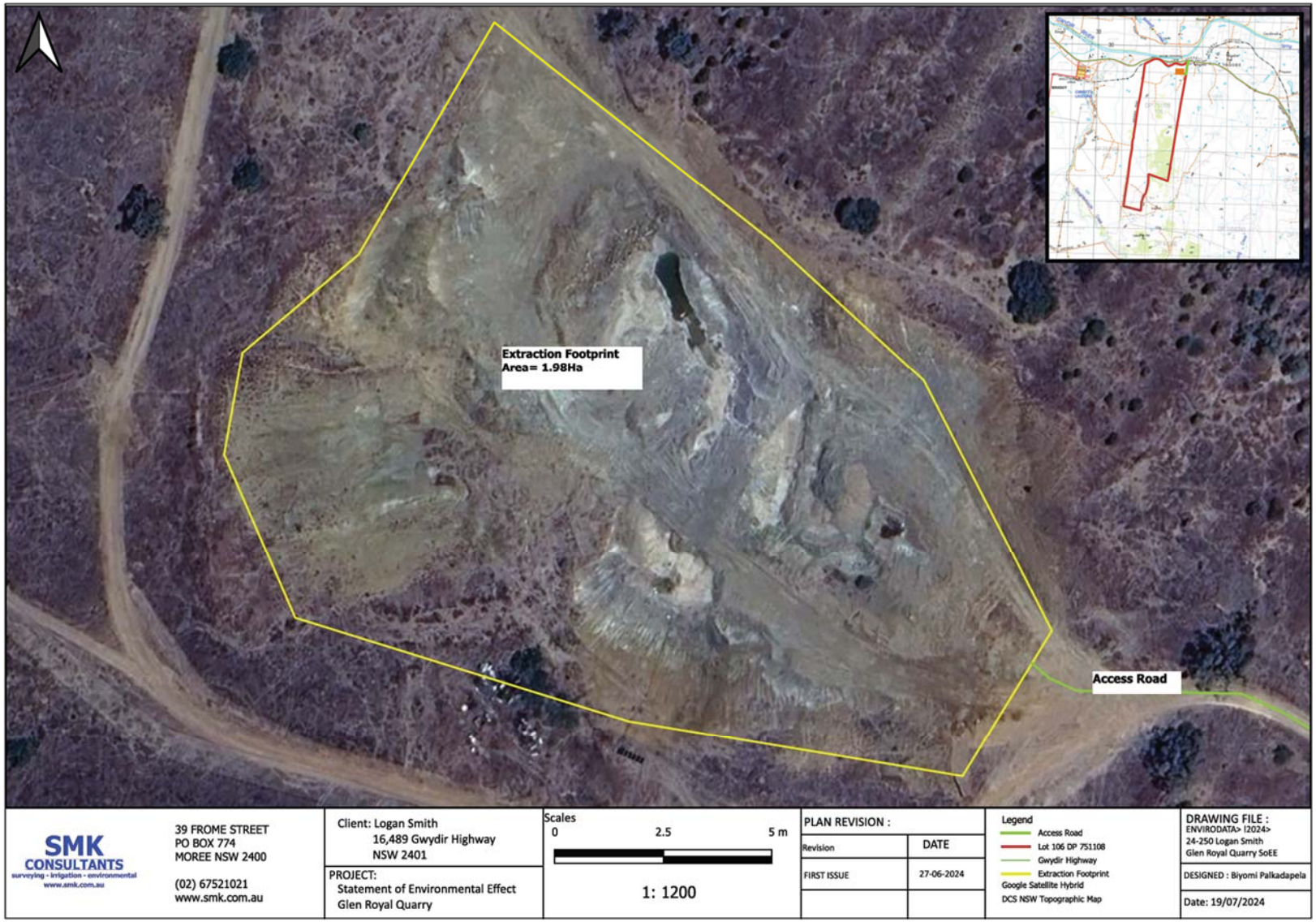
Section 7.2 of the Biodiversity Conservation Act 2016 (BC Act) requires that the significance of the impact of a development on threatened species and endangered ecological communities is assessed using a five-part test known as a Test of Significance. Where a significant impact is likely to occur, a Species Impact Statement (SIS) must be prepared in accordance with the Director-General's requirements, or a Biodiversity Development Assessment Report (BDAR) must be prepared by an accredited assessor in accordance with the Biodiversity Assessment Method (BAM).

The Test of Significance in this report has been prepared in accordance with requirements under Section 7.3 of the BC Act. It includes an assessment of the development against five parameters to determine whether there is likely to be a significant effect on the threatened species, ecological communities, or their habitats, which are recorded at or likely to occur at the site. The assessment has been conducted in accordance with the Threatened Species Test of Significance Guidelines (OEH 2018). It investigates the effects of the development proposal on threatened species, populations, and ecological communities, as listed under the BC Act, pursuant to Section 1.7 of the Environmental Planning & Assessment Act 1979 (EPA Act).

Proposed Project Details

The proposed development involves operation of a gravel quarry on a private property located at Lot 106 in Deposited Plan 751108 approximately 8.5 km northwest of Gravesend and 40 km east of Moree in north-west NSW. The extraction limit of the quarry would be 29,900 tonnes/year. The location of the proposed development site is shown in Figure 1.

Figure 1: Glen Royal Quarry Locality Plan



Site Assessment

The quarry is situated approximately 500 m south of the Gwydir Highway, within the property of Glen Royal on Lot 106 in DP 751108. The current quarry footprint covers an area of 1.98 ha, including the extraction area and the overburden/gravel stockpiles. No change to the existing quarry footprint is proposed. An existing farm track provides access to the quarry site from the Gwydir Highway.

"Glen Royal" was historically cleared for grazing purposes. The property contains some native plant communities approximately 1.2 km south and 600 m west of the quarry site. The remainder of the property consists of a mix of native and introduced pastures.

The proposed development footprint has been predominantly cleared over time, as extraction activities have progressed. The topsoil layer over the cleared area has been removed and stockpiled. No mature trees are present in the development footprint.

Vegetation surrounding the quarry footprint is mapped as 'PCT 0—Non-Native' on the NSW SEED mapping portal. This was confirmed during the field inspection' where the vicinity of the development footprint was observed to consist of non-native pastures with isolated trees.

Several weed species were observed at relatively low densities across the area, particularly in disturbed soil and cleared areas. These include:

- *Sclerolaena murtica*- Black roly-poly
- *Gomphocarpus Fruticosus* – Cotton Bush
- *Vachellia farnesiana* - Mimosa bush
- *Opuntia aurantiaca* - Tiger Pear
- *Opuntia stricta* - Common Prickly Pear

Study Area and Site Delineation

The following definitions are used throughout this report to refer to locations in the proposal area:

- The 'subject site' describes all areas that would be directly impacted by the works. This includes the approved footprint of the existing quarry.
- The 'study area' includes the site and the adjacent areas that may be indirectly impacted by the proposed works. This includes the property described as Lot 106 in DP 751108;
- The 'search area' refers to a 10 km area surrounding the proposal for database searches.

Habitat Assessment for Significant Species

A site inspection was carried out in July 2024 to inform this test of significance.

The availability of habitat on site was assessed using a number of factors including:

- Structural and floral diversity.
- Occurrence and extent of habitat types in the general vicinity.
- Continuity with similar habitat adjacent to the site, or connection with similar habitat off-site by way of corridors.
- Key habitat features such as tree hollows, water bodies, crevices, and rocky areas.
- Degree of disturbance and degradation.
- Topographic features such as aspect and slope.

This information was used to evaluate the site as a potential habitat for each of the threatened species considered and assign each species with a rating based on their likelihood to occur within the subject site. The 'likelihood of occurrence' categories are detailed in Table 1. The habitat assessment is provided in Appendix B.

Table 1: **Likelihood of Occurrence Criteria**

Likelihood Rating	Criteria
Known	The species was recorded within the study area during site surveys.
High	It is likely that a species would inhabit or utilise a habitat within the subject site. Criteria for this category may include: • Species recently and/or regularly recorded in contiguous or nearby habitat; • High quality habitat types or resources present within study area; • Species is known or likely to maintain a resident population surrounding the study area; and • Species is known or likely to visit during migration or seasonal availability of resources.
Moderate	Potential habitat for a species occurs within the subject site. Criteria for this category may include: • Species previously recorded in contiguous habitat albeit not recently (>10 years); • Poor quality, depauperate or modified habitat types and/or resources • present within study area; • Species has potential to utilise habitat during migration or seasonal availability of resources; and • Cryptic flora species with potential habitat available within the subject site that have not been seasonally targeted by surveys.
Low	It is unlikely that the species inhabits the area and would likely be considered a transient visitor if ever encountered. Criteria for this category may include: • The subject site or study area lacks specific habitat types or resources required by the species;

Likelihood Rating	Criteria
	• The subject site is beyond the current distribution of the species or is isolated from known populations; • Non-cryptic flora species that were found to be absent during targeted surveys; and • The subject site only contains common habitat which would not be considered important for the local survival of a threatened species.
Unlikely	The habitat within the subject site and study area is unsuitable for the species.

Limitations

The effectiveness of a survey detecting a given species is influenced by a range of factors. For this type of survey, such limitations are related to the period of time in which the fieldwork was carried out during one season. Given that one half-day was spent on site, the detection of certain species may be limited by:

- Seasonal migration (particularly migratory birds).
- Seasonal flowering periods (some species are cryptic and are unlikely to be detected outside of the known flowering period).
- Seasonal availability of food such as blossoms.
- Weather conditions during the survey period (some species may go through cycles of activity related to specific weather conditions, for example, some micro chiropteran bats, reptiles, and frogs can be inactive during cold and very hot weather).
- Species lifecycle (cycles of activity related to breeding).

These limitations have been accounted for by applying the precautionary principle in all cases where the survey methodology may have given a false negative result. All species have been assessed based on the presence of habitat and the likely significance of that habitat to support a viable local population.

Assessment of Potential Presence of Threatened Species

A search of the National Parks and Wildlife Atlas of NSW Wildlife (BioNet) identified species with recorded sightings within a 10 km radius of the proposed development site. The complete search result for the listed species is presented in Appendix A.

The subject site is located within the Northern Basalt subregion of the Brigalow Belt South Bioregion. A broader search for species, populations, and communities that may occur within the locality of the development site was therefore conducted by investigating known and predicted species' distributions within this IBRA Subregion. A copy of the search results for listed species is presented in Appendix B.

Species were considered with regards to their known distribution and habitat requirements, to assess whether the subject site is likely to serve as suitable habitat, and subsequently whether/how the development is likely to impact upon the species. Only species that have the potential to be present within the available habitat are listed in Table 2 and assessed in this Test of Significance.

The following species, populations, and communities are considered in the Test of Significance for the proposed development .

Table 2: Results of BioNet Atlas Search

Species Name	Common name	Status	Local Records
Geophaps scripta scripta	Squatter Pigeon (southern subspecies)	BC Act – V	2
Calyptorhynchus lathami lathami	South-eastern Glossy Black-Cockatoo	BC Act – V	42
Climacteris picumnus victoriae	Brown Treecreeper (eastern subspecies)	BC Act - V	18
Grantiella picta	Painted Honeyeater	BC Act – V	19
Melanodryas cucullata cucullata	Hooded Robin (south-eastern form)	BC Act - E	9
Stagonopleura guttata	Diamond Firetail	BC Act - V	1
Dasyurus maculatus	Spotted-tailed Quoll	BC Act - E	P
Phascolarctos cinereus	Koala	BC Act – E	103
Chalinolobus dwyeri	Large-eared Pied Bat	BC Act – E	3
Nyctophilus corbeni	Corben's Long-eared Bat	BC Act - V	21
Furina dunmalli	Dunmall's Snake	BC Act - V	1
Tylophora linearis		BC Act - E	4
Lepidium aschersonii	Spiny Peppercress	BC Act - V	4
Swainsona murrayana	Slender Darling Pea	BC Act - V	2
Dichanthium setosum	Bluegrass	BC Act - V	17
Homopholis belsonii	Belson's Panic	BC Act - V	285
Hakea pulvinifera	Lake Keepit Hakea	BC Act - E	3
Thesium australe	Austral Toadflax	BC Act - V	11
Cadellia pentastylis	Ooline	BC Act - V	46

[1]Number of BioNet Atlas records in the selected area. Status Abbreviations: Vulnerable (V), Endangered (E), Protected (P), and Sensitivity Classes 2 and 3 (Sensitive Species Data Policy) (2) (3).

Species were considered with regards to their known distribution and habitat requirements, to assess whether the site is likely to serve as suitable habitat. Each species was assigned a

rating based on their likelihood to occur within the subject site. The 'likelihood of occurrence' categories is detailed in Table 2. The habitat assessment is provided in Appendix B.

Test of Significance - Assessment of Criteria and Discussion

The following is to be considered for the purposes of determining whether a proposed development or activity is likely to significantly affect threatened species or ecological communities, or their habitats:

a) in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction

In this assessment, a viable local population of a threatened terrestrial flora or fauna species is defined as a population that occurs within the study area and the connected habitat to the north, south, east and west of the proposed development.

Flora Species

Tylophora linearis, Spiny Peppercress, Slender Darling Pea, Bluegrass, Belson's Panic, Lake Keepit Hakea, Austral Toadflax, Ooline

The site inspection did not reveal the presence of a local population of the above-mentioned flora species. The cryptic nature of some threatened species, however, is such that the species may not have been visible during the site visit. Therefore, it must be assumed that viable populations of threatened flora species may be present within the region in accordance with the precautionary principle.

Potential habitat for the listed species is present on the margins of the subject site, which has a small remaining area of pasture to the south of the quarry. The proposed development will not impact this area. These areas have historically been cleared and subject to grazing. Should these flora species be present within the development footprint, there is a low risk that the species may be displaced in the short term. Given that extensive adjoining areas of the same habitat retain the potential to support this species, it is considered that the risk of a viable population being placed at risk of extinction is minimal.

Bats and flying foxes

Large-eared Pied Bat, Corben's Long-eared Bat

The above-mentioned bat species may occasionally use the subject site for foraging. However, given the sparsity of foraging habitat within the subject site and the extensive areas of woodland and forest habitat in both the study area and the surrounding search area, these species are unlikely to regularly or heavily utilise the subject site. Additionally, no clearing is proposed for the subject site and no operations occur at night when these species are active.

The risk to these species from the proposed development is negligible. No viable local population of these species will be placed at risk of extinction as a result of the proposed development.

Woodland Species

Squatter Pigeon (southern subspecies), South-eastern Glossy Black-Cockatoo, Brown Treecreeper (eastern subspecies), Painted Honeyeater, Hooded Robin (south-eastern form), Diamond Firetail

Habitat loss and/or degradation as a result of clearing, increased weed invasion, under-shrubbing and "tidying up", are all significant threats for these species. No scattered woodland habitat occurs within the subject site and these species are not at risk of any direct impact.

The natural habitat remaining within the subject site consists of low-quality scrub and open habitat, which has been subject to clearing and grazing. Woodland habitat occurs in the study area surrounding the quarry. No viable habitat exists within the subject site for these species.

Given that significant suitable habitat on the property south of the subject site retains the potential to support these species, they are not considered to be impacted by the proposed development.

Mammals

Spotted-tailed Quoll, Koala

The subject site does not provide viable habitat for the Spot-tailed Quoll, which uses tree hollows or rocky outcrops cliff faces as den sites. During the site visit, no tree species suitable for koala feeding were identified. However, given the proximity of the subject site to higher quality native vegetation, it is possible that these species may occasionally transit through vegetated areas around the subject site. Any displacement or disturbance incurred as a result of the quarry operation would not result in a significant impact to the species. It is therefore considered that there is no risk of a viable population being placed at risk of extinction.

No population of listed threatened mammals was identified within the subject site, and minimal indirect impacts are expected to occur off-site. It is therefore considered that no viable local population of any threatened species will be placed at risk of extinction as a result of the proposed development.

The subject site is surrounded by areas native vegetation which provide viable habitat for these species and local populations have the ability to access or preference these areas. It is unlikely that any local population of threatened species within the study area will be placed at risk.

Reptilia

Dunmall's Snake

This species mainly occurs in Brigalow forest and woodland with fallen timber and ground litter, growing on cracking clay soils and clay loam soils. The subject site does not currently provide suitable habitat. Given that adjoining vegetation retains a potential to support these species, it is considered that the risk of a viable population being placed at risk of extinction is minimal.

It is considered that no viable local population of any threatened species would be placed at risk of extinction due to the proposed development.

b) in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,

The subject site does not support an endangered or critically endangered ecological community. The proposed development will not impact the extent or composition of any listed endangered or critically endangered ecological communities.

c) in relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality,

The proposed development is for an existing quarry in the study area and has been previously cleared for grazing. The subject site does not currently support habitat deemed to be important for any threatened species or population and significant areas of remnant native vegetation are retained to the south of the proposed development.

The proposal is therefore not considered to remove, modify, fragment or isolate habitat essential for the survival of a threatened species within the area. No endangered ecological community will be removed, modified or fragmented as part of the proposal.

d) whether the proposed development is likely to have an adverse effect on critical any declared area of outstanding biodiversity value (either directly or indirectly):

The proposed development is not located in an area of outstanding biodiversity value and will not adversely affect these areas (either directly or indirectly).

e) whether the proposed development or activity is or is part of a key threatening process or is likely or increase the impact of a key threatening process.

Invasion of Native Plant Communities by Exotic Perennial Grasses

Exotic perennial grasses may be present within the grassed areas of the subject site and the surrounding study area (property). There is a risk that vehicles movement associated with the proposed development may increase the transport weed seeds to native plant communities with higher ecological value native ground cover. This risk is considered minimal as the vehicle access track is well established and traverses through the same pastures that surround quarry and does not come near native plant communities.

Weed management strategies will be implemented through the Operational and Environmental Management Plan (OEMP) to minimise the risk of weed establishment and proliferation as a result of the proposed development. Weed management strategies will include vehicle hygiene procedures to minimise the potential for seed transport onto and off the work site.

Provided safeguards regarding weed management are implemented, the proposed development is unlikely to result in increased weed incursion or increase the impact of any key threatening processes.

Conclusion

This Test of Significance for the proposed development has found that it is not likely to significantly affect threatened species, ecological communities, or their habitats. It has determined that potential adverse impacts of the proposed development on threatened species, populations or communities are likely to be minimal and no further investigation in the form of a Species Impact Statement is required.

References

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Appendix A: Bionet Threatened Species, Populations and Communities Search Results for a 10-kilometre radius from the Subject Site

Scientific Name	Common Name	Legal Status	Records
Tyto novaehollandiae	Masked Owl	BC Act: V, P3	1
Pomatostomus temporalis temporalis	Grey-crowned Babbler (eastern subspecies)	BC Act: V, P	2
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	BC Act: V, P	1
Chalinolobus picatus	Little Pied Bat	BC Act: V, P	2
Falsistrellus tasmaniensis	Eastern False Pipistrelle	BC Act: V, P	2
Vespadelus troughtoni	Eastern Cave Bat	BC Act: V, P	1
Miniopterus orianae oceanensis	Large Bent-winged Bat	BC Act: V, P	1
Cadellia pentastylis	Ooline	BC Act: V	2

Appendix B: Bionet Threatened Species, Populations and Communities Search Results for Brigalow Belt South Bioregion (Northern Basalt IBRA Subregion)

Species Name	Status	Habitat Description and Locally Known Populations	Local Records	Potential to Occur and Importance of Habitat Present	Assessment of Significance
Aves					
Geophaps scripta scripta **Squatter Pigeon (southern subspecies)**	BC Act – V	Mainly found from north Queensland to the Northwest Slopes of NSW and extending down to the Liverpool Plains and Dubbo. Habitat ranges from Grassy woodlands and plains, preferring sandy areas and usually close to water. Feed on the ground, on seeds of grasses, herbs and shrubs, as well as insects. Nest on the ground.	2	**Moderate** This species may hunt within the subject site.	Yes
Hirundapus caudacutus **White-throated Needletail**	BC Act – V	White-throated Needletails Non-breeding migrants to Australia, arriving from their breeding grounds in the northern hemisphere in October each year and leaving between May and August. The species is recorded in all coastal regions of Queensland and NSW, extending inland to the western slopes of the Great Dividing Range and occasionally onto the adjacent inland plains. The species is almost exclusively aerial; however, it is known to roost in trees.	9	**Low** The subject site is not considered an important habitat for this species	No
Botaurus poiciloptilus **Australasian Bittern**	BC Act - E	Favours permanent freshwater wetlands with tall, dense vegetation, particularly bullrushes (*Typha* spp.) and spikerushes (*Eleocharis* spp.). It hides during the day amongst dense reeds or rushes and feeds mainly at night on frogs, fish, yabbies, spiders, insects and snails. Feeding platforms may be constructed over deeper water from reeds trampled by the bird; platforms are often littered with prey remains.	p	**Low** The subject site is not considered an important habitat for this species	No

Species Name	Status	Habitat Description and Locally Known Populations	Local Records	Potential to Occur and Importance of Habitat Present	Assessment of Significance
Rostratula australis **Australian Painted Snipe**	BC Act - E	This species prefers fringes of swamps, dams and nearby marshy areas where there is a cover of grasses, lignum, low scrub or open timber. Nests on the ground amongst tall vegetation, such as grasses, tussocks or reeds. The nest consists of a scrape in the ground, lined with grasses and leaves.	P	**Low** The subject site is not considered an important habitat for this species	No
Black-tailed Godwit Limosa limosa	BC Act – E,C,J,K	This species is primarily a coastal species. Usually found in sheltered bays, estuaries and lagoons with large intertidal mudflats and/or sandflats. Further inland, it can also be found on mudflats and in water less than 10 cm deep, around muddy lakes and swamps.	P	**Low** The subject site is outside the species' range (coastal habitat) and is not considered an important habitat.	No
Calyptorhynchus lathami lathami **South-eastern Glossy Black-Cockatoo**	BC Act - V	This species Inhabits open forest and woodlands of the coast and the Great Dividing Range where stands of sheoak occur. Black Sheoak (*Allocasuarina littoralis*) and Forest Sheoak (*A. torulosa*) are important foods. Inland populations feed on a wide range of sheoaks, including Drooping Sheoak, *Allocasuaraina diminuta*, and *A. gymnathera*. Belah is also utilised and may be a critical food source for some populations. Feeds almost exclusively on the seeds of several species of she-oak (*Casuarina* and *Allocasuarina* species), shredding the cones with the massive bill.	42	**Moderate** Suitable habitat and food sources for the species may occur within the study area, but not within the subject site.	Yes

Species Name	Status	Habitat Description and Locally Known Populations	Local Records	Potential to Occur and Importance of Habitat Present	Assessment of Significance
Lathamus discolor *Swift Parrot*	BC Act – CE	Breeds in Tasmania during spring and summer, migrating in the autumn and winter months to south-eastern Australia from Victoria and the eastern parts of South Australia to south-east Queensland. In NSW, it mostly occurs on the coast and southwest slopes. Favoured feed trees include winter flowering species such as Swamp Mahogany *Eucalyptus robusta*, Spotted Gum *Corymbia maculata*, Red Bloodwood C. gummifera, Forest Red Gum E. tereticornis, Mugga Ironbark *E. sideroxylon*, and White Box *E. albens*. Commonly used lerp infested trees include Inland Grey Box *E. microcarpa*, Grey Box *E. moluccana*, Blackbutt *E. pilularis*, and Yellow Box *E. melliodora.* Return to some foraging sites on a cyclic basis depending on food availability.	P	**Low** The subject site is not considered an important habitat for this species	No
Climacteris picumnus victoriae **Brown Treecreeper (eastern subspecies)**	BC Act - V	The Brown Treecreeper is endemic to eastern Australia and occurs in eucalypt forests and woodlands of inland plains and slopes of the Great Dividing Range. Found in eucalypt woodlands (including Box-Gum Woodland) and dry open forest of the inland slopes and plains inland of the Great Dividing Range; mainly inhabits woodlands dominated by stringybarks or other rough-barked eucalypts, usually with open grassy understorey, sometimes with one or more shrub species. When foraging in trees and on the ground, they peck and probe for insects, mostly ants, amongst the litter, tussocks,	18	**Low** The subject site is not considered an important habitat for this species	No

Species Name	Status	Habitat Description and Locally Known Populations	Local Records	Potential to Occur and Importance of Habitat Present	Assessment of Significance
		and fallen timber, and along trunks and lateral branches. Hollows in standing dead or live trees and tree stumps are essential for nesting.			
Aphelocephala leucopsis **Southern Whiteface**	BC Act - V	Southern whiteface occurs across most of mainland Australia south of the tropics, from the north-eastern edge of the Western Australian Wheatbelt, east to the Great Dividing Range. There is a broad hybrid zone between the two subspecies extending north. from the western edge of the Nullarbor Plain. The northern boundary extends to about Carnarvon in the west, to the southern Northern Territory in central Australia, but is slightly further south in Queensland where the species is largely confined to the south-west of the Mitchell Grass Downs and along the southern state border. They live in relatively undisturbed open woodlands and shrublands with an understorey of grasses or shrubs or habitat with low tree densities and an herbaceous understory litter cover that provides essential foraging habitat.	2	**Unlikely** There is no suitable habitat for the species within the proposed subject site.	No
Anthochaera phrygia **Regent Honeyeater**	BC Act - CE	The Regent Honeyeater is a flagship threatened woodland bird whose conservation will benefit a large suite of other threatened and declining woodland fauna. The species inhabits dry open forest and woodland, particularly Box-Ironbark woodland, and riparian forests of River Sheoak.	P	**Unlikely** There is no suitable habitat for the species within the proposed subject site.	No

Species Name	Status	Habitat Description and Locally Known Populations	Local Records	Potential to Occur and Importance of Habitat Present	Assessment of Significance
		Regent Honeyeaters inhabit woodlands that support a significantly high abundance and species richness of bird species. These woodlands have significantly large numbers of mature trees, high canopy cover and abundance of mistletoes.			
Grantiella picta **Painted Honeyeater**	BC Act - V	The Painted Honeyeater is nomadic and occurs at low densities throughout its range. The greatest concentrations of the bird and almost all breeding occurs on the inland slopes of the Great Dividing Range in NSW, Victoria and southern Queensland. Inhabits Boree/ Weeping Myall (*Acacia pendula*), Brigalow (*A. harpophylla*) and Box-Gum Woodlands and Box-Ironbark Forests. A specialist feeder on the fruits of mistletoes growing on woodland eucalypts and acacias. Prefers mistletoes of the genus *Amyema*.	19	**Moderate** Suitable habitat for the species may occur within the study area, but not within the subject site.	Yes
Melanodryas cucullata cucullata **Hooded Robin (south-eastern form)**	BC Act - E	The south-eastern form (subspecies *cucullata*) is found from Brisbane to Adelaide and throughout much of inland NSW, with the exception of the extreme north-west, where it is replaced by subspecies *picata*. Two other subspecies occur outside NSW. Requires structurally diverse habitats featuring mature eucalypts, saplings, some small shrubs and a ground layer of moderately tall native grasses. Prefers lightly wooded country, usually open eucalypt woodland, acacia scrub and mallee, often in or near clearings or open areas.	9	**Moderate** This species may hunt throughout the subject site.	Yes

Species Name	Status	Habitat Description and Locally Known Populations	Local Records	Potential to Occur and Importance of Habitat Present	Assessment of Significance
		Requires structurally diverse habitats featuring mature eucalypts, saplings, some small shrubs and a ground layer of moderately tall native grasses.			
Stagonopleura guttata **Diamond Firetail**	BC Act - V	Found in grassy eucalypt woodlands, including Box-Gum Woodlands. Also occurs in open forest, mallee, Natural Temperate Grassland, and in secondary grassland derived from other communities. Prefers clearings or areas with open understoreys. Feeds exclusively on the ground, on ripe and partly ripe grass and herb seeds and green leaves, and on insects. Nests are globular structures built either in the shrubby understorey, or higher up, especially under hawk's or raven's nests. Birds roost in dense shrubs or in smaller nests built especially for roosting.	1	**Moderate** Suitable habitat for the species may occur within the study area, but not within the subject site.	Yes
Mammalia					
Dasyurus maculatus **Spotted-tailed Quoll**	BC Act - E	Recorded across a range of habitat types, including rainforest, open forest, woodland, coastal heath and inland riparian forest, from the sub-alpine zone to the coastline. Quolls use hollow-bearing trees, fallen logs, other animal burrows, small caves and rock outcrops as den sites. Mostly nocturnal, although will hunt during the day; spend most of the time on the ground, although also an excellent climber and will hunt possums and gliders in tree hollows and prey on roosting birds.	P	**Moderate** Suitable habitat for the species may occur within the study area, but not within the subject site.	Yes

Species Name	Status	Habitat Description and Locally Known Populations	Local Records	Potential to Occur and Importance of Habitat Present	Assessment of Significance
		Use communal 'latrine sites', often on flat rocks among boulder fields, rocky cliff-faces or along rocky stream beds or banks. Such sites may be visited by multiple individuals and can be recognised by the accumulation of the sometimes characteristic 'twisty-shaped' faeces deposited by animals.			
Phascolarctos cinereus **Koala**	BC Act - E	In New South Wales, koala populations are found on the central and north coasts, southern highlands, southern and northern tablelands, Blue Mountains, southern coastal forests, with some smaller populations on the plains west of the Great Dividing Range. Inhabit eucalypt woodlands and forests. Feed on the foliage of more than 70 eucalypt species and 30 non-eucalypt species, but in any one area select preferred browse species. Home range size varies with the quality of habitat, ranging from less than two ha to several hundred hectares in size.	103	**Moderate** Suitable habitat for the species may occur within the study area, but not within the subject site.	Yes
Pteropus poliocephalus **Grey-headed Flying-fox**	BC Act - V	Occur in subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps as well as urban gardens and cultivated fruit crops. Roosting camps are generally located within 20 km of a regular food source and are commonly found in gullies, close to water, in vegetation with a dense canopy. Individual camps may have tens of thousands of animals and are used for mating, and for giving birth and rearing young.	3	**Low** The subject site does not contain any viable habitat for this species	No

Species Name	Status	Habitat Description and Locally Known Populations	Local Records	Potential to Occur and Importance of Habitat Present	Assessment of Significance
		In times of natural resource shortages, they may be found in unusual locations.			
Chalinolobus dwyeri **Large-eared Pied Bat**	BC Act - E	Roosts in caves (near their entrances), crevices in cliffs, old mine workings and in the disused, bottle-shaped mud nests of the Fairy Martin (Petrochelidon ariel), frequenting low to mid-elevation dry open forest and woodland close to these features. Females have been recorded raising young in maternity roosts (c. 20-40 females) from November through to January in roof domes in caves, overhangs, mine adits and concrete structures such as derelict buildings. They remain loyal to the same cave over many years. Found in well-timbered areas containing gullies. The relatively short, broad wing combined with the low weight per unit area of wing indicates manoeuvrable flight. This species probably forages for small, flying insects below the forest canopy.	3	**Moderate** The species may forage and roosting within the subject site.	Yes
Nyctophilus corbeni **Corben's Long-eared Bat**	BC Act - V	Inhabits a variety of vegetation types, including mallee, bulloke Allocasuarina leuhmanni and box eucalypt dominated communities, but it is distinctly more common in box/ironbark/cypress-pine vegetation that occurs in a north-south belt along the western slopes and plains of NSW and southern Queensland. Roosts in tree hollows, crevices, and under loose bark.	21	**Moderate** Suitable habitat for the species may occur within the study area, but not within the subject site.	Yes

Species Name	Status	Habitat Description and Locally Known Populations	Local Records	Potential to Occur and Importance of Habitat Present	Assessment of Significance
Reptilia					
Uvidicolus sphyrurus **Border Thick-tailed Gecko**	BC Act – V	This species often occurs on steep rocky or scree slopes, especially granite. Recent records from basalt and metasediment slopes and flats indicate its habitat selection is broader than formerly thought and may have extended into areas that were cleared for agriculture. Favours forest and woodland areas with boulders, rock slabs, fallen timber and deep leaf litter. Occupied sites often have a dense tree canopy that helps create a sparse understorey. These Geckos are active at night and shelter by day under rock slabs, in or under logs, and under the bark of standing trees.	2	**Low** The subject site is not considered an important habitat for this species	No
***Anomalopus mackayi* Five-clawed Worm-skink**	BC Act – V	The species has a patchy distribution on the Northwest Slopes and Plains of north-east NSW. Occurs close to or on the lower slopes of slight rises in grassy White Box woodland on moist black soils, and River Red Gum-Coolibah-Bimble Box woodland on deep cracking loose clay soils. May also occur in grassland areas and open paddocks with scattered trees.	29	**Low** The subject site is not considered a viable habitat for this species	No
***Furina dunmalli* Dunmall's Snake**	BC Act – V	This Species occurs in the south-east interior of Queensland, including the Darling Downs, and is thought to potentially extend into inland north-eastern NSW. Most locality records are between 200 and 500 m elevation. The preferred habitat is Brigalow Forest and woodland with fallen timber and ground litter growing on cracking clay soils	1	**Moderate** Given the availability of suitable habitat within and adjacent to the subject site, the species may occur throughout it.	Yes

Species Name	Status	Habitat Description and Locally Known Populations	Local Records	Potential to Occur and Importance of Habitat Present	Assessment of Significance
		and clay loam soils. Also occurs in eucalypt and Callitris woodland with fallen timber and ground litter. Nocturnal.			
Flora					
Tylophora linearis	BC Act – E	Grows in dry scrubland that may have a eucalypt, *Callitris glaucophylla* and/or *Allocasuarina luehmannii* overtopping the scrub, in the Barraba, Mendooran, Temora and West Wyalong districts. Also grows in association with Acacia hakeoides, Acacia lineata, Melaleuca uncinata, Myoporum species and Casuarina species	4	**Moderate** This species was not observed during the site visit due to seasonal fluctuations; however, the habitat is suitable for the species and is therefore considered in this assessment.	Yes
Lepidium aschersonii **Spiny Peppercress**	BC Act – V	Found on ridges of gilgai clays dominated by Brigalow (*Acacia harpophylla*), Belah (*Casuarina cristata*), Buloke (*Allocasuarina luehmanii*) and Grey Box (*Eucalyptus microcarpa*). In the south has been recorded growing in Bull Mallee (*Eucalyptus behriana*). Often the understorey is dominated by introduced plants. The species grows as a component of the ground flora, in grey loamy clays. Vegetation structure varies from open to dense, with sparse grassy understorey and occasional heavy litter	4	**Moderate** This species was not observed during the site visit due to seasonal fluctuations; however, the habitat is suitable for it and is therefore considered in this assessment.	Yes
Lepidium monoplocoides	BC Act – E	Widespread in the semi-arid western plains regions of NSW. Occurs on seasonally moist to waterlogged sites, on heavy	P	**Unlikely**	No

Species Name	Status	Habitat Description and Locally Known Populations	Local Records	Potential to Occur and Importance of Habitat Present	Assessment of Significance
Winged Peppercress		fertile soils, with a mean annual rainfall of around 300-500 mm. Predominant vegetation is usually an open woodland dominated by *Allocasuarina luehmannii* (Bulloak) and/or eucalypts, particularly *Eucalyptus largiflorens* (Black Box) or *Eucalyptus populnea* (Poplar Box). The field layer of the surrounding woodland is dominated by tussock grasses.		There is no suitable habitat for the species within the proposed subject site.	
Swainsona murrayana **Slender Darling Pea**	BC Act – V	Found throughout NSW, it has been recorded in the Jerilderie and Deniliquin areas of the southern riverine plain, the Hay plain as far north as Willandra National Park, near Broken Hill and in various localities between Dubbo and Moree. It grows in a variety of vegetation types, including bladder saltbush, black box and grassland communities on level plains, floodplains and depressions and is often found with *Maireana* species. Plants have been found in remnant native grasslands or grassy woodlands that have been intermittently grazed or cultivated.	2	**Moderate** This species was not observed during the site visit due to seasonal fluctuations; however, the habitat is suitable for the species and is therefore considered in this assessment.	Yes
Acacia pycnostachya **Bolivia Wattle**	BC Act – V	Restricted to NSW. Three extensive populations exist in the vicinity of Bolivia Hills and Bluff River Nature Reserves south of Tenterfield, and on nearby Crown Land. Acacia pycnostachya typically grows in dry sclerophyll forest amongst granite outcrops, on hillsides at altitudes of 700 to 900 m, but is flexible in its habitat. Soil types range from acid volcanics to sandy and skeletal on exposed outcrops, to	1	**Unlikely** There is no suitable habitat for the species within the proposed subject site.	No

Species Name	Status	Habitat Description and Locally Known Populations	Local Records	Potential to Occur and Importance of Habitat Present	Assessment of Significance
		shallow sandy loams in less exposed sites. It often grows in stands in areas sheltered from fire. Generally plants appear to dominate the understorey or tall shrub stratum below an open canopy of taller shrubs or trees. Dense stands are currently common.			
Homoranthus bebo	BC Act – CE	Homoranthus bebo is endemic to NSW and currently only known from a single population occurring on the northern edge of Dthinna Dthinnawan Nature Reserve, c. 20 km north-west of Yetman, near the Queensland border (*Copeland et al. 2011; PlantNET 2017*). Homoranthus bebo occurs on deep sandy soils over sandstone and is associated with Smooth Barked Apple/Black Cypress Woodland.	344	**Low** This species was not observed during the site The subject site is not considered a viable habitat for this species	no
Dichanthium setosum **Bluegrass**	BC Act – V	Bluegrass occurs on the New England Tablelands, Northwest Slopes and Plains, and the Central Western Slopes of NSW, extending to northern Queensland. It occurs widely on private property, including in the Inverell, Guyra, Armidale and Glen Innes areas. 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 pastures.	17	**Moderate** This species was not observed during the site visit due to seasonal fluctuations; however, the habitat is suitable for the species and is therefore considered in this assessment.	Yes

Species Name	Status	Habitat Description and Locally Known Populations	Local Records	Potential to Occur and Importance of Habitat Present	Assessment of Significance
Homopholis belsonii **Belson's Panic**	BC Act – V	It occurs on the northwest slopes and plains of NSW, mostly between Wee Waa, Goondiwindi and Glen Innes. It also occurs in Queensland, mainly in the Brigalow Belt South bioregion. Grows in dry woodland (e.g. Belah) often on poor soils, although sometimes found in basalt-enriched sites north of Warialda and in alluvial clay soils. Habitat and ecology appear to be poorly known.	285	**Moderate** This species was not observed during the site visit due to seasonal fluctuations; however, the habitat is suitable for the species and is therefore considered in this assessment.	Yes
Hakea pulvinifera **Lake Keepit Hakea**	BC Act – E	Lake Keepit Hakea is confined to the North West Slopes of NSW, where it is known from a single population near Lake Keepit, north-east of Gunnedah. Attempts are currently in progress to expand the population to nearby sites. Associated species at the site include *Alstonia constricta* and *Acacia decora*. A sparse cover of grasses and forbs forms a ground layer but at least fifty percent of the site is bare earth or rock. The most common ground cover species is the introduced plant *Petrorhagia nanteuilii*. Other common species are the grasses *Themeda australis, Cymbopogon obtectus* and *Aristida* species.	3	**Moderate** This species was not observed during the site assessment. However, it is known to occur in moderately disturbed areas and the subject site has potential habitat for the species. The species is therefore included in this assessment.	Yes
Thesium australe ***Austral Toadflax***	BC Act – V	Occurs in grassland on coastal headlands or grassland and grassy woodland away from the coast. Often found in association with Kangaroo Grass (*Themeda australis*).	11	**Moderate** This species was not observed during the site assessment. However, it is known to occur in	Yes

Species Name	Status	Habitat Description and Locally Known Populations	Local Records	Potential to Occur and Importance of Habitat Present	Assessment of Significance
		A root parasite that takes water and some nutrient from other plants, especially Kangaroo Grass.		moderately disturbed areas and the subject site has potential habitat for the species. The species is therefore included in this assessment.	
Cadellia pentastylis Ooline	BC Act – V	This species forms a closed or open canopy mixing with eucalypt and cypress pine species. There appears to be a strong correlation between the presence of Ooline and low- to medium-nutrient soils of sandy clay or clayey consistencies, with a typical soil profile having a sandy loam surface layer, grading from a light clay to a medium clay with depth. Has the capacity to resprout from rootstock and coppice vigorously from stumps, a feature which may be critical for the species survival in a fire-prone environment	46	**Moderate** This species was not observed during the site assessment. However, it is known to occur in moderately disturbed areas and the subject site has potential habitat for the species. The species is therefore included in this assessment.	Yes
Communities					
Brigalow (Acacia harpophylla dominant and co-dominant)	BC Act – E	The Brigalow ecological community is characterised by the presence of *Acacia harpophylla* as one of the most abundant tree species (Butler, 2007). *A. harpophylla* is either, dominant in the tree layer, or co-dominant with other species – notably *Casuarina cristata* (belah), other species of Acacia, or species of Eucalyptus. Occasionally these other species may be more common than *A. harpophylla* within the broad matrix of brigalow woodlands vegetation.	K	**Low** Occurrence of this EEC was not observed on subject site or study area and is not considered likely to occur within the development footprint	Low

Species Name	Status	Habitat Description and Locally Known Populations	Local Records	Potential to Occur and Importance of Habitat Present	Assessment of Significance
Coolibah - Black Box Woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions	BC Act – E	The Coolibah-Black Box Woodlands are found on the grey, self-mulching clays of periodically waterlogged floodplains, swamp margins, ephemeral wetlands and stream levees. The structure of the ecological community may vary from tall woodland in riparian zones to very open woodland with a sparse mid-layer of shrubs and saplings and a grassy ground layer. The structure and composition vary depending on topography and flooding or disturbance history.	K	**Low** Occurrence of this EEC was not observed on subject site or study area and is not considered likely to occur within the development footprint	No
Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia	BC Act – E	The Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-Eastern Australia predominantly occurs on the drier edge of the temperate grassy eucalypt woodland belt and ranges from central New South Wales through northern and central Victoria into South Australia.	K	**Moderate** This EEC may occur within the study area	Yes
Mount Kaputar land snail and slug community	BC Act – E	Known from the Mount Kaputar National Park the TEC may also occur elsewhere in the region where suitable habitats exist. Tall open forest above 1000m altitude with rough-barked mountain gum (*Eucalyptus volcanica*), silvertop stringybark (*E. laevopinea*) and red stringybark (*E. macrorhyncha*) Open forests of snow gum (*E. pauciflora*), ribbon gum (*E. viminalis*) and white gum (*E. dalrympleana*)	K	**Low** the subject site and study area are not suitable habitat for this community which is very unlikely to occur within the area	No

Species Name	Status	Habitat Description and Locally Known Populations	Local Records	Potential to Occur and Importance of Habitat Present	Assessment of Significance
		The land snail and slug EEC tends to occur in habitat with low average temperatures, and high rainfall and humidity, resulting in favourable moisture conditions for the land snails and slugs.			
Natural grasslands on basalt and fine-textured alluvial plains of northern New South Wales and southern Queensland	BC Act – EC	The species composition of tussock grasslands varies throughout its range and is influenced by factors such as rainfall, soil, geology and land use history. These influences may vary the expression of the ecological community over short periods or across small distances. Many grass genera that occur as grassland dominants cover a diversity of habitats.	K	**Moderate** This EEC may occur within the subject site	Yes
New England Peppermint (Eucalyptus nova-anglica) Grassy Woodlands	BC Act – CE	Grassy eucalypt woodlands formerly covered an extensive, continuous belt of vegetation from southern Queensland through New South Wales and northern Victoria to eastern South Australia. The New England Peppermint (Eucalyptus nova-anglica) Grassy Woodlands ecological community is a type of temperate grassy eucalypt woodland to open forest in which the tree canopy is dominated or co-dominated by Eucalyptus nova-anglica (New England Peppermint) and the ground layer is mostly grassy.	K	**Moderate** This EEC may occur within the study area	Yes
Poplar Box Grassy Woodland on Alluvial Plains	BC Act – E	The Poplar Box Grassy Woodland on Alluvial Plains ecological community is typically a grassy woodland or occasionally open grassy forest, with a canopy dominated by *Eucalyptus*	K	**Moderate** This EEC may occur within the study area	Yes

Species Name	Status	Habitat Description and Locally Known Populations	Local Records	Potential to Occur and Importance of Habitat Present	Assessment of Significance
		populnea and an understorey mostly of grasses and other forbs.			
Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions	BC Act – E	A low, dense form of dry rainforest generally less than 10 m high, made up of vines and rainforest trees as well as some shrubs. This community often stands out as a bright green against surrounding woodland due to many species having bright-coloured leaves. The main canopy is dominated by rainforest species such as Red Olive Plum (*Cassine australis var. angustifolia*), Wilga (*Geijera parvifolia*) Native Olive (*Notelaea microcarpa var. microcarpa*) and Peach Bush (*Ehretia membranifolia*), with taller eucalypts and cypress pines from surrounding woodland vegetation emerging above the main canopy.	K	**Low** Occurrence of this EEC was not observed on subject site or study area and is not considered likely to occur within the study area	No
Weeping Myall Woodlands	BC Act – E	The Weeping Myall Woodlands occur in a range from open woodlands to woodlands, generally 4-12 m high, in which Weeping Myall (*Acacia pendula)* trees are the sole or dominant overstorey species.	K	**Low** Occurrence of this EEC was not observed on subject site or study area and is not considered likely to occur within the subject site	No
White Box-Yellow Box-Blakely's Red Gum Grassy	BC Act – CE	Characterised by current or prior occurrence of White Box, Yellow Box and/or Blakely's Red Gum and a generally grassy	K	**Moderate** This EEC may occur within the development footprint.	Yes

Species Name	Status	Habitat Description and Locally Known Populations	Local Records	Potential to Occur and Importance of Habitat Present	Assessment of Significance
Woodland and Derived Native Grassland		understorey. In the Nandewar Bioregion, Grey Box may also be dominant. The trees may occur as pure stands, mixtures of the three species or in mixtures with other trees, including wattles.			