Department of Planning and Environment

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Our ref: DOC22/256365-2
Your ref: SSD 12469087

Dear Nagindar

Subject: **Gunlake Quarry Continuation Project Response to Submissions**

I refer to your request dated 15 March 2022 for comments on the Response to Submissions (RTS) for the Gunlake Quarry Continuation Project dated 14 March. We initially commented on the Biodiversity Development Assessment Report (BDAR) for this project on 29 October 2021.

The inclusion of the following information in the RTS addresses several of our previous concerns, including –

- **Provision for an adaptive management plan -** we agree with approach of addressing potential biodiversity through an adaptive management plan, however the plan needs to meet minimum standards, which we have outlined in **Attachment 1.**
- **Providing BAM plot data for the area formerly considered Plant Community Type (PCT) 1256 –** this data confirms that the community was incorrectly mapped and does not meet the description of *Montane Peatlands and Swamps of the New England Tableland, NSW North Coast, Sydney Basin, South East Corner, South Eastern Highlands and Australian Alps bioregions*.
- **Road widening –** the RTS has confirmed that no impacts to native vegetation or species habitat will result from upgrades to the primary access route.

Several outstanding issues remain, including –

- **Issue 1:** The significant discrepancies between the groundwater modelling for the Gunlake Quarry Continuation Project and Holcim's Lynwood Quarry have been completely ignored.
- **Issue 2:** There are discrepancies between the assessment of Groundwater Dependent Ecosystems (GDE) in the RTS and the BDAR in relation to PCT 1330 which lack adequate justification.
- **Issue 3:** The Applicant is not proposing to undertake BAM plots within the ground water drawdown area prior to approval in all PCTs considered to be groundwater dependent.
- **Issue 4:** The Applicant has not addressed why Area A appears to have been cleared.

These problems can be resolved by –

- Implementing the Department of Planning and Environment (DPE) Water's advice and undertaking an independent review of the groundwater model. This should occur *prior to consent.* A properly validated and calibrated groundwater model is consistent with other similar projects involving groundwater drawdown; or,
- Conditioning that an increase in depth of the quarry floor (from the currently approved 572 m AHD, to 546m AHD) is not allowed until such time as a properly calibrated and validated groundwater model has been provided and independently reviewed by an expert who is entirely independent of the approval process;
- Stipulating the minimum requirements of adaptive management plan which is submitted to the Biodiversity Conservation Division (BCD) *prior to approval*. This would include collection of BAM plot data in Threatened Ecological Communities (TECs) considered to be Groundwater Dependent Ecosystems (GDE) occurring in a revised groundwater drawdown area based on the independently verified model. Where monitoring demonstrates that impacts have occurred to this community, the Biodiversity Offset Scheme (BOS) should be used to retire credits to compensate the impact.
- Providing spatial data for Area 1 and Area A and demonstrating that native vegetation in has not been subject to direct impacts.

This approach is justified because –

- Groundwater drawdown could impact the nearby biodiversity offset site, which was required for a previous consent and which the Applicant has a legal obligation to manage in a way which conserves its biodiversity value in-perpetuity.
- Of the presence of a critically endangered ecological community within the current groundwater drawdown area.
- Of the significant changes to hydraulic flow resulting from deepening of the pit and the interception of the groundwater table, which will transition Gunlake from a dry quarry to wet quarry.
- It is consistent with conditions for other projects in the south east of NSW, such as Dargues Reef Gold Project

We recommend a meeting between BCD, the Planning and Assessment Group and the Applicant to discuss how these uncertain impacts can be addressed in a revised BDAR and Groundwater Assessment. We note that this project has not been referred to the Commonwealth Department of Agriculture Water and Environment (DAWE) as a Controlled Action.

Further detail is provided in in **Attachment 1.**

Yours sincerely

John Bucinskas 11 April 2022
Acting Director, Biodiversity and Conservation, South East
Enclosure: Attachment 1 – Outstanding biodiversity issues for the Gunlake Quarry Continuation Project

Attachment 1 - Outstanding biodiversity issues for the Gunlake Quarry Continuation Project

Issue 1: The significant discrepancies between the groundwater modelling for the Gunlake Quarry Continuation Project and Holcim's Lynwood Quarry have been completely ignored.

- The RTS has not provided explanation for why the predicted groundwater level is 30m different to that of the Holcim model for the same area. This is a discrepancy equivalent to a seven-storey building. Both the Holcim and the Gunlake models cannot be correct.
- The RTS has still not considered all available geological evidence which was included in the Holcim EIS for Lynwood Quarry (**see Figure 1**), such as faults and an adamelite dyke to the south and southeast of the pit (not to the south west, as stated in the RTS). It is noted that the groundwater modelling area for Gunlake Quarry includes the area of the dyke identified in the Holcim EIS (**see Figure 1, right panel**).
- There may be other structures closer to the Gunlake Quarry area which have not been identified because no rigorous geological investigations have taken place to support the conceptual model, for example, by seismic investigation.
- The RTS contains a conceptual model of a perched and confined aquifer, but the only evidence that it in fact exist is a single borehole which detected water to 0.6 metres below ground level (mbgl). It is not clear how far this localised perched water table extends across the groundwater drawdown area, or why it is disconnected from the regional groundwater system. In the absence of traditional evidence used to validate conceptual groundwater models, such as peizometer data, the assertion of a localised, perched, disconnected aquifer amounts to conjecture.
- It is still unclear why the groundwater model only shows drawdown occurring to the south of the pit.

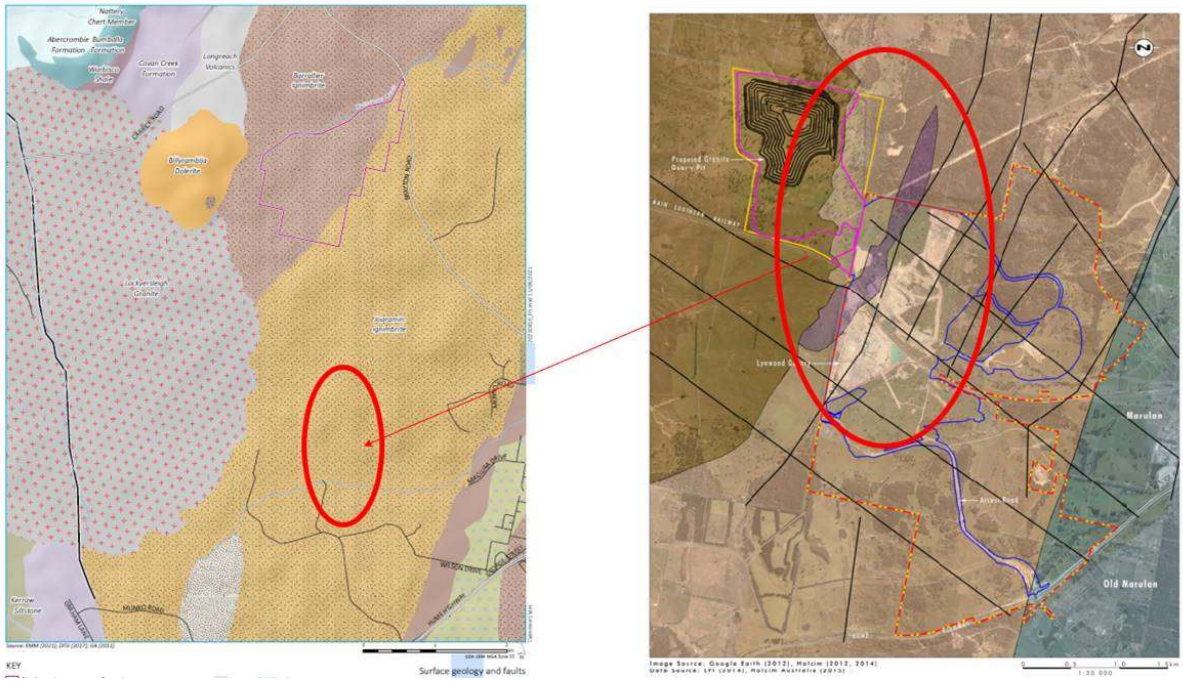

Figure 1 – Geological features included in the Holcim EIS for Lynwood Quarry, including faults and dykes (righthand pane), which are excluded from the Gunlake groundwater model (lefthand pane).

- **Significance:** There are significant amounts of PCT 1330 occurring in the drawdown area. If it is a facultative opportunistic GDE, as stated by the BDAR, it may be subject to impacts from drawdown. This is significant because it is critically endangered ecological community and a Serious and Irreversible Impact (SAII) entity. Furthermore, the biodiversity offset site for the Gunlake Quarry Extension Project is situated to the north and west of the pit. Drawdown could potentially impact on an area to which the Applicant has a legal obligation to provide in-perpetuity protection and management for conservation purposes. Chapmans Creek, which runs along the northern boundary of the pit, is also mapped as surface GDE by the NSW Groundwater Dependent Ecosystem layer (Kuginis et al 2016)

    - **Recommendation:** We agree with DPE Water's recommendation that the Applicant should improve the robustness of the impact predictions with a numerical groundwater flow model that is -
        - calibrated and validated.
        - consistent with the Australian Groundwater Modelling Guidelines.
        - independently reviewed.
    - 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 consen*t.
    - 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.

Issue 2: There are discrepancies between the assessment of Groundwater Dependent Ecosystems (GDE) in the RTS and the Biodiversity Development Assessment Report (BDAR), particularly in relation to PCT 1330.

- The BDAR previously indicated that PCT 1330 is considered a GDE. It stated in section 6 that '*PCT 1330 is primarily located along lower slopes and waterways within the prescribed impact area, where it would be expected to see groundwater expressing at shallower depths when compared to surrounding hillslopes and crests. This is reflected in the groundwater assessment. This PCT is determined to be facultative-opportunistic, in accordance with the definitions shown in Table 6.2, with 71% of the PCT mapped in areas with groundwater at 5 mbgl or less. PCTs which are considered facultative opportunistic are not considered to wholly depend on groundwater for survival; however, they are likely to use groundwater opportunistically to survive where surface water sources are absent or low, particularly during times of drought… PCT 1330 is predicted to experience potential impacts to 54.53 ha of the community where groundwater drawdown is modelled to result in groundwater being at depths of >20 mbgl and thus potentially inaccessible to this portion of the community.'*
- This contrasts with the RTS which now indicates that PCT 1330 is not a GDE. It states in section 4.3.5iid '*The regional fractured rock aquifer is considered highly unlikely to support PCT 1330 vegetation. 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.'

- **Significance:** There is no evidence in the RTS to validate this revised position that PCT 1330 is not a facultative-opportunistic GDE. This is significant because there is 57.9 ha of PCT 1330 in the biodiversity offset site to the north and west of the pit, which is a critically endangered ecological community. The NSW regional groundwater mapping considers Tablelands Grassy-Box Woodlands within the drawdown area, such as PCT 1330, to have a moderate to low dependence on groundwater (Kuginis 2016).

    - **Solution:** Undertake an independent review of a more sophisticated groundwater model (see Issue 1), which is used to revise the assessment of groundwater dependent ecosystems in the drawdown area.

Issue 3: The Applicant is not proposing to undertake BAM plots within all PCTs in the groundwater drawdown area considered to groundwater dependent prior to approval because –

- '*PCT mapping was verified across the broader Gunlake site during the review of the BioBanking agreement in 2018'* and
- *'Entering of vegetation integrity scores into the BAM has not been required for other projects where only prescribed impacts due to changes in hydrology occur.'*

- **Significance:** Plot data is necessary for two reasons. Firstly, as baseline data to determine if groundwater drawdown in GDEs results in a change in vegetation composition that would amount to a partial direct impact. Secondly, while changes in hydrological processes is a prescribed impact, if groundwater drawdown results in delayed 'removing' or 'killing' of native vegetation, then it satisfies the definition of clearing in s 60C of the Local Land Services Act 2013. In which case, plot data would be used for adaptive management to calculate an offset liability for partial direct impacts or full direct impacts. Plot data would have the additional benefit of improving the accuracy of vegetation mapping for communities considered to be GDEs. Given that the plot data for the RTS demonstrated that a large area mapped as PCT 1256 was incorrect, it is entirely possible that other vegetation communities in the drawdown area which have not been ground-truthed are also mapped incorrectly.

    - **Solution:** Because potential impacts to GDEs would be uncertain, both timing and extent, we agree with the Applicant's approach of establishing an Adaptive Management Plan requiring the installation of nested monitoring bores. However, this Adaptive Management plan should, at minimum, include the following elements –
        - Preparation in consultation with BCD pr*ior to approval.*

- Before After Control Impact (BACI) design with adequate pre-impact, baseline BAM plot data and groundwater monitoring data collected from Threatened Ecological Communities (TECs) considered to have any reliance on groundwater (ie. entirely obligate, facultative – high, facultative -proportional or facultative opportunistic). This should include both sites in the groundwater drawdown area and reference sites outside it. Candidate threatened species associated with these TECs should also be surveyed.
- Baseline BAM plot data and groundwater monitoring data collected prior to consent. Density of BAM plots should reflect Table 3 of BAM 2020.
- Daily monitoring of groundwater drawdown throughout the lifetime of the operation of Gunlake Quarry Continuation Project. This should also be coupled with a surface water monitoring program along Chapman's Creek to ensure that the loss of baseflow does not exceed 4.6%.
- Collection of post-impact BAM plot data every two years for after groundwater drawdown is detected, and continuing for the lifetime of the operation. 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.
- 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.

It should be noted that offsetting for impacts caused by groundwater drawdown is consistent with conditions for other projects in the south east of NSW, such as Dargues Reef Gold Project. Condition 3(35)(b) (PA10_0054) requires the implementation of *'offsetting measures if adverse impacts on phreatophytic vegetation are predicted.'*

Issue 4: The Applicant has not addressed why Area A appears to have been cleared. The RTS states '*Area 1 identified in Figure 3.1 of the EIS is not the same as Area A in the original project approval, although there is some overlap. The area was included in the biodiversity offsets for the original quarry approval. The Continuation Project has reincluded this area in the Continuation Project area to correct a previous error/oversight in the Extension Project application'*

- **Significance:** Area 1 coincides with Area A, which was identified in the original approval as an area for water irrigation, as it was only to be used for water irrigation the area was not offset under the Part 3A as stated. The only impacts were to the groundlayer not the overstorey vegetation. It appears from aerial imagery that the area has now been cleared.

References

Kuginis L, Dabovic J, Byrne G, Raine A, Hemakumara H (2016) 'Methods for the identification of high probability groundwater dependent vegetation ecosystems.' (DPI Water: Sydney, NSW)" and the HEVAE data as "Dabovic, J., Dobbs, L., Byrne, G, Raine, A. 2019 A new approach to prioritising groundwater dependent vegetation communities to inform groundwater management in New South Wales, Australia Australian Journal of Botany, 67, 397–413 https://doi.org/10.1071/BT18213