

Gunlake Quarry Continuation Project

Responses to information requests

Prepared for Gunlake Quarries Pty Ltd

August 2022

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Gunlake Quarries Pty Ltd

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1 Introduction

Gunlake Quarries Pty Ltd (Gunlake) operates a hard rock quarry (the 'Quarry') located at 715 Brayton Road, Marulan NSW. The Quarry is approximately 7 kilometres (km) north-west of Marulan in the Goulburn Mulwaree local government area.

Since receiving the Gunlake Quarry Extension Project approval in 2017 (SSD 7090, NSW Land and Environment Court (LEC) Approval 2017/108663), the tonnage of saleable product dispatched by the Quarry has steadily increased. With an infrastructure boom in the Greater Sydney region, Gunlake forecast that demand for products from the Quarry will continue to increase. It is proposed to increase the tonnage of saleable products dispatched from the Quarry in response to this increased demand. This is known as the Gunlake Quarry Continuation Project (the 'Continuation Project'). The Continuation Project operations would remain similar to the currently approved Extension Project operations, with proposed changes primarily relating to the increased rate of extraction, processing and transport.

The *Gunlake Quarry Continuation Project (SSD-12469087) Environmental Impact Statement (EIS)* (EMM 2021a) was exhibited from 8 October to 4 November 2021. Public submissions in response to the exhibition of the EIS were lodged through the Major Projects Portal, and government agencies submissions were submitted directly to the Department of Planning, Industry and Environment (now, Department of Planning and Environment (DPE)).

The *Gunlake Quarry Continuation Project (SSD-12469087) Submissions Report* (EMM 2022) was prepared responding to the matters raised in the submissions received.

The following agencies commented on the Submissions Report:

- WaterNSW, 29 March 2022;
- Crown Lands, 29 March 2022;
- Environment Protection Agency (EPA), 11 April 2022;
- DPE-Biodiversity, Conservation and Science (DPE-BCS), 11 April 2022;
- DPE-Water, 13 April 2022;
- Transport for NSW (TfNSW), 31 May 2022 and 28 July 2022; and
- Goulburn Mulwaree Council, 19 July 2022.

Accordingly, DPE has made the following requests for information:

- Director, Resource Assessments, S. Donoghue, 1 April 2022;
- Acting Director, Resource Assessments, C. Dumbleton, 14 April 2022; and
- Director, Resource Assessments, J. Evans, 30 June 2022 (accompanied by an independent review prepared by Bitzios (2022)).

These requests are summarised in Table 1.1.

Table 1.1 **DPE requests for information**

Request date	Requested information	Information
1 April 2022	Landowner's consent from Crown Lands.	Crown Lands landowners consent provided on 23 June 2022 – see Appendix A.
	Outcomes of discussions with Goulburn Mulwaree Council regarding a Planning Agreement for the utilisation of local roads.	See Section 2.3.
	Digital shapefiles of spatial data used to prepare figures in the project's Environment Impact Statement (EIS), the Biodiversity Development Assessment Report (BDAR) and Groundwater Assessment	Information provided to DPE 8 April 2022.
14 April 2022	Response to the issues raised by the agencies who have provided advice on the Response to Submissions document.	Responses provided in this report.
	Landowner's consent from Crown Lands.	Crown Lands landowners consent provided on 23 June 2022 – see Appendix A.
30 June 2022	Additional information referred to in Section 5.2 of the independent transport review (Bitzios 2022) and regarding the transport options review.	See Section 2.4.

These responses provide, or further explain, commitments made by Gunlake since the exhibition of the EIS, including:

- the extension of the wide centre line treatment (WCLT) along the Primary Transport Route, as allowed by widening Culverts A to E, to provide a further 700 m of WCLT along the 7-km long route (see Section 2.1.4);
- installation of an expanded groundwater monitoring network (see Section 3.2.1); and
- a commitment to prepare an adaptive management plan (see Section 4.2.1).

2 Traffic and transport

Traffic and transport comments were provided by Council, TfNSW, the independent traffic and transport review commissioned by DPE (Bitzios 2022), and DPE. These comments are addressed below.

2.1 Road upgrades

2.1.1 Red Hills Road/Hume Highway intersection

Comment

In its 31 May 2022 letter, TfNSW noted that it considers that trucks are “departing the Hume Highway via Red Hills Road cutting the corner (southern side of the Red Hills Road/Hume Highway intersection) and damaging existing infrastructure within the road reserve (e.g. existing pits, etc)”; that the increased truck movements associated with the Continuation Project would increase this damage; and that it is not TfNSW’s responsibility to maintain the intersection/repair damage as a result of larger vehicles traversing outside the painted edge line. TfNSW believes that Gunlake must identify measures to stop/prevent heavy vehicles departing the Hume Highway via Red Hills Road cutting the corner.

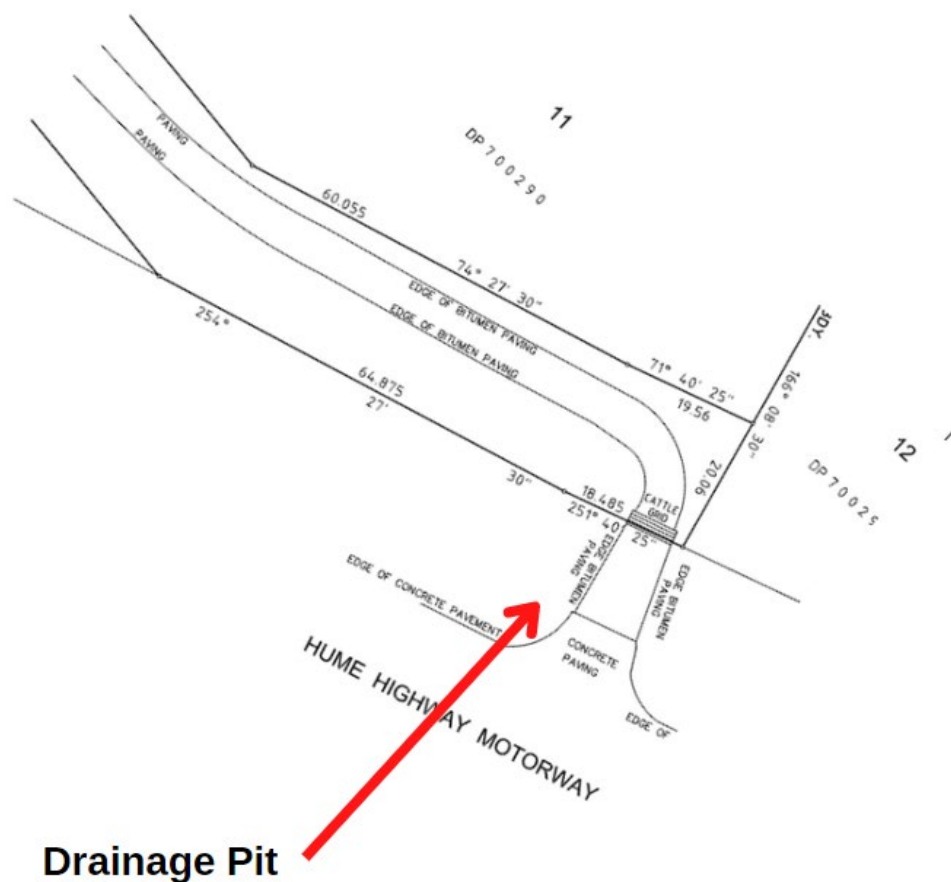
In its 28 July 2022 letter, TfNSW noted that while their 31 May 2022 comments generally apply, that TfNSW consider that the inside of the corner where damage has occurred is:

located outside the section of the Hume Highway that TfNSW understands it has the responsibility for ongoing management and maintenance. As such, the area falls within the responsibility of Goulburn Mulwaree Council for repair should it be damaged as well as for determination of what improvements may be required.

Bitzios (2022) recommend an assessment of the increase in traffic (and potential changes to vehicle size) on the geometric design for this intersection, including methods to mitigate the impact of vehicles cutting the corner when turn left from Hume Highway.

Response

The land section is clearly owned by TfNSW as is evident in Deposited Plan 700290 (Figure 2.1).



Drainage Pit

Figure 2.1 Deposited Plan 700290 extract showing TfNSW road corridor

The propensity for trucks to leave the travelling lane is dependent on the geometry of the intersection and the truck type. While the number of quarry-related trucks using the intersection will increase as a result of the Continuation Project, there will be no change to the types of trucks as a result of the Continuation Project.

In 2017/18, Gunlake designed and upgraded this intersection in consultation with Roads and Maritime Services (RMS). The intersection design applied the Austroads Design Vehicles and Turning Path Templates and was approved by RMS. Additional measures were installed to prevent trucks cutting the corner and leaving the travel lane as agreed with RMS. Although some damage to the shoulder and guideposts is evident, Gunlake do not believe that this damage was caused by Gunlake Quarry trucks.

As shown in the video footage provided to DPE, trucks can traverse the corner without leaving the travel lane.

The intersection geometry was approved by RMS/TfNSW based on quarry truck usage. The increase in truck numbers as a result of the Continuation Project will not change the path of trucks through the intersection. Further assessment of the intersection geometry as part of the assessment of the Continuation Project is therefore not warranted.

The intersection forms part of a Gazetted B-Double route and given that this issue exists with or without the Continuation Project, Gunlake maintain that the road authority has a responsibility to maintain, and if required design and implement any improvements to this intersection.

Gunlake notes that all previous improvements to this intersection were approved by RMS/TfNSW and does not agree with TfNSW’s position that “the area falls within the responsibility of Goulburn Mulwaree Council for repair should it be damaged”. Rather, Gunlake believe that maintenance of the intersection is TfNSW’s responsibility.

2.1.2 Brayton Road/quarry access road intersection

Comment

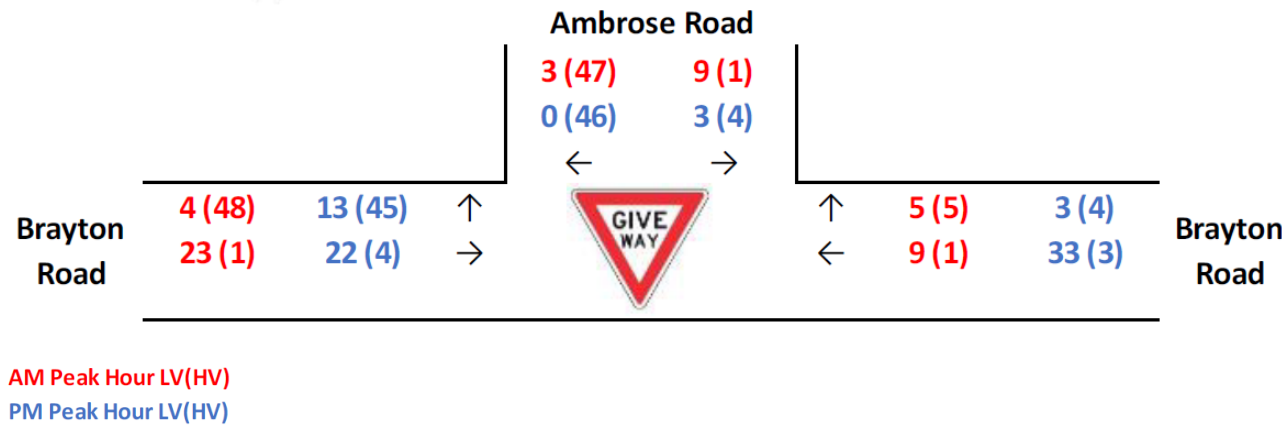
Bitzios (2022) recommend an intersection capacity assessment of the Brayton Road/quarry access road intersection.

Response

Intersection capacity assessments using SIDRA modelling for the key intersections of public roads are presented in the *Gunlake Quarry Continuation Project Traffic Impact Assessment* (TIA) (EMM 2021b, provided in EIS Appendix F.1). This did not include the Brayton Road/private quarry access road intersection. This intersection has been designed and constructed so that it does not limit, delay or impede traffic flow on Brayton Road.

The TIA is based on a maximum of 40 trucks dispatched from the quarry during a peak hour (TIA Section 4.4.2), ie an average of one outbound truck every 1.5 minutes and one inbound truck every 1.5 minutes (ie a peak of one movement every 45 seconds was included in the traffic assessments).

The future (2051) cumulative traffic volumes (ie Gunlake Quarry traffic plus all non-Gunlake Quarry traffic) are shown in TIA Figure 5.9. The traffic volumes on Brayton Road between the quarry and the Brayton Road/Ambrose Road intersection are shown in Figure 2.2 below.



Source: Figure 5.9 of EMM (2021b).

Figure 2.2 Future (2051) cumulative traffic volumes

There are low non-Gunlake Quarry traffic volumes on this section of Brayton Road. As there are no intersections between the Quarry and Ambrose Road, the traffic volumes shown in Figure 2.2 can be used to determine through traffic at the Brayton Road/quarry access road intersection. For example, it is predicted that there will be 27 light vehicles (4+23) and 9 heavy vehicles (48+1-40) southbound through traffic during the whole of the morning peak hour (about one southbound vehicle every two minutes). Given the low number of movements on each leg of the Brayton Road/private quarry access road intersection, the intersection SIDRA modelling was not warranted for this intersection as it is clear that this has ample capacity.

2.1.3 Sight lines

Comment

Bitzios (2022) commented that the traffic assessments do not detail or assess the available intersection sight distances against Austroads Guideline and that the proposed treatments do not address the sight line restrictions and therefore would not lower the residual risk as suggested in the ARRB Road Safety Assessment. Accordingly, Bitzios recommend a detailed intersection sight distance assessment of Brayton Road/Ambrose Road, Ambrose Road/Red Hills Road, quantifying any sight distance constraints and proposed mitigation measures.

Response

The required and available sight distances are quantified in Table 1 and Table 2 of ARRB (2022) provided in Appendix C of the Submissions Report. This was based on a further inspection of the intersections, including taking physical measurements of sight distances. This found:

- Brayton/Ambrose Road intersection:
 - Ambrose Road approach: "Requirement is not achieved due to the road curve approach. This approach sight distance cannot be reasonably achieved given the approach geometry. Estimated sight distance = ~130 m. **Suggested action** – install advanced T-intersection warning sign and maintain delineation."
 - Brayton Road westbound approach: "Not achieved due to roadside vegetation. Measured sight distance = 218 m. **Suggested action** - clear/trim vegetation to improve the line of sight available to light vehicle drivers; this will then exceed the minimum SIRD required."
 - Required sight line distances achieved on the other approaches.
- Ambrose Road/Red Hills Road intersection:
 - Red Hills Road westbound approach: "Not achieved for light vehicles due to the road incline and roadside vegetation. This approach sight distance cannot be reasonably achieved given the approach geometry. Measured sight distance = 131 m. **Suggested action** - Trimming/clearing roadside vegetation will improve line of sight available to light vehicle drivers."
 - Required sight line distances achieved on the other approaches.

Gunlake supports the findings of the Road Safety Assessment Report (ARRB 2021a, provided in Appendix F.2 of the EIS), the Road Safety Audit (ARRB 2021b, provided in Appendix C of the Road Safety Audit) and ARRB (2022) provided in Appendix C of the Submissions Report.

2.1.4 Culverts and wide centre line treatment

Comment

Gunlake have committed to widening Culverts A to E. This approach is supported in Section 5.2 of the independent review commissioned by DPE (Bitzios 2022) that recommends that widening of Culverts A–E (not Culvert F) is imposed as a consent condition. However in Section 5.2, Bitzios (2022) also recommend that "[f]urther justification should be provided by the applicant as to why the WCLT [wide centre line treatment] is not extended through Culvert F".

Council request that DPE impose a condition requiring Culverts A–F to be widened.

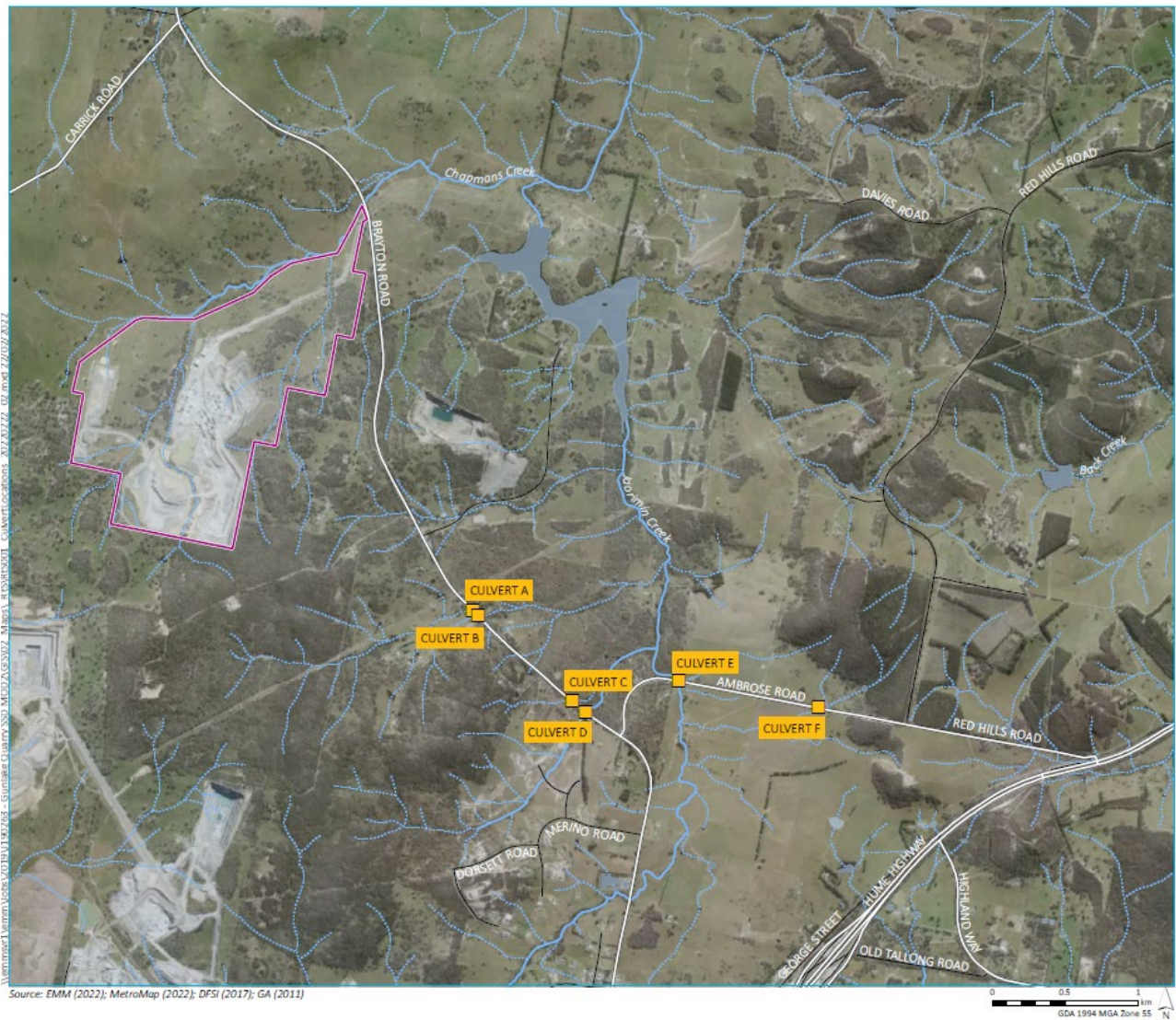
Response

A wide centre line treatment (WCLT) was provided along the majority of the 7-km long Primary Transport Route as part of the road upgrades financed by Gunlake following the approval of the Gunlake Quarry Extension Project. The WCLT provides a minimum 1-m separation between passing vehicles (Photograph 2.1). The pavement was widened along sections of the Primary Transport Route to allow the WCLT to be provided.



Photograph 2.1 **Wide centre line treatment on Brayton Road (July 2018)**

It is proposed to widen Culverts A to E (culvert locations are shown in Submissions Report Figure 3.1 which is replicated in Figure 2.3 below) as part of the Gunlake Quarry Continuation Project to allow the WCLT to be extended across these culverts. The additional sections of WCLT are described below along with an explanation of why there would be negligible benefit from widening Culvert F.



Source: Figure 3.1 of EMM (2022).

Figure 2.3 Culvert locations

It is proposed to widen Culverts A–E along the Primary Transport Route (see Section 3.2 of the Submissions Report) to allow the WCLT to continue across these culverts (Table 2.1). Widening the culverts will provide an additional 700 m WCLT along the Primary Transport Route.

Table 2.1 Primary Transport Route – sections with WCLT

Primary Transport Route section	Associated culverts	Additional WCLT length (approximate)
Brayton Road	Culverts A and B	170 m
Brayton Road	Culverts C and D	410 m
Ambrose Road	Culvert E	120 m
Total		700 m

Culverts A–E will be installed and the WCLT extended prior to Gunlake Quarry truck numbers exceeding those approved under LEC Approval 2017/108663.

Further information on widening the culverts is provided in ARRB responses to Council and TfNSW queries, provided in Appendix C of the Submissions Report.

It is not proposed to extend the WCLT on the steep incline on Ambrose Road. As noted by ARRB:

The WCLT does not currently extend through the section of Ambrose Road from Culvert F to Red Hills Road. Travelling eastbound, this section is straight and relatively short and rises steeply to the T-intersection with Red Hills Road, causing heavy vehicle traffic to slow considerably. While there are good lines of sight for traffic in each direction, overtaking is restricted by linemarking; this is due to the location of the Red Hills Road intersection at the cresting of the road at the top of the incline section.

Extending the WCLT along this section of the Primary Transport Route would complete a consistent traffic arrangement, however, the physical constraints to widening the road formation in this section are considerable. In addition to widening the box culvert, works to provide a WCLT along this section would require:

- a. Large cut and fill batter works between the road and the adjoining properties. These works would encroach into the adjoining properties, impacting them with fill, loss of land, removal of existing vegetation, and restriction of existing and potential future access.
- b. An asymmetrical adjustment of the road alignment to avoid the altering the large gabion rock retaining wall over the crest in Ambrose/Red Hills Road. This adjustment would create undesirable 'kinks' in an otherwise straight length of road, and this may create other road safety issues for traffic traveling in each direction.
- c. Fill works at the north-east and north-west corners of the Red Hills Road intersection, further encroaching into the adjoining properties [which would require this private land to be purchased].

As the WCLT does not extend up the steep incline on Ambrose Road, widening of Culvert F would only allow the WCLT to be extended across the culvert itself which would be of little benefit. This position is supported by Bitzios (2022) which states in Table 4.3:

The ameliorative works to improve the consistency of wide centre line treatments offers a safety benefit to all users of the road. Culvert F is located on a section of Ambrose Road, with good sightlines and limited horizontal curves. As such, maintaining this culvert as per existing conditions is considered appropriate.

2.1.5 Road upgrade plans

Comment

Council commented that detailed road upgrade plans for all works must be submitted to Council for approval in accordance with Section 138 of the *Roads Act 1993* or as outlined in the Planning Agreement.

Response

Gunlake will submit an application for an approval under Section 138 of the *Roads Act 1993* to widen Culverts A–E and to extend the WCLT. Detailed plans will be supplied as part of the application.

Gunlake do not propose to enter into Planning Agreement as part of the Continuation Project (see Section 2.3).

2.1.6 B-Doubles

Comment

Council commented that any proposals for the future use of haulage trucks beyond the currently approved higher mass limit B-Doubles (25/26m) on the Primary and Secondary Haulage Routes will prompt a structural assessment of bridges and culverts along the Primary Transport Route.

Response

The Heavy Vehicle National Law (HVNL) provides General Mass Limits (GML), Concessional Mass Limits (CML) and Higher Mass Limits (HML) for heavy vehicles operating on the national road network. The Primary Transport Route is a Gazetted HML 25/26m B-double route. The suitability of a road is considered by the Regulator when issuing access permits.

It is not proposed to change the types of quarry trucks used as a result of the Continuation Project and the current systems will continue to be applied.

2.1.7 Road Safety Assessment Report actions

Comment

Council commented that it requires all actions identified in the Australian Road Research Board *State Significant Development Road Safety Assessment Report* (ARRB 2021), which is provided in Appendix F.2 of the EIS, for the Primary Transport Route to be implemented prior to commencement of operations.

Response

Gunlake is supportive of this recommendation but notes that the majority of the actions identified are the responsibility of the road authority (Council) and should be completed as part of ongoing road maintenance for which section 7.11 contributions are paid and which will increase as truck numbers increase.

2.1.8 Passing lane environmental impacts

Comment

Bitzios (2022) recommend explaining the extent of environmental impact associated with the widening of the Primary Transport Route on steep inclines to provide a breakdown lane or a passing lane.

Response

It is not proposed to construct a passing lane. This is supported by the passing lane analysis presented in Section 4.3 of the *Road Safety Assessment Report* (ARRB 2021). This is confirmed by Bitzios (2022) Section 3.3 that states:

Given the very low volume of non-quarry related traffic on Ambrose Road and the relatively short distance of traffic impacts by slow-moving truck, Bitzios Consulting is of the view that the impacts and cost would outweigh the benefits of constructing climbing lanes on Ambrose Road.

This section of Ambrose Road is in a one-sided cutting. Road widening would require cut and fill earthworks along the entire section – extending the footprint beyond the additional pavement area and the road reserve. Impacts associated with road widening would include:

- clearing of native vegetation on the north and/or south side of the road; and
- clearing of commercial pine plantation trees on the north side of the road (Figure 2.4).

Widening would require private land acquisition along the road corridor. The required land is not for sale and Gunlake has no power to compulsorily acquire the land.



Source: MetroMap

Figure 2.4 Ambrose Road – steep incline section

2.2 Speed limit

Comment

Council commented that they continue to advocate with TfNSW and the NSW Government Local Member of Parliament that the speed limit for the Primary Transport Route be reduced to 80 km/h for all vehicles.

Response

Gunlake are also advocating for an 80 km/h speed limit along the Primary Transport Route.

2.3 Planning agreement

Comment

Council seeks to enter into a Planning Agreement with Gunlake to address the outstanding pavement width, pavement integrity and developer contributions matters.

Response

As noted in Submissions Report Section 4.3.7iii, Gunlake may consider entering into a Planning Agreement in place of section 7.11 contributions in the future. However, details of the potential contents of a Planning Agreement have not been provided by Council to Gunlake and therefore this is not proposed as part of the Continuation Project.

2.4 Transport options review

Comment

Bitzios (2022) recommended that the Transport Options Review should be expanded. DPE recommended that Gunlake considers providing additional information regarding social and environmental costs and benefits of rail and road transport, information from previous assessments, and in particular the NSW Land and Environment Court's (NSW LEC) consideration of Gunlake Quarry Extension Project application (SSD-7090). DPE requested that this information be consolidated into a single report.

TfNSW commented on the need for a transport options assessment in their submission (3 December 2021) on the EIS. This information was presented in the Submissions Report Section 4.5.2. TfNSW submissions on the Submissions Report (31 May 2022 and 28 July 2022) did not raise any further comments regarding transport options assessment.

Response

It is important to note that that Gunlake is not on rail at either Marulan or in Sydney and has applied for road transport only for the Gunlake Quarry Continuation Project.

a Gunlake Quarry Extension Project transport options assessments

Gunlake extensively assessed the financial, economic and environmental costs and benefits of transporting Gunlake Quarry products by road and rail as part of the Gunlake Quarry Extension project (see Submissions Report Section 4.5.2). As part of these assessments, the *Gunlake Quarry Rail Transport Study* (Hatch 2016) found that the lowest cost rail option (for the transport of 1.5 mtpa) would add a cost of \$121 million compared to road transport, making the Extension Project economically unfeasible.

b Gunlake Quarry Extension Project NSW Land and Environment Court Proceedings

As part of the reasons for refusal for the Gunlake Quarry Extension Project Application, the determining authority, the Planning Assessment Commission (PAC), considered that Gunlake had provided insufficient information to allow a genuine and accurate consideration of road versus rail-based haulage. Gunlake commenced a Land and Environment Court appeal against the refusal. The DPE (in consultation with the PAC), raised a number of contentions in the appeal which included a road versus rail-based haulage contention.

The DPE and Gunlake engaged in negotiations in an effort to resolve the contentions at a Court mandated conciliation conference pursuant to section 34 of the *Land and Environment Court Act 1979*. Following those negotiations, the DPE dropped all contentions, including the road versus rail-based haulage contention, and agreed to enter into a section 34 agreement whereby the Court would approve the Project Application, subject to conditions. Specifically, DPE (informed by its consultation with the PAC), agreed that Condition 29 was adequate to resolve the road versus rail-based haulage contention.

c Gunlake Quarry Continuation Project transport options

Gunlake Quarry Continuation Project transport options are addressed in Submissions Report Section 4.5.2 and the cost of rail transport for the Continuation Project, compared to the Extension Project, is further explained below.

The *Gunlake Quarry Continuation Project Economic Assessment* (Gillespie Economics 2021) found that the Continuation Project would have an incremental net benefit to the NSW community of \$74 million when transporting 4.2 tonnes per annum (mtpa) of quarry products by road. Assuming that the capital costs for the higher-capacity rail infrastructure were no higher for the Continuation Project, implementation of the lowest cost rail option (\$121 million) would result in the Continuation Project shifting from having a net benefit of \$74 million to the community, to having a net cost of \$47 million.

Therefore, rail transport of Gunlake Quarry products is not economically feasible regardless of whether 1.5 mtpa or 4.2 mtpa is transported. A rail option is not financially feasible in either case due to the magnitude of the capital costs, and to a lesser extent the operation and maintenance costs.

d Policy

The State Government has no official planning policy which favours rail transport over road transport for the movement of quarry products within NSW, rather, the Strategies and Plans call for a light-handed approach by government, reduction in the burdens of compliance, reduction in regulatory inconsistency, cutting red tape, and achieving a level playing field. In the absence of a clear State Government policy on this issue there is no basis for including the use of rail in this project and Gunlake has not applied for a rail-based option.

From a social impact perspective, the connection from the Quarry to the Hume Highway is 7-km long and passes eight houses at distance, whereas a connection from a rail unloading terminal to the final destinations of the aggregate would pass thousands of houses within residential areas.

e Further assessment

At the 9 February 2022 meeting, DPE requested that the key points regarding the transport options assessments be summarised. We believe that the information presented in Submissions Report Section 4.5.2 and above addresses DPE's request. Gunlake do not believe that DPE's request to prepare a further consolidated transport assessment is reasonable.

Condition 29 requires a review every 10 years. Only 5 years have passed and as described in the RTS and above, rail transport clearly remains economically and practically unfeasible (and with more environmental impacts) regardless of the proposed tonnage increase. In this respect, there has been no change since this issue was first raised during the Extension Project application and Court appeal (which was ultimately resolved through a Court ordered approval). However, Gunlake would accept Condition 29 (which was agreed as part of the Court ordered approval) being carried into the new consent to address community concerns.

2.5 Conditions

Comments request a number of Conditions to be included within the Continuation Project Consent (Table 2.2).

Table 2.2 Requested conditions

Requested condition	Source	Response	Further information
Increased frequency of independent environmental audits (currently three years);	Bitzios (2022)	Not considered to be required/reasonable.	Section 2.5.1
Provide 6-monthly product transport reports to TfNSW	Bitzios (2022) TfNSW	Not considered to be required/reasonable.	Section 2.5.2
Widening of Culverts A–E, as identified in the Submissions Report	Bitzios (2022)	Gunlake notes Bitzios's support for a condition requiring the widening Culverts A–E. This accords with Gunlake's commitments. It is noted that Bitzios does not extend this recommendation to Culvert F.	Section 2.1.4
Provide a Transport Options Review which is consistent with Schedule 3, Condition 29 of Land and Environment Court issued consent (Ref: Appeal o.2017/108663),	Bitzios (2022)	Gunlake accepts that the Transport Options Review be prepared in line with Schedule 3, Condition 29 of Land and Environment Court issued consent (Appeal 2017/108663), ie 10 years after this consent was commenced.	Section 2.4
If a Planning Agreement is not executed, Council request the following consent conditions:	Council	Gunlake do not propose to enter into a planning agreement with Council (see Section 2.3) so the Council's requested conditions require consideration.	-
Prior to the consent becoming operational, written confirmation is to be provided from Council demonstrating that the following matters have been addressed by the applicant:	Council	-	-

Table 2.2 Requested conditions

Requested condition	Source	Response	Further information
a) A 3 m clear zone be implemented along the entirety of the primary haulage route, or alternatively the use of safety barrier in locations where this cannot be achieved, including a plan identifying when the works will be undertaken.	Council	Already provided along the Primary Transport Route.	Section 2.5.3
b) Provision of a Wide Centre Line Treatment through all affected culverts (Culverts A-F) along the Primary Haulage Route ¹ . Prior to endorsement Council will require a written commitment from the applicant that identifies the timeframe in which the works are to be completed.	Council	It is proposed to provide a WCLT across Culverts A–E. It is not proposed to provide a WCLT across Culvert F. Culverts A–E will be installed prior to Gunlake Quarry truck numbers exceeding those approved under LEC Approval 2017/108663.	Section 2.1.4
c) Provision of documentation demonstrating that the pavement of the entirety of the haulage route (incl. the secondary haulage route) can achieve the required minimum 10 year expected lifespan. This documentation must include a desktop audit by an independent geotechnical consultant (of whom the appointment will be made upon the agreement of Council and the applicant) to validate the methodology used to determine pavement life.	Council	This documentation, <i>Gunlake Quarries – FWD and Pavement Remaining Life</i> , was prepared as required by Section 7.2.3 of the Goulburn Mulwaree Development Control Plan 2009, by Pavement Management Services and is provided in Submissions Report Appendix E.	Section 2.5.4
d) The applicant must pay to Council a financial contribution toward the maintenance of Council roads along its primary and secondary transport routes. The contribution must be determined in accordance with the Goulburn Mulwaree Local Infrastructure Contributions Plan 2021, any subsequent relevant contributions plan adopted by Council, or in accordance with any Planning Agreement or otherwise entered into by the applicant and Council.	Council	Gunlake will pay a financial contribution toward the maintenance of Council roads along its primary and secondary transport routes determined in accordance with the <i>Goulburn Mulwaree Local Infrastructure Contributions Plan 2021</i> .	-

1. Wording reflects Council Resolution 2022/238 passed on 19 July 2022 rather than 21 July 2022 submission to DPE which incorrectly reports the resolution.

2.5.1 Independent environmental audits

Comment

See requested condition in Table 2.2.

Response

Independent environmental audit requirements are a standard part of the Environmental Management, Reporting and Auditing appendix of state significant development consents. These comprehensive audits require assessment of the environmental performance of the development; compliance with consent conditions; compliance with other permits and licences (including the EPL and water licences); the adequacy and compliance of all assessments, strategy, plan or program required under the consent and identification of measures or actions to improve the environmental performance of the development, and/or any assessment, strategy, plan or program required under the abovementioned approvals. They are required to be completed every three years for most developments. Bitzios (2022) do not explain why they recommend more frequent independent environmental audits of the entire quarry and it is believed that it would be inconsistent with other quarry consents to reduce the audit frequency from once every three years.

2.5.2 Product transport reporting

Comment

See requested condition in Table 2.2.

Response

Schedule 3, Condition 23 of the Extension Project Approval (Land and Environment Court (LEC) Approval 2020/00327172) requires that transport records are published on the project website every six months:

23. The Applicant must keep accurate records of all truck movements to and from the site (including time of arrival and dispatch) and publish a summary of records, which includes daily maximum and calendar month averages, on its website every 6 months.

Gunlake complies with this condition. The published information is accessible to TfNSW through Gunlake's website.

It is noted that this condition is more onerous than the conditions for comparable operations. For example, Schedule 2, Condition B83 of the Marulan South Limestone Mine Continued Operations Project Development Consent (granted 19 August 2021) and Schedule 3, Condition B33A of the Lynwood Quarry (DA 128-5-2005, as modified in May 2016) require that a summary of transport records is published the quarries' Annual Reviews.

A condition equivalent to these consents is therefore requested.

2.5.3 Clear zone and safety barrier

Comment

See requested condition in Table 2.2.

Response

As noted in Submissions Report Section 4.2.2i and the ARRB responses to Council and TfNSW Queries (Submissions Report Appendix C), previous upgrades of the Primary Transport Route have provided minimum 3-m wide clear zones in accordance with the Austroad Guide, except through deep cutting sections and across the road culvert or high fill embankments, where steel guardrail has been installed.

2.5.4 Pavement life

Comment

See requested condition in Table 2.2.

Response

Section 7.2.3 'Heavy vehicle haulage development routes' of the Goulburn Mulwaree Development Control Plan (DCP) 2009 specifies the information to be provided in a road condition and pavement assessment:

Information to accompany an application for development involving heavy vehicle haulage should establish the existing road condition and include an assessment of the remaining pavement life. This assessment should be undertaken by an appropriately qualified professional and should factor in the estimated additional load to be generated by the heavy vehicle haulage development and the resulting impact on the existing road. Design traffic should be calculated in equivalent standard axles (ESAs).

The following information should be submitted with an application for heavy vehicle haulage development:

- Pavement testing results for the intended haulage route/s;
- An estimation of the remaining pavement life of all intended haulage routes given the anticipated additional load from the proposed development; and
- A plan and/or schedule identifying any upgrades required to the pavement to ensure that the road has a minimum pavement life of 10 years taking into account the additional load.

The *Gunlake Quarries – FWD and Pavement Remaining Life* report, prepared by Pavement Management Services (provided in Submissions Report Appendix E) assesses the remaining pavement life of the Primary and Secondary Transport Routes.

The report uses Austroads remaining pavement life methodology as well as internationally accepted and standard road-testing methods and calculations. The report meets the requirements of the DCP.

Pavement Management Services is an independent consultancy specialising in pavement testing, design, evaluation and management of roads, airports and ports. More information is available on their website: <https://www.pavement.com.au/>.

The assessment included evaluation of the roads under existing traffic volumes and under the Continuation Project traffic volumes. The report found:

This report presents the outcomes and methodologies adopted in the analysis of the recently completed Falling Weight Deflectometer assessment for Gunlake Quarries. Three traffic scenarios were considered separately for remaining life analysis to provide a comprehensive evaluation of potential developments.

Considering all roads evaluated as part of this study, the structural remaining life is seen to be at least 15 years based on the Austroads remaining life methodology. This analysis is based on the pavement remaining in its current configuration of a spray sealed flexible unbound pavement that is subject to permanent deformation (rutting) being the primary mode in which these roads can be expected to fail.

3 Water

Comments regarding water supply and groundwater were provided by DPE-Water and DPE- Biodiversity and Conservation, now DPE-Biodiversity, Conservation and Science (BCS). These comments are addressed below.

3.1 DPE-Water recommended pre-approval requirement: water demand

Comment

DPE-Water recommend that prior to determination, that the proponent addresses the risk to the project of uncertainty in meeting water demands during a dry period and the need to obtain additional approvals and licences.

Response

The Surface Water Assessment (SWA) (EMM 2021c, provided in EIS Appendix F.6) includes an updated water balance model. Two operational water balance scenarios are considered with a dry, median and wet year modelled for each scenario (see SWA Section 5.4):

- Scenario 1 (2022 to 2026): pit excavation above the groundwater table, with approximately 2.2–4.2 mtpa production; and
- Scenario 2 (2027 to 2051): Pit excavation below the groundwater table, with up to 4.2 mtpa production.

With a dry year (10th percentile rainfall), median year and wet year (90th percentile rainfall) modelled for each scenario. The water modelling predicted that 23 ML/year will need to be imported during a dry year during Scenario 1 (SWA Table 5.4) but that negligible (1 ML/year) or no water will need to be imported under all other conditions. Scenario 1 represents quarry operations as currently approved and approval of the Continuation Project will not alter these predictions. The shortfall in a dry year would occur because the quarry does not have access to groundwater flowing into the pit.

As described in Section 5.2 of the Groundwater Assessment (EMM 2021d, provided in EIS Appendix F.5), monitored groundwater levels indicate that quarry operations to date have not impacted ground level levels. However by 2026, water take to the quarry void is expected. The quarry dams are currently close to capacity and it is likely that the wetter than usual weather patterns will continue into summer. Scenario 1 extends to 2026 (ie 4 years) and it is very unlikely that a dry year (10th percentile rainfall) will occur in this period. However, should this occur Gunlake could access the groundwater, for which WALs are held, to make up any shortfall or import water.

3.2 DPE-Water recommended post-approval requirements

DPE-Water's recommended post-approval requirements are provided in Table 3.1 along with Gunlake's responses.

Table 3.1 DPE-Water recommended post-approval requirements

Recommendation	Response
Water supply	
Update the Soil and Water Management Plan to reflect monitoring, metering and management measures to report on groundwater and surface water take and potential impacts to water sources due to the activity.	Accepted.
Report on water take at the site each year (direct and indirect) in the Annual Review. This is to include water take where a water licence is required and where an exemption applies. Where a water licence is required, the water take needs to be reviewed against existing water licences.	Accepted.
Ensure sufficient water entitlement is held in a water access licence/s to account for the maximum predicted take for each water source prior to take occurring. Ensure that relevant nomination of work dealing applications for Water Access Licences proposed to account for water take by the project have been completed prior to the water take occurring. Be aware of the rules of the relevant water sharing plans and how they may impact the project and ability to trade water.	Accepted. Gunlake hold Water Access Licence (WAL) 42340 to access 37 ML units of the Goulburn Fractured Rock Groundwater Source annually and are finalising WAL 10AL124684 to access 35 ML units of the same source annually to account for the maximum inflows to the pit (68 ML/year). Gunlake notes that the Goulburn Fractured Rock Groundwater Source is likely to be amalgamated with the Coxs River Fractured Rock Groundwater Source and become the Lachlan Fold Belt Greater Metropolitan Groundwater Source when the revised Greater Metropolitan Region Groundwater sharing plan becomes operational in 2023. These requirements will be reviewed annually.
Groundwater impacts	
That the conditions of approval ensure commitment to each recommendation of the department's EIS submission OUT21/15056 prior to implementing the proposed project:	-
reporting water take (direct and indirect) in the Annual Review	Accepted.
- developing a numerical groundwater flow model - submitting an independent review of the groundwater model prior to construction	Not accepted – see Section 3.2.1.
'make good' provisions for neighbouring groundwater users	Accepted. There are only two registered water bores within a 2.5-km radius of the quarry. One is owned by Gunlake and one by Holcim. The <i>Gunlake Quarry Soil and Water Management Plan</i> will be updated to include 'make good' provisions in accordance with the Aquifer Interference Policy.
DPE consultation on updating the Water Management Plan	Accepted.

3.2.1 Numerical groundwater model

Numerical groundwater models are used to estimate direct impacts to water bore and environmental receptors, and induced surface and groundwater takes due to proposed and/or ongoing activities, and to determine potential drawdown impacts.

The current Gunlake Quarry analytical groundwater model is very conservative compared to a numerical groundwater model and will overestimate surface and groundwater 'take' impacts and potential drawdown impacts within the fractured rock aquifer. The maximum predicted water take is 68 ML/year.

Water access licences for a total of 72 ML/year will be held to account for the conservatively modelled maximum predicted water take (68 ML/year).

It is proposed to expand the groundwater monitoring network to provide bores on the north, east, south and west of the quarry (see Section 3.3.2) to confirm (or otherwise) that impacts to groundwater levels are no greater than predicted. Monitored groundwater levels will be reviewed annually and compared to the groundwater level predictions as part of the Annual Review.

Specific groundwater monitoring will be undertaken as part of the Adaptive Management Plan to confirm (or otherwise) that impacts to Yellow Box – Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion (Box Gum Woodland Endangered Ecological Community – Plant Community Type (PCT) 1330) are not occurring (see Section 4.2.2).

Given the conservative nature of the current analytical groundwater model predictions, the expanded groundwater monitoring network, and the application of the Adaptive Management Plan; development of a numerical groundwater model is unlikely to yield information relevant to the operation of the quarry or that is of practical value for the assessment of potential impacts that it not better obtained through environmental monitoring.

It is therefore not accepted that a numerical groundwater model is required.

However, a numerical groundwater could be prepared if, over time, environmental monitoring shows that predicted impacts (eg groundwater drawdown at boundaries or beneath PCT1330 exceeds the EIS predictions) are exceeded and the cause of these exceedances are unknown.

3.2.2 Expanded groundwater monitoring network

It is proposed to expand the groundwater monitoring network to validate the findings of the groundwater model and to determine if there any changes to water levels below PCT1330 (see Section 4.1). The proposed monitoring bore locations are listed in Table 3.2 and are indicatively shown on Figure 3.1. Actual locations will be determined as part of the quarry's management plans.

Table 3.2 Proposed monitoring bores

Proposed bore	Approximate bore depth (m bgl)	Purpose	Notes
GWS1 (40WA418 484)	120	Monitoring bore/stock and domestic supply.	Drilling to continue through any seepage zones until a supply is obtained from an open fracture zone. The bore should be cased to solid rock, cemented at surface and left open against the fractured rock (unless unstable) to stop the ingress of stormwater and any perched water/interflow that occurs in the weathered zone after a rainfall event.
GM37	60	Monitoring groundwater levels north of the pit.	-

Table 3.2 **Proposed monitoring bores**

Proposed bore	Approximate bore depth (m bgl)	Purpose	Notes
GM38	10	Monitoring potential impacts to PCT1330 due to water table draw-down.	Nested site: - One bore to the base of the weathered zone (approximately 10 m) to determine if any perched water occurs in this zone – if no water encountered during drilling, leave open as a ‘dry’ monitoring bore but continue to monitor. - One bore adjacent monitoring bore to the first aquifer zone in the fractured rock (approximately 75 m).
GM39	75	Monitoring groundwater levels east of the pit.	
GM40	100	Monitoring groundwater levels south of the pit.	-

mbgl: metres below ground level.

The current monitoring bores, GM6 and GM13, would be discontinued.

Loggers will be installed in each bore to continuously monitor water levels.

Annually, the measured levels will be compared to the groundwater levels predicted by the groundwater model. The results will be reported in the Annual Review.

The monitored groundwater levels at the nested site (GM38/GM39) will be used as part of the adaptive management regime (see Section 4.2.2).



Source: EMM (2021, 2022); Google Earth (2019); DFSI (2017); DPI (2015); GA (2011)

KEY

- Site boundary
- Surface elevation (mAHD)
- == Major road
- Minor road
- Watercourse/drainage line
- Waterbody
- Indicative groundwater monitoring location
- + Proposed groundwater bore (approximate depth below ground level [bgl])

Proposed groundwater monitoring network

Gunlake Quarry Continuation Project

Figure 3.1

3.3 Discrepancies between Gunlake Quarry Continuation Project and Holcim's Lynwood Quarry assessments (DPE-BCS Issue 1)

Comment

DPE-BCS commented that:

- there are significant discrepancies between the groundwater modelling for the Gunlake Quarry Continuation Project and Holcim's Lynwood Quarry and that the Gunlake Quarry groundwater model has ignored groundwater level differences and geological features;
- a perched aquifer is inadequately assessed; and
- it is unclear why the Gunlake Quarry groundwater model only shows drawdown to the south.

Responses are provided in Section 3.3.1 to Section 3.3.3.

3.3.1 Groundwater model

The Gunlake Quarry Continuation Project groundwater model is presented in the *Gunlake Continuation Project Groundwater Assessment* (GWA) (EMM 2021d provided in EIS Appendix F.5). The most recent Lynwood Quarry groundwater model is presented in the *Lynwood Quarry Extraction Area Modification Groundwater Assessment* (Hydro Toolkit 2015) provided as Appendix 9 of the *Environmental Assessment* (Umwelt 2015) to support the Modification 4 application to develop the Lynwood Quarry Granite Pit.

i Lynwood Quarry groundwater model

The Holcim Lynwood Quarry Granite Pit is in a significantly different geological unit (Lockyersleigh Granite) than the Gunlake Quarry Pit (Barrallier and Joarimin Ignimbrite).

There is an inconsistency between groundwater levels within in the Lynwood Quarry GWA:

- existing groundwater levels are provided in Lynwood Quarry GWA Figure 2.5: the water level shown on the eastern side of the (future) Granite Pit is approximately 675 mAHD, and about halfway between the Granite Pit and Gunlake Quarry Pit is estimated to be approximately 675–680 mAHD; while
- modelled steady state pre-quarrying groundwater levels are provided on Lynwood Quarry GWA Figure 5.1: the water level shown on the eastern side of the (future) Granite Pit is approximately 641 mAHD, and about halfway between the Granite Pit and Gunlake Quarry Pit is approximately 650 mAHD.

That is, the modelled pre-quarrying water level is about 25 m deeper than the measured groundwater level. This suggests poor model calibration in this area and may mean that the Lynwood Quarry pit has been modelled to intrude less into the fractured rock aquifer than will actually occur.

The Lynwood groundwater model predicts that after 30 years of quarrying, when the Granite Pit is fully developed, there will be no groundwater drawdown outside of the pit (Lynwood Quarry GWA Figure 5.5).

No groundwater dependent ecosystems (GDEs) were identified by the *Lynwood Quarry Extraction Area Modification Groundwater Assessment* or by the *Lynwood Quarry Extraction Area Modification Biodiversity Assessment Report* provided as Appendix 7 of the EIS to support the modification application to develop the Lynwood Quarry Granite Pit.

The Gunlake Quarry groundwater model considers 14 years of groundwater monitoring data collected at the quarry. The Lynwood Quarry and Gunlake groundwater models can be compared in the area between the pits where there are overlapping groundwater level contours:

- existing groundwater levels are provided in Gunlake Quarry GWA Figure 5.1 (monitoring locations) and Figure 5.2 (hydrographs): the water levels within the Gunlake Quarry pit range between 650 and 660 mAHD and would be slightly higher about halfway between the Granite Pit and Gunlake Quarry pit (estimated to be around 675–680 mAHD but there is no offsite data to confirm); while
- modelled steady state pre-quarrying groundwater levels are provided on Gunlake Quarry GWA Figure 6.4: the water level about halfway between the Granite Pit and Gunlake Quarry pit is estimated to be approximately 680–685 mAHD (a conservative estimate but one that is in reasonable agreement with the pre-quarrying site data collected by Gunlake and Holcim).

The Gunlake groundwater model predicts that after 30 years of quarrying, when the Gunlake Quarry pit is fully developed, there will be about 30 m groundwater drawdown immediately outside of the pit and 2 m drawdown up to 1.3 km from the pit (Gunlake Quarry GWA Figure 6.5) to the south.

The Gunlake Quarry GWA is based on a more elevated regional water table level that is closer to the ground surface than the Lynwood Quarry GWA.

The points above illustrate that the Gunlake Quarry groundwater model is highly conservative assessment, particularly compared to the Lynwood Quarry groundwater model. The model is likely to overestimate groundwater inflows to the quarry pit once the regional water table is reached.

3.3.2 Perched aquifer

As described above, Gunlake Quarry is predicted to result in drawdown in the regional water table in the fractured volcanics. This will occur once the pit extends into the regional aquifer at around 655 mAHD. Across most of the project area this is the only groundwater system present. However, where there is alluvium/colluvium in minor gullies and creek lines or there is a deep weathered rock profile, perched groundwater can occur above the regional water table. This groundwater is very localised, ephemeral and is disconnected from the regional groundwater system.

The localised perched watertable between the Gunlake Quarry pit and the Lynwood Quarry pit is described in Submissions Report Section 4.3.5i as:

A perched water table exists in the alluvium/colluvium located along the primary gully located south of the quarry. This localised system is disconnected by tens of metres from the regional groundwater system in the fractured rock aquifer and consequently will be unaffected by any drawdown in the fractured rock aquifer.

The Submissions Report goes on to describe this perched aquifer. This perched aquifer is only known to occur in the colluvial material along the line of the swale/swamp south of the quarry. It occurs at approximately 685–690 mAHD and is estimated to occur 10 to 20 m above the regional water table in the fractured rock.

By definition, a perched aquifer is isolated from the regional aquifers by an unsaturated zone, ie there is no hydraulic connection. Drawdown in the regional aquifer cannot impact water levels or storage in a perched aquifer. The DPE-BCS's comments do not recognise this fundamental feature of perched aquifers. The January 2022 site inspection, noted in Submissions Report Section 4.3.5i, confirmed that the southern swampy area has the attributes of being a perched aquifer well above the regional water table. Inspection of the exposed quarry faces confirmed this assessment.

The proposed new monitoring bores (see Section 3.2.2) will further define the presence of any perched groundwater and the depth to regional groundwater in the fractured rock near the quarry's south boundary.

3.3.3 Extent of drawdown

Quarrying below the regional water table in the fractured rock will be concentrated in the southern portion of the quarry. At the end of quarrying, modelled drawdown of 2 m is predicted to extend approximately 1.3 km to the south-west of the site, and to the north the 2 m drawdown remains within the project area and does not reach Chapmans Creek. The actual extent of drawdown as quarrying progresses will be measured by ongoing site groundwater monitoring.

3.3.4 DPE-BCS recommendations regarding groundwater modelling

DPE-BCS's recommendations regarding groundwater modelling are provided in Table 3.3 along with Gunlake's responses.

Table 3.3 DPE-BCS recommendations regarding groundwater modelling

Recommendation	Response
DPE-BCS agree with DPE Water's recommendation that the Applicant should improve the robustness of the impact predictions with a numerical groundwater flow model. Due to the potential risks to an existing biodiversity offset site and a critically endangered ecological community, the independently reviewed groundwater model should be prior to consent.	Not accepted. Groundwater impacts have been assessed using a highly conservative analytical groundwater model (see Section 3.2.1 and Section 3.3.1) that has been informed by over 14 years of groundwater monitoring. The model cannot assess risks to a potential GDE without site specific data on localised perched water levels (if present) and regional groundwater levels. There is no merit in having the analytical model independently reviewed. It is proposed to expand the groundwater monitoring network to further validate the groundwater model predictions (see Section 3.2.2).
Alternatively, Planning and Assessment could commission an entirely independent groundwater review for the area, assessing the veracity of all groundwater models provided to date, including the Holcim and Gunlake models.	This is a matter for DPE-Planning and Assessment.

4 Biodiversity

Comments regarding biodiversity were provided by DPE-BCS. These comments are addressed below.

4.1 Groundwater dependent ecosystems (DPE-BCS Issue 2)

Comment

DPE-BCS commented that there are discrepancies between the assessment of GDEs in the RTS and the BDAR and recommend an independent review of a more sophisticated groundwater model, which is used to revise the assessment of GDEs in the drawdown area.

Response

As described in Section 3.3, a more sophisticated numerical groundwater model is expected to predict less drawdown than the highly conservative analytical groundwater model.

The Submissions Report Section 4.3.5ii(d) examines the potential for PCT 1330 to be a GDE in greater detail than the BDAR (EMM 2021e, provided as EIS Appendix F.7) and offers evidence that although large areas of PCT 1330 occur in areas with shallow groundwater, PCT 1330 also occurs in areas where groundwater is at significant depth. This indicates that the distribution of PCT 1330 is driven by landscape factors rather than by the depth of the regional water table:

The two groundwater systems (shallow perched aquifers and regional groundwater system) are not hydraulically connected and hence drawdown in the fractured rock aquifer as a result of quarry operations will not affect any localised perched groundwater or associated terrestrial vegetation (noting that PCT 1256 is not present).

PCT 1330 (Box Gum Woodland) is in the area below which drawdown of the fractured rock aquifer is predicted.

There is no evidence of deep-rooted vegetation in the exposed quarry faces and PCT 1330 is mapped across a variety of groundwater depths. The extent of PCT 1330 is more likely to be driven by landscape features and soil composition than groundwater.

It is concluded that PCT 1330 will not be impacted by the predicted local drawdown in the regional water table.

Notwithstanding, it is proposed to install nested monitoring bores within PCT 1330 at a site outside the quarry boundary but within the predicted drawdown area to (i) confirm there is no shallow groundwater in the weathered zone that would support this community, and (ii) confirm the depth to regional groundwater in the fractured rock aquifer.

Additional modelling will not determine whether PCT 1330 is groundwater dependent. Rather, a nested monitoring bore (shallow and deep) immediately adjacent to PCT 1330 woodland (so as to not damage trees by installing the bores within the woodland) is proposed to improve the conceptualisation of groundwater systems across the site and to validate the analytical groundwater model predictions (see Section 3.2.2).

The proposed groundwater monitoring network will allow validation of this assessment. This will form an important input to the implementation of the Adaptive Management Plan (see Section 4.2.2).

4.2 Biodiversity Assessment Method plots (DPE-BCS Issue 3)

4.2.1 Biodiversity Assessment Method plots

Comment

DPE-BCS commented that BAM plots are required prior to approval within all PCTs in the groundwater drawdown area that are considered to be to GDEs.

Response

As described in the Submissions Report, impacts to PCT 1330 are not predicted as a result of draw-down in the regional groundwater aquifer. The Continuation Project pit area is the same as that for the approved Extension Project but after about 2047 the final pit depth will increase from the approved 598 m AHD to 572 m AHD. If there are any additional groundwater impacts from the Continuation Project, they are expected to take several years after the extraction rate exceeds 2.6 mtpa as currently approved. Model validation is best achieved by collecting a minimum of two years of additional groundwater data from the extended groundwater monitoring network.

Gunlake propose to prepare an adaptive management plan to groundwater draw-down to be identified and to assess any resulting impacts to PCT 1330 (see Section 4.2.2). Biodiversity plots will be surveyed as required by the adaptive management plan.

4.2.2 Adaptive management plan

Comment and response

DPE-BCS and Gunlake agree that preparation of an adaptive management plans is appropriate. The minimum elements listed by DPE-BCS are provided in Table 4.1 along with Gunlake's responses.

Table 4.1 Adaptive management plan

DPE-BCS comment	Response
Preparation in consultation with BCD prior to approval.	Management plans are generally required to be prepared in consultation with the appropriate agencies as a requirement of the Project Approval. It is considered that this approach is appropriate for the Adaptive Management Plan.
BACI design with baseline BAM plot data and GW monitoring data prior to consent.	The Adaptive Management Plan will consider the environment before and after the potential impact occurs. There are extensive vegetation plot data for PCT 1330 around the quarry area. Further plots are not warranted prior to project approval. The additional groundwater monitoring bores will be installed within 12 months of approval of the Continuation Project. Given that the quarry is not expected to substantially intersect the regional water table until 2026, these bores, coupled with groundwater monitoring results to date, will provide an adequate groundwater baseline. The monitoring will only consider changes to the potentially impacted vegetation and will not include a reference site. Although it is noted that the monitoring of biodiversity offsets to the north of the quarry and bore GM37 will provide data from areas that are not predicted to be impacted.

Table 4.1 **Adaptive management plan**

DPE-BCS comment	Response
The density of BAM plots should reflect Table 3 of BAM 2020.	Additional BAM plots would only be collected if the groundwater monitoring at the nested bores (GM38/GM39) indicated that the regional water table was high enough for groundwater to be accessed by species within PCT1330 and that drawdown was occurring. Table 3 of BAM 2020 would require four BAM plots within PCT 1330. These would need to be within the drawdown area. However, Gunlake does not own the majority of this land. The number of plots would be determined as part of preparing the plan and would consider land access. It is not proposed to monitor other PCTs.
Daily monitoring of groundwater drawdown.	Loggers would collect continuous (6-hourly) water level data.
Surface water monitoring program along Chapman's Creek to ensure that the loss of baseflow does not exceed 4.6%	Chapman's Creek is ephemeral, only flowing after extended rainfall. Flows are expected to be highly variable depending on the preceding climatic conditions (over months to years) and meteorological conditions (over days to weeks) conditions. A realistic monitoring program could not be devised to measure this change in flow.
A long monitoring period is required to account for delayed impacts, especially in the case of facultative – opportunistic GDEs which may only access groundwater during times of drought...BAM plot data every two years for after groundwater drawdown is detected, and continuing for the lifetime of the operation.	It is agreed that long-term monitoring of the regional groundwater levels is required, as has been the case under the approved management plan since the commencement of the quarry. However, biodiversity monitoring would only be undertaken if groundwater draw-down is measured that could impact PCT1330. The length of any biodiversity monitoring programme would be linked to a) whether any impacts attributable to groundwater draw-down were observed and b) trends in groundwater levels.
Unless the Applicant can demonstrate that a change in vegetation was not caused by groundwater drawdown, biodiversity credits must be used to offset any direct impacts in accordance with s 8.6 of BAM 2020, including partial direct impacts.	The link between groundwater drawdown in the regional fractured rock (if it occurs beneath PCT1330) and degraded vegetation condition is likely to be difficult to detect, particularly within the Australian environment that naturally experiences considerable climatic fluctuations. This condition would be unreasonable given these uncertainties.
Offsetting for impacts caused by groundwater drawdown is consistent with conditions for other projects, such as Dargues Reef Gold Project requires the implementation of 'offsetting measures if adverse impacts on phreatophytic vegetation are predicted	This condition is a requirement of the Biodiversity Management Plan that is to be prepared post-approval for Dargues Reef Gold Project and is not relevant to the Gunlake Quarry.

4.3 Area A (DPE-BCS Issue 4)

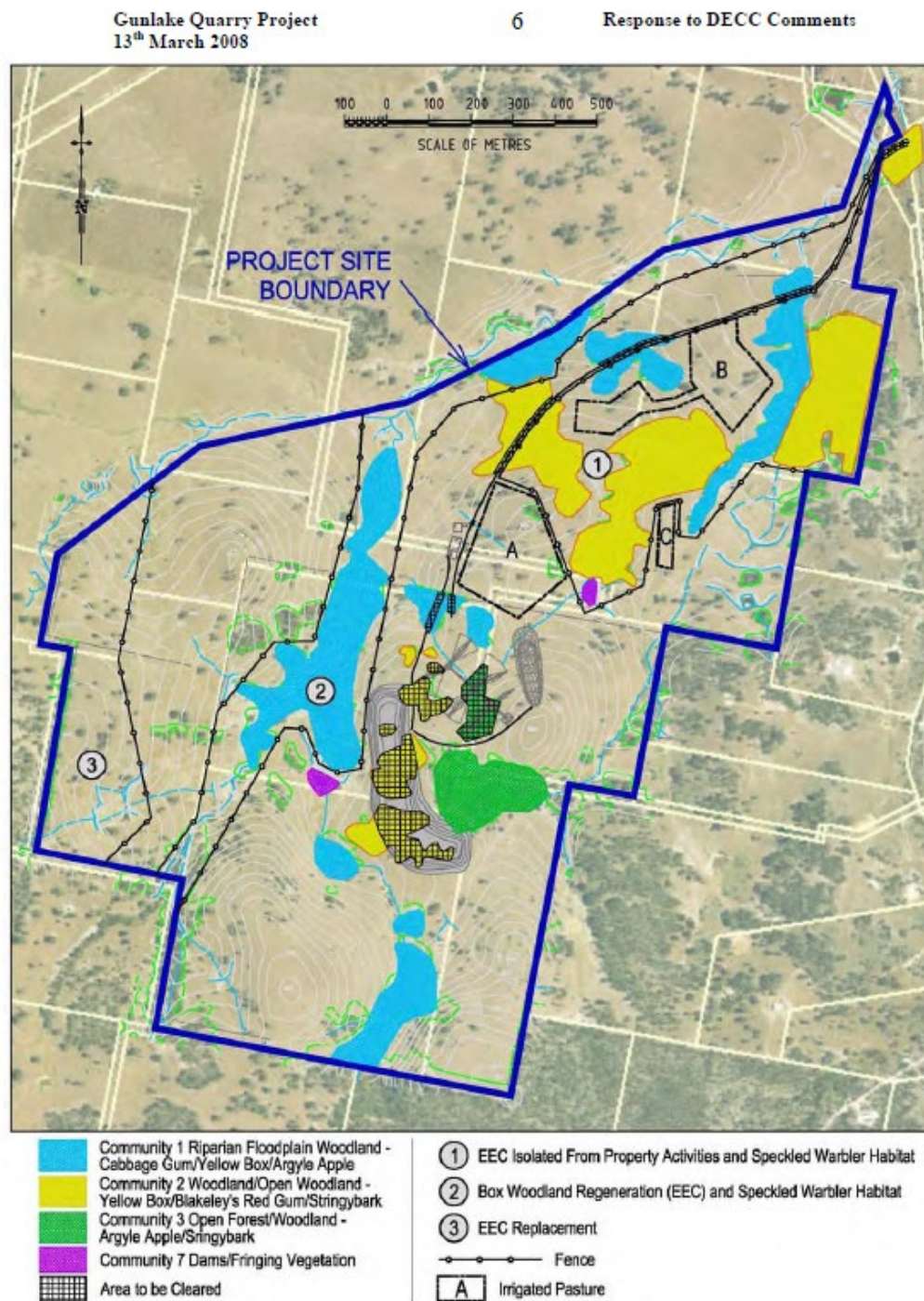
Comment

DPE-BCS comment that Gunlake have not addressed why Area A has been cleared.

Response

The Continuation Project proposes to include Area 1 within the Continuation Project disturbance boundary as it was cleared under the Part 3A approval (PA07-00074) but was not omitted from the disturbance boundary for the Extension Project. Area 1 largely coincides with the original Area A. Appendix III (Ecotone 2008b) of the original

quarry Response to Submissions report (Olsen 2008) did not map native vegetation in Area 1 (see Figure 1 – reproduced below). Regardless, the original Part 3A approval for the quarry provided a biodiversity offset package to compensate for all vegetation impacts of the original quarry.



Gunlake Quarry Project
Figure 2. EEC, Conservation/Habitat Areas and Management

5 Other matters

5.1 Environment Protection Licence

The EPA noted Gunlake's commitment to apply to vary the Environment Protection Licence (EPL 13012) if the proposal is granted approval and noted that supporting information that will be required to support the application to vary the EPL.

Gunlake will supply the requested information as part of the EPL variation application.

5.2 Environment Protection and Biodiversity Conservation Act 1999

DPE-BSC notes that the Continuation Project was not referred to the Commonwealth Department of Climate Change, Energy, the Environment and Water (DEECCW) under the *Environment Protection and Biodiversity Conservation Act 1999*. As described in Section 8.1 of the *Biodiversity Development Assessment Report* (EIS Appendix F.7), the Continuation Project will not result in any significant direct or indirect impacts to threatened species or communities or migratory species listed under the EPBC Act. The project will not result in a significant impact to any Matters of National Environmental Significance and referral of the project to DEECCW is not required.

5.3 Crown Land

Crown Lands noted that Gunlake has applied to close and purchase the Crown Land within the quarry site and provided advice regarding this process. The application is being assessed by Crown Lands.

Crown Lands has provided landowner's consent to lodge the Gunlake Quarry Continuation Project application (see Appendix A).

5.4 No comments

WaterNSW had no comments on the submission report.

References

- ARRB 2021a, *State Significant Development Road Safety Assessment Report*. Report prepared by Australian Road Research Board for Gunlake Quarries Pty Ltd.
- ARRB 2021b, *Gunlake Quarry Primary Transport Route – Road Safety Audit*. Report prepared by Australian Road Research Board for Gunlake Quarries Pty Ltd.
- ARRB 2022, *Gunlake Quarry Continuation Project (SSD-12469087)*. Letter report prepared by Australian Road Research Board for Gunlake Quarries Pty Ltd.
- Bitzios 2022, *The Gunlake Quarry Continuation Project (SSD-12469087) Traffic and Transport Peer Review*. Report prepared by Bitzios Consulting for the Department of Planning and Environment.
- EMM 2021a, *Gunlake Quarry Continuation Project (SSD-12469087) Environmental Impact Statement (EIS)*. Report prepared by EMM Consulting Pty Limited for Gunlake Quarries Pty Ltd.
- EMM 2021b, *Gunlake Quarry Continuation Project (SSD-12469087) Traffic Impact Assessment*. Report prepared by EMM Consulting Pty Limited for Gunlake Quarries Pty Ltd.
- EMM 2021c, *Gunlake Quarry Continuation Project (SSD-12469087) Surface Water Assessment*. Report prepared by EMM Consulting Pty Limited for Gunlake Quarries Pty Ltd.
- EMM 2021d, *Gunlake Quarry Continuation Project (SSD-12469087) Groundwater Assessment*. Report prepared by EMM Consulting Pty Limited for Gunlake Quarries Pty Ltd.
- EMM 2021e, *Gunlake Quarry Continuation Project (SSD-12469087) Biodiversity Development Assessment Report*. Report prepared by EMM Consulting Pty Limited for Gunlake Quarries Pty Ltd.
- EMM 2022, *Gunlake Quarry Continuation Project (SSD-12469087) Submissions Report*. Report prepared by EMM Consulting Pty Limited for Gunlake Quarries Pty Ltd.
- Gillespie Economics 2021, *Gunlake Quarry Continuation Project Economic Assessment*. Report prepared by Gillespie Economics for Gunlake Quarries Pty Ltd.
- Hydro Toolkit 2015, *Lynwood Quarry Extraction Area Modification Groundwater Assessment*. Report prepared by Hydro Toolkit for Holcim (Australia) Pty Ltd.
- Umwelt 2015, *Environmental Assessment Lynwood Quarry Extraction Area Modification*. Report prepared by Umwelt (Australia) Pty Ltd for Holcim (Australia) Pty Ltd.

Appendix A

Crown Lands landowner consent

Department of Planning and Environment

Letter to Applicant (consent granted)

Our reference: 22/01911#01
LOC No: 633144

Mr David Kelly
Gunlake Quarries Pty Ltd
Street/PO Box Address
SUBURB STATE POSTCODE

Dear Mr Kelly

Consent for Development Comprising:	Gunlake Quarries Continuation Project SSD 12469087
Crown Road	CADID 108388618
Parish	Billyramnija
County	Argyle
Applicant	Gunlake Quarries Pty Ltd – David Kelly

Consent is granted by the Minister Lands & Water to the lodgement of applications for approval under the *Environmental Planning and Assessment Act 1979*, and other associated applications required under other legislation, for the development proposal described above.

The Land Owner Consent is granted conditional to the following:

1. Land Owner Consent will expire after a period of 12 months from the date of this letter if not acted on within that time. Extensions of this consent may be sought
2. You are required to forward a copy of the development approval to the NSW Department of Planning & Environment – Crown Lands (“the department”) after approval and prior to commencing works.
3. You are required to ensure that the approval provided is consistent with this Land Owner Consent.
4. The Land Owner Consent is provided for the works detailed on the plans provided by you and retained by the department as DOC22/028479 & DOC22/048992.

Land Owner Consent is granted in accordance with the following:

- Land Owner Consent is given without prejudice so that consideration of the proposed development may proceed under the *Environmental Planning and Assessment Act 1979* and any other relevant legislation.
- The grant of this Land Owner Consent does not guarantee that any subsequent authority to occupy will be granted.
- Land Owner Consent does not imply the concurrence of the Minister for Lands & Water; for the proposed development and does not provide authorisation under the *Crown Lands Management Act 2016* for this proposal.
- The issue of Land Owner Consent does not prevent the department from making any submission commenting on, supporting or opposing an application.
- The Minister reserves the right to issue Land Owner Consent for the lodgement of applications for any other development proposals on the subject land concurrent with this Land Owner Consent.

- Any changes made to the proposal, including those imposed by the consent authority, must be consistent with the Land Owner Consent and therefore if modifications are made to the proposed development details must be provided to the department for approval.
- Land Owner Consent also allows application to any other approval authority necessary for this development proposal.

This letter should be submitted to the relevant consent or approval authority in conjunction with the development application and/or any other application. You are responsible for identifying and obtaining all other consents, approvals and permits required under NSW and Commonwealth laws from other agencies for the proposed development.

It is important that you understand your obligations relating to Condition 3. If any alterations are made to the application (whether in the course of assessment, by conditions of consent, or otherwise), it is your responsibility to ensure the amended or modified development remains consistent with this Land Owner Consent. If there is any inconsistency or uncertainty you are required to contact the department before undertaking the development to ensure that the department consents to the changes. A subsequent LOC application may incur additional application fees.

During the assessment of your proposal, it was noted that native title has not been extinguished on the subject land and that the proposal will require notification under the *Native Title Act 1993* and the Gundungurra Indigenous Land Use Agreement (ILUA) in order to afford the claimants or potential claimants procedural rights.

During the assessment the department conducted an Aboriginal Heritage Information Management System (AHIMS) search and an Aboriginal site and/or Aboriginal place has been recorded in or near the proposed development site and/or there are natural landscape features that indicate the potential presence of Aboriginal heritage in or near the proposed development site. You are required to undertake the due diligence process to identify if any Aboriginal heritage is present at or nearby the proposal site and should seek further advice from the NSW Office of Environment, Energy and Science.

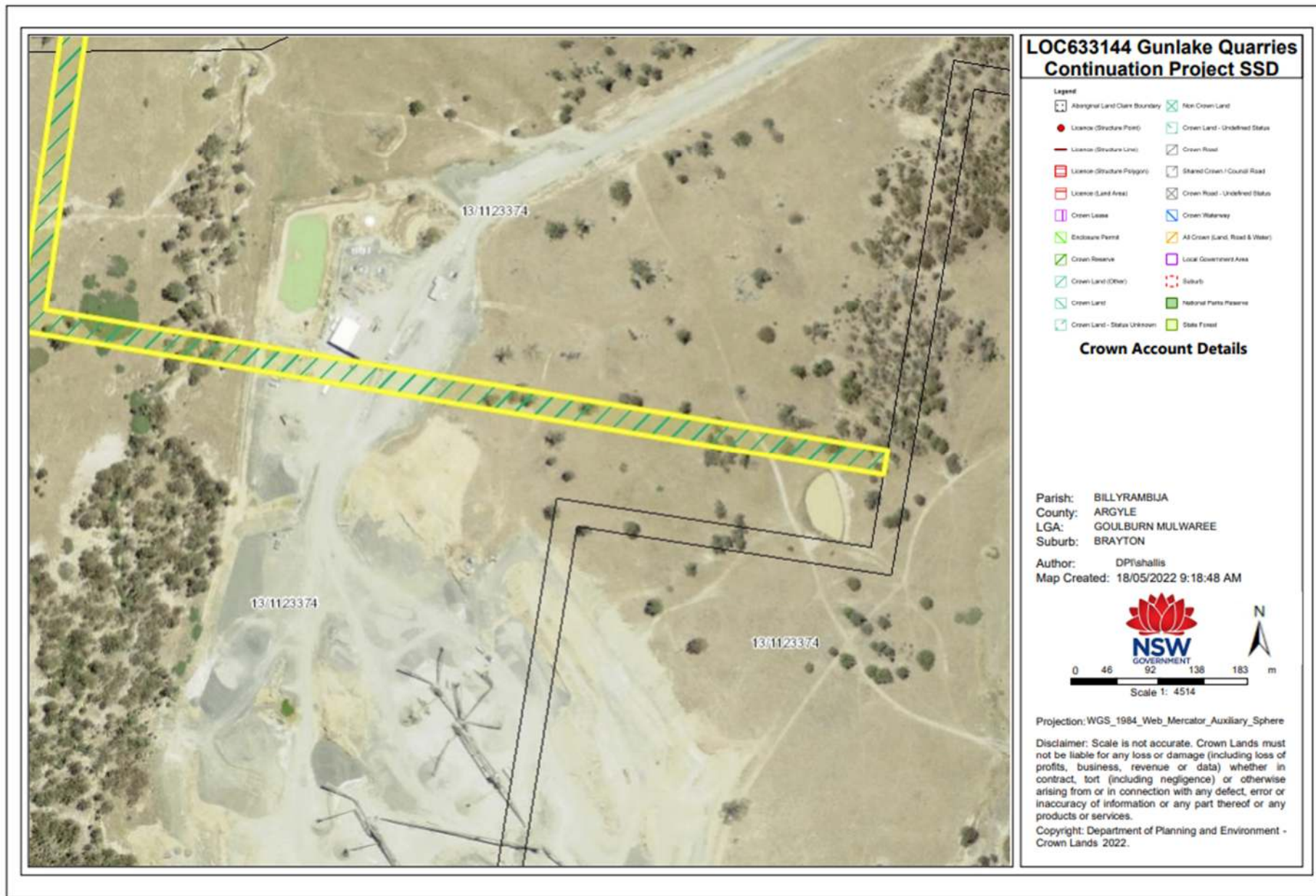
Should you require any further information, please do not hesitate to contact me at the Goulburn Crown Lands Office by phone on 02 4824 3761 or email sue.shallis@crowland.nsw.gov.au

Yours sincerely



Sue Shallis
 A/Senior Natural Resource Management Officer
 Department of Planning & Environment - Crown Lands
 23/06/2022

Diagram 1 – Location Map



Australia

SYDNEY

Ground floor 20 Chandos Street
St Leonards NSW 2065
T 02 9493 9500

NEWCASTLE

Level 3 175 Scott Street
Newcastle NSW 2300
T 02 4907 4800

BRISBANE

Level 1 87 Wickham Terrace
Spring Hill QLD 4000
T 07 3648 1200

CANBERRA

Level 2 Suite 2.04
15 London Circuit
Canberra City ACT 2601

ADELAIDE

Level 4 74 Pirie Street
Adelaide SA 5000
T 08 8232 2253

MELBOURNE

Suite 8.03 Level 8 454 Collins
Street
Melbourne VIC 3000
T 03 9993 1900

PERTH

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Georges Terrace
Perth WA 6000

Canada

TORONTO

2345 Young Street Suite 300
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