Gunlake Quarry Continuation Project

State Significant Development Assessment
SSD-12469087

March 2023

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Cover image: Gunlake Quarry Extraction Pit, March 2022

Executive Summary

Gunlake Quarry is an existing hard rock quarry located within the Goulburn Mulwaree Local Government Area, approximately 7 kilometres (km) northwest of Marulan. The quarry has been operating since 2010 and is currently owned and operated by Gunlake Quarries Pty Ltd (Gunlake).

In September 2021, Gunlake submitted a State significant development (SSD) application for the Gunlake Quarry Continuation Project (SSD 12469087) (the Project). The application is seeking approval to increase the maximum production rate to 4.2 million tonnes per annum (Mtpa) and increase the road transportation limits along its existing Primary Transport Route over a 30-year period.

Strategic Context

Demand for quarry products in NSW is driven by government spending on public infrastructure and private investment in commercial, industrial and residential development. The need for infrastructure investment in NSW, including within the Southern Highlands, is identified in several key State and regional strategy documents and the NSW Government has committed over $108 billion in infrastructure spending over the four years to 2025. The construction of these projects will require substantial quantities of high-quality hard rock quarry products.

Gunlake Quarry and the nearby Peppertree, Lynwood and Ardmore Park Quarries have become important sources of quarry products, given their reasonable proximity and convenient transport links to the Greater Sydney Region. Collectively, these quarries currently produce the largest volume of hard rock aggregates in NSW.

The quarry's location near the Hume Highway allows economic delivery of quarry products to the highway, and direct transport to markets, including to growth areas in the Greater Sydney region and to regional areas to the southwest. If the Project is approved, the quarry would be one of the largest producing hard rock quarries in the region.

Statutory Process

The Project is an extractive industry development with a resource of more than 5 Mt and is therefore declared to be SSD under Schedule 1 of *State Environmental Planning Policy (Planning Systems) 2021.* The Minister for Planning (the Minister) is the consent authority for the Project. However, under the Minister's delegation of 9 March 2022, the Executive Director – Energy, Resources and Industry, may determine the development application as Gunlake has not made any reportable political donations, Goulburn Mulwaree Council (Council) did not object to the development application, and there were less than 50 unique objections from the general public.

Gunlake has advised the Department that the Commonwealth Government has confirmed that no referral of the Project is required under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) for potential impacts on the Matters of National Environmental Significance (MNES).

Engagement

The Department publicly exhibited the Project from 8 October until 4 November 2021. The Department received 57 public submissions from the community and special interest groups, of which 58% objected to the Project, 37% supported the Project and 5% provided comments. Advice was received from a

further 12 public agencies. While none of the public agencies objected to the Project, several commented on particular aspects and proposed recommended conditions.

The Department considers that its engagement process met the community participation requirements of the EP&A Act and associated EP&A Regulation.

Assessment

Due to the Project's proposal to significantly increase the number of heavy vehicle movements along local roads associated with the Primary Transport Route (i.e. 27% increase), the Department considers that the key assessment issues relate to traffic and transportation, including traffic congestion and road safety. Given the proposal involves deepening of the existing approved quarry pit well below the regional groundwater level, the Department considers that potential impacts to water resources (groundwater and surface waters) and associated groundwater dependent biodiversity are also important assessment issues for the Project.

Traffic and Transportation

The Department acknowledges that traffic and transportation impacts have been a key concern for the community. The aspects of the Project that have the greatest potential for adverse traffic and transportation impacts are those affecting the efficiency and safety of the local road network as a result of increased road haulage of materials to and from the quarry along the Primary Transport Route.

The Department commissioned an independent peer review of the traffic and road safety assessments completed for the Project.

The Department considers that the increased number of heavy vehicles associated with the Project is unlikely to result in an unacceptable level of impact to road network capacity or intersection performance along the Primary Transport Route.

However, the Department considers that improvements to the existing road safety measures should be implemented to ensure the additional heavy vehicle traffic associated with the Project does not cause unacceptable road safety risks. The key improvement recommended in the road safety audit and by the Department's independent reviewer included widening five culverts to accommodate wide-centreline treatment and provide a consistent road treatment along the vast majority of the Primary Transport Route. A range of additional repairs, delineation measures and sight distance maintenance measures were also recommended. The Department has proposed conditions requiring these measures to be implemented by Gunlake in consultation with Council, prior to heavy vehicle traffic volumes exceeding currently approved numbers.

The Department has also recommended that Gunlake be required to pay Council contributions for the ongoing maintenance along the transport routes in accordance with the recent *Goulburn Mulwaree Local Infrastructure Contributions Plan 2021*.

Alternative options to transport quarry products have been considered in detail, including rail-based options. The Department accepts that significant challenges exist for rail-based options and considers that Gunlake has demonstrated that there is currently no economically viable way to transport its quarry products by rail as part of the Project. The Department accepts that the nature of Gunlake's business, which involves transporting its products a relatively short distance to dispersed locations mostly in the

Sydney metropolitan region, means that the Project would be unviable if Gunlake was required to use rail to transport its products.

However, the Department has recommended a condition requiring Gunlake to re-evaluate the economic, social and environmental costs and benefits of all reasonable and feasible options for the transport of quarry products from the site in 5 years, and every 10 years thereafter, in consultation with relevant agencies.

Groundwater

Groundwater modelling predicts that quarrying from the pit would intercept the regional fractured rock groundwater aquifer from approximately 2027 onwards (i.e. in about 5 years). At the end of quarrying, the modelling predicts that the final void pit depth would be approximately 100 metres (m) below the groundwater table.

The cone of depressurisation around the quarry pit following the interception of the groundwater table is predicted to extend primarily to the south and southwest of the quarry pit, with the 2 m drawdown contour from the regional fractured rock aquifer extending approximately 1.3 km to the southwest. Drawdowns of approximately 50 m are predicted in the immediate vicinity of the pit.

The regional groundwater at the site is classified as 'less productive' porous and fractured rock water source in accordance with the NSW Aquifer Interference Policy (AIP). No landowner water bores in the vicinity of the quarry pit are predicted to experience drawdown greater than the 2 m maximum threshold defined by the AIP. As a precaution, the Department has recommended that a water census and the application of 'make good' provisions if any privately-owned water supply bore is compromised by the Project.

Once quarrying operations proceed below the groundwater table from approximately 2027 onwards until approximately 2052, the groundwater modelling predicted that the average groundwater inflows to the quarry pit would be approximately 68 mega litres (ML)/year. The Department accepts that there are sufficient entitlement shares within the relevant Water Sharing Plans to allow Gunlake to purchase the additional water access licence to account for this water take.

The Department acknowledges that the current groundwater model is based on limited data and considers that additional groundwater data is required, and a more sophisticated numerical flow model should be developed for the quarry prior to the pit intercepting the regional groundwater table. The Department has recommended that Gunlake be required to expand the existing groundwater monitoring network and prepare and implement a Groundwater Modelling Plan, which provides details for the future development and calibration of a numerical groundwater model for the Project.

Surface Water

The Project is unlikely to result in significant changes to the existing site water balance due to greater process water requirements offsetting increased groundwater inflow volumes once quarrying in the pit extends below the regional groundwater level.

During dry years prior to the interception of groundwater in the quarry pit, there is the potential that the quarry could experience water deficits (i.e. shortfalls) ranging from 11-25 ML/year. The Department accepts that there are measures available to Gunlake to manage water supply shortfalls (i.e. chemical dust suppressants, scaling of operations and/or third-party purchases). The Department has

recommended a condition requiring Gunlake to ensure that it has sufficient water for all stages of the Project, and if necessary, adjust the scale of the development to match its available water supply.

During wet years, particularly once quarrying extends below the regional groundwater table, the quarry is likely to experience water surpluses of up to 300 ML/year, some of which may need to be discharged from the site water storage dams. The Department has recommended that Gunlake update the Surface Water Management Plan prior to any water discharges being approved, to provide details of surplus water re-use and disposal; water quality and treatment; and mitigation and monitoring. Any subsequent discharges from the quarry would be required to comply with the *Protection of the Environment Operations Act 1997* (POEO Act) and discharge limits set by the Environment Protection Authority (EPA) in the quarry's Environment Protection Licence.

The Department considers that these requirements would ensure the continued operation of the Project would have a neutral or beneficial effect on water quality within Sydney's drinking water catchment.

Biodiversity

Additional resource for the proposed increase in the production rate would be sourced from a deepening of the existing pit and the remaining unextracted resource rather than a surface expansion. The Project would therefore avoid any direct impacts on biodiversity.

However, the Project has the potential to result in indirect or prescribed impacts on biodiversity, primarily from increased groundwater drawdown impacting vegetation associated with groundwater dependent ecosystems (GDEs). Approximately 55 ha of one plant community *(Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion)* that is considered to have a facultative dependence on groundwater occurs in the predicted drawdown area. This GDE is a listed as a critically endangered ecological community under both the *Biodiversity Conservation Act 2016* and the EPBC Act and is known to support threatened species.

The biodiversity assessment presented uncertainty in the level of risk to this GDE from the predicted drawdown in the regional water table as a result of the Project. In accordance with Biodiversity Conservation Division's recommendations, the Department has therefore recommended conditions requiring Gunlake to prepare and implement a comprehensive Adaptive Management Plan to identify and determine any impacts to GDEs as a result of the Project and offset any detected impacts in accordance with the Biodiversity Assessment Method.

Other Issues

The Department has assessed the impacts of the Project on other values including noise, air quality, social, economic, waste and greenhouse gas emissions. The Department considers that, following the implementation of reasonable and feasible mitigation measures, the residual impacts of the Project can be suitably managed and/or offset.

Evaluation

The Department has carried out a detailed assessment of the merits of the Project, having regard to all of Gunlake's Project documentation, advice from NSW government agencies and an independent expert, and all submissions from members of the public and special interest groups. The Department's assessment has also considered the objects of the *Environmental Planning and Assessment Act* (EP&A Act) and relevant considerations under Section 4.15(1) of the EP&A Act.

The Department acknowledges that there are some community concerns regarding the Project, including but not limited to impacts on the safety and efficiency of the local road network, air quality, greenhouse gas emission and noise impacts. It is also acknowledged that numerous community members consider that alternative product transportation options, such as rail should be adopted for the Project. Notwithstanding these community concerns, the Department considers that Gunlake has responded to feedback from the Department, other government agencies and the community, while maintaining the economic viability of the Project.

The Department considers that a contemporary SSD consent for the quarry would provide an opportunity to address most of these concerns by clearly defining the Project's operating parameters and enabling holistic, contemporary environmental performance standards and management practices to be applied. The recommended comprehensive and precautionary suite of conditions would ensure that the Project complies with contemporary criteria and standards, and that residual impacts are effectively minimised, managed, offset and/or compensated for. The recommended conditions were provided to key NSW Government agencies and their comments taken into account in finalising the conditions.

The Department recognises that the proposed continuation of the quarry would contribute a range of affordable, high-quality construction materials to local and regional markets. It would contribute to the supply of materials for the construction of housing and major regional infrastructure projects. The Department recognises the proximity between the Project's hard rock resource and the existing approved operations, and the synergies this presents for utilising existing infrastructure and reducing capital costs. The Department accepts there is a strategic need for hard rock quarry materials in the Greater Sydney region and considers the site to be well-suited for the Project.

The Department also considers that the Project would result in substantial economic and social benefits to the region and to the State of NSW through the supply of materials critical to the construction industry. The Project is estimated to have incremental net production benefits to NSW of $74 million and is therefore justified from an economic efficiency perspective. Further, the Project would provide employment for 228 people, the majority of which would reside in the local area, therefore providing a social benefit.

The Department has carefully weighed the environmental impacts of the Project against the significance of the Project's identified hard rock resource and the wider socio-economic benefits associated with extending the operation of the quarry for a further 30 years under a contemporary development consent. On balance, the Department considers that the benefits of the Project outweigh its residual costs and that the Project is in the public interest and is approvable, subject to the strict conditions of consent.

Contents

1 Introduction

Gunlake Quarry is an existing hard rock quarry located within the Goulburn Mulwaree Local Government Area (LGA), approximately 7 kilometres (km) northwest of Marulan (see **Figure 1**). The quarry is operated by Gunlake Quarries Pty Ltd (Gunlake) and has been operating since 2010.

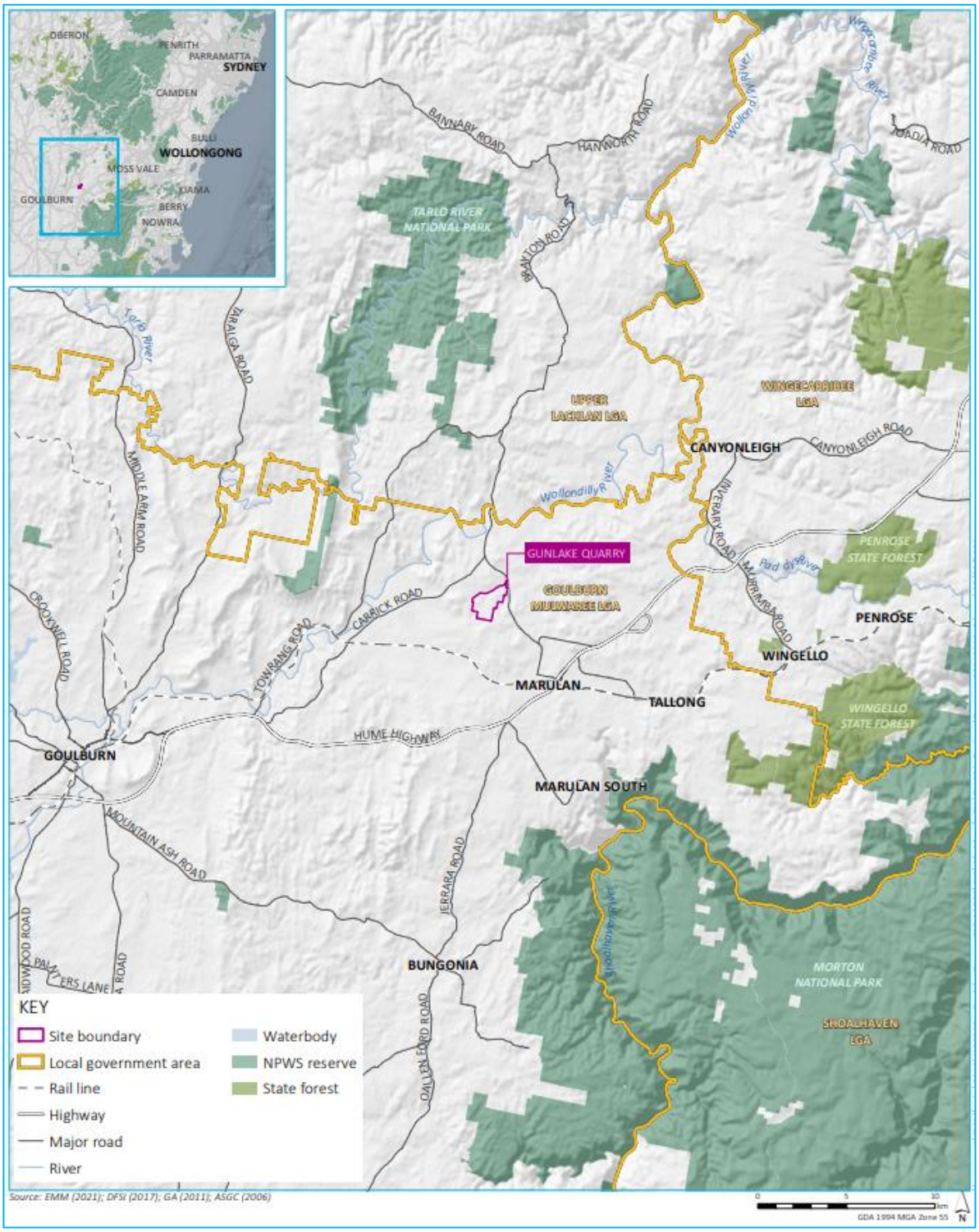


Figure 1 | Regional Context Map

2 Project

Gunlake proposes to continue its existing operations at the quarry site, however, is seeking approval to increase the maximum production rate and road transportation limits along the Primary Transport Route (see **Figure 2**).

Table 1 provides a summary of the key components of the existing approved operations under the Gunlake Quarry Extension Project (the Extension Project) compared to the proposed Gunlake Quarry Continuation Project (the Project). A detailed description of the Project is provided in Gunlake's Environmental Impact Statement (EIS), Submissions Report and responses to additional information (see **Appendices A, B** and **C**, respectively). The site layout for the Project is shown in **Figure 3.**

Table 1 | Key Components of the Project

Aspect	Approved Extension Project	Proposed Continuation Project
Project Life	30 June 2042	30 years from date of approval
Production Rates	2.6 Mtpa	4.2 Mtpa
Extraction Pit Depth	372 m Australian Height Datum (AHD)	346 m AHD (i.e. 26 m deeper)
Disturbance Footprint	99 ha	No change
Product Transport	**Primary Transport Route**: • maximum of 295 laden trucks per working day • average of 220 laden trucks per working day	**Primary Transport Route**: • maximum of 375 laden trucks per working day
	Secondary Transport Route: • maximum of 38 laden trucks per working day • average of 25 laden trucks per working day	**Secondary Transport Route**: No change
Water Management	Diversion drains, process water dam (35 ML), pit dewatering dam (30 ML), cleanwater dam (15 ML) and 3 sedimentation dams.	No change to the surface water management system. Upgrade of the onsite septic system to accommodate increased workforce.
Waste Management	Receipt of 30,000 tpa of cured concrete for recycling / beneficial reuse, with 2,500 tonnes stored at the site at any one time	Receipt of 50,000 tpa of cured concrete for recycling / beneficial reuse, with 2,500 tonnes stored at the site at any one time
Blasting	Two times per week	No change
Construction	New infrastructure approved under the Extension Project	• Installation of an additional weighbridge • Repair and sealing of quarry site access road
Hours of operation	**Quarrying, loading/dispatching, transport on Primary Transport Route:**	No change

Aspect	Approved Extension Project	Proposed Continuation Project
	• 24 hours a day but not between 6 pm Saturday and 2 am Monday • At no time on Sunday or public holidays **Overburden removal, emplacement and drilling:** • 7 am to 6 pm Monday to Saturday • At no time on Sunday or public holidays **Transport on Secondary Transport Route:** • 6 am to 7 pm Monday to Saturday • At no time on Sunday or public holidays	
Workforce	32 employees and 58 truck drivers	70 employees, 20 contractors and 138 truck drivers
Capital investment value	$3,773,000	$600,000

2.1 Approval History

The quarry was originally approved on 24 September 2008 under the then Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act) (the Part 3A Project) by the then Minister for Planning (MP 07_0074). This project approval was surrendered in 2018 after a new State Significant Development (SSD) consent (SSD 7090) for the Extension Project was approved by the NSW Land and Environment Court (NSW LEC) in June 2017. As detailed in **Table 2**, Gunlake has since made two applications to the NSW LEC to modify the consent for the Extension Project.

Table 2 | Summary of Modifications

MOD No.	Description	Status
MOD 1	Amend the biodiversity offset obligations	Refused by the LEC in October 2022
MOD 2	Increase product transport rates from 2 Mt to 2.6 Mt in any calendar year, including associated increase in truck movements to a maximum of 295 (average of 220) on the Primary Transport Route and a maximum of 38 (average of 25) on the Secondary Transport Route.	Approved by the NSW LEC (2020/00327172) on 9 June 2021

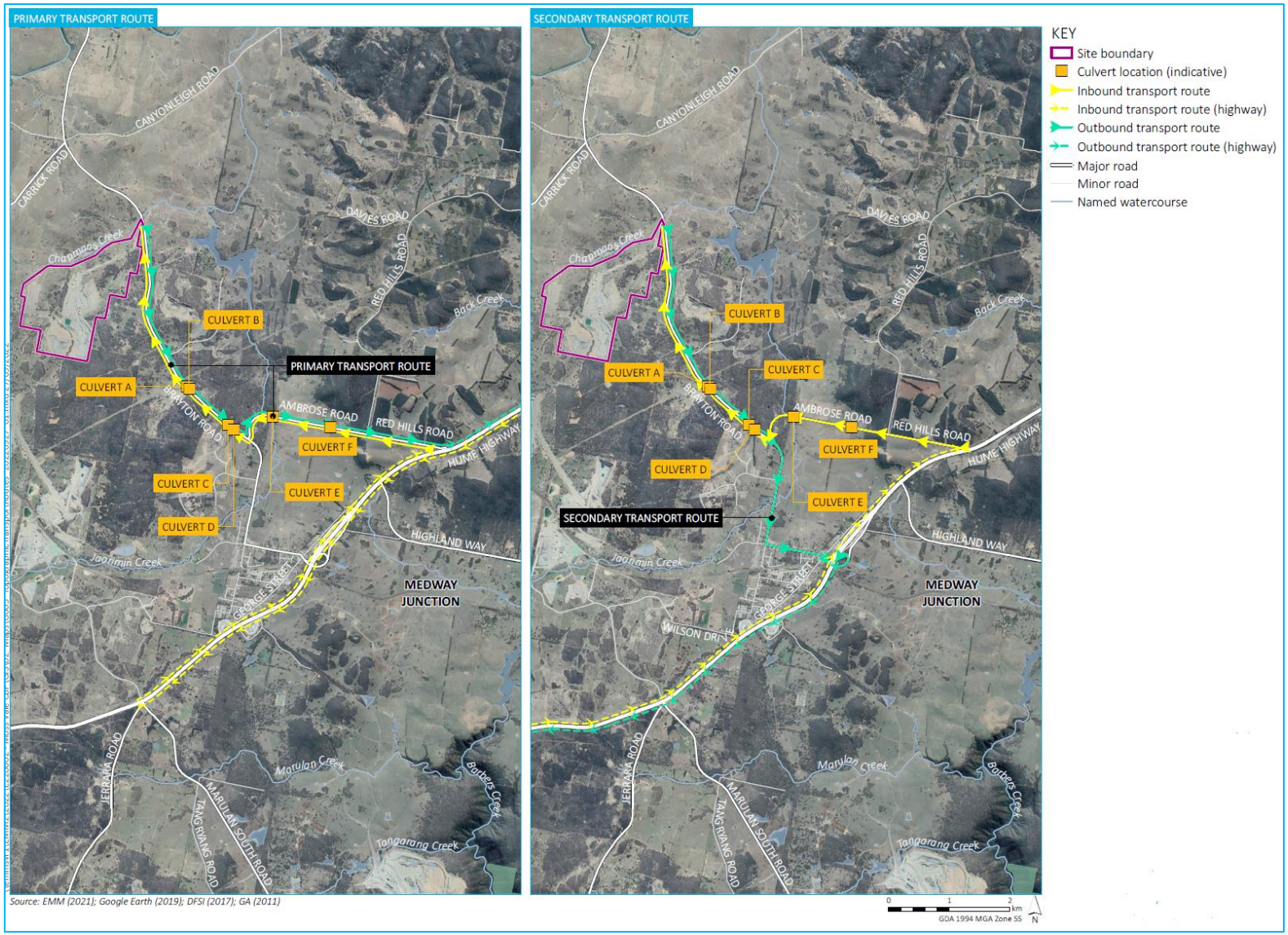


Figure 2 | Primary (left) and Secondary (right) Transport Routes

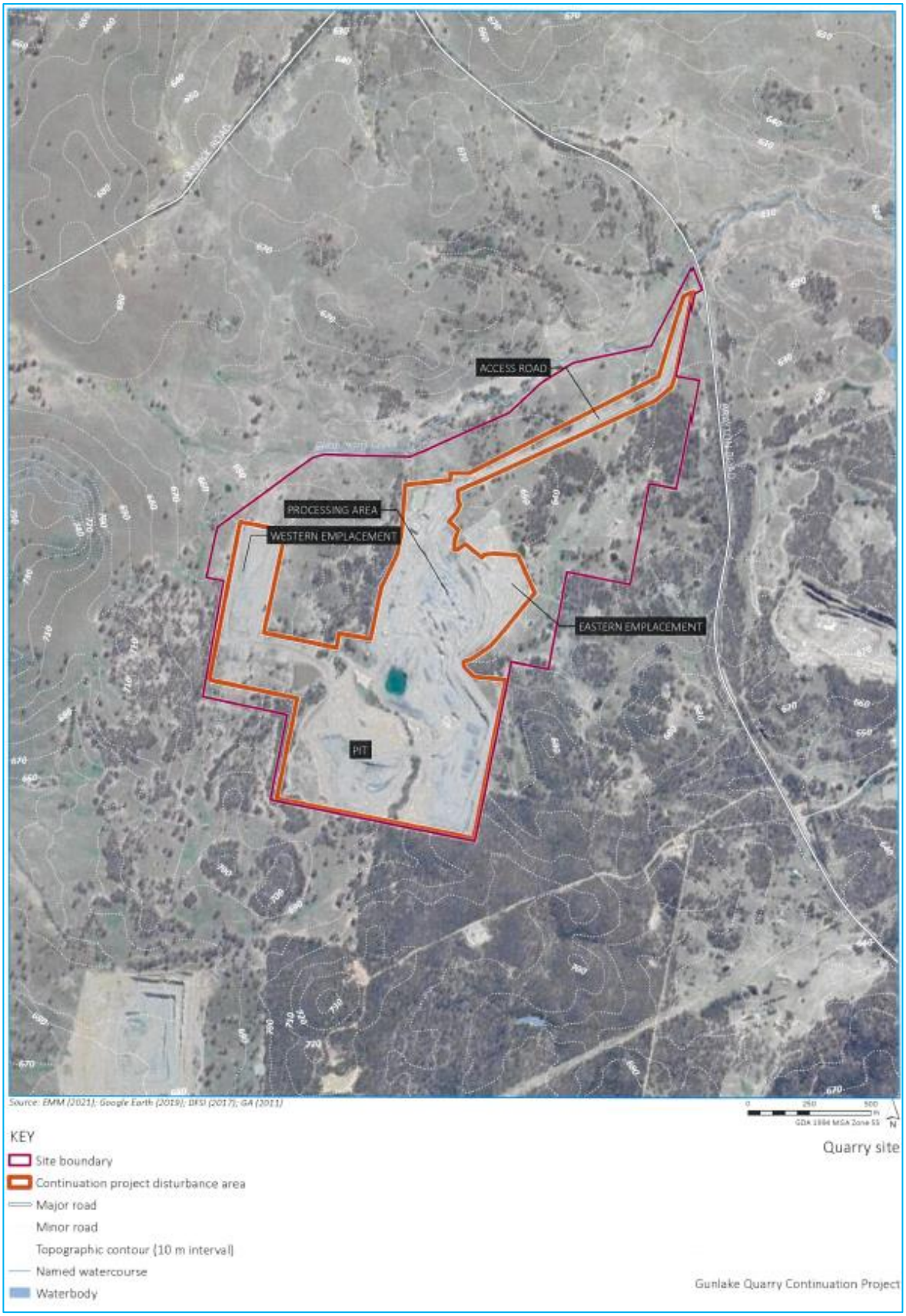


Figure 3 | Development Site layout

3 Strategic Context

3.1 Product Demand

The quarry has been operating since 2010 and has a well-established market base. The quarry's key products include hard rock aggregates, road base, manufactured sands and crusher dust. Gunlake primarily supplies its products to their concrete batching plants in Sydney, as well as the general industrial and construction sectors across NSW.

Overall demand for quarry products is driven by population growth and the resulting need for additional construction materials for housing, landscaping and infrastructure projects. The construction sector is a key contributor to economic growth in NSW, employing approximately 370,000 workers and contributing 45% of the NSW taxation revenue base. Competitive and reliable supplies of quarry products are critical to the NSW construction industry. Demand for these products further is driven by government spending on public infrastructure and private investment in commercial, industrial and residential development.

There are several key government strategies and plans which support the growing need for construction materials in the local, regional and Greater Sydney markets, including:

- *Local Strategic Planning Statement* (Goulburn Mulwaree Council, 2020): provides a 20-year land use vision for the LGA and recognises extractive industries and renewable energy as growing sectors in which assist with financing road upgrades and community facilities.
- *South East and Tablelands Regional Plan 2036* (Department of Planning and Environment, 2017): has identified extractive resources in the Marulan area as important for the construction materials market in Sydney. Extractive resources from Marulan are supplied to Western Sydney, Australia's third largest economy, where the population is projected to increase by 32% over the next 15 years. The resulting increases in demand for residential dwellings and associated infrastructure would require continuing provision of substantial quantities of construction materials.
- *Western Sydney Aerotropolis Plan* (NSW State Government 2020): sets a vision for the Western Sydney Aerotropolis (the Aerotropolis) as Australia's next global gateway, built around the Western Sydney International (Nancy-Bird Walton) Airport currently being constructed and will open in 2026. The Aerotropolis will become home to global industries that will provide jobs of the future. The largely rural landscape in Western Sydney is rapidly transitioning to include large new urban and industrial areas with major construction works underway.
- *Greater Sydney Regional Plan – A Metropolis of Three Cities* (Greater Sydney Commission, 2018): provides a vision to 2056 to meet the needs of a growing and changing population in NSW and seeks to transform Greater Sydney in a metropolis of three cities (Western Parkland City, Central River City and Eastern Harbour City).
- *Future Transport Strategy 2056* (Transport for NSW, 2018): sets out the direction for continuing to improve every part of the State's transport system.
- *A 20-Year Economic Vision for Regional NSW* (NSW Government, 2021): sets out the State's vision to create the economic terms needed for services, manufacturing, resources and agriculture sectors to recover quickly and return to growth.

To meet these identified needs, the NSW Government has committed over $108 billion in infrastructure spending over the four years to 2025. This infrastructure pipeline includes multi-billion dollar road and rail projects in the Sydney metropolitan area, and new and upgraded education and health infrastructure throughout the State. The construction of these projects would require substantial quantities of high-quality hard rock quarry products.

3.2 Regional Extractive Industry Market

Access to suitable extractive resources is limited by geology, local lithology and competing land uses. To be economically viable, extractive material suppliers also need to be relatively close to markets, with good transport links to enable conveyance of high volumes of product.

Gunlake quarry's location near the Hume Highway allows economic delivery of quarry products to the highway, and direct transport to markets, including to growth areas in the Greater Sydney region and to regional areas to the southwest.

Until 2016, the Penrith Lakes Scheme dominated supply of quarry products such as construction sand and gravel across the Sydney Region. Since the closure of this river floodplain quarry scheme, the Gunlake Quarry and the nearby Peppertree, Lynwood and Ardmore Park Quarries have become important sources of quarry products, given their reasonable proximity and convenient transport links to the Greater Sydney Region. Collectively, these quarries currently produce the largest volume of hard rock aggregates in NSW.

A breakdown of production rates and total available resources from these quarries is presented in **Table 3**.

Table 3 | Approved Southern Highlands Hard Rock Quarries and Production Rates

Quarry	Production Rate (tpa)	Resource (Mt)
Gunlake Quarry	2,600,000	80
Peppertree Quarry	3,500,000	105
Lynwood Quarry	5,000,000	115
Ardmore Park Quarry	580,000	9

4 Statutory Context

4.1 State Significance

The Project is an extractive industry development with a resource of more than 5 million tonnes. Accordingly, the Project is SSD under Schedule 1 of *State Environmental Planning Policy (Planning Systems) 2021* (Planning Systems SEPP).

4.2 Permissibility

The Project site is zoned RU1 – Primary Production and RU2 – Rural Landscape under the *Goulburn Mulwaree Local Environment Plan 2009*. Extractive industries are permissible with development consent in both these zones.

The Project is also permissible with consent under section 2.9(3)(a) of the *State Environmental Planning Policy (Resources & Energy) 2021* (Resources & Energy SEPP).

4.3 Consent Authority

Under section 4.5(a) of *the Environmental Planning and Assessment Act 1979* (EP&A Act), the Minister for Planning (the Minister) is the consent authority for the Project. However, under the Minister's delegation of 9 March 2022, the Executive Director – Energy, Resources and Industry, may determine the development application as Gunlake has not made any reportable political donation, Goulburn Mulwaree Council (Council) did not object to the development application, and there were less than 50 unique objections from the general public.

4.4 Mandatory Matters for Consideration

The Department has undertaken a detailed assessment of the Project, taking into consideration each of the relevant matters listed in Section 4.15 of the EP&A Act, including:

- issues raised in submissions on the Project (see **Section 5**);
- the likely environmental, social and economic impacts of the Project (see **Section 6**);
- the suitability of the site for the Project (see **Sections 3** and **6**);
- the objects of the EP&A Act (see **Appendix E**);
- applicable Environmental Planning Instruments (EPIs) (see **Appendix E**); and
- the public interest (see **Section 7**).

4.5 Surrender of Development Consent

Section 4.63 of the EP&A Act provides that if a development consent is surrendered as a condition of a new development consent and the new consent includes continuation of development that was previously authorised, then the consent authority:

- is not required to re-assess the likely impact of the continued development to the extent that it could have been carried out but for the surrender of the consent;
- is not required to re-determine whether to authorise that continued development under the new development consent (or the manner in which it is to be carried out); and
- may modify the manner in which that continued development is to be carried out for the purpose of the consolidation of the development consents applying to the land concerned.

If the Project is approved, Gunlake has committed to surrender the existing development consent for the Extension Project. While the consent authority is not required to re-assess the impacts of the ongoing activities of an approved project, the Department's assessment has considered worst-case impact scenarios to ensure that the full range of impacts are considered.

4.6 Other Approvals

Under section 4.41 of the EP&A Act, several approvals are integrated into the SSD approval process and consequently are not required to be separately obtained for the proposal. These include:

- approvals relating to heritage required under the *National Parks and Wildlife Act 1974* and the *Heritage Act 1977*
- certain water approvals under the *Water Management Act 2000*.

Under section 4.42 of the EP&A Act, several other approvals (if required) cannot be refused and must be granted in terms substantially consistent with any consent granted for the project. These include:

- consents under the *Roads Act 1993*; and
- an EPL under the *Protection of the Environment Operations Act 1997* (POEO Act).

Gunlake can obtain these other approvals where required. The Department has consulted with the relevant government authorities responsible for these other approvals (see **Section 5**) and considered the relevant issues relating to these approvals in its assessment of the development (see **Section 6**). No relevant authorities object to the Project.

4.7 Biodiversity Development Assessment Report

Section 7.9(2) of the *Biodiversity Conservation Act 2016* (BC Act) requires all applications for SSD to be accompanied by a Biodiversity Development Assessment Report (BDAR) unless it has been determined that the proposed development is not likely to have any significant impact on biodiversity values. The EIS contained a BDAR (Appendix F.7).

4.8 Commonwealth Matters

On 15 October 2015, the Extension Project was declared to be 'controlled action' under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) due to its potential impacts on the Matters of National Environmental Significance (MNES), specifically for MNES or controlling provisions relating to listed threatened species and communities under sections 18 and 18A of the EPBC Act. The Extension Project was assessed under the Bilateral Agreement between the Commonwealth and NSW Governments, which allowed a single integrated assessment of the Extension Project to be undertaken by the Department in its Assessment Report. However, given the Commonwealth-decision maker maintains a separate approval role, the Extension Project was granted a separate Commonwealth approval (EPBC 2015/7557) with conditions on 17 November 2017 after the NSW LEC approval was granted. The EPBC Act approval has effect until 31 December 2042.

Gunlake has advised the Department that the Commonwealth has confirmed the referral of the Project is not required and that the existing Commonwealth approval would continue to apply to the quarry. On this basis, the Department does not need to assess any potential impacts of the Project on MNES. Notwithstanding this, an assessment of impacts under the EPBC Act was undertaken in the BDAR.

4.9 Sydney Drinking Water Catchment

Section 8.1(b) of the *State Environmental Planning Policy (Biodiversity and Conservation) 2021* (Biodiversity and Conservation SEPP) provides that a consent authority must not grant consent to a

proposed development unless it is satisfied that the proposed development will have a neutral or beneficial effect (NorBE) on water quality. The Biodiversity and Conservation SEPP requires all proposed developments in the Sydney Drinking Water Catchment to demonstrate NorBE on water quality.

5 Engagement

5.1 Department's Engagement

The Department publicly exhibited the Project from 8 October until 4 November 2021. The Department advertised the exhibition of the Project in the *Goulburn Post*. The Department also notified adjoining landowners and sought advice from relevant Government agencies, including Goulburn Mulwaree Council (Council).

The Department considers that its engagement process meets the community participation requirements of the EP&A Act and associated EP&A Regulation.

5.2 Summary of Agency Advice and Submissions

The Department received advice from 11 government agencies and a submission from Council. Issues raised are discussed in **Section 5.3**.

A total of 57 public submissions (47 individual and 10 organisations) were received in response to the exhibition of the Project. Of these:

- 21 (37%) submissions supported the Project;
- 33 (58%) submissions objected, of which 32 were unique objections; and
- 3 (5%) submissions provided comments.

Copies of all submissions are included in **Appendix D**. A summary of the issues raised in public submissions is provided in **Section 5.4**.

5.3 Agency Advice

No government agencies, nor Council objected to the Project. However, several raised issues or expressed concern with specific aspects of the Project while others provided comments or recommendations relating to their administrative and regulatory responsibilities. A copy of all advice received from agencies is included in **Appendix D**. The advice and recommendations are summarised below in **Table 3** and considered in more detail in **Section 6**.

Table 3 | Agency Advice on the Project

Agency / Council	Advice / Submission

Transport for New South Wales (TfNSW)	• Requested:
	  ○ measures be implemented to ensure that productive Performance Based Standards vehicles are used to minimise total trips;
	  ○ distribution information of traffic generated to / from the north and south;
	  ○ monitoring and reporting to ensure the development would operate within maximum permitted hourly and daily traffic volume limits;
	  ○ assessment of impacts on the Red Hills Road and Hume Highway intersection;
	  ○ explanation why there is no proposal to increase truck movements along the Secondary Transport Route;
	  ○ further assessment of a rail-based option and a 'Transport Options Review' for product transportation;
	  ○ measures to ensure how the Drivers' Code of Conduct would be managed / enforced.
	• Following its consideration of the final Submissions Report and supplementary information provided by Gunlake, TfNSW indicated that any residual matters could be dealt with via recommended conditions of consent.

Biodiversity Conservation Division (BCD)	• Commented on several deficiencies with the information provided in the BDAR. • Noted that an area of the site (ie. Area 1 on **Figure 3**) was approved for water irrigation, with the understorey to be retained, however this area appears to have been cleared. • Advised that there was inadequate evidence from groundwater modelling to support the conclusion that risk of groundwater drawdown impacts to Groundwater Dependent Ecosystems (GDEs) would be low. • Recommended an adaptive management plan for uncertain impacts to GDEs, and the use of biodiversity credits to offset if monitoring demonstrates impacts to vegetation. • Following its consideration of the final Submissions Report and supplementary information provided by Gunlake, BCD indicated that any residual matters could be dealt with via recommended conditions of consent.

DPE Water	• Advised that a viable path for acquiring the necessary groundwater take entitlements (ie. 31 units) via the 2021 Controlled Allocation Order exists.
	• Requested:
	  ○ further information to confirm the ability to source the predicted water supply shortfall during dry periods;
	  ○ updated Soil and Water Management Plan for the Project;
	  ○ reporting on the water take (direct and indirect) at the site each year;
	  ○ sufficient water entitlement is held in water access licences (WALs) to account for the maximum predicted take from each source, prior to the take occurring;
	  ○ conditions of approval requiring an independently reviewed numerical groundwater model; and
	  ○ a water census of private registered bores within 2 km of the quarry be completed post-approval and 'make good' provisions be implemented, if necessary.
	• Following its consideration of the final Submissions Report and supplementary information provided by Gunlake, DPE Water/NRAR indicated that any residual matters could be dealt with via recommended conditions of consent.

Council	• In regard to the Primary Transport Route, requested:
	  ○ widening of bridges and culverts to allow for implementation of a consistent road width and centre line treatment;
	  ○ installation of a school bus stop near Johnniefelds Quarry;
	  ○ an independent traffic consultant to investigate any appropriate lighting and/or delineation upgrade at all intersections;
	  ○ Brayton Road/ Ambrose Road intersection to be assessed for consistency with Austroads Guidelines;
	  ○ review of sight distances at the intersection of Red Hills Road and Ambrose Road;
	  ○ reduction of the speed limit on the route to 80 km/hour for all vehicles;
	  ○ establishment of minimum 3-metre trafficable clear zones;
	  ○ a pavement assessment report to determine if the existing pavement would achieve a 10-year pavement life; and
	  ○ inclusion of a consent condition that restricts the use of engine brakes on the route.

Agency / Council	Advice / Submission

	• Recommended:
	  ○ actions identified in the EIS's Road Safety Assessment Report be implemented;
	  ○ completion of all route upgrade works prior to transportation of greater than 220,000 tonnes per month;
	  ○ detailed road work plans be submitted under section 138 of the *Roads Act 1993;* and
	  ○ section 7.11 contributions be calculated in accordance with the *Goulburn Mulwaree Local Infrastructure Contributions Plan 2021* or alternatively, a Gunlake enter into a Planning Agreement with Council under section 7.4 of the EP&A Act.
	• Following its consideration of the final Submissions Report and supplementary information provided by Gunlake, Council indicated that any residual matters could be dealt with via recommended conditions of consent.

Environment Protection Authority (EPA)	• Supported the proposal to retain the existing voluntary acquisition rights for dwelling R2 which is exposed to quarry noise.
	• Noted some inconsistencies with the current approved and proposed receipt of cured concrete waste and the quarry's EPL and provisions in the *Protection of the Environment and Operations Act 1997*.
	• Requested further information regarding:
	  ○ capacity and suitability of the premises to receive and manage 50,000 tpa of cured concrete waste per year;
	  ○ details of the proposed storage location(s); and
	  ○ proposed tonnage verification and record keeping.
	• Following its consideration of the final Submissions Report and supplementary information provided by Gunlake, EPA indicated that any residual matters could be dealt with via recommended conditions of consent.

Crown Lands	• Advised that:
	  ○ a parcel of Crown Land which was formally roads is currently being used by Gunlake, and would continue to be used as part of the Project;
	  ○ an application needs to be made to purchase this Crown Land;
	  ○ a tenure is required to authorise the use of and/or access the land, and Native Title may be a consideration in the granting of a tenure or future sale of the land.
	• Requested information on:
	  ○ ongoing management and maintenance for Crown Land involved in the Project area; and
	  ○ long-term management and maintenance strategies for when the Crown Land is no longer required for the Project.
	• Following its consideration of the final Submissions Report and supplementary information provided by Gunlake, Crown Lands indicated that any residual matters could be dealt with via recommended conditions of consent.

WaterNSW	• Requested to be consulted in the review and update of the Soil and Water Management Plan and Rehabilitation and Biodiversity Offset Management Plan. • Advised that the existing onsite wastewater management system would not have adequate capacity for the wastewater load to be generated by the increased workforce proposed. Requested to be consulted in any review and upgrade of the existing wastewater management system. • Recommended monitoring of the water in the site storages and an assessment of maximum flow rates of any offsite controlled discharges. • Following its consideration of the final Submissions Report and supplementary information provided by Gunlake, WaterNSW indicated that any residual matters could be dealt with via recommended conditions of consent.
Heritage NSW	• Indicated that, as the Project would not include additional ground disturbance activities, it does not require any additional Aboriginal cultural heritage assessment. • Requested that the existing Heritage Management Plan be updated to include the small area (Area 1) proposed to be re-included within the Project boundary.
Department of Primary Industries (DPI)	• DPI – Fisheries advised it had no comments on the proposal. • DPI – Agriculture advised that the Project would not have any significant impacts on agricultural land.

Agency / Council	Advice / Submission
Mining, Exploration and Geoscience	• Stated that it has no resource sterilisation concerns. • Recommended a condition requiring provision of annual production data.
NSW Resources Regulator	• Noted that Gunlake would need to comply with the *Work Health and Safety (Mines and Petroleum Sites) Act 2013* and Regulation as well as other WHS regulatory obligations.

5.4 Community Submissions

Approximately 57% of community members who made a submission live locally (within 5 km from the quarry), approximately 23% live regionally (within 50 km from the quarry), and approximately 20% live at distances greater than 50 km from the quarry.

The key issues raised in the objecting community and special interest group submissions are summarised in **Figure 4**. These issues have been given detailed consideration in the assessment of the Project's impacts, as set out in **Section 6**.

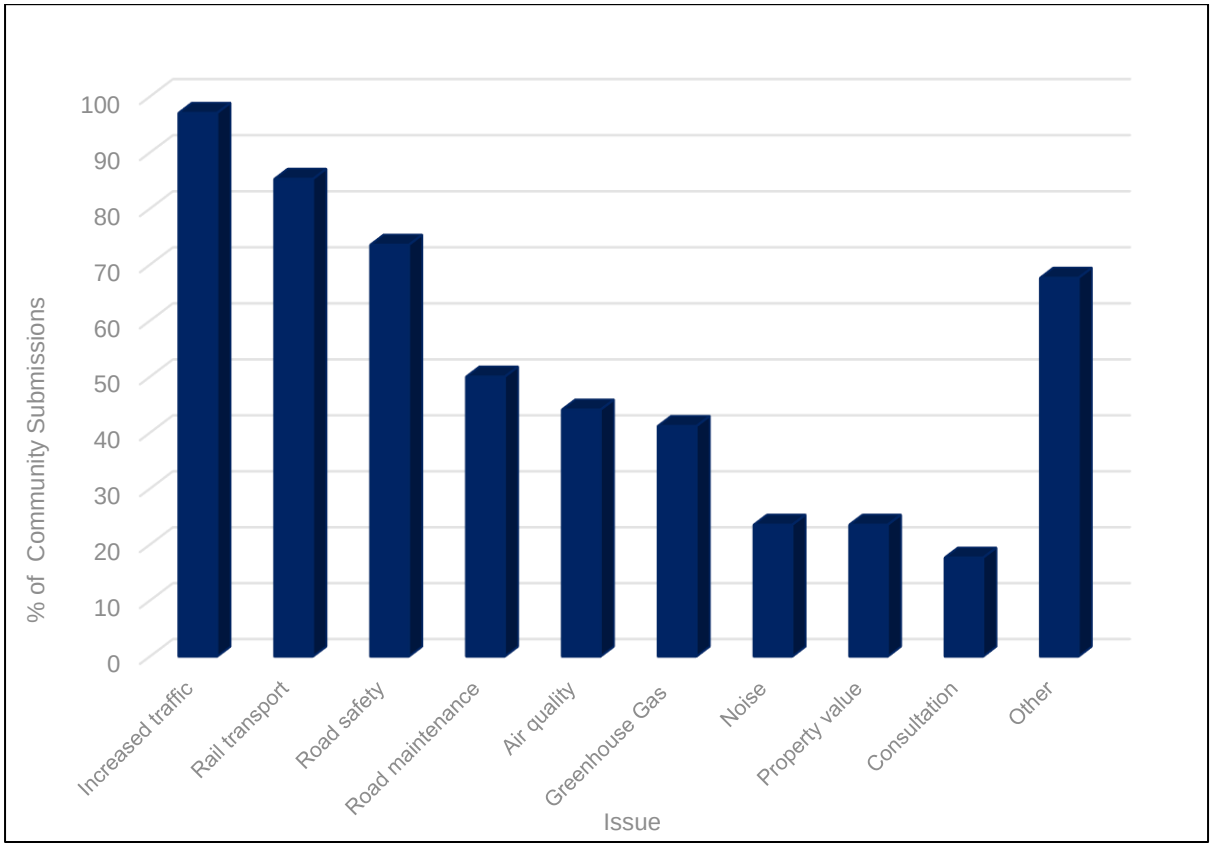


Figure 4 | Key Issues Raised in Community and Special Interest Group Submissions

5.5 Response to Submissions, Government Agency Advice and Additional Information

On 5 November 2021, the Department requested Gunlake to prepare a Submissions Report that responded to the issues raised in the agency advice and public submissions following exhibition of the Project. Gunlake provided its Submissions Report on 14 March 2022 (see **Appendix B)**.

Additional advice on the Submissions Report was sought from agencies and provided to Gunlake in conjunction with several requests for additional information issued by the Department. Responses to these requests from Gunlake have been carefully considered in the Department's assessment and evaluation of the Project. Where necessary, they have also been provided to relevant agencies for comment. Copies of these requests and corresponding responses are available in **Appendix D**.

6 Assessment

In assessing the merits of the Project, the Department has considered:

- the EIS (see **Appendix A**);
- submissions and agency advice received during public exhibition of the EIS (**Appendix C**) and representations from the community received outside the exhibition period;
- the Submissions Report (see **Appendix B**);
- additional comments from government agencies on the Submissions Report, independent review report on traffic and transport by Bitzios Consulting (Bitzios), and Gunlake's responses to additional requests for information (**Appendix D**);
- relevant EPIs, policies and guidelines; and
- the requirements of the EP&A Act, including the relevant objects of the Act.

The Department considers the key assessment issues for the Project are traffic and transport, water resources (groundwater, surface water) and biodiversity. Assessments of other issues comprising noise, air quality, social, economic, waste and greenhouse gas impacts are provided in **Table 7**.

6.1 Traffic and Transport

6.1.1 Alternative Transport Options

Community submissions on the Project expressed a strong preference for quarries in the Marulan area to use rail to transport quarry products and indicated that Gunlake should be required to commission an independent transport options review to investigate this option. Similarly, TfNSW commented that a transport options review should be conducted to consider why some materials cannot be transported by means other than by public road.

Bitzios, commissioned by the Department to undertake an independent review of the traffic and transport aspects of the Project, agreed, noting the existing requirement in the NSW LEC approval (condition 29, Schedule 3) required a Transport Options Review within 10 years of approval (i.e. 2027). Given the Project would increase product transport, Bitzios considered it reasonable that a more comprehensive review of rail-based options, which also considers social and environmental costs and benefits, be undertaken for the Project.

Gunlake subsequently engaged Gillespie Economics (Gillespie) to prepare an Economic Assessment of Rail Transport (see Additional Information Response dated 29 August 2022, **Appendix C**). The assessment drew on several studies, including the Economic Assessment (Gillespie, 2021) for the Project (Appendix F.11 of the EIS) and a previous Rail Transport Study (Hatch, 2016) conducted as part of the Extension Project application (SSD 7090).

The Hatch (2016) study analysed numerous transport options, including 17 rail options and a base case road option for the Extension Project. The lowest cost rail option (Option 13) involved construction of a private haul road to the Main Southern Railway, a new loading conveyor and rail spur on the existing rail line, rail transport to an unloading facility at Smeaton Grange and the distribution of product by truck to Gunlake's Sydney-based customers. Hatch estimated that the capital, operating and maintenance costs for this rail option would be $121M more than the proposed road transport option (i.e. $262 million for road-based option and $383M for rail based option).

Gillespie noted that the cost benefit analysis undertaken as part of the Economics Assessment for the Project using road transport estimated an incremental net benefit to NSW of $74M (present value at 7% discount). Gillespie estimated that if the incremental cost of the least cost rail option from Hatch (i.e. Option 13, $121M) is combined with the estimated net benefit of the current proposal, then the Project would shift from having a net social benefit to the NSW community of $74M to a net cost of $47M (present value at 7% discount).

On this basis, Gillespie concluded a rail option would result in the Project having a net cost to the NSW community and would also become financially unviable for Gunlake, as most of the additional capital and operating costs would be borne by the company.

Gillespie noted that the rail cost estimates are based on 2016 dollars and are likely to be higher in 2022 dollars (due to inflation and increases in construction and land value costs), resulting in a greater net cost in present dollar values. The difference in production rates between the approved Extension Project and the Project is also acknowledged (i.e. 2 Mtpa (as originally approved) versus the proposed 4.2 Mtpa), however Gillespie considered that this would not alter the finding due to the magnitude of the capital costs associated with a rail option. Finally, Gillespie indicated that environmental and social externality costs (for air pollution, greenhouse gas, water, nature and landscape, urban separation and crash costs) associated with the Project are small relative to other costs of the Project, and that there was very little difference between the road and rail options.

Gunlake noted other issues which would make rail-based options problematic, including the:

- comparatively small product shipment volumes, and the range of quarry products and variability in day-to-day customer demand;
- need to truck products from a Sydney-based rail facility to numerous customers throughout Sydney (i.e. no single-point destination);
- need to acquire private land for the development of rail infrastructure which is not for sale, and Gunlake having no land acquisition rights;
- challenges in gaining planning approval for a new rail-based option; and
- additional environmental and amenity issues associated with construction of a new railway line and associated facilities, which would potentially pass thousands of houses compared to eight houses along the Primary Transport Route.

The Department accepts that these challenges exist for rail based options and considers that Gunlake has demonstrated that there is currently no economically viable way to transport its quarry products by rail as part of the Project. The Department accepts that the nature of Gunlake's business, which involves transporting its products a relatively short distance to dispersed locations mostly in the Sydney metropolitan region, means that the Project would likely be unviable if Gunlake was required to use rail to transport its products.

However, in accordance with the existing LEC approval, the Department has recommended a condition requiring Gunlake to re-evaluate the economic, social and environmental costs and benefits of all reasonable and feasible options for the transport of quarry products from the site in 5 years, and every 10 years thereafter, in consultation with relevant agencies.

6.1.2 Traffic and Road Safety Assessments

The EIS included a Traffic Impact Assessment (TIA) prepared by EMM Consulting (EMM) and developed in accordance with the *Guide to Traffic Generating Developments* (NSW Roads and Traffic Authority, 2002). The TIA considered:

- the existing local and regional road networks and traffic volumes;
- potential impacts on the efficiency of the road network due to Project-related, predicted future background and cumulative traffic volumes;
- further road and intersection upgrade and maintenance requirements; and
- recommended road transport mitigation, management and monitoring measures.

The EIS also included a Road Safety Assessment (RSA) and Road Safety Audit Report prepared by the Australian Road Research Board (ARRB) to identify existing road safety risks and corrective actions.

Potential traffic impacts associated with the Project were key issues raised in public submissions, including concerns relating to increased congestion and road safety impacts. TfNSW and Council also provided extensive comments on traffic and transport related issues, with both agencies requesting additional information on the proposed road/pavement upgrades and associated responsibilities; sight distances; lighting requirements; and speed limits. TfNSW also recommended that Gunlake conduct a Transport Options Review to assess a rail-based option for the transport of product to Sydney. This additional information was provided in the Submissions Report (see **Appendix C**).

The Department considers that traffic and transportation issues are critical assessment issues for the Project. Bitzios in its review of the TIA, RSA and the additional traffic information in the Submissions Report (see **Appendix B**) provided independent advice. Bitzios concluded that the TIA methodology and scope were "*generally acceptable*" and that the overall findings were "*logical, and consistent with first principles analysis*". Bitzios considered that the RSA was "*fit for purpose, and thoroughly describes the existing issues, and accurately assesses the likely impacts*" of the Project. However, Bitzios recommended improvements be made to the Transport Options Review, as well as additional assessment of specific intersection capacity and sight distances.

This information was provided by Gunlake in the Additional Information Responses dated 17 and 29 August 2022 (see **Appendix C**). These responses as well as ongoing discussions with Council and TfNSW have been considered in detail by the Department below.

6.1.3 Existing Transport Routes

Gunlake currently has consent to transport its quarry products by road along two transport routes (**Figure 2**), namely a:

- Primary Transport Route for trucks heading north along the Hume Highway to Sydney (Brayton Road, Ambrose Road, Red Hills Road); and
- Secondary Transport Route for trucks heading south along the Hume Highway (along Brayton Road, through the northern edge of Marulan to the Marulan Interchange on the Hume Highway).

Trucks returning to the quarry from the north are required to drive past Marulan and proceed to the South Marulan Interchange, where they cross over the highway and enter the north-bound lanes of the Hume Highway before making a left-hand turn into Red Hills Road. Trucks returning on the Hume Highway from the south proceed past Marulan and also make a left-hand turn onto Red Hills Road.

Since the Project was approved by the NSW LEC in 2017, Gunlake has been required to substantially upgrade the Primary Transport Route so that it meets the Austroads (2020) standards for rural roads with 1,000 to 3,000 average vehicle movements per day[1]. Upgrades have included the widening of the road pavements; provision of 3 m wide clear zones; upgrade of the Quarry Access Road/Brayton Road and Red Hills Road/Hume Highway intersections; the installation of guideposts, landmarking and signage; and the construction of roadside bus bays.

Currently about 90% of Gunlake's quarry products are transported to Sydney on the Primary Transport Route and about 10% are transported on the Secondary Transport Route (see **Figure 2**) to locations to the south of the quarry or within the Southern Highlands. Between 52% and 77% of the existing traffic on the Primary Transport Route (before the Hume Highway) consists of quarry trucks associated with Gunlake Quarry.

The Primary Transport Route is currently approved for all vehicles up to 26 m in length (including rigid vehicles, truck and dogs, B-doubles and A-doubles), and is generally subject to a speed limit of 100 km/hour. However, in response to community concern about road safety, Gunlake has instructed its drivers to travel at less than 80 km/hour on this route. Gunlake has approval to transport its products on the Primary Transport Route 24 hours per day between 2 am Mondays to 6 pm on Saturdays, but with no transportation allowed on Sundays or Public Holidays.

The roads along both the primary and secondary transport routes are all local collector roads under the care and control of Council. As discussed below, Gunlake is required to pay Council financial contributions towards the maintenance of the roads along the transport routes[2].

6.1.4 Predicted Project Traffic

Gunlake is seeking approval for increased heavy vehicle movements along the Primary Transport Route in response to increased customer demand for quarry product in the northern markets. The number of truck movements is proposed to increase from a maximum of 295 inbound and 295 outbound truck movements to 375 inbound and 375 outbound truck movements per day, which is a net increase of 80 truck movements in each direction per day.

[1] In accordance with condition 26, Schedule 3 of the LEC Approval 2017/108663
[2] In accordance with conditions 21 and 22, Schedule 2 of the LEC 2020/00327172

Gunlake confirmed that, as the additional demand for the quarry product comes from northern markets, the increases in heavy vehicle volumes would be restricted to the Primary Transport Route. There is no proposal to increase heavy vehicle volumes on the Secondary Transport Route.

Table 4 provides EMM's estimates of the current and predicted future (i.e. 2051) cumulative traffic volumes based on the proposed quarry traffic plus the approved/proposed traffic from the five other local quarries and the recently approved residential subdivision off Corriedale Drive.

Table 4 | Current and Proposed Traffic Volumes per Day (Bidirectional)

	2020 Traffic Volume			2051 Volume			
Primary Route	**Light Vehicles**	**Heavy Vehicles**	**Total**	**Light Vehicles**	**Heavy Vehicles**	**Gunlake Proposed**	**Total**
Brayton Rd	461	325[1]	**786**	628	99	750	**1,477**
Ambrose Rd and Red Hills Rd	160	233[2]	**393**	218	26	750	**994**

[1] Includes 252 (77%) Gunlake heavy vehicles
[2] Includes 214 (92%) Gunlake heavy vehicles

Table 4 shows that by 2051 there would be an overall increase in traffic on:

- Brayton Road of 47%, with 51% of total vehicles attributed to Gunlake quarry operations; and
- Ambrose Road and Red Hills of 60%, with 75% of total vehicles attributed to Gunlake quarry operations.

6.1.5 Traffic Impacts

(i) Road Network and Intersection Capacity

Numerous community submissions on the Project raised concerns regarding increased congestion and travel times on the road network as a result of the Project.

EMM used the SIDRA intersection model to predict the potential impact of the Project on intersection performance and potential delays along the Primary Transport Route, which contains four key intersections: Quarry Access Road / Brayton Road; Brayton Road / Ambrose Road; Ambrose Road / Red Hills Road and Red Hill Road / Hume Highway.

The SIDRA results showed that:

- all intersections currently operate at a "good" level of service (LOS) A in all approaches with minimal delay (<14 seconds per vehicle) and queuing; and
- with the additional Project related and cumulative traffic, all intersections would continue to operate at a LOS A in the short (i.e. 2022) and long (i.e. 2051) terms.

ARRB assessed the potential for increased travel times for light vehicles due to the increased number of slower moving heavy vehicles. This involved a climbing lane assessment through the uphill sections on Ambrose Road, which was considered to have the largest potential impact on travel times along the Primary Transport Route. This assessment found that slow moving heavy vehicles do have the potential to restrict light vehicle travel speeds along the uphill section of Ambrose Road. However, the light vehicle volume is low (9 and 12 vehicles during the morning and evening peak hours, respectively) and

the travel time delay that would be experienced by light vehicle drivers is brief and occurs over a short length of the total journey along the Primary Transport Route (i.e. steepest incline being approximately 600 m). Additionally, free flow conditions soon become available when joining the Hume Highway.

Based on these considerations, ARRB concluded that the provision of a climbing lane is not supported since the travel time and road safety impact are considered low and the cost and environmental impacts to provide the climbing lane would be significant. Bitzios agreed, stating that "*given the very low volume of non-quarry related traffic on Ambrose Road and the relatively short distance of traffic impacts by slow-moving trucks*" it "*is of the view that the impacts and cost would outweigh the benefits of constructing climbing lanes on Ambrose Road*".

The Department accepts this outcome and considers that the increased number of heavy vehicles associated with the Project is unlikely to result in an unacceptable level of impact to road network capacity or intersection performance along the Primary Transport Route.

(ii) Road Safety

One of the key issues raised in community and Council submissions on the Project was in relation to road safety.

ARRB completed an RSA and road safety audit which investigated the existing road and intersection designs, roadside features and road conditions to identify potential road safety issues which may arise from the proposed increase in heavy vehicle traffic volume. Overall, ARRB concluded that the recent upgrades of the Primary Transport Route undertaken in accordance with the existing consent ensure that the:

- impact on road safety for all road users would be negligible, with no major road safety hazards identified;
- existing cross-sections, road geometry and intersection geometry would support the proposed additional heavy vehicle movements; and
- recorded crash history along the does not indicate an existing or developing road safety problem that would be made worse by the Project.

However, ARRB made recommendations which it considered would improve road safety along the Primary Transport Route, including:

- widening to accommodate an extension of the wide centreline treatment (WCLT) and the approved typical cross-section through locations adjacent to major culverts to provide a consistent road treatment;
- installation of T-intersection warning signage on each approach to the intersections of Ambrose/Brayton Road and the Ambrose/Red Hill Road; and
- implementation of an inspection and renewal program to ensure the deterioration in road surface condition, line marking, guideposts, and other delineation is identified and addressed in a timely manner.

Further detail on suggested corrective actions were included in the road safety audit, including specific delineation measures, maintenance of sight distances and reduced speed limits. These road safety recommendations and actions, as well as additional road safety issues raised by Council and TfNSW, are discussed below.

(iii) Culverts and WCLTs

As part of the previous road upgrades, Gunlake widened the road pavement to provide a WCLT along the majority 7 km long Primary Transport Route. The WCLT provides a minimum 1 m separation between opposing traffic, thus reducing the risk of high severity crashes.

ARRB identified that WCLTs have currently not been implemented at the six major culverts present along the route (i.e. Culverts A to F), and recommended that five of the culverts (A to E) be extended and the road widened and protected with guardrail to increase the consistency of the road cross-section along the route and further mitigating road safety risk (see **Figure 2**). ARRB did not support the widening of Culvert F along Ambrose Road due to the high environmental, property, and financial costs involved.

In its Submissions Report, Gunlake committed to widening the pavement across Culverts A to E including using pre-cast concrete slabs, relocating the road safety barriers, extending the sealed width and remarking the centre and edgelines to reflect the WCLT arrangement.

In response to a recommendation from Bitzios, Gunlake engaged ARRB to provide further justification for not proposing to widen Culvert F (see **Appendix C**). ARRB indicated that there are considerable physical constraints to widening the road formation in this section of Ambrose Road. In addition to widening the box culvert, works to provide a WCLT along this section would require:

- large cut and fill batter works between the road and the adjoining properties, encroaching on these properties and removing existing vegetation;
- an adjustment of the existing road alignment to avoid an existing gabion rock retaining wall, resulting in kinks in the length of road; and
- land acquisitions from private properties.

ARRB considered that these works are "*impractical and cost prohibitive, and the scope of work required is disproportionate to the road safety risk of retaining the existing common centerline arrangement*". Council disagrees with this justification, indicating that provision of a WCLT should be provided for the length of the Primary Transport Route, including an upgrade of all affected culverts.

The Department re-commissioned Bitzios to provide independent expert advice on this issue (see **Appendix C**). Bitzios confirmed that "*the safety impact of realigning the road is considered to be greater than the benefits gained through the WCLT*".

Based on this advice, the Department accepts Gunlake's justification for not widening Culvert F. The Department considers that the provision of the WCLT across all but one of the major culverts along the Primary Transport Route would improve consistency in the road configuration and reduce the isolated road safety risk. The Department has therefore recommended a condition requiring five major culverts (Culverts A to E) along the Primary Transport Route to be appropriately widened by Gunlake, in consultation with Council, prior to heavy vehicle traffic volumes exceeding currently approved numbers.

(iv) Sight Distances and Delineation Measures

ARRB identified restricted sight distances for drivers of lower profile light vehicles when exiting Ambrose Road at the Ambrose Road/Brayton Road intersection and when exiting Red Hills Road at the Ambrose Road/Red Hill Road intersection. Without corrective actions, ARRB considered these intersections currently present a high safety risk. Improvements to these intersections were recommended in the road safety audit, including installation of intersection warning signs; trimming and maintenance of roadside vegetation impeding lines of sight; renewing line markings; and relocating guardrails.

As part of the road safety audit, ARRB also identified a range of deficiencies in the existing delineation measures (guideposts, line marking, signage and supplementary markers) along other sections of the Primary Transport Route which it considered presented medium to high safety risks to road users. ARRB recommended specific improvements in the delineation measures to ensure appropriate and consistent guidance in night and low visibility conditions. These included maintenance line marking, replacing missing guideposts, replacing/additional chevron delineation on guardrail terminals, reflective line markers and advanced intersection warning signs.

In its submissions on the Project, Council required that a 3 m clear zone be implemented along the entirety of the Primary Haulage Route, or alternatively that safety barriers be installed where this cannot be achieved. Although Gunlake claims that previous upgrade works have provided the minimum 3 m clear zones or steel guardrails along the route, the Department notes outcomes of the road safety audit which identified gaps and degradation in the condition of guardrails, as well as significant sections of the route where remnant vegetation along roadside verges impede on the clear zone.

In response to requests from Council and TfNSW, ARRB conducted a review of the need for lighting to further delineate the intersections along the route (see **Appendix C**). In consideration of relevant standards[3], the review concluded that standard streetlighting would be out of character for the route and flag lighting would not provide a material improvement in safety. ARRB considered that the road safety audit recommendations for retroflective advanced warning and guidance are adequate to improve delineation of the route and intersections. Council and TfNSW accepted this outcome.

Council requested all actions identified in the road safety audit of the Primary Transport Route to be implemented prior to the commencement of operations. The Department agrees that the corrective actions detailed in the road safety audit should be implemented to ensure road user safety, and has recommended that they are completed prior to transporting more than the currently approved volume of quarry products (i.e. 2.6 million tonnes per calendar year). As discussed below, the Department considers that ongoing maintenance of road safety features would be undertaken by Council via future contributions made by Gunlake in accordance with the *Goulburn Mulwaree Local Infrastructure Contributions Plan 2021* (LICP).

(v) Speed Limit

The existing speed limit along the Primary Transport Route is 100 km/hour. In response to previous road safety concerns raised by Council and the community, Gunlake have a requirement in its Driver Code of Conduct that truck drivers adhere to an 80 km/hour speed limit along the route. Setting of speed limits is the responsibility of TfNSW. Both Council and Gunlake have confirmed that they support a reduction in the regulatory speed limit to 80 km/hour for all vehicles, and that they have and will continue to advocate with TfNSW and the NSW Government Local Member of Parliament to reduce the speed limit.

(vi) Road Pavement Condition

In its submissions on the Project, Council requested that an independent assessment be undertaken to investigate the integrity of the existing road pavement to determine if it would achieve a 10 year pavement life with the projected heavy traffic volumes.

Gunlake confirmed that a Falling Weight Deflectometer (FWD) and Pavement Remaining Life assessment was prepared by Pavement Management Services Pty Ltd (PMS) in October 2021,

[3] Australian Standard for Lighting for Roads and Public Spaces – Performance and Design Requirements (AS1158.1.1:2005)

following lodgement of the EIS (see Appendix E of the Submissions Report (**Appendix B**)). PMS concluded that "*the structural remain life is seen to be at least 15 years based on the Austroads remaining life methodology*".

Although Council initially indicated that it did not accept the FWD method used in the PMS assessment, following further discussions with Gunlake and review of the assessment, Council has subsequently advised that it accepts the pavement assessment methodology. Council has agreed to work with Gunlake in the coming months to continue to refine the preferred way forward in terms of a continual pavement improvement program as well as an agreed scope of works for ongoing road pavement maintenance.

(vii) Red Hills Road/Hume Highway Intersection

In its advice on the Project, TfNSW identified an area on the southern corner of the Red Hills Road/Hume Highway intersection where the existing road pavement and drainage infrastructure within the road reserve has been damaged by vehicles cutting the corner when exiting the Hume Highway and entering Red Hills Road. It has been determined that this road infrastructure is within the road reserve managed by Council.

Bitzios recommended an assessment of the increase in traffic as a result of the Project on the geometric design of this intersection, including methods to mitigate the impact of vehicles cutting the corner. Gunlake provided a response to this recommendation in its Additional Information Response dated 17 August 2022 (see **Appendix C**). Gunlake indicated that this intersection was upgraded in 2017/2018 in consultation with the then Roads and Maritime Services. Gunlake considered that although some damage to the intersection shoulder and guideposts is evident, it does not believe that the damage was caused by quarry vehicles and that the road authority should have the responsibility to maintain and improve the intersection.

The Department disagrees. As noted by Bitzios, given the high proportion of quarry vehicles (up to 77%) using this intersection compared to general traffic, it is reasonable to assume that the impact to the road shoulder is a consequence of quarry generated traffic. Unless mitigated, this damage is likely to be exacerbated as a result of the increased vehicles associated with the Project. The Department has therefore recommended a condition requiring the existing damage to the road shoulder and infrastructure to be repaired and measures to be implemented to stop/prevent vehicles exiting the Hume Highway and entering Red Hills Road cutting the corner. The Department has recommended the works be funded by Gunlake and undertaken in consultation with Council prior to heavy vehicle traffic numbers currently approved being exceeded.

(viii) School Bus Stop

In its initial advice on the Project, Council indicated that Gunlake should fund and install a bus stop in a safe location outside Johniefelds Quarry. Gunlake confirmed that the company subsequently consulted with the bus company responsible for school transport (PBC Goulburn Bus Services) in relation to this matter. PBC advised that they are satisfied with the existing pull off bays provided by Gunlake along Brayton Road, which were installed as part of the previous road upgrades. It was also noted that there is no requirement for a specific bus stop given that the locations for collections and drop-offs alters on an ongoing basis. Council accepted this outcome.

6.1.6 Contributions to Council

In accordance with an existing Deed of Agreement with Council dated 2008, Gunlake currently pay contributions to Council for the ongoing maintenance of local roads along its Primary and Secondary Transport Routes at a rate of $0.0393 per km per tonne (2020/21 rate) of product transported. As detailed above, Gunlake has also undertaken capital works on local roads used to transport its product, including the construction of Ambrose Road which it has dedicated to Council.

Council has advised that future contributions be paid in accordance with Council's recent LICP. The current rate as adopted in Council's fees and charges for 2022/23 for developments involving heavy vehicle movements on local and regional roads is $0.0531 per km per tonne. Gunlake has agreed to pay future local contributions in accordance with the LICP.

The Department has reviewed Council's contributions plan and considers it provides a sound basis for calculating future contributions. The Department has therefore recommended a condition requiring Gunlake to pay contributions in accordance with the LICP, or any subsequent relevant contributions plan adopted by Council.

6.1.7 Traffic Management

Gunlake has committed to continue to manage the Project's traffic impacts through an updated Traffic Management Plan (TMP), that includes measures to minimise impacts on the local road network and a Driver's Code of Conduct. The Department has recommended conditions to this effect.

Additionally, to address a concern raised by TfNSW, the Department has recommended a condition requiring Gunlake to keep accurate records of all truck movements to and from the site (including time of arrival and dispatch) and publish comprehensive records, including daily maximum and calendar month averages, on its website every month.

6.1.8 Conclusion

The Department has carefully considered all the transport and traffic related issues raised by the community and agencies.

The Department accepts that the increased number of heavy vehicles associated with the Project is unlikely to result in an unacceptable level of impact to road network capacity or intersection performance along the Primary Transport Route. However, the Department considers that Gunlake should implement measures along the Primary Transport Route to improve road safety, including:

- widen five culverts to accommodate WCLT and provide a consistent road treatment along the vast majority of the Primary Transport Route;
- implement measures detailed in the road safety audit and confirm that a 3 m clear zone has been provided (or guardrails installed) along the route; and
- repair damage to corner shoulder of Red Hills Road/Hume Highway intersection and implement measures to stop/prevent vehicles cutting the corner in future.

The Department has recommended that these measures be implemented by Gunlake in consultation with Council, prior to heavy vehicle traffic volumes exceeding currently approved numbers. It has also been recommended that Gunlake be required to pay Council contributions for the ongoing maintenance along the transport routes in accordance with the recent LICP.

Additional conditions have also been recommended requiring the update and implementation of the TMP and Driver's Code of Conduct; comprehensive reporting of quarry related truck movements; and re-evaluation of transport options for the Project initially after 5 years and thereafter every 10 years.

Subject to the recommended conditions and having regard to the social and economic benefits of the Project, the Department is satisfied the transport impacts of the Project are acceptable.

6.2 Groundwater

6.2.1 Groundwater Environment

The groundwater systems in the vicinity of quarry site include the:

- unconfined perched groundwater source (shallow alluvial aquifer) contained within the alluvial / colluvial deposits along the alignment of the Chapmans Creek and Joaramin Creek (and associated drainage channels); and
- regional fractured rock groundwater source (deeper hardrock aquifer) contained within the geological discontinuities (joints and fractures) of the Barralier Ignimbrite complex.

Groundwater monitoring shows groundwater levels at the site range from 634.9 m AHD to 659.5 m AHD [ie. 6.3 to 22.5 m below ground level (bgl)]. Groundwater flow is generally towards the northeast, reflecting the topography, with eventual discharge to the Wollondilly River.

The groundwater systems are recharged via direct infiltration of rainfall and potentially overlying surface water sources where alluvium is located. The regional groundwater at the site is classified as 'less productive' porous and fractured rock water source in accordance with the NSW Aquifer Interference Policy (AIP).

No 'high priority' GDEs under the Water Sharing Plans (WSPs) have been identified in proximity to the quarry.

6.2.2 Groundwater Assessments

The EIS included a conceptual groundwater model and a Groundwater Assessment (GA) prepared by EMM, which included an analytic element groundwater flow model to predict impacts to groundwater behaviour as a result of the Project. The GA was prepared in consideration of the *Australian Groundwater Modelling Guidelines* (AGMG) (Barnett et al, 2012) and the requirements of the AIP.

(i) Conceptual Groundwater Model

The EIS included a conceptual cross-section of the groundwater system in the vicinity of the quarry (see **Figure 5**). The cross-section was revised following a site visit by EMM consultants in January 2022. This revised conceptualisation of the groundwater systems postulates a localised perched water table (see **Figure 5(a)**) in the alluvium / colluvium (approximately 0.6 m below ground level) located along the primary gully located south of the quarry. EMM considered that this perched system is separated from the regional groundwater system in the fractured rock aquifer by tens of metres and consequently would be unaffected by any drawdown in the regional fractured rock aquifer.

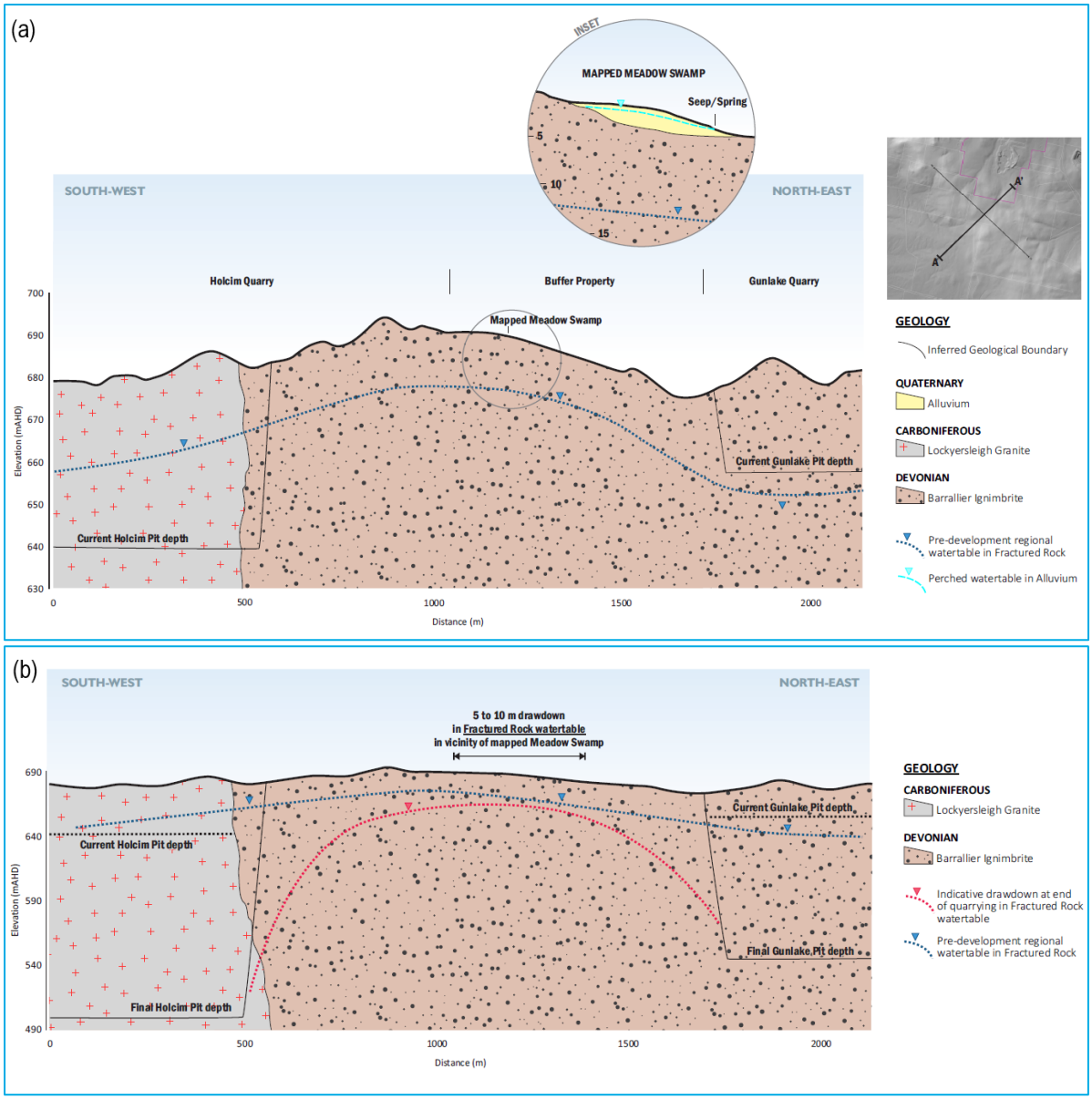


Figure 5 | (a) – Regional Geological Section
(b) – Indicative Drawdown of Regional Water Table at End of Quarrying

The conceptual model predicted that quarrying from the pit would intercept the regional groundwater table from approximately 2027 onwards (i.e. in about 5 years). At the end of quarrying, the conceptual model predicts that the final void pit depth would be approximately 100 m below the groundwater table (see **Figure 5(b)**).

BCD questioned the validity of the revised conceptual groundwater model, particularly given that the information on the perched and confined aquifer was based on only one test borehole. The Department agrees with BCD that additional groundwater data is required to verify the existence and lateral extent of the shallow groundwater system in the vicinity of the quarry. As discussed in detail below, the Department has recommended that the existing groundwater monitoring network be expanded prior to the pit intercepting the regional groundwater system to better conceptualise the localised groundwater systems. As discussed in **Section 6.4**, this is considered particularly important to determine any

predicted impacts of groundwater drawdown on the potentially groundwater dependent ecosystems within the prescribed impact area located to the south of the pit.

(ii) Groundwater Flow Model

The GA included an analytic element groundwater flow model for the Project, which aligns with a Class 1 model in accordance with the AGMG. The model provided predictions of inflows, groundwater drawdown and baseflow reductions due to the quarrying activities over a 30-year period until 2052.

EMM indicated that the model calibration was based on monitoring data from four groundwater bores located within the quarry pit area collected from 2007 until 2019-2020, as well as groundwater studies completed in the surrounding area. The steady state calibration indicated a reasonable match for historic and simulated groundwater levels.

Both BCD and DPE Water raised issues in relation to the groundwater modelling calibration and predictions, particularly given the model relied on limited monitoring data. BCD also raised concerns regarding the discrepancies in the modelled groundwater heights compared to those modelled as part of the groundwater assessment prepared for the neighbouring Lynwood Quarry.

DPE Water recommended that Gunlake improve the robustness of the impact predictions using a numerical groundwater flow model to be developed prior to extraction in the pit that would intercept the groundwater table (i.e. within 5 years of Project determination). BCD agreed with this approach, and also recommended that the model be independently reviewed.

In its response, Gunlake considered that the existing numerical groundwater model is acceptable as it is based on 14 years of groundwater monitoring data and is based on highly conservative assumptions. However, Gunlake committed to expanding its existing groundwater monitoring network by installing shallow and deep groundwater bores ranging from 10 m to 120 m bgl and using the monitoring data from the additional piezometers to confirm the groundwater modelling predictions.

The Department acknowledges that the current flow model is based on limited data and agrees with BCD and DPE Water that additional groundwater data is required, and a more sophisticated numerical flow model should be developed for the quarry prior to the pit intercepting the regional groundwater table and worst-case groundwater impacts being realised. To facilitate this, the Department has recommended that Gunlake be required to:

- expand the existing groundwater monitoring network, including installation of piezometers within GDEs in the vicinity of the quarry (see **Section 6.2.6**);
- prepare and implement a Groundwater Modelling Plan, which:
    - provides details for the future development and calibration of a numerical groundwater model which must be prepared in accordance with the AGMGs and completed within 2 years of the date of the consent;
    - is independently third-party reviewed;
    - provides for the incorporation of the outcomes of groundwater modelling undertaken at surrounding quarry sites, including the Lynwood Quarry;
    - considers field data and results of local and regional groundwater monitoring; and

- provides for periodic validation and where necessary recalibration, of the groundwater model for the development, including an independent review of the model every 3 years, and comparison of monitoring results with modelled predictions.

The Groundwater Modelling Plan is required to be prepared in consultation with BCD and DPE Water as part of the revised and updated Water Management Plan, prior to commencing quarrying operations associated with the Project.

6.2.3 Groundwater Impact Predictions

Predicted groundwater impacts associated with groundwater inflows, drawdown, baseflow reductions, quality and the final void are discussed below. Potential impacts on GDEs as a result of the Project are discussed in detail in **Section 6.4** below.

(i) Groundwater Inflows

The quarry currently operates as an essentially dry operation. Once quarrying operations proceed below the groundwater table from approximately 2027 onwards until 2052, the groundwater analytic modelling predicted that the average groundwater inflows to the quarry pit would be approximately 68 ML/year. The long-term seepage into the pit post-quarrying is predicted to be approximately 28 ML/year. As discussed in **Section 6.3**, Gunlake proposes that groundwater inflows would be stored and/or re-used onsite during the Project.

As part of the Groundwater Modelling Plan, the Department has recommended progressive review and model revision to confirm these estimates. Groundwater licensing arrangements to account for this water take are discussed in **Section 6.2.5** below.

EMM modelled pre-quarrying (2007) and post-quarrying (2052) groundwater level contours due to the Project. The key groundwater receptors and modelled groundwater table drawdown at the end of quarrying (i.e. 2052) is shown in **Figure 6**. Modelling predicted that the cone of depressurisation around the quarry pit following the interception of the groundwater table would extend primarily to the south and southwest of the quarry pit, with the 2 m drawdown contour from the regional fractured rock aquifer extending approximately 1.3 km to the southwest. Drawdowns of approximately 50 m are predicted in the immediate vicinity of the pit.

As discussed in detail in **Section 6.2.4**, none of the landowner water bores in the vicinity of the quarry pit are predicted to experience drawdown greater than the 2 m maximum threshold defined by the AIP.

BCD questioned why drawdown is not predicted to occur to the north of the quarry, and therefore impacting potentially groundwater dependent vegetation within the approved biodiversity offset areas to the north. BCD also raised concerns regarding potential cumulative local groundwater drawdown associated with neighbouring quarries.

EMM did not provide clear clarification as to why the drawdown contours are predominantly to the south of the pit, however the Department considers that this is likely due to the fact that existing groundwater levels in this area are higher (i.e. closer to the surface) than those further to the north of the site. EMM indicated that cumulative impacts between local quarry operations are likely to be negligible given the low permeability of the fractured rock groundwater system in this area (see **Figure 5(b)**).

Figure 6 | Predicted Groundwater Drawdown in 2052

The Department accepts that predicted groundwater drawdown contours will be refined as part of the revision of the groundwater model. The revised modelling will be required to incorporate the outcomes of groundwater modelling undertaken at surrounding quarry sites, including the Lynwood Quarry, to better understand any cumulative groundwater impacts. Further, as discussed in detail in **Section 6.4**, the Department has recommended that an adaptive monitoring and management process will be required to be implemented for GDEs identified in the prescribed drawdown area. This process will require Gunlake to determine baseline conditions and identify any post-mining impacts to GDEs. If impacts are identified, then Gunlake would be required to provide a biodiversity offset. The Department considers that these processes would ensure that any uncertainties in the current groundwater prediction and associated impacts are addressed.

(ii) Baseflow Losses from Chapmans Creek

Chapmans Creek is an ephemeral watercourse which is often dry, but flows following rain events. EMM predicted that Chapmans Creek receives baseflow from the adjacent alluvium/colluvium weathered fractured rock system under sustained rainfall conditions. EMM predicts that the long-term average baseflow to Chapmans Creek is relatively low, at approximately 79 kL/day (i.e. 29 ML/year). The proposed dewatering of the intercepted groundwater inflows to the quarry pit, when extraction below the groundwater table occurs, is predicted to intercept some of this baseflow, reducing flows by 3.7 kL/day (i.e. 1.35 ML/year) or by approximately 5% at the end of quarrying. Long term baseflow reductions are predicted to be approximately 13.0 kL/day (i.e. 4.7 ML/year).

EMM indicated that, since discharges from seeps in the surrounding areas is not resulting in perennial flow, the predicted baseflow reductions are unlikely to result in significant impacts the flow regimes in Chapmans Creek.

The Department accepts that these baseflow losses are unlikely to result in significant adverse impacts in the ephemeral system, however, requires that the magnitude of the baseflow reduction due to pit dewatering is further quantified and assessed as part of the revised groundwater modelling process.

(iii) Groundwater Quality

EMM indicated that the groundwater quality in the vicinity of the quarry is highly variable. The baseline groundwater monitoring results indicate that the electrical conductivity (EC) of the groundwater ranges from fresh to brackish during the monitoring period from 2014 to 2018 (i.e. EC ranging from 119 μS/cm to 6080 μS/cm). The upper end of this recorded EC range exceeds the ANZECC/ARMCANZ (2000) default guideline value range (125 – 2200 μS/cm) for 95% protection of freshwater species. The average groundwater pH conditions are neutral. Groundwater concentrations of dissolved metals and nutrients are also typically elevated.

EMM predicted that the groundwater flowing into the quarry pit when extraction commences below the groundwater table from 2027 onwards would be similar to the baseline water quality.

As noted above, EMM predicted that the maximum inflow rate into the pit would be approximately 68 ML/year. EMM indicated that dewatering of the pit and use of the groundwater in the process water system would ensure the hydraulic gradient would not be reversed during quarrying operations and therefore the likelihood of contamination of the regional aquifer would be unlikely. Consequently, quarrying operations are unlikely to lower the beneficial use (i.e. stock) category of the groundwater bores located in the vicinity of the quarry, noting that the nearest landowner bore is located at 2.5 km from the quarry.

EMM indicated that the groundwater collected in the pit would be prioritised for use in the process water system, therefore minimising the volume of groundwater required to be discharged to the surrounding environment. The proposed surface water treatment and management system, and measures to minimise impacts to the receiving environment from controlled discharges, is discussed in detail in **Section 6.3**.

(iv) Final Void

Gunlake has confirmed that a final void would be left in the landscape following quarrying operations. EMM indicated the final void would continue to receive inflows from the hard rock regional aquifer post-quarrying operations, albeit at a reduced rate. The majority of the water within the final void lake would be from surface runoff from direct rainfall, with water loss from the void occurring through evaporation. EMM predicted that the pit lake would gradually rise with equilibrium elevation of 599 to 609 m AHD occurring approximately 60 to 70 years after completion of quarrying. However, EMM notes that the elevation of the pit lake would remain below the pre-quarrying groundwater level and the final landform would form a perpetual evaporative sink.

The Department notes that the seepage of groundwater into the pit lake post extraction would be diluted by rainwater, and therefore unlikely to impact the regional aquifer water quality. The Department has recommended that Gunlake include a conceptual closure plan as part of the Biodiversity and Rehabilitation Plan that considers the hydrological and hydraulic impacts of the final void. The Department has also recommended rehabilitation objectives requiring the size, depth, batter slopes and catchment draining to the final void to be minimised.

6.2.4 NSW Aquifer Interference Policy

Projects that intercept groundwater need to consider the AIP as it defines the regime for protecting and managing the impacts of the aquifer interference activities on NSW's water resources. The Project is located within a 'less productive' porous and fractured rock water source.

EMM indicated that there are 39 groundwater works within a 5 km radius of the quarry pit, including 9 local groundwater works which are registered for private use purposes (stock or domestic/stock). There are 2 bores within a 2.5 km radius of the quarry, one owned by Gunlake and one by Lynwood Quarry (see **Figure 6**). EMM confirmed that these bores are located outside of the predicted 2 m drawdown contour. As noted in **Section 6.2.3(iv)**, quarrying operations are unlikely to change in the current beneficial use category of the existing bores. EMM therefore concluded that the Project meets the minimal impact considerations of the AIP.

The Department notes that further assessment of the AIP minimal impact considerations would be required once the numerical groundwater flow model has been developed.

Due to the identified potential for cumulative impact and noted limitations with both the analytical model and baseline dataset, DPE Water recommended that a water census be undertaken to confirm any registered users within 2 km of the quarry, and that the registered bores within 2 km be added to the monitoring program as part of the Water Management Plan and be offered 'make good' provisions if bore water supply is compromised.

The Department agrees with this approach, and notes that it is now common for 'make good' conditions to be included in approvals for projects which have the potential to impact the water supply of privately registered bores. The Department has recommended conditions accordingly.

6.2.5 Groundwater Licensing

Under the *Water Management Act 2000* (WM Act), Gunlake is required to hold a water access licence (WAL) for groundwater take within the *Water Sharing Plan for the Greater Metropolitan Region Groundwater Sources 2011* (Groundwater WSP), Goulburn fractured rock groundwater source.

As indicated above, the predicted maximum groundwater take from inflows into the pit is 68 ML/year. Gunlake has confirmed that it already holds WAL 42340 which allows access to 37 ML/year from the water source. The company has registered its interest to acquire the additional shares (i.e. 35 ML/year) of WAL required for the Project. Gunlake has confirmed that there are currently 46,809 unit shares of unassigned water within the Groundwater WSP.

The Department is satisfied that there are sufficient share entitlements within the groundwater source to allow Gunlake to purchase the residual WALs to account for its groundwater take.

In addition, Gunlake is required to hold a surface WAL for predicted baseflow reductions within the *Nepean River Water Source* in accordance with the *Water Sharing Plan for the Greater Metropolitan Region Unregulated Rivers Water Source 2011* (Surface Water WSP). The predicted long-term baseflow reductions from Chapmans Creek are approximately 4.7 ML/year. Gunlake currently does not hold a surface WAL from the Surface Water WSP.

The Department's recommended conditions require Gunlake to report on all water extracted from the development each year (direct and indirect) and note the requirement to obtain all necessary water licences under the WM Act.

6.2.6 Groundwater Monitoring and Management

Gunlake has committed to expand its existing groundwater monitoring network by installing shallow and deep groundwater bores in the vicinity of the site to confirm groundwater predictions and impacts associated with the Project. However, Gunlake proposed that the two existing monitoring bores (i.e. GM6 and GM13) located adjacent to the quarry pit would be replaced with additional bores in new locations away from the operational areas of the quarry. The Department considers these bores have provided valuable baseline data and would be important to identify ongoing groundwater impacts associated with the Project. The Department has therefore recommended that these bored be retained, and that they be supplemented with additional bores surrounding the quarry.

In addition, the Department has recommended that the groundwater monitoring network be expanded to identify any Project-related impacts to potential GDEs identified in the vicinity of the site (see **Section 6.4** below).

The expanded groundwater monitoring network is required to be described in detail in the updated Groundwater Management Plan, to be prepared in consultation with DPE Water and BCD and implemented as part of the Water Management Plan for the Project.

6.2.7 Conclusion

The Department accepts that groundwater impacts associated with the Project are unlikely to be realised until the quarrying pit intercepts the regional fractured rock aquifer in approximately 2027. The Department considers that prior to this time, Gunlake should expand its existing groundwater monitoring network and use the monitoring data for the future development and calibration of a numerical groundwater model. The Department has recommended conditions requiring:

- the preparation and implementation of a Groundwater Management Plan, including details of an expanded groundwater monitoring network; and
- details for the future development and calibration of the numerical groundwater model be included in an independently third-party reviewed Groundwater Modelling Plan to be prepared and implemented within 2 years.

The Department considers that there are sufficient entitlement shares within the relevant WSPs to allow Gunlake to purchase the additional WALs to account for its water take.

The Department has also recommended that Gunlake complete a bore census for any registered users within 2 km of the quarry, and that they be offered 'make good' provisions if bore water supply is compromised.

The Department is satisfied that with the implementation of the recommended consent conditions, the groundwater impacts from the proposed quarrying in the Project would be appropriately managed.

6.3 Surface Water

6.3.1 Surface Water Environment

The quarry is located within the upper reaches of the Chapmans Creek catchment, which is part of the Sydney Drinking water catchment. Chapmans Creek is a 3rd order ephemeral watercourse, flowing only during and immediately after large rainfall events. The creek system is classified as an 'upland river' and is reported to be slightly to moderately disturbed. There are a range of environmental values attributed to this water catchment including primary industry, aquatic ecosystems, recreational users, irrigation and stock use.

Chapmans Creek flows along the north-western boundary of the quarry site (**Figure 7**), into Jaorimin Creek and the Wollondilly River, approximately 3 km and 8.6 km downstream of the quarry, respectively. The Wollondilly River is a major river in the region and is one of the key watercourse flowing into Lake Burragorang,

Surface water quality monitoring from three sites in the vicinity of the quarry has been undertaken since 2007. Background water quality is highly variable, which is considered to be a result of the highly intermittent flow regime of Chapmans Creek and the surrounding land uses.

Monitoring results demonstrate variability in EC values within the site and surrounds, which are significantly greater than the default guideline values for upland rivers[4]. The elevated EC is considered likely to be attributed to the degraded state of Chapmans Creek and possible soil sodicity issues. Concentrations of nutrients are also elevated and well above the guideline values, which is thought to be attributed to the surrounding agricultural land use. Total suspended solids and metal concentrations are typically below the guideline values.

6.3.2 Surface Water Assessment

The EIS contained a Surface Water Assessment (SWA) prepared by EMM, which included a site water balance model and a water management strategy for the Project.

[4] As provided in the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG, 2018).

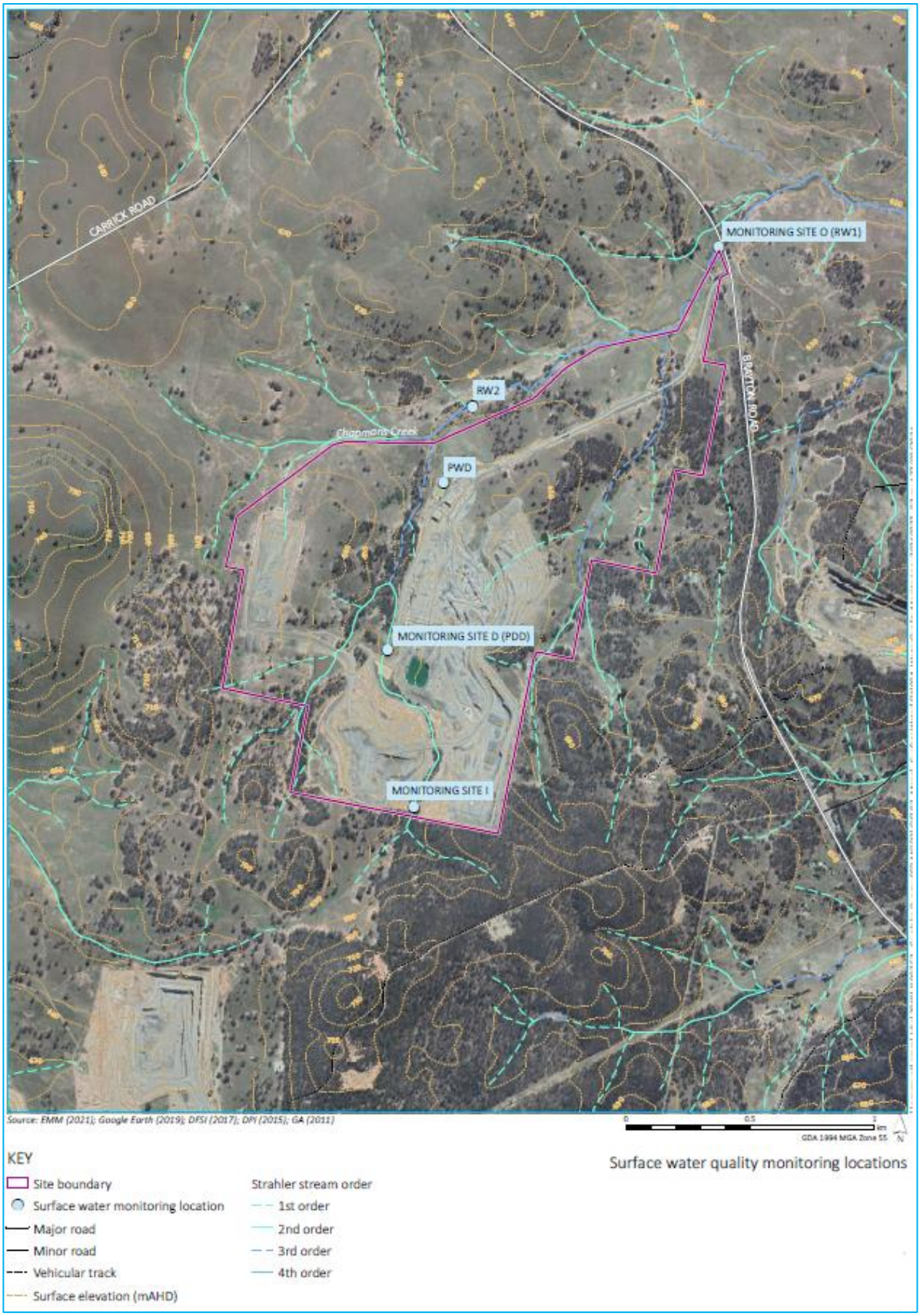


Figure 7 | Location of Watercourses and Monitoring Sites

In its submission on the EIS, the EPA indicated that the SWA lacked detailed information on how the proposed excess water discharges to Chapmans Creek would be managed to ensure compliance with section 120 of the POEO Act. The EPA requested clarification on the nature of the discharges; reasonable and feasible options to prevent/minimise discharges; water quality and geomorphological impacts to Chapmans Creek; and proposed mitigation, management and monitoring measures.

Similarly, the Department requested further assessment to demonstrate whether a NorBE on water quality can be met by the Project due to the proposed discharges, in accordance with the *Neutral or Beneficial Effect on Water Quality Assessment Guideline* (WaterNSW, 2022).

Gunlake provided additional information in relation to these issues in its Additional Information Response dated 10 January 2023. The response, as well as ongoing discussions with EPA and WaterNSW, have been considered in detail by the Department below.

6.3.3 Site Water Balance

The SWA included a site water balance model for the Project to predict the water requirements and discharges; assess the adequacy of the surface water management strategy; and determine surface water licencing requirements. The site water balance modelled two scenarios for typical dry (10th percentile), median (50th percentile) and wet (90th percentile) rainfall years, including for:

- **Scenario 1**: (2022 – 2026) for pit excavation above the groundwater table and a production rate of 2.2 Mtpa; and
- **Scenario 2**: (2027 – 2051) for pit excavation below the groundwater table and a production rate of 4.2 Mtpa.

The modelled site water balance for the two scenarios is summarised in **Table 5**. Modelling predicts that during dry years in both Scenario 1 and 2 there would be a water deficit ranging from 11-25 ML/year. However, in wet years significant water surpluses are predicted ranging from 40-303 ML/year. Measures to manage the predicted water deficits and surpluses are discussed below.

DPE Water advised that the site water balance should be continually refined based on accurate metering of captured and pumped water within the Project's water management system, to inform surface and groundwater model updates and water licensing requirements. The Department agrees and has recommended that an updated Site Water Balance incorporating DPE Water's recommendations is prepared as part of the Water Management Plan.

6.3.4 Site Water Management System

The existing approved water management system at the quarry is shown in **Figure 8**. It involves:

- separation of clean and dirty water by using diversion drains to divert clean water around the disturbance area and minimise the volume of water entering the water management system;
- capturing sediment laden runoff from onsite disturbed areas in three existing Sediment Dams 1, 2 and 3 (total 5 ML capacity) with treated water discharged into tributaries of Chapmans Creek;
- diverting clean water around the disturbance areas into the existing Clean Water Dam 2 (15 ML) and pumping excess water to the Process Water Dam (25 ML capacity); and
- future dewatering of the pit sump (drop cut) (80 ML capacity) and pumping pit water into the Pit Dewatering Dam (30 ML capacity) (yet to be constructed), where it will be stored for process water use, and excess water discharged into Chapmans Creek.

Table 5 | Site Water Balance Summary (ML/year)

Water Balance	Scenario 1			Scenario 2		
	Dry	Median	Wet	Dry	Medium	Wet
Inflows						
Total runoff	95	183	393	107	204	426
Groundwater inflows	0	0	0	68	68	68
Water import	23	1	0	1	0	0
Total inflows	*118*	*184*	*393*	*176*	*272*	*494*
Outflows						
Dust suppression (haul roads)	73	69	66	73	69	66
Plant water use	40	40	40	80	80	80
Evaporation	30	35	41	34	40	45
Total outflows	*143*	*144*	*147*	*187*	*189*	*191*
Deficit (-) / Surplus (+)	**-25**	**+40**	**+246**	**-11**	**+83**	**+303**

EMM confirmed that all dirty water dams are designed and constructed to provide adequate sedimentation treatment in accordance with methods recommended by *Managing Urban Stormwater: Soils and Construction – Volume 2E Mines and Quarries* (DECC, 2008).

Gunlake propose that the existing surface water management system would continue to be utilised for the Project.

6.3.5 Site Water Impacts

(i) Water Deficits

During dry years, water deficits (i.e. shortfalls) ranging from 11-25 ML/year are predicted. DPE Water raised concerns regarding Gunlake's ability to source water for its operations during dry years. In its response, Gunlake identified a number of contingency measures that it committed to implement to address water supply shortfalls, including:

- the use of chemical dust suppressants to reduce the haul road dust suppression water demand;
- scaling of operations to reduce water use in the process plant;
- sourcing water from alternative supply arrangements such as water purchases from a third party; and
- drilling a new groundwater production bore and licensing its use to supply water under the WM Act.

The Department accepts that these measures are available to Gunlake to manage water supply shortfalls at the quarry site. However, as noted by DPE Water, uncertainty still remains in the ability to

fully address the predicted water shortfalls in dry periods. An inability to source additional water represents an operational risk to Gunlake. The Department has recommended a condition requiring Gunlake to ensure that it has sufficient water for all stages of the Project, and if necessary, adjusting the scale of the development to match its available water supply.

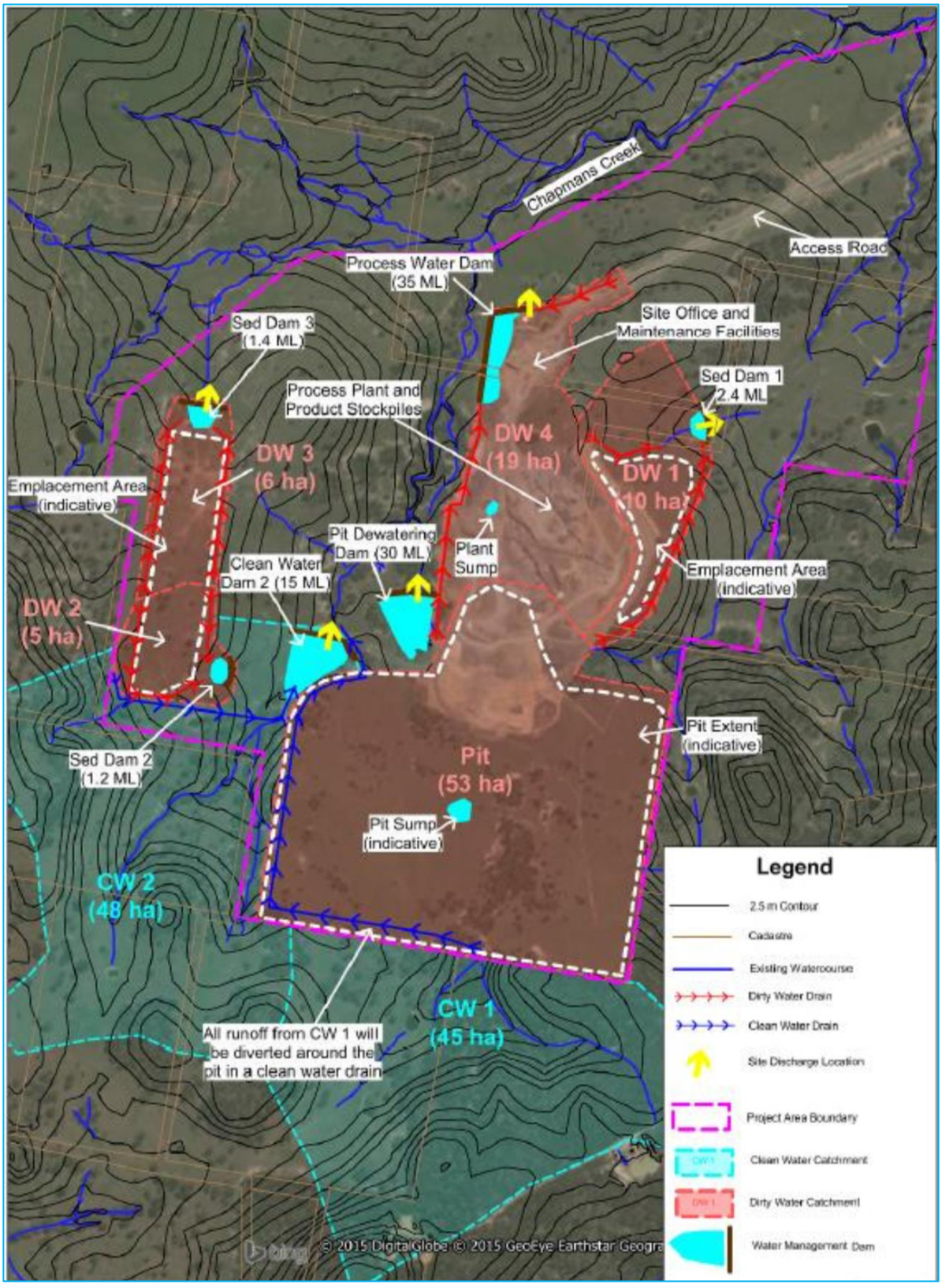


Figure 8 | Water Management Strategy

(i) Water Surpluses

During average to wet rainfall years, water surpluses are predicted, with surpluses of up to approximately 83 ML predicted during a medium rainfall year and up to approximately 300 ML during a wet year when quarrying in the pit is below the groundwater level (i.e. after 2027).

The Department acknowledges that the predicted water surplus volumes, and the predicted likelihood and magnitude of controlled discharges from the site, are similar to what is currently approved[5] due to greater process water requirements offsetting increased groundwater inflow volumes.

EMM indicated that the majority of the excess water would be contained within the water management system storages, which have a total combined capacity of approximately 155 ML. However, controlled discharges are proposed from the sedimentation dams and the Pit Dewatering Dam. The SWA and subsequent Additional Information Responses from Gunlake provided limited information on the predicted discharge rates or water quality.

The EPA has advised that the existing EPL for the quarry (No. 13012) does not nominate licenced discharges to waters from the site. The Department has consulted with the EPA and the EPA noted that any application for a licenced discharge point by the licensee (i.e. Gunlake) must be supported by a water pollution discharge assessment.

WaterNSW recommended that the Department impose similar requirements prior to approval of the release of surplus waters from the site. Specifically, WaterNSW recommended long term monitoring of EC of the water in the sump pit and the Pit Dewatering Dam and an assessment of maximum flow rates of controlled discharges to maintain the stability of Chapmans Creek. WaterNSW stated that no releases to Chapmans Creek should be approved unless the EC values of the discharge water is similar or lower than the water in Chapmans Creek.

The Department agrees with both the EPA and WaterNSW. The Department has recommended conditions prohibiting discharges from the onsite water storages until the existing Surface Water Management Plan is updated to include the detailed information on surface water discharges required by these agencies. Further, the Department has recommended that, once approved, all surface water discharges from the site comply with all relevant provisions of the POEO Act, including any discharge limits (both volume and quality) set for the development in any revised EPL.

6.3.6 Neutral or Beneficial Effect Predictions

Gunlake is located within Sydney's drinking water catchment. Biodiversity and Conservation SEPP provides that a consent authority must not grant consent to a proposed development unless it is satisfied the proposed development would have a neutral or beneficial effect (NorBE) on water quality in the catchment.

As noted above, the Department has recommended that discharges from the site only be approved once adequate information on re-use and disposal, water quality and treatment, and mitigation and monitoring are provided in an updated Surface Water Management Plan. Any subsequent discharges must comply with all relevant provisions of the POEO Act and discharge limits set in the revised EPL. The Department considers that this would ensure that the continued operation of the water management system would achieve a NorBE on water quality within Sydney's drinking water catchment.

[5] As detailed in Gunlake's existing approved Soil and Water Management Plan (September 2021)

6.3.7 Surface Water Licensing

Surface water licensing for the Project is regulated by the WM Act. Surface water requirements for predicted baseflow take is discussed in **Section 6.2.5**.

In addition, Gunlake is required to hold a licence for the capture and use of clean runoff from the quarry site. Under Section 53 of the WM Act, Gunlake is entitled to capture, store and use up to 10% of the average regional runoff for their property. Gunlake's current landholding that is within or adjacent to the Project site is 227 ha. EMM determined that the Maximum Harvestable Right for the site based on this land area is 17 ML. EMM indicated that there are three existing small farm dams located within Gunlake's landholding, which are estimated to have a collective volume of less than 1 ML. Hence, the available harvestable rights allocation is 16 ML.

EMM state that the Clean Water Dam 2 is the only storage at the quarry that captures clean water runoff. This dam has a volume of 15 ML. Given this volume is within the calculated maximum harvestable rights, EMM confirmed that there is no licensing required for the capture or use of clean runoff at the site. The Department accepts this outcome.

6.3.8 Surface Water Monitoring and Management

Gunlake has committed to continue utilising the existing surface water monitoring network (**Figure 7**) which includes:

- two monitoring sites along the downstream reaches of Chapmans Creek (RW1 and RW2); and
- one monitoring site within the Process Water Dam (PWD).

In response to recommendations made by the EPA and WaterNSW, the Department has recommended that this monitoring network be expanded to also include:

- metering of captured water volumes in all water storages and measuring of volumes of water pumped between water storages;
- water quality monitoring of any surface water discharges from the sedimentation dams, pit sump and the Pit Dewatering Dam;
- monitoring of surface water flows and quality in watercourses and/or waterbodies that could potentially be impacted by the development;
- monitoring of stream stability, riparian condition and geomorphic processes in receiving watercourses; and
- monitoring of the overall effectiveness of the water management system.

The Department has recommended that the surface water monitoring and management measures are detailed in a comprehensive Surface Water Management Plan.

6.3.9 Conclusion

The Project is unlikely to result in significant changes to the existing site water balance due to greater process water requirements offsetting increased groundwater inflow volumes once quarrying in the pit extends below the regional groundwater level. Gunlake therefore proposes to utilise the existing surface water management system at the quarry for the Project.

The Department understands that the quarry has essentially been functioning as a dry operation, with captured dirty and clean surface water being utilised for process water and haul road dust suppression. However, with increased production rates associated with the Project, during dry years prior to the interception of groundwater in the quarry pit (i.e. prior to 2027), there is the potential that the quarry could experience water deficits. If this occurs, Gunlake has committed to adjust the scale of the development to match its available water supply. The Department has recommended conditions to ensure this occurs.

During wet years, particularly once quarrying extends below the regional groundwater table, the quarry is likely to experience water surpluses which may need to be discharged from the site water storage dams. The Department has recommended that Gunlake update the Surface Water Management Plan prior to any water discharges being approved, to provide details of surplus water re-use and disposal, water quality and treatment, and mitigation and monitoring. Gunlake will also be required to provide details of how the receiving environment would be protected from adverse impacts of water discharges.

Any subsequent discharges from the quarry must comply with of the POEO Act and discharge limits set in the EPL. The Department considers that these requirements would ensure the continued operation of Project would ensure a NorBE on water quality within the drinking water catchment.

6.4 Biodiversity

The EIS included a Biodiversity Development Assessment Report (BDAR) prepared by EMM in accordance with *Biodiversity Assessment Method* (BAM) (DPIE, 2020). The BDAR describes and assesses potential impacts to biodiversity from the Project, including threatened biodiversity listed under the BC Act and MNES listed under the EPBC Act.

BCD raised several issues regarding the BDAR, particularly in relation to field surveys and plot data, and the adequacy of the groundwater modelling to inform the assessment of potential impacts on GDEs (see **Section 6.2.2**). Additional information to address these issues, including results of supplementary field investigations, were included in the Submissions Report. BCD's suggested approach to resolve residual issues, primarily through implementation of an adaptive management process, are discussed below.

6.4.1 Biodiversity Context

The majority of the quarry site and surrounding lands were largely cleared for historical agricultural purposes. Historical aerial photos show that much of the quarry site was cleared of trees in the 1960s, with only scattered clusters of paddock trees being retained. The woodland vegetation currently on site has regenerated around those paddock trees over the last 50 years.

Patches of remnant vegetation occur along drainage depressions and on slopes of lower agricultural utility. There are larger areas of remnant vegetation immediately to the south and south-east, as well as to the northwest of the quarry beyond Carrick Road. Despite the previous use of the site for grazing, much of the grassland has not been substantially modified and still comprises mainly native pasture.

Under NSW's vegetation classification system of Plant Community Types (PCTs), EMM has confirmed there are five native vegetation communities in the vicinity of the quarry, including the Box Gum Woodland Critically Endangered Ecological Community (CEEC) (PCT 1330), which is listed as CEEC under both the BC Act and the EPBC Act and considered a potential facultative-opportunistic GDE.

BCD raised an issue in relation to an area of land immediately to the north-east of the quarry pit which was originally identified as an area to be used for irrigation with the overstorey vegetation to be retained (i.e. see Area 1 on Figure 3.1 of the EIS). BCD noted that the recent aerial photography shows that this area has been cleared and is being used for overburden emplacement. BCD indicated that this appears to be a breach of existing conditions of consent.

Gunlake has not provided any clear clarification in relation to this issue. The Department confirms that it has referred the issue to its Compliance Division, which will complete a comprehensive investigation to determine if the area has been unlawfully cleared and if a breach of the consent has occurred.

For the purposes of this assessment, the Department has removed Area 1 from the Project boundary and description and has completed its assessment based on potential impacts outside of this area. Once the compliance investigation is complete, Gunlake can seek to modify the development consent, if granted, to include Area 1 and any appropriate outcomes.

6.4.2 Predicted Biodiversity Impacts

As part of the Project, Gunlake committed to avoiding any additional surface disturbance beyond that previously approved. Additional resource for the proposed increase in the production rate would be sourced from a deepening of the existing pit and the remaining unextracted resource rather than a surface expansion. The Project would therefore avoid any direct impacts on biodiversity.

However, EMM indicates the Project has the potential to result in indirect or prescribed impacts on biodiversity, including from:

- increased groundwater drawdown impacting vegetation associated with GDEs; and
- additional vehicle movements increasing the potential for fauna vehicle strike.

(i) Potential Impact to GDEs

Groundwater drawdown predicted as a result of the Project has the potential to impact the vegetation composition, structure and health of GDEs (see **Section 6.2.3(i)**).

As discussed in **Section 6.2.2(ii)**, groundwater drawdown of 2 m is predicted to extend up to 1.3 km from the edge of the pit at the cessation of quarrying within the predicted drawdown area (see **Figure 9**). As noted above, one plant community (PCT 1330) occurs in the predicted drawdown area that is considered to have a facultative dependence on groundwater, meaning that it may rely on groundwater on a seasonal basis or during extended drought periods[6]. As noted above, this GDE is a listed as a CEEC under both the BC Act and the EPBC Act and is known to support threatened species.

EMM confirmed that approximately 54.53 ha of PCT 1330 south of the quarry is predicted to experience potential impacts where groundwater drawdown is modelled to result in groundwater being at depths of >20 mbgl, or less, and thus potentially inaccessible to this portion of the community. EMM indicated that the predicted impact area represents 52% of the approximately 104 ha of the community mapped in the prescribed impact area, 0.25% of the 21,710 ha of the community mapped within the local area and 0.18% of the estimated 30,000 ha of the CEEC remaining.

[6] It is noted that supplementary field survey has confirmed that a small area of vegetation originally assessed as Montane Peatland Swamp (PCT1256) is dominated by exotic species and is now not considered part of the EEC or a GDE. BCD has accepted this outcome.

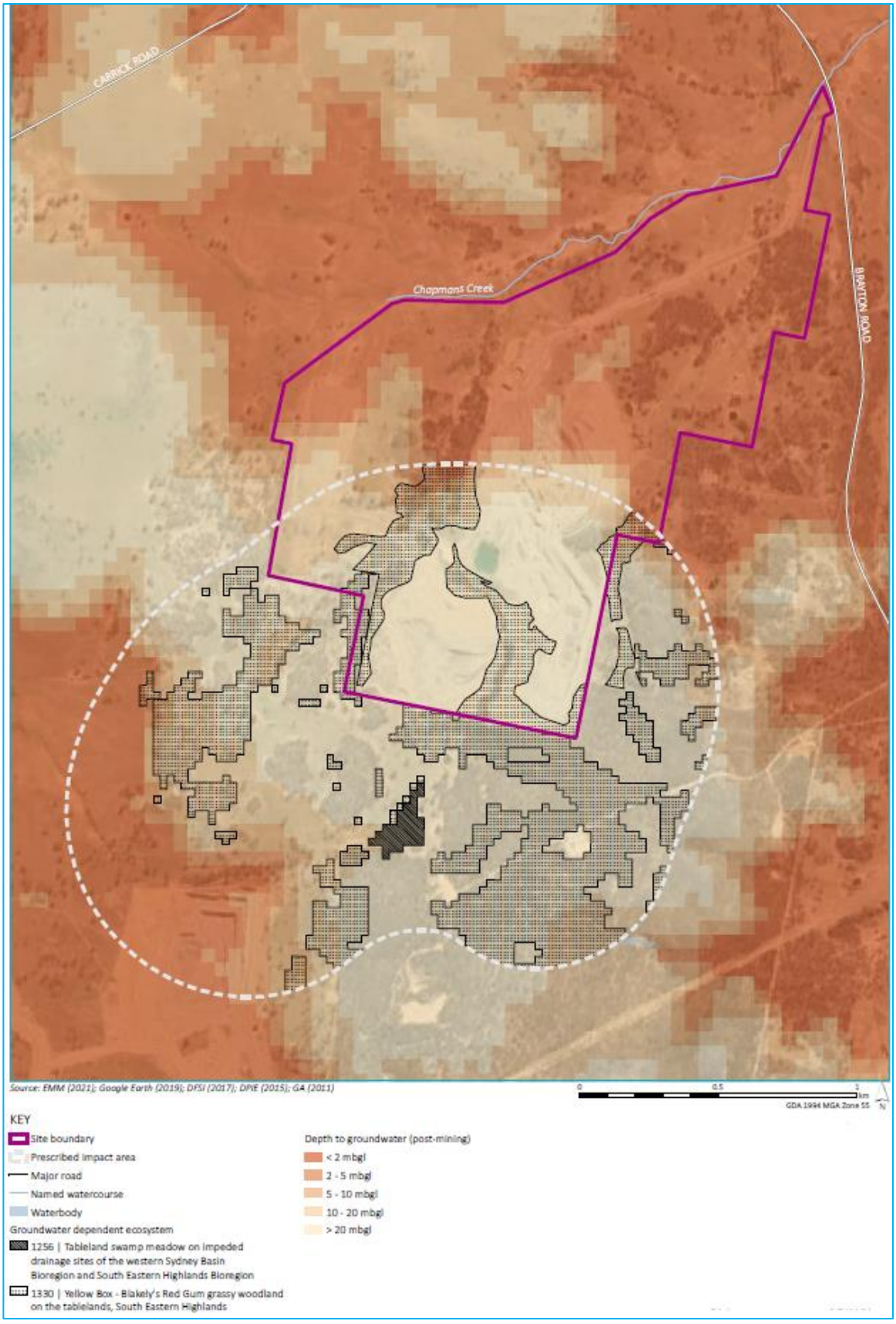


Figure 9 | Groundwater drawdowns and Groundwater Dependent Ecosystem

EMM's initial assessment of the risk of impact to this GDE as a result of the Project indicated that the level of groundwater drawdown on a community with an opportunistic reliance on groundwater is unlikely to have any measurable effect on the ability of the community to access groundwater, except during periods of stress, and is therefore unlikely to result in any significant changes in the biological integrity of the GDEs. EMM in this initial assessment in the BDAR considered the level of risk to this GDE from Project-related drawdown to be low.

BCD requested more scientific evidence to support this conclusion. In its response, EMM confirmed via an additional site inspection that that there is no evidence of deep-rooted vegetation within the PCT 1330 community in the exposed quarry faces. EMM also noted that the PCT 1330 community is mapped across a variety of groundwater depths. EMM therefore considered the extent of PCT 1300 is more likely to be driven by landscape features and soil composition than groundwater. Based on this information, EMM concluded that PCT 1300 would not be impacted by the predicted drawdown in the regional water table.

In its comments on the Submissions Report, BCD noted the discrepancies in the BDAR and the Submissions Report in relation to the predicted groundwater dependency and nature of impacts on PCT 1300 as a result of the Project. BCD stated that uncertainties remain in both the extent and timing of predicted impacts and noted that prediction is further complicated by the time delays that changes in hydrological processes, such as groundwater drawdown, have in delaying impacts to native vegetation.

Given these uncertainties, BCD recommended that an Adaptive Management Plan be prepared and implemented for the PCT 1330 GDE and any other potential GDEs identified in the prescribed impact area. As discussed in detail below, the adaptive management approach would involve a Before After Control Impact (BACI) design to determine baseline conditions and identify any post-mining impacts to GDEs. If impacts are identified, then Gunlake would be required to provide an offset in accordance with the BAM. The Department agrees with this approach and has recommended performance measures and conditions to give it effect.

(ii) Vehicle Strike

Several community submissions raised concern that increased vehicle movements associated with the Project may result in increased fauna vehicle strike and associated fauna mortality.

EMM completed a prescribed impact assessment for vehicle strike in accordance with the BAM. EMM stated that given the fragmented nature of vegetation along the Primary Transport Route, the fauna which are at the greatest risk of vehicle strike are more mobile species such as brushtail possums, wallabies, kangaroos and wombats. EMM considered that while there is a risk of fauna strike on all roads, the magnitude of the proposed increase in traffic movements on the local road network (see **Section 6.1**) is unlikely to substantially impact fauna within the locality. EMM concluded that this, coupled with the relatively common nature of the specifies most likely to be subject to fauna strike, means impacts to the persistence of these species in the region would be negligible. BCD accepted this conclusion.

6.4.3 Commonwealth Matters

EMM confirmed that the Project is unlikely to result in any direct or indirect impacts to threatened species or communities or migratory species listed under the EPBC Act. Further, EMM state that the Project would not result in a significant impact to any MNES. Based on these outcomes, Gunlake did not refer the Project to DAWE.

DAWE confirmed that no new referral is required for the Project. The Department notes that an existing EPBC Act approval currently applies to the currently approved quarrying operations and will continue to apply to the Project.

6.4.4 Mitigation, Management and Offsetting

The Department has recommended that Gunlake be required to comply with a biodiversity performance measure of '*negligible environmental consequences'* for GDEs, including '*negligible change to the composition or distribution of native vegetation with the communities*'.

For Gunlake to identify and determine any impacts to GDEs as a result of the Project and compliance with the proposed biodiversity performance measures, the Department has recommended that the company prepare and implement an Adaptive Management Plan for GDEs, requiring:

- installation of nested monitoring bores within PCT 1330 and other potential GDEs both within the predicted drawdown area and reference site(s) to determine baseline depth to groundwater, including any localised shallow groundwater in the weathered zone that may support GDEs and the regional groundwater in the fractured rock aquifer;
- complete BAM plots within PCT 1330 and other potential GDEs to collect baseline data on vegetation composition, structure and health, and any candidate threatened species associated with the communities;
- collect groundwater monitoring data (monthly) to detect any groundwater drawdown during quarrying operations;
- collection of BAM plot data every 2 years after groundwater drawdown is detected, and continuing for the lifetime of the operation; and
- if a change in vegetation is detected and found to be caused by groundwater drawdown associated with the Project, offset the partial or full direct impacts in accordance with the BAM.

In accordance with BCD's request, the Department has recommended that the Adaptive Management Plan be prepared prior to commencement of quarrying operations associated with the Project.

Further, the Department has recommended that the existing conditions for biodiversity offsets required for previous vegetation impacts (conditions 31-35 of Schedule 3) and the preparation and implementation of a Biodiversity and Rehabilitation Management Plan (condition 38, Schedule 3), are maintained in the consent for the Project.

6.4.5 Conclusion

The Department accepts that Gunlake has implemented sufficient avoidance measures by designing the Project to ensure it would not result in any direct impacts to native vegetation or fauna habitat. To address the uncertainty regarding Area 1 and to permit the Department's compliance investigation to be finalised without delaying assessment of this Project, the Department has removed Area 1 from the Project boundary.

In accordance with BCD's recommendations, the Department has recommended that Gunlake is required to prepare and implement a comprehensive Adaptive Management Plan and to identify and determine any impacts to GDEs as a result of the Project and offset any detected impacts in accordance with the BAM.

It is also recommended that Gunlake be required to prepare and implement a Biodiversity and Rehabilitation Management Plan for the Project.

Subject to the recommended conditions, the Department is satisfied the biodiversity impacts of the Project are acceptable.

6.5 Other Issues

Other issues associated with the Project include noise, air quality, social, economic, waste and greenhouse gas emissions. These are assessed in **Table 7**. The Department notes that the Project would not change the existing approved impacts associated with blasting, visual amenity, Aboriginal cultural and non-Aboriginal heritage or rehabilitation and has therefore not considered these issues further as part of this assessment. The Department has recommended that contemporary standard conditions to manage these issues are included in the development consent.

Table 6 | Other Issues

Issue	Findings
Noise	• EMM prepared a Noise Impact Assessment (NIA) which assesses the operational and traffic noise impacts associated with the Project, with reference to the *Noise Policy for Industry* (NPfI) (EPA, 2017), *Voluntary Land Acquisition and Mitigation Policy* (VLAMP) (NSW Government, 2018) and *NSW Road Noise Policy* (RNP) (EPA, 2011). • Council requested that the Department engage an independent acoustic consultant to review the NIA. However, the EPA did not raise any concerns in relation to the NIA. The Department notes that the NIA has been based on recent noise monitoring undertaken at the quarry and surrounds, and accepts that it has been prepared in accordance with the relevant guidelines. The Department therefore considers the NIA is adequate to assess the noise impacts associated with the Project. • Several community members raised concerns about noise impacts associated with the continued operation of the quarry and existing and increased heavy vehicles. • There are 7 privately-owned rural residences within 2 km of the quarry, including four to the southeast along Brayton Road (R2, R7, R8 and R9), one to the northeast (R10) and two to the northwest along Carrick Road (R5 and R6). The closest residence (R2) is located approximately 500 m to the southeast of the site boundary. Approximately 13 residences are located within 600 m of the Primary Transport Route. • The consent for the Extension Project includes operational noise criteria for surrounding residences which were set under the *Industrial Noise Policy* (EPA, 2000). These noise limits are also reflected in the quarry's EPL 13012. In addition, residence R2 has voluntary acquisition rights and residences R2 and R7 have mitigation on request rights. Gunlake is also required to undertake traffic noise compliance assessments. • Noise monitoring results presented in Gunlake's *Annual Reviews* indicate that existing operational and traffic noise levels are compliant with the relevant noise limits. • EMM predicted operational noise levels using iNoise software and equipment sound power levels based on recent onsite monitoring. Project Noise Tigger Levels (PNTLs) for day/evening/night of 40/35/35 dB $L_{Aeq,\ 15\ mins}$ respectively were then set in accordance with the NPfI. • EMM completed a low frequency noise assessment in accordance with the NPfI which confirmed that the residences surrounding the quarry are not subject to dominant low frequency noise and that modifying factor correlations are therefore not required to be applied to the predictions. • EMM predicted that noise levels for quarry operations associated with the Project would be at, or below, the relevant PNTLs at all residential receivers except at R2. The predicted noise levels at R2 for the day/evening/night periods are 47/46/46 dB $L_{Aeq,\ 15\ mins}$ respectively which are greater than 5 dBA above the PNTLs and considered to be a significant impact in accordance with the VLAMP. • EMM also predicted that the maximum noise level that may cause sleep disturbance (i.e. L_{Amax} 52 dBA) would not be exceeded at any residence. • The Department notes the predicted operational noise levels are also below the existing consent noise impact assessment criteria at all residences, except at residences R6 and

Issue	Findings
	R9 during the daytime period, where the predicted noise levels are 1 dBA above the existing 35 dBA criteria. • In relation to road traffic noise, EMM provided predicted noise levels from the future total traffic, inclusive of the additional proposed quarry trucks associated with the Project. Predictions indicated that the total road traffic noise levels at the nearest potentially affected residences along the Primary Transport Route (i.e. Brayton Road, Ambrose Road and Red Hills Road) would be well below the RNP criteria for the day (i.e. 9 dB below the 60 dB criterion) and night (i.e. 7 dB below the 55 dB criterion) time periods. • In its submission on the EIS, Council requested the inclusion of a condition of consent that restricts the use of engine brakes on the secondary transport route and on the Primary Transport Route in the vicinity of the Brayton Road/Ambrose Road intersection. In response, Gunlake noted that engine brakes are an essential part of heavy vehicle safety and therefore it is not feasible to prohibit their use for safety reasons. However, Gunlake noted that the Quarry Truck Driver Code of Conduct states that all drivers must minimise air/compression brakes unless in emergencies. Council raised no further comments on this issue. The Department accepts Gunlake's response, and notes that the traffic noise compliance assessments conducted in 2020 demonstrated that road traffic noise levels generated by quarry trucks and other road users during day and night periods satisfied the RNP criteria. • In accordance with the VLAMP and consistent with the existing consent, the Department has recommended conditions giving the owner of residence R2 voluntary mitigation and acquisition rights. The Department also considers it reasonable that residence R7 retains its existing mitigation rights, notwithstanding that the updated noise predictions do not exceed the PNTLs and would typically not attract mitigation rights under the VLAMP. The Department has recommended a condition to give this effect. • The Department has recommended noise impact assessment criteria at all other residences which are in line with the predicted noise levels (or minimum noise level of 35 dBA $L_{Aeq,\ 15\ mins}$). The Department notes that this results in stricter noise limits at two residences (i.e. R7 and R8) and marginally higher noise limits at two residences (i.e. R6 and R9), when compared to the existing consent noise limits. • The Department notes that the existing consent requires traffic noise compliance assessments to be undertaken once the dispatch of quarry products exceeds certain volumes. As noted above, the most recent assessment found that traffic noise levels remain well below the RNP criteria. However, given concerns raised by community members regarding existing and proposed traffic noise, as well as the significant increase in heavy vehicle movements proposed as part of the Project, the Department considers compliance with RNP criteria should continue to be regularly verified, and has recommended this be undertaken when each additional 1 Mt of quarry products are dispatched from the quarry. • In addition, Department has recommended conditions requiring Gunlake to: - comply with a range of noise operating conditions, including taking all reasonable steps to minimise all operational and traffic noise; - carry out regular attended noise monitoring (every three months) to determine compliance; and - prepare and implement a comprehensive Noise Management Plan. • Subject to the recommended conditions, the Department considers that the noise impacts of the Project are able to be managed and are therefore acceptable.
Air Quality	• EMM prepared an Air Quality Impact Assessment (AQIA) which assesses the operational air quality impacts associated with the Project in accordance EPA's *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* (2016). • Council requested that the Department engage an independent consultant to review the AQIA. However, the EPA did not raise any concerns in relation to the AQIA. The Department notes that the assessment was based on recent (2018) regional and local air quality and meteorological data and has been prepared in accordance with the relevant guidelines. The Department therefore accepts that the AQIA is adequate to assess the air quality impacts associated with the Project. • Several community members raised concerns about air quality impacts associated with the continued operation of the quarry and existing and increased heavy vehicles. One

Issue	Findings
	submission raised concerns that no air quality monitoring is conducted on their property which is located less than 2 km from the quarry site. • EMM indicated that the quarry's atmospheric emissions may increase as a result of the Project due to the proposed increased production rate and increased truck movements. The AQIA included the following key emission sources in the Project: - dust from the additional removal, handling and hauling of hard rock on site; increased processing of hard rock (crushing, screening and conveying), wind erosion from exposed surfaces, and transportation of hard rock aggregates along unpaved internal roads and paved public roads; and - fuel combustion-related emissions from quarry plant, equipment and additional product transport trucks. • In addition to emission sources from the quarry, EMM identified potential cumulative emissions from the nearby Lynwood and Johnniefields Quarries. • Gunlake committed to continue to implement a range of best practice air quality mitigation measures for the Project, as outlined in its existing Air Quality Management Plan. Key measures include water spray dust suppression at key processing plant points, on haul roads and hard stand areas, dust aprons on drill rigs, enclosure of the crusher, and temporarily ceasing or relocating activities during high wind speed events. • The Department notes that historical operations at the quarry have generally complied with applicable air quality criteria contained in the existing consent. • EMM used monitoring data from the quarry, as well as regional datasets to determine background air quality concentrations at the nearest residential receptors. Incremental and cumulative concentrations and deposition rate were then modelled for total suspended particulates (TSP), coarse particles (PM_{10}) and fine particles ($PM_{2.5}$) to determine the predicted concentrations at 10 residential assessment locations surrounding the quarry. • The AQIA predicted that the Project would comply with applicable NSW EPA particulate matter impact assessment criteria for TSP, PM_{10}, $PM_{2.5}$ and deposition rate at all assessment locations. • However, as background particulate emissions were found to exceed the 24-hour PM_{10} criteria on three occasions and the 24-hour $PM_{2.5}$ criteria on two occasions, further assessment was undertaken to predict whether the Project would result in additional days of exceedance at the closest receivers. This assessment combined the 4th highest cumulative 24-hour PM_{10} and the 3rd highest cumulative $PM_{2.5}$ concentrations at each assessment location to assess if additional exceedance events were predicted. The assessment did not predict any additional days of exceedances. • The AQIA also confirmed that in accordance with the VLAMP the Project-only predictions for 24-hour PM_{10} and $PM_{2.5}$ would not exceed the applicable criteria across more than 25% of privately-owned land. • Gunlake has committed to continue to operate its existing air quality monitoring network at the quarry which comprises a meteorological station, two high volume air samplers to record 24-hour average PM_{10} and three dust deposition gauges to record monthly TSP. In addition, Gunlake has committed to installing an additional High Volume Air Sampler to record $PM_{2.5}$ concentration at the quarry. The Department supports these commitments. • The Department has recommended conditions requiring Gunlake to: - comply with contemporary air quality criteria; - implement all reasonable and feasible 'source-based' measures to minimise dust emissions on site; - continue to implement a comprehensive air quality monitoring program and an active air quality management system to identify and manage potential exceedances; and - prepare and implement a comprehensive Air Quality and Greenhouse Gas Management Plan (AQGHGMP). • Subject to the recommended conditions, the Department considers that the air quality impacts of the Project are acceptable.
Social	• EMM prepared a Social Impact Assessment (SIA) for the Project in accordance with the *Social impact assessment guideline: For State significant mining, petroleum production and extractive industry development* (DPE, 2017) and the *Social impact assessment guideline for state significant projects* (DPIE 2021).

Issue	Findings
	• The SIA was informed by an engagement program which involved meetings and interviews with stakeholders, letter box drops, newsletters, a community information session and Community Consultation Committee (CCC) meetings. • Key social impact concerns identified by the SIA included: - public safety, reduced amenity and impacts to property values from the increased truck movements along the Primary Transport Route; - increased pressure on local emergency services and demand for trade services; and - noise and air quality impacts from the operation of the quarry, and cumulative impacts with other local quarries. • Key social benefits identified in the SIA included: - ongoing and increased local employment and job opportunities; - community benefits from funding and grant commitments; and - retention of youth in the rural and regional area. • The Department notes that these social issues and benefits were also raised in many community submissions on the Project. • In its Submissions Report, Gunlake provided an historical analysis of property values in the vicinity of the quarry (post code 2579) to assess the potential impact of the existing and future quarrying operation on local property market. Data indicated that median residential prices in Southeast Regional NSW recorded a strong increase of 15% from July 2020 to July 2021, while the area in vicinity to the quarry increased by 40% from 2016 to 2021. Gunlake considered that this indicates that quarry operations to date have not affected property prices and potentially that the economic activity of quarry and the other quarries near Marulan are increasing the value of houses in the area. • The Department notes that, although property values are based on a range of factors (including supply and demand, interest rates, the local economy, demographics and the property's location), property values in the vicinity of the quarry do not appear to have been adversely impacted by the existing operations and are unlikely to be significantly impacted by future activities associated with the Project. • Regardless of the above, the Department notes that property values are not a consideration for assessment under the EP&A Act and have not been a consideration in recommending approval of the Project. • Gunlake has proposed a range of mitigation and management strategies to address the other identified social impacts of the Project. These measures are additional to those proposed to mitigate the traffic, air quality and noise impacts, and include commitments to: - continue to communicate with residences within 2 km of the quarry to notify them on specific quarrying activities, such as blast times; - liaise with other quarries in the area to address potential cumulative impacts; - continue to prioritise local hiring and local procurements; - continue to provide community support in the form of annual contribution commitments to organisations within the local and regional area; - maintain existing relationships with local emergency services, including ongoing provision of Project updates and emergency response protocols and procedures; and - continue the community and stakeholder engagement, including the operation of the CCC. • The Department supports these commitments. The Department has also recommended the continued operation of a CCC in accordance with the Department's *Community Consultative Committee Guidelines: State Significant Projects* (2019), as well as requirements to regularly publish relevant documentation on Gunlake's website, and a community hotline and complaints register. • The Department considers that with the implementation of the mitigation measures proposed by Gunlake in respect of the various social impacts and the application of the Department's recommended conditions (coupled with the management measures proposed in respect of traffic and transport impacts, noise impacts, blasting impacts and air quality impacts), the extent of social impacts can be appropriately managed and the Project would not significantly impact the local community.
Economic	• Gillespie prepared an Economic Assessment (EA) for the Project incorporating a Cost Benefit Analysis (CBA) and a Local Effects Analysis (LEA) to estimate the incremental

Issue	Findings
	net benefits of the Project to the State and the local benefits to the Goulburn Mulwaree region. The EA was undertaken in accordance with the Guidelines for *Economic Assessment of Mining and Coal Seam Gas Proposals* (NSW Government, 2015) and the associated Technical Notes. • The CBA indicated that the Project would have incremental (i.e. above that of the approved project) net production benefits to NSW of $74M (present value at 7% discount rate) comprising an additional $64M in quarrying benefits and $10M in ex-quarry transport benefits. This includes the costs of environmental mitigation costs. • The LEA indicated that when the Project is at full production it would provide a total of 228 direct jobs, comprising 90 quarry jobs and 138 transport jobs. As with the existing workforce, it is presumed that most of these workers (87%) would reside in the local area. • The LEA estimates that the incremental net income (i.e. wages) and incremental net employment to local residents as a result of the Project would be $1.7M in net income and 22 jobs from 2026 to 2042. This is estimated to increase to $6.2M in net income and 79 jobs in 2043 until 2051. • Overall, Gillespie estimate that the quarrying and transport components of the Project would provide the following annual direct and indirect effects to the local economy: - $277M in output; - $115M in value-added; - $47M in gross wages; and - 731 direct and indirect jobs. • The Department accepts the Project would generate many jobs, and that a significant percentage of the workers would likely reside in the local and regional area. Further, the Department expects that a large proportion of workers' salaries would be reinvested and circulated within the region. • The Department also recognises that a key economic benefit of the Project would be the continued supply of concrete and associated aggregates to facilitate housing and infrastructure development in the Sydney Regions. • The Department considers that the Project would result in positive economic benefits to the local and regional areas and to the State of NSW and is therefore considered desirable and justified from an economic efficiency perspective.
Waste	• The existing consent allows the quarry site to receive up to 30,000 tonnes of cured concrete per calendar year for beneficial reuse/recycling, with 2,500 tonnes stored at the site at any one time. As part of the Project, it is proposed to increase this volume of cured concrete to 50,000 tonnes per year. There is no proposal to increase the volume stored on site at any one time (ie. 2,500 tonnes). • No additional waste types or volumes, above what is already approved, are proposed as part of the Project. • The EPA identified that the existing quarry EPL does not correctly list the receipt of cured concrete as a scheduled activity and identify the premises as a waste storage facility in accordance with the requirements of the POEO Act. The EPA agreed to vary the EPL to permit the receival of 30,000 tonnes per calendar year of cured concrete products, however noted that Gunlake would need to separately apply for a licence variation to be able to import up to 50,000 tonnes (2,500 tonnes at any one time). The EPA requested more detail about the capacity and suitability of the premises to receive and manage 50,000 tonnes of cured concrete waste, including detail on the storage location(s), tonnage verification and record keeping. • Gunlake confirmed that that the cured concrete will continue to be received and handled in the processing area (see Additional Information Response dated 12 October 2022).
Effluent Management	• The SWA provided a description of the existing wastewater and effluent management system at the quarry site. Both Council and WaterNSW raised concerns regarding the adequacy of the existing onsite wastewater and effluent system to cater for the proposed increase in workforce to 90 FTE personnel. • Gunlake indicated that the existing onsite septic system for wastewater management system, which comprises a primary collection tank (3,000 L) and an absorption trench system of aggregate covered by topsoil and grass, was approved by Council in 2010 under section 68 of the *Local Government Act 1993* (LGA Act). Clarified effluent

Issue	Findings
	(wastewater) from the primary collection tank is conveyed over the absorption trench system. The sludge from the primary collection tank is periodically transported off site to a licensed facility. Council advised that the existing system as designed and installed was suitable for 25 people. • Gunlake has committed to upgrade the effluent management system to accommodate the proposed increase in workforce, however has advised that given the wide range of effluent management technologies available, the selection of the best system may take several months. • In the interim, Gunlake has committed to installing a full pump-out system with no discharge to the environment (including infiltration or irrigation) prior to the commencement of the Project. It estimated that for 90 FTE personnel one effluent truck per week would be required to transport effluent off site. • The Department has accepted Gunlake's proposal of an interim pump out system, followed by the implementation of a long-term effluent management strategy at the quarry once the different options have been investigated. The Department recommend a condition accordingly, including requiring that the upgraded effluent management system is designed in consultation with EPA and Council following approval from Council under section 68 of the LGA Act.
Greenhouse Gas Emissions	• The AQIA includes an assessment of the greenhouse gases (GHGs) associated with the Project. • Numerous public submissions raised concerns that the Project is not aligned with the government net zero / carbon neutral policies. • The Department queried the GHG emission estimates for the Project compared to those estimated for the Extension Project. Revised emissions, including all Scope 3 estimates for third party product transport, were subsequently provided in Gunlake's response dated 7 November 2022 (see **Appendix C**). • The revised GHG predictions indicated that the Project would generate approximately 18,530 t $CO_{2\text{-}e}$ /year of Scope 1 and 2 emissions annually, primarily from the combustion of diesel and the use of electricity over the quarry life. The Project is also forecast to be associated with approximately 52,900 t $CO_{2\text{-}e}$ /year of Scope 3 emissions, which would be generated by third parties who transport and consume the Project's quarry products. These emissions are approximately 40% greater than that estimated to be generated In the Extension Project quarrying operations. • The GHG assessment indicated that the annual Scope 1 and 2 GHG emissions generated by the Project represent approximately 0.0136% of total GHG emissions for NSW and 0.0035% of total GHG emissions for Australia, based on the National Greenhouse Gas Inventory for 2019. • Gunlake has committed to implement GHG mitigation and minimisation measures from quarrying operations including quarry product transportation as follows: - regular maintenance and servicing of road trucks, plant and equipment to manufacturers emissions standards; - upgrading mobile equipment which are compliant with the USA – EPA Tier 3 or Tier 4 emissions standards; - efficient quarry staging and planning (e.g. minimising the rehandling of extracted material, optimisation of haul routes, etc.) to minimise fuel consumption; - utilising energy efficient plant and equipment during equipment purchasing; - utilising the use of energy efficient motors, regenerative drives, variable speed drives and soft starters within the quarry processing plant, where practicable; and - installing energy efficient lighting technologies and hot water and air conditioning systems wherever practical. • Gunlake also committed to continue to minimise indirect Scope 3 emissions by utilising higher truck payloads, to minimise the number of truck movements required to transport the quarries annual production. • The Department supports these measures and considers that the GHG emissions predicted to be generated by the Project are relatively minor and, in isolation, are unlikely to influence global emissions and climate change trajectories. • The Department has recommended that Gunlake be required to prepare and implement an updated AQGHGMP to further detail the measures to minimise GHG emissions associated with the operation of the Project.

7 Evaluation

The Department has carried out a detailed assessment of the merits of the Project, having regard to all of Gunlake's Project documentation, advice from NSW government agencies and an independent expert, and all submissions from members of the public and special interest groups. The Department's assessment has also considered the objects of the EP&A Act and relevant considerations under Section 4.15(1) of the EP&A Act.

The Department acknowledges that there are some community concerns regarding the Project, including but not limited to impacts on the safety and efficiency of the local road network, air quality, greenhouse gas emission and noise impacts.

Gunlake has sought to improve safety measures along the Primary Transport Route by committing to widening culverts and providing a consistent road treatment. The Department has recommended conditions requiring a range of additional repairs, delineation measures and sight distance maintenance measures to ensure the safety and maintain the efficiency of the local road network. Gunlake has also agreed to pay contributions to Council for the ongoing maintenance of the transport routes.

The Department also acknowledges that numerous community members consider that alternative product transportation options, such as rail should be adopted for the Project. The Department accepts that significant challenges exist for rail-based options and considers that Gunlake has demonstrated that there is currently no economically viable way to transport its quarry products by rail as part of the Project.

In relation to amenity, the Department acknowledges that one nearby residence may experience noise levels which represent a significant impact in accordance with the VLAMP. The Department has recommended conditions giving the owner of this residence voluntary mitigation and acquisition rights. The Department considers that with the implementation of strict mitigation, management and monitoring measures for other issues, including noise and air quality, the amenity of surrounding residents would be preserved.

The Department has assessed the impacts of the Project on other values including water resources, biodiversity, social, economic, waste and greenhouse gas emission impacts. The Department considers that the residual impacts of the Project can be suitable mitigated, managed and/or offset.

The Department has recommended a comprehensive and precautionary suite of conditions to ensure that the Project complies with contemporary criteria and standards, and that residual impacts are effectively minimised, managed, offset and/or compensated for. The recommended conditions were provided to key NSW Government agencies and their comments taken into account in finalising the conditions. Gunlake has reviewed and accepted the recommended conditions. The Department considers that the conditions reflect current best practice for the regulation of hard rock quarrying projects. A copy of the recommended consent is provided at **Appendix G**.

The Department recognises that the proposed continuation of the quarry would contribute a range of affordable, high-quality construction materials to local and regional markets. It would contribute to the supply of materials for the construction of housing and major regional infrastructure projects. The Department recognises the proximity between the Project's hard rock resource and the existing approved operations, and the synergies this presents for utilising existing infrastructure and reducing

capital costs. The Department accepts there is a strategic need for hard rock quarry materials in the Greater Sydney region and considers the site to be well-suited for the Project.

The Department also considers that the Project would result in significant economic benefits to the region and to the State of NSW through the supply of materials critical to the construction industry and is therefore justified from an economic efficiency perspective.

The Department has carefully weighed the environmental impacts of the Project against the significance of the Project's identified hard rock resource and the wider socio-economic benefits associated with extending the operation of the quarry for a further 30 years under a contemporary development consent. On balance, the Department considers that the benefits of the Project outweigh its residual costs and that the Project is in the public interest and is approvable, subject to the strict conditions of consent.

8 Recommendation

It is recommended that the Executive Director, Energy, Resources and Industry, as delegate of the Minister for Planning:

- **considers** the findings and recommendations of this report;
- **accepts and adopts** all of the findings and recommendations in this report as the reasons for making the decision to grant approval to the application;
- **agrees** with the key reasons for approval listed in the notice of decision;
- **grants consent** for the application in respect of SSD 12469087, subject to the conditions in the attached development consent; and
- **signs** the attached development consent and recommended conditions of consent (see attachment).

Recommended by:

27/02/2023

Nagindar Singh
Senior Environmental Assessments Officer
Resource Assessments

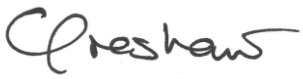
Recommended by:

27/02/2023

Jessie Evans
Director
Resource Assessments

9 Determination

The recommendation is **Adopted** by:



02/03/2023

Clay Preshaw
Executive Director
Energy, Resources and Industry Assessments

Appendices

Appendix A – Environmental Impact Statement

https://www.planningportal.nsw.gov.au/major-projects/project/40926

Appendix B – Submissions Report

https://www.planningportal.nsw.gov.au/major-projects/project/40926

Appendix C – Additional Information

https://www.planningportal.nsw.gov.au/major-projects/project/40926

Appendix D – Government Agency Advice and Community Submissions

https://www.planningportal.nsw.gov.au/major-projects/project/40926

Appendix E – Consideration of Statutory Requirements, Policies and Strategies

E1 Objects of the EP&A Act

The objects of the EP&A Act are the underpinning principles for all decision-making under the Act. They must be considered by the consent authority when determining a development application under the Act. **Table F1** summarises how the relevant objects in section 1.3 of the EP&A Act have been considered in the Department's assessment of the Project.

Table E1 | Consideration of Objects of the EP&A Act

Object of the EP&A Act	Consideration
(a) to promote the social and economic welfare of the community and a better environment by the proper management, development and conservation of the State's natural and other resources;	• The Project would provide significant economic benefits to the region and to the State of NSW. • While the Project has the potential to result in both positive and negative social impacts, overall the Department considers that any negative impacts can be appropriately managed under recommended conditions. • Social and economic impacts are discussed further in **Section 6.5**.
(b) to facilitate ecologically sustainable development by integrating relevant economic, environmental and social considerations in decision-making about environmental planning and assessment;	• The Department's assessment of the Project (see **Section 6**) has sought to integrate all significant environmental, social and economic considerations. • The Department considers the Project can be carried out in a manner that is consistent with the principles of Ecologically Sustainable Developments.
(c) to promote the orderly and economic use and development of land;	• The Project involves the deepening of an existing hard rock quarry pit which can be largely carried out using the existing site infrastructure and the unextracted resource within the existing quarry pit. No additional land disturbance is proposed. • The Department considers that this represents an orderly and economic use of land.
(e) to protect the environment, including the conservation of threatened and other species of native animals and plants, ecological communities and their habitats;	• The Department has assessed the biodiversity impacts of the Project in accordance with the relevant State legislation policies and guidelines. • The Project does not propose any direct clearing of native vegetation. The Department has assessed the likely indirect groundwater drawdown impacts of the Project on the biodiversity values within the prescribed impact area and has recommended an adaptive management approach which requires offsetting if impacts are determined to occur to biodiversity. These matters are further discussed in **Section 6.4**.
(f) to promote the sustainable management of built and cultural heritage (including Aboriginal cultural heritage);	• The Project is unlikely to impact on the Aboriginal cultural heritage and historic heritage values of the area. • The Aboriginal cultural heritage values would continue to be managed at the quarry in accordance with an approved Aboriginal Cultural Heritage Management Plan.
(i) to promote the sharing of the responsibility for environmental planning and assessment between the different levels of government in the State;	• The Department has led a whole-of-government assessment of the Project in consultation with other NSW government agencies and Goulburn Mulwaree Council, the relevant local government for this Project.

E2 Environmental Planning Instruments

E2.1 *State Environmental Planning Policy (Resources and Energy) 2021* (Resources and Energy SEPP)

Table E1 | Mandatory Matters for Consideration under Part 2.3 of the Resources and Energy SEPP

Section	Matter for Consideration	Consideration
2.16	Non-discretionary development standards for mining	• The Project has been assessed as complying with respect to noise and air quality. • The Project has been predicted to comply with the Level 1 minimal impact considerations under the *Aquifer Interference Policy* at all privately-owned groundwater bores.
2.17	Compatibility of proposed mine, petroleum production or extractive industry with other land uses	• The Department has undertaken a merit assessment of the Project, having regard to existing and approved land uses in the vicinity of the site. • The Department has also considered what it understands to be the preferred uses of land in the area, having regard to relevant Environmental Planning Instruments and strategic plans.
2.18	Consideration of the *Voluntary Land Acquisition and Mitigation Policy* (VLAMP)	• The Department has considered the VLAMP in its assessment of noise and air quality impacts. • Voluntary acquisition rights and mitigation on request rights under the VLAMP apply in the Project at two residential sensitive receptors.
2.19	Compatibility of proposed development with mining, petroleum production or extractive industry	• The Department has recommended a comprehensive suite of consent conditions to ensure the Project is undertaken in an environmentally responsible manner. • The conditions include mitigation requirements to avoid and minimise, to the greatest extent practicable, impacts on water resources and biodiversity values of the area.
2.20	Natural resource management and environmental management	• The Department has recommended a comprehensive suite of consent conditions to ensure the Project is undertaken in an environmentally responsible manner. • The conditions include mitigation requirements to avoid and minimise, to the greatest extent practicable, impacts on water resources and biodiversity values of the area.
2.21	Resource recovery	• The Department is of the view that the Project represents an efficient recovery of hard rock extractive resources. Accordingly, no specific conditions in this regard are considered necessary
2.22	Transport	• The Department consulted with TfNSW during the exhibition and assessment phases of the Project. • The Department considers that the Project would unlikely to result in an unacceptable level of impact to road network capacity or intersection performance. • The Department has recommended conditions requiring:

Section	Matter for Consideration	Consideration
		- the widening of five culverts and implementation of safety measure improvements along the Primary Transport Route; - Gunlake to make contributions to Council for the ongoing maintenance of the Primary and Secondary Transport Routes; - the preparation of the Traffic MP in consultation with TfNSW and Council to the satisfaction of the Planning Secretary; and - Gunlake to prepare, using experienced and independent expert/s endorsed by the Planning Secretary, a Transport Options Review within 5 years of the date of consent for the Project and every 10 years thereafter.
2.23	Rehabilitation	• The Department has recommended a condition requiring the progressive rehabilitation of disturbed areas at the quarry no longer required. • The life of quarry rehabilitation condition requires that it must be undertaken to the satisfaction of the Planning Secretary and must comply with the defined rehabilitation objectives.

E2.2 *State Environmental Planning Policy (Biodiversity and Conservation) 2021* (Biodiversity and Conservation SEPP)

The Project site falls within the Sydney Drinking Water catchment. The Biodiversity and Conservation SEPP requires all proposed developments in the Sydney Drinking Water Catchment to demonstrate neutral or beneficial effect (NorBE) on water quality.

The Department has recommended conditions prohibiting offsite discharges from the quarry's water storages until the existing Surface Water Management Plan is updated to include the detailed information on potential surface water discharges, including re-use and disposal; water quality and treatment; and mitigation and monitoring. The Department has recommended that, once approved, all surface water discharges from the site comply with all relevant provisions of the POEO Act, including any discharge limits (both volume and quality) set for the development in any revised EPL. The Department considers that these measure will ensure the continued operation of the water management system would achieve a NorBE on water quality within the drinking water catchment.

E2.2 *State Environmental Planning Policy (Resilience and Hazards) 2021* (Resilience and Hazards SEPP)

All hazardous substances for the carrying out of the development fall below the site storage and handling and the transportation screening tests under the Resilience and Hazards SEPP. The Department accepts that subject to Gunlake's existing and proposed management controls of the hazardous materials the Project would not be considered a potentially hazardous development.

The air and noise emissions from the Project would not result in unacceptable levels of pollution. The water emissions from the Project would be managed appropriately to ensure that no unacceptable

pollution results. Accordingly, the Department accepts that the Project would not be considered a potentially offensive industry under the Resilience and Hazards SEPP.

E2.3 *Goulburn Mulwaree Local Environment Plan 2009* (Goulburn LEP)

The Department considers the Project is generally consistent with the aims and provisions of the Goulburn LEP.

The Project site is zoned RU1 – Primary Production and RU2 – Rural Landscape under the Goulburn LEP. Extractive industries are permissible with development consent in both these zones.

In accordance with clause 7.2 (Terrestrial Biodiversity) of the Goulburn LEP, the Department notes that parts of the Project site are mapped as having terrestrial biodiversity values. The Department has considered the objectives of this clause and is satisfied that the development has been designed with sufficient management controls to avoid potential environmental impacts and therefore would be generally consistent with the objectives in the clause.

E3 Regional Plans and Strategies

The Department has considered several relevant policies and strategies in its assessment of the Project (see **Section 3.2**), including Council's *Local Strategic Planning Statement*, the Department's *South East and Tablelands Regional Plan 2036* and NSW Government's *A 20-Year Economic Vision for Regional NSW*.

The Department considers that the Project is consistent with the aims and objectives of these plans and strategies.

Appendix G – Recommended Instrument of Consent

https://www.planningportal.nsw.gov.au/major-projects/project/40926