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20 December 2023

Response to questions regarding the Deep Creek Quarry Project (SSD-11591659)

Dear Mr Barry

I refer to your requests seeking a response to the questions raised by the Commission Panel during our briefing meeting on Wednesday 3 December 2023 and the public meeting held at the Clarence Town School of Arts Hall on Wednesday 13 December 2023 regarding the Deep Creek Quarry Project (SSD-11591659; the Project). The Department's responses to each of the Commission Panel's questions are set out below.

Question 1: **Please advise the decay rate of diesel particulates in the air and how long impacted residents would be exposed to them for.**

The Department's answer to this question relies on information provided by Dr Jackie Wright in her independent air quality health advice to the Department regarding diesel particulate emissions from the Project.

After emission from the exhaust pipe, diesel exhaust undergoes dilution and chemical and physical transformations in the atmosphere, as well as dispersion and transport in the atmosphere. The atmospheric lifetime for some compounds that are present in diesel exhaust ranges from hours to days.

Dr Wright indicated that adverse health effects from diesel particulate emissions can be caused by both acute and chronic exposure. She advised that the most health protective guideline values are:

- 10 $\mu g/m^3$ for acute exposure, which typically relates to a one hour exposure period; and
- 5 $\mu g/m^3$ for chronic exposure, which relates to long-term exposure or annual average exposure.

The air quality impact assessment for the Project considered both incremental impacts from the Project and cumulative impacts. The assessment of incremental impacts focused on diesel emissions from all vehicles associated with the Project. For the purpose of the assessment, incremental impacts of PM2.5[1] were assumed to comprise 100% diesel particulate matter.

[1] Particulate matter less than 2.5 microns in diameter

The assessment of cumulative impacts included consideration of background concentrations of PM2.5 based on measured concentrations relevant to the local area. Background PM2.5 would be sourced from a large number of regional sources, with diesel emissions only part of the total PM2.5. Several studies indicate that diesel particulate matter comprises about 7-8% of the outdoor PM2.5. For the cumulative assessment, diesel particulate matter was conservatively assumed to comprise 8% of background PM2.5.

Using this data, the maximum predicted concentration at the most sensitive receiver location (R30) was directly compared with the guidelines considered to be protective of acute and chronic effects (including hypersensitive effects).

Dr Wright predicted that the Project would result in incremental and cumulative maximum 1 hour average diesel particulate matter concentrations at R30 of 0.175 $\mu g/m^3$ and 1.9 $\mu g/m^3$, respectively, which is well below the guideline value of 10 $\mu g/m^3$.

In terms of chronic exposure, Dr Wright predicted incremental and cumulative annual average concentrations at R30 of 0.02 $\mu g/m^3$ and 0.6 $\mu g/m^3$ respectively, which are well below the guideline value of 5 $\mu g/m^3$.

She ultimately concluded that exposure to diesel particulates from the Project would be below guideline levels protective of adverse health effects, including for hypersensitive individuals.

Question 2: In their assessment, did Transport for NSW comment on how the Project would affect the performance of the intersection of The Bucketts Way and the Pacific Highway during school holiday periods? If so, what were the findings of this assessment?

No, Transport for NSW (TfNSW) did not provide any comments in relation to how the Project would affect the performance of the intersection of the The Bucketts Way and the Pacific Highway during school holiday periods. Following review of the Environmental Impact Statement, TfNSW raised no objection to or requirements for the Project as it considered there would be no significant impact on the State road network.

The Department acknowledges that the road network may operate differently during school holiday periods and measures to manage impacts during these periods may be a consideration for the Project's traffic management plan.

3. Has the current crash history of The Bucketts Way from the proposed quarry access road to the intersection of The Bucketts Way and the Pacific Highway been incorporated into the assessment of road safety?

Yes, the crash history of the proposed haulage route was reviewed as part of the road safety audit used to inform the traffic impact assessment for the Project. Crash history data is presented in section 3.6.1 of the road safety audit (Appendix E of the Traffic Impact Assessment, which can be found in Appendix K of the Environmental Impact Statement).

4. Please provide further information on how the Project will manage extreme rain fall events.

The Applicant has committed to ensuring the dirty water management system, including sediment dams, is designed to manage runoff from the 5 day 95th percentile rainfall event. This is the most stringent design criterion for erosion and sediment control measures set out in the Managing Urban Stormwater: Soils and Construction Volume 2E (the Blue Book Volume 2E). As is explained in the Blue Book Volume 2E, this criterion should be applied to the design of long-term erosion and sediment control measures in circumstances where projects are located in a sensitive[2] receiving environment.

The Applicant's proposed water management system would also include:

- scour protection measures for the proposed watercourse crossings along the dedicated quarry access road;
- stable spillways on sediment dams for managing overflows in wet weather;
- scour protection controls at discharge points; and
- a water management plan that includes management measures to the implemented prior to, during and after extreme rainfall events.

Potential impacts on flooding has also been a consideration for the Department's assessment of the Project's ability to manage extreme rainfall events. The surface water assessment modelled the risk of flooding impacts from the Project. The modelling predicted flood behaviour during a range of extreme events, including the 50%, 10%, and 1% Annual Exceedence Probably (AEP) events and the Probable Maximum Flood (PMF) event. The potential impacts of climate change on flooding within Deep Creek were also assessed using the 0.5% and 0.2% AEP events. These events were used as representative proxies for potential future changes to the 1% AEP event, in response to increased storm intensities due to climate change.

The modelling indicated:

- for more frequent events (i.e. the 50% and 10% AEP events), the proposed crossing of Deep Creek is expected to locally increase flow velocities and depths. This is due to the concentration of flow required to drive the modelled flows through the proposed culvert;
- for larger events (i.e. the 1% AEP and the PMF), the proposed crossing of Deep Creek is expected to reduce flow velocities, with continued increases in depths. This is due to the routing effects of the access track, temporarily storing excess stormwater prior to overtopping the road or discharging through the proposed culvert. It is noted that the increases depths are limited to about 200 m upstream of the proposed crossing, with modelled depths downstream of the proposed crossing point expected to decrease;
- there are regions within the proposed operational areas that would be inundated during the PMF event, but not during any of the smaller modelled events, including the 0.5% and 0.2% AEP events used as proxies for potential future changes to the 1% AEP event due to climate change; and

[2] A sensitive receiving environment is one that has a high conservation value, or supports human uses of water that are particularly sensitive to degraded water quality.

- the Project will have negligible impact on flood flows or extents during the PMF and as such is not expected to impact on the extent of flood prone land in the wider Deep Creek catchment.

5. Please advise how long it has been since 'Managing Urban Stormwater: Soils and Construction Volume 2E' was updated and whether this guide still provides a contemporary framework for managing extreme rainfall events.

Managing Urban Stormwater: Soils and Construction Volume 2E (the Blue Book Volume 2E) was published in June 2008. It has not been updated since its original publication. The document provides guidelines, principles and recommended minimum design standards for the management of erosion and sediment control at mines and quarries.

The Department considers that the Blue Book Volume 2E remains relevant to the design of erosion and sediment controls for quarries such as the proposed Deep Creek Quarry. The Department notes that it was one of the key guidance documents referenced in EPA's recommended environmental assessment requirements for the Project.

The Department also notes that the Blue Book Volume 2E is not the only document that has been relied upon to assess the extent to which the Project is able to appropriately manage extreme rainfall events. The Department's consideration of the Project's potential to cause adverse impacts during such events has also been guided by advice from key government agencies included NSW EPA and DPE Water, outcomes of flood modelling and other aspects of the surface water assessment completed for the Project, and comparison against other relevant policies, standards and guidelines (all of which are documented in the Secretary's Environmental Assessment Requirements for the Project).

6. Is the biodiversity stewardship site (235 ha) proposed by the Applicant required to go onto title?

Yes. The biodiversity stewardship site would be established by registering a biodiversity stewardship agreement on the title of the land in perpetuity. The biodiversity stewardship agreement would be a legal agreement between the Applicant and the Minister administering the *Biodiversity Conservation Act 2016* to establish a biodiversity stewardship site for the purpose of generating biodiversity credits under the Biodiversity Offset Scheme (i.e. to establish an offset site). The land would then be bound by the terms of the agreement, which would clearly define the area, boundaries and management obligations of the biodiversity stewardship site.

7. Did the Independent Air Quality Health Advice, dated 15 June 2023 differentiate between the construction and the operational period?

The focus of the independent air quality health advice (EnRisks, June 2023) was to assess the potential air quality-related human health impacts from operation of the project. Whilst the Department recognises that air quality impacts during construction would also require careful management to minimise adverse impacts, the Department considers that the focus on operational impacts was appropriate for the following reasons:

- in their submission to the Department, receiver R30 indicated their key concerns were associated with diesel particulate emissions from operation of the Project; and
- the Project seeks approval to operate the quarry for a period of 30 years, and the Applicant has indicated that construction would be undertaken for a period of approximately 12 weeks. Therefore, construction impacts would be relatively shortlived when compared to operational impacts.

Conclusion

Thank you for the opportunity to provide this additional information to support the Commission Panel's deliberations regarding the Project.

If you wish to discuss the matter further, please contact Jessie Evans on [redacted] or [redacted]

Yours sincerely

[redacted]

Jessie Evans
Director
Energy and Resource Assessments