SF18/33564; DOC19/288059

Department of Planning and Environment
Coal and Quarries Assessments
GPO Box 39
SYDNEY NSW 2001

Attention – Howard Reed

Dear Mr Reed

MARULAN SOUTH LIMESTONE MINE CONTINUED OPERATIONS PROJECT
SSD-7009 – EPA Comments

I refer to an email of 1 April 2019 from the Department of Planning and Environment (DP&E) in which you requested the NSW Environment Protection Authority's (EPA) comments on Boral Limited's proposal for the Marulan South Limestone Mine Continued Operations Project (SSD-7009) (the proposal).

The EPA has reviewed the following documents:

- The Environmental Impact Statement (the **EIS**) titled '*Marulan South Limestone Mine Continued Operations State Significant Development Application – Environmental Impact Statement*', prepared for Boral Cement Limited by Element Environmental and dated 20 March 2019;
- The '*Marulan South Limestone Mine Continued Operations Groundwater Technical Study*' prepared by Australian Groundwater and Environmental Consultants Pty Ltd and dated March 2019 (the **GTS**);
- The '*Marulan South Limestone Mine Continued Operations Project Surface Water Assessment*' prepared by Advisian and dated March 2019 (the **SWA**);
- The "*Air Quality Impact Assessment Marulan South Limestone Mine Continued Operations*' prepared by Todoroski Air Sciences and dated 14 February 2019 (the **AQIA**); and
- The '*Marulan South Limestone Mine Continued Operations Project Marulan SSD Noise and Blasting Assessment*' prepared by Wilkinson Murray and dated March 2019 (the **NBIA**).

The EPA has identified a number of issues in relation to the proposal for DP&E's further consideration in its determination of the proposal. **Attachment 1** to this letter outlines the specific details in relation to these issues and includes the EPA's recommendations where appropriate. In summary, these issues relate to:

a) Groundwater monitoring;
b) Surface water discharges;
c) Air quality impacts; and
d) Operational noise.

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Based on the information provided in the NBIA, the EPA is not in a position to provide recommended conditions for this aspect of the proposal.

Nevertheless, should the proposal be approved, the applicant will need to apply to the EPA to vary the existing Environment Protection Licence (No. 944) for the Marulan South Limestone Mine. Licence conditions relating to groundwater monitoring, surface water discharges, air quality monitoring would likely require modification.

I trust these comments on this proposal are helpful. Should you or the applicant have any queries or wish to discuss this matter, please contact Michael Heinze on Ph: 6229 7002.

Yours sincerely

1/5/19

JANINE GOODWIN
Unit Head
NSW Environment Protection Authority

ATTACHMENT 1

EPA comments - Marulan South Limestone Mine Continued Operations Project SSD-7009

The comments below reference the following documents:

- The Environmental Impact Statement (the **EIS**) titled '*Marulan South Limestone Mine Continued Operations State Significant Development Application – Environmental Impact Statement*', prepared for Boral Cement Limited by Element Environmental and dated 20 March 2019;
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A. GROUNDWATER

Revision of EPL water pollutant monitoring point

According to the proposal documentation, the in-pit production well, WP16, will be '*consumed*' by the mine. This is assumed as having to be removed as a result of mining expansion. Currently, mine operations are reliant on the water sourced from two production bores within the existing mining pits, WP16 and WP17. Both are scheduled to be removed if the proposal is approved.

WP16 is currently licenced as point 13 on EPL944, monitoring for oil and grease, as well as for total suspended solids. It is the only monitoring point across the existing mine that monitors for pollutants to water. No other alternative bores or locations have been proposed by the proponent to allow for the monitoring of pollutants should WP16 be removed.

It is therefore suggested that the proponent identify potential locations where continued pollutant monitoring can be undertaken, or request the proponent establish a location where monitoring can continue in future, prior to the removal of WP16.

Other than the expansion of mining operations, the proponent is seeking the approval of an upstream dam to allow for the continued supply of water on-site, in lieu of the existing production wells. Should the dam not be approved, the proponent has a contingency plan to install a series of six new wells north of the pit expansion area to maintain the supply of water for mining operations. It may be a viable option to utilise one or more of these bores as an additional licenced monitoring point in future.

Recommendation

1. **That the proponent establish a new water pollutant monitoring point to be incorporated into EPL 944 prior to the onsite removal of EPL monitoring point 13 (North Pit Bore / WP16), should the proposal be approved.**

Offset Monitoring Bores

The proposed modification of the pit boundary will remove four existing on site wells, including the only licenced water monitoring point on EPL944. Two production wells (WP16 and WP17), and two monitoring wells (MW1 and MW2) are proposed to be removed as expansion of the quarry pits progresses if the modification is approved. No additional monitoring wells commensurate with pit boundary expansions were proposed in the proposal.

Given the removal of the two monitoring bores, in particular the closest bore to mining operations (MW1) and the only monitoring bore nearest to the south pit (MW2), the creation of blind spots will occur in the existing monitoring network, possibly negating indications of impact to groundwater dependent environments south of the pit in Bungonia Gorge, and east of the pit towards Barbers Creek.

The establishment of two or more monitoring bores to counter the loss of the two existing monitoring bores is not proposed in the proposal.

If additional bores are to be constructed to offset the removal of MW1 and MW2, then the collection of adequate baseline data (2 years of groundwater information) from the newly constructed bores would assist in increasing the confidence of established groundwater characteristics, given the nature of the geology of the site. Preferably, any new bores would be drilled prior to the removal of the existing bores.

Recommendation

2. **That the proponent establishes a series of new monitoring bores to offset the predicted removal of the existing bores that are within the proposed pit expansion boundary, should the proposal be approved.**

B. SURFACE WATER

Sediment basin discharges
The EIS proposes that:

- runoff collected in the sediment basins would either be pumped to one of the mine water dams for reuse in limestone processing or dust suppression or would drain to the mine pit. In the event that there is insufficient capacity in the mine water dams to retain water pumped from the sediment basins, water quality in the sediment basins would be tested and flocculant added if necessary to achieve total suspended solids of 50 mg/L for discharge.
- sediment basins will be sized in accordance with - *Managing Urban Stormwater: Soils and Construction - Volume 2E Mines and Quarries.*

This indicates that due to reuse a lower frequency and volume of controlled discharges will occur compared to a Volume 2E design without reuse, however controlled discharges from each discharge point are proposed and will require limits for all analytes that may have a non-trivial impact on receiving waters. This may include total suspended solids, pH, bicarbonate alkalinity and settling agents.

Samples of "waste rock" indicated slight alkalinity, indicating that these materials are likely to contribute alkalinity to initial surface runoff and seepage. The alkalinity ranges from 23 to 1,426 mg/L (median 50 mg/L) and is typically well in excess of the measured acidity leading to positive net alkalinity values.

The EPA believes that the potential risk of bicarbonate alkalinity has not been adequately assessed for controlled discharges and managed overflows from sediment basins, and a standard 50 mg/L total suspended soils may not take into account all practical measures that could be implemented considering downstream national park waterways.

It is the responsibility of licence holders to ensure their licence regulates the discharge of all pollutants that pose a risk of non-trivial harm.

It appears there are potential contingencies and mitigation measures that could be implemented to address any residual risk of alkalinity and total suspended solid at the site considering:

- the relatively low frequency of controlled discharges due to reuse within the operation
- potential mitigation of risks during managed overflows due to the volume of rainwater
- potential for gaining a better understanding natural background levels of alkalinity in receiving waters
- the proponent could commit to implementing all practical contingency measures based on a post-approval assessment to inform licence conditions.

Recommendation:

3. **That a post-approval assessment to inform environment protection licence conditions is conducted on potential impacts of bicarbonate alkalinity, total**

suspended solids and settling agents to determine the final set of analytes requiring limit conditions on the licence and the limits that would apply.

4. **That a basic suite of metals, including aluminium and chromium, bicarbonate alkalinity, settling agents and current licence analytes are included in a post-approval verification monitoring program if there are any residual risks identified in the post-approval assessments.**

Proposed total suspended solids limit

The proposal proposes limits of 50mg/L TSS from three sediment basin discharge points.

Some activities will present a higher risk to waterways and therefore require a more detailed assessment. A more detailed assessment would be expected for a project occurring adjacent to a waterway that flows through a national park. Application of a 50 mg/L limit for total suspended solids may not be adequately protective of downstream waters or reflect the full range of potential impact mitigation measures that could be put in place such as the addition of grassed swales and vegetative strips below the discharge point from the sediment basins. These additional measures should also take into account mitigating any potential risks associated with bicarbonate alkalinity and residual settling agents.

Recommendation:

5. **That a post-approval assessment considers an appropriate limit for total suspended solids based on:**
   a) **the full range of potential impact mitigation measures that could be put in place such as the additional of grassed swales and vegetative strips below the discharge point from the sediment basins;**
   b) **the sensitivity of downstream waters such as streams through national parks and above drinking water supplies.**

Road Sale Stockpile Area

The EIS proposes a small sediment basin (PI) to treat runoff from the Road Sales Stockpile Area located adjacent to the access road on the northern side of the site. This site would contain stockpiles of crushed limestone and road base products (from Peppertree Quarry). The sediment basin would be designed in accordance with the criteria for 'coarse' sediments as set out in Managing Urban Stormwater: Soils & Construction (Landcom 2004). It is unclear why this basin is not designed in accordance with Managing Urban Stormwater: Soils & Construction Volume 2E.

Recommendation:

6. **That the sizing of the road sales stockpile area sediment basin, and the potential risk of total suspended solids, alkalinity and settling agency are included in the recommended post-approval assessment to inform license conditions.**

Trigger values

While the EPA regulates impacts at the point of discharge, it should be noted that the proposed trigger value for salinity (1600 µS/cm) used to assess potential mining induced impacts on water quality in creeks in the vicinity of the mine (Table 4.3) is unlikely to provide a useful trigger or action as those creeks show very different salinity characteristics and the high value from one system is used as the trigger for all creeks. The trigger values also should include bicarbonate alkalinity.

Recommendation:

7. **That trigger values to be used in the operational environmental management plan take into account the difference between receiving waters adjacent to different parts of the site and also include appropriate trigger values for alkalinity.**

C. AIR QUALITY

Air Quality Impact Assessment - review and comments

The AQIA has been conducted with reference to and in general accordance with the EPA's *Approved Methods for the Modelling and Assessment of Air Pollutants in NSW.*

Three operating scenarios were assessed to evaluate potential impacts from emissions associated with various indicative stages of the proposal.

- Stage 1 – summarised on page 35 of the AQIA;
- Stage 2 – summarised on pages 35 and 36 of the AQIA; and
- Stage 3 – summarised on page 36 of the AQIA

The AQIA Executive Summary concludes that "*adverse air quality impacts are unlikely to arise due to the continued operations of Marulan South Limestone Mine if air emissions from the operations continue to be managed and mitigated effectively".*

The above AQIA conclusion is generally consistent with assessment results presented with the AQIA modelling results showing compliance with the EPA's impact assessment criteria. However, some assessment methods adopted in the AQIA are inconsistent with the requirements of the EPA's Approved Methods, potentially influencing on the modelling results presented. A sample of those issues is listed and briefly described below.

- Despite the long history of mine operation at the site, there was no continuous ambient particle monitoring data available to characterise the existing/background local air quality. On this basis, alternate methods and adjustments to available data were made to undertake the cumulative PM10 and PM2.5 assessments.

- Two methods were used to account for PM2.5 background concentrations. Neither method is consistent with requirements of the Approved Method Modelling or demonstrated in the AQIA as conservative.

    - Method 1 assumed equivalency between the annual average PM2.5 and PM10 criteria and subsequently applied the ratio of the two criteria (8/25=0.32) to monitored PM10 values to generate a PM2.5 dataset. The method and subsequent ratio was not demonstrated as robust and conservative. Notwithstanding the questionable assumption of ratioing criteria to adjust monitoring data, given the adjustment was undertaken for the 24-hour prediction, the more defensible ratio would be based on the 24-hour values rather than the annual values. Applying the 24-hour criteria to the ratio method adopted in the AQIA yields a ration of (25/50) 0.5, which is significantly greater than 0.32 and would result in an increase in modelling assessment results.

    - Method 2 adopts a Victorian assessment methodology, using the 70th percentile of monitored results. This methodology was not demonstrated as conservative and is not consistent with NSW Approved Methods Modelling assessment requirements.

- For the cumulative 24-hour PM10 assessment, where periodic hi-volume air sampler (HVAS) data was not available (the monitor works on a 1 day in 6 cycle) the 70th percentile of observed values was adopted as the background value without justification. It is noted that the 70th percentile value (~20ug/m3) was applied on many days with high model increments, resulting in some uncertainty in the final prediction.

- Cumulative 24-hour PM10 results are presented for a subset of residential receptors. Assessment results for this metric were not presented for the commercial receptors. The incremental (project contribution) result at receptor C1 was more than 45ug/m^3, representing 90% of the EPA's cumulative assessment criteria. It is therefore likely that the criteria would have been exceeded, had a cumulative analysis been undertaken and presented in the AQIA.

- Cumulative 24-hour predictions were not presented for Boral owned receptors. It is noted that the incremental predictions for PM10 exceed the EPA's (cumulative) assessment criteria at receptor B4.

Interpretation of assessment results

To help interpret the AQIA modelling results in conjunction with the AQIA method uncertainty, it is noted that:

- The proposal is not a greenfield development. Rather the proposal is for continued operation incorporating a modest expansion in mine extraction and processing rate.
- Section 8.6 of the AQIA summarises current and proposed dust management practices for the proposal, which were included in the dust emission estimates for the proposal (where applicable).
- The EPA's experience is that the mine has a long history of operating without significant air quality issues or dust complaints.

Based on the AQIA results and considering the above factors, it is likely that continued mine operations could be managed and regulated adequately – provisional upon the application of *all reasonable and feasible proactive and reactive best practice air quality management measures.*

Recommendation

8. That the following condition be included in any approval:

All operations and activities occurring at the premises must be carried out in a manner that will prevent and or minimise the emission of air pollutants, including dust, from the premises.

D. NOISE

The EPA has identified a number of concerns relating to the adequacy of the NBIA. The EPA recommends that the proponent provide a response to clarify these concerns and address any issues relating to the adequacy of the assessment.

Recommendation:

9. That the proponent addresses the matters highlighted below in bold text, in any response to submissions required as part of the planning process. Such a response should clarify these concerns and address any issues relating to the adequacy of the assessment.

The following details the EPA's concerns and comments on the NBIA.

I. Rating background levels were not calculated in accordance with the Noise Policy for Industry (NPfI).

The rating background levels have not been calculated using the methods in Fact Sheets A and B in the NPfI. The NBIA has used the median of a series of attended noise measurements to calculate a rating background level. Noise measurements were reported to be potentially affected by continued operations, hence attempts were made to measure over the three-day Christmas Shutdown period in 2014 which was affected by adverse weather. The method used is not in accordance with the NPfI and further justification is required if the EPA is to consider a deviation from the established procedure. Specifically, the proponent needs to provide justification for the following:

- **Why the monitoring was not conducted according to the established method in the NPfI.**
- **Why background levels were not derived using long term noise monitoring, for the minimum duration required by the NPfI.**
- Section 6.3 of the NBIA states that it is unlikely that the mine influenced noise levels during attended measurements. Therefore, it follows that long-term noise measurements could have been conducted at potentially affected receivers since there was no influence from the mine. In the event that there was an influence, NPfI Fact Sheet A allows for noise from existing operations to be included in noise measurements under certain circumstances. **Therefore, the**

reasons for not conducting noise measurements in accordance with the NPfI to derive the rating background levels is not clear and the proponent must justify this decision and method used.

- Attended noise monitoring was taken at different times of the day. **The proponent should demonstrate that these measurements are representative of the quietest times during each assessment period if they are to be considered for a rating background level.**
- **Why the minimum background levels in the NPfI were not adopted as a default in the absence of data suitable to derive rating background levels in accordance with the NPfI.** Especially in consideration that some attended measurements were below the minimum background levels.
- **Why measurements were not taken at locations potentially most affected by the development.**

Given the proposal proposes a 30-year extension of mining operations in this area, it is considered prudent that the project noise trigger levels which are used to determine EPL noise limits are based on appropriate data using justifiable and robust methods.

II. Sources included in the noise modelling not consistent with proposed operations or source location maps.

A number of sources and proposed operations have not been adequately accounted for or described in the NBIA. The proponent should clarify the following points and update the NBIA accordingly.

- The maps showing the location of noise sources in Appendix D of the NBIA do not match the names of the plant provided in Table 8-1. **The names of the plant listed in Table 8-1 should match those on the maps in Appendix D.**
- The maps in Appendix D of the NBIA include a number of noise sources whose name or sound power levels are not included in Table 8-1, nor anywhere else in the report. These include, but are not limited to: the Kiln Exhaust, Kiln Discharge Building, Quickbin Crusher, Lime Hydration Plant, Radial Stacker, Small DC, Sand Plant Screen, Primary Crusher, Secondary Crusher building. **The details of these sources should be included in the report, including the location of each source on a map.**
- **The information requested by the EPA in Attachment 2 of the SEARs requires that octave or one third octave band data for each source be provided.**
- The majority of the product from the mine is moved via rail, however no rail or rail related sources have been nominated in Table 8-1 or on the maps in Appendix B. **The proponent should provide a justification for not including any rail loading related noise sources in the NPfI assessment.**
- **The proponent should provide a demonstration of the validation of the noise model.** As all of the noise sources currently exist, and many noise measurements have been conducted over the years, the NBIA should include a demonstration of the validity of the model by comparing predicted and measured noise levels at reference locations.
- The shared road sales stockpile area only includes one source, a static truck. However, Table 8-1 nominates a CAT 980 loader to be at the road sales area. **The proponent should review the source locations and update noise predictions accordingly.**

III. Assessment of meteorological conditions requires further clarification.

The wind analysis presented in Table 8-4 essentially shows two prevailing wind directions. Easterlies are prevalent during Summer, Autumn and Spring; and North-westerlies prevalent during Autumn and Winter nights. A number of the wind vectors have percentages close to the threshold. Section D2 of the NPfI requires that wind analyses that use a 16 direction method should consider the two adjacent directions either side of the direction of interest. **The proponent should confirm if the methodology in Section D2 of the NPfI was followed, or alternatively provide a revised analysis and update noise predictions.**

IV. Predicted noise levels requires confirmation that all potential sources and locations have been considered.

The NBIA has identified two sources which generate the potentially highest maximum noise levels: trucks tipping overburden; and impact noise from material dropping into bins. Dozers reversing are also known to generate high maximum noise levels. **The proponent is to confirm if these noise**

events are controlled by current practices at the mine, or have been addressed by other maximum noise level assessments, or should be included in an updated assessment.

It was not clear in the NBIA if the location of L_{max} and L_{eq} noise sources were consistent for similar activities:

- Noise levels for Stage 3 include a dozer (SWL L_{eq},15min 116 dBA) operating closest to R12 with a predicted Leq,15min of between 26 and 29 dBA. However, the predicted maximum noise level is L_{max} 48 dBA with an SWL of 120 dBA for haul trucks. There is only a 4 dB difference in sound power levels, however the predicted noise levels differ by over 20 dB. The dozers and trucks would likely be operating in the same area (location and height) on the emplacement areas and therefore the large difference in noise levels would not be expected. **If the difference is due to a duration correction for the L_{eq},15min noise level, this needs to be outlined in the report.**
- The propagation losses would likely be similar for each source. Therefore, it is questionable why a difference of 4 dB in source levels leads to a large difference at the receiver. **The proponent should review the assumptions, equipment locations, and propagation paths for sources; provide an explanation for this discrepancy and update the NBIA accordingly.**

The modelled location of plant on the expanded western overburden emplacement area should be confirmed to represent reasonable worst-case locations for R9 and R12.

V. Construction activities using a similar fleet indistinguishable from operations should be assessed under the NPfl.

The EPA does not agree that the relocation of the stockpile reclaim area and construction of the road sales stockpile area should be assessed under the Interim Construction Noise Guideline (ICNG). Since the operations are within the mine area, uses the same equipment fleet and is described in Section 11.2 of the NBIA as "*generally indistinguishable from normal operation*", they should be assessed under the NPfl. **The assessment should be revised to include these activities in the NPfl assessment.**