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Dear Ms Allen

EPA Comments on MOD 9 – Dendrobium Mine - Gas Management Infrastructure (DA60-03-2001-Mod-9)

The Environment Protection Authority (EPA) refers to the Department of Planning and Environment's request for input to the proposed modification of the Development Approval for Dendrobium Mine (Approval 08_0150).

The proposal is outlined in the report "Dendrobium Mine – Gas Management Infrastructure Modification Report" dated 11 February 2022. The proposal is for a methane gas extraction plant to be built at the vent shaft 2 and 3 site adjacent to Cordeaux reservoir in the Sydney Drinking Water Catchment. The site is a premise regulated under Environment Protection Licence 3241 held with the EPA.

The EPA has reviewed the report and provided comments below that it requests are addressed by the proponent and considered by the Department.

If you have questions regarding the above, please phone Andrew Couldridge on (02) 4224 4100.

Yours sincerely

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ATTACHMENT

The following comments refer to the "Dendrobium Mine – Gas Management Infrastructure Modification Report" dated 11 February 2022 (the report).

Gas Management

The report states that forecast methane quantities in Area 3C exceed the dilution capacity of the ventilation circuit. The proposed methane management system involves post drainage collection and would allow some flaring to reduce greenhouse gas emissions (page 4). This would occur under conditions suitable for flaring (page 6).

The report states that consideration was given to adopting a gas turbine for power generation instead of flaring (page 5). However this was apparently discounted to avoid additional land disturbance, to avoid heavy industry (transmission lines and substations) in the drinking water catchment, and because of the short duration of gas supply – assuming the Dendrobium Mine Extension Project (State Significant Infrastructure [SSI]-33143123) is not approved.

The EPA notes that the project application includes installation of cooling towers, vacuum pumps, substations, water tanks, an upgrade of electricity transmission including poles and lines, modification to motors, drives and impellers at the site. It is unclear how installing a gas turbine would significantly increase the intended industrialisation of the previously cleared site.

The EPA requests that the following information be provided to support the assertion that power generation from a gas turbine and the resultant reduction in greenhouse gas emissions to atmosphere is not reasonable and feasible over the life of the project.

- The mass/volume of gas expected to be generated overall and on an average daily basis from Area 3C and the mine expansion project.
- Comparison of gas supply from Area 3C and the extension project with volumes of gas produced and electricity generated at the Appin, Tower and Tahmoor methane gas plants.
- The expected timeframe of gas supply from Areas 3C and the mine extension project.
- A comparison of methane generation under option 1 (pre-drainage) and the preferred option 3 (post-drainage) in the report.
- A preliminary financial assessment of the feasibility of power generation at the site under options 1 and 3.
- An assessment of the comparative greenhouse gas emission (& reduction) under flaring, venting and power generation.

In relation to the proposed vent/flare system, additional information is needed as follows.

- What conditions would make flaring of gas unsuitable and result in venting?
- What will be done to optimise flaring of gas?
- What percentage of the gas generated will be flared and vented?

Site Water Management

Process Water and Fire Water

The EPA understands that the Vent shaft site is currently used for mine ventilation with ducts, fans, an electrical sub-station and a small quantity of tools and materials stored on site to service the equipment.

The water management component of the proposal is not fully described in the report but appears to involve the transport, storage and use of saline mine water. If that is the case, the proposal would

be a change in the use of the site by introduction of a large volume of potentially polluting liquids adjacent to Cordeaux reservoir.

Page 19 the report states

"*The proposed Modification includes construction of a process water and fire water management system. The water management system is proposed to comprise bores to pump water from and return water to the underground mine workings in addition to pipes/tanks to convey and store recovered water within the Modification area*."

Little information is provided about the water management system apart from the statement above. It is assumed that minewater will be used for cooling the vacuum extraction fans through an evaporative cooling system. Such systems generally have a blowdown waste product and use anti-scaling and anti-fouling additives. Risks come from storage, transport and use of chemicals and mine water in a site adjacent to the reservoir.

A full description of the cooling water system is needed to assess the level of risk presented. A listing of measures to minimise the risks is not provided except in a basic table in Attachment 2 of the report. Given the sensitivity of the site, a detailed consideration of factors is considered necessary.

No examination of alternative means for cooling the pumps is discussed such as dry cooling. There is also no holistic reasoning given for selection of the gas drainage option 3 over options 2 and 4 which may have lower catchment risks (on page 4). The report states the option was selected because "*only option 3 is viable to deliver planned production rates*."

In order to assess the possible risk of environment impact of the proposal, the EPA requests a full description the water management systems be provided. This should also include consideration of dry cooling or using catchment water as feed to the evaporative cooler. In addition, the EPA requests that following specific questions be addressed in relation to the proposal.

- What is meant by process water supply?
- Why is minewater to be used for fire fighting & process water given it introduces an additional risk?
- How much minewater will be transported to the site and how much will be stored?
- What are the chemical and physical characteristics of water proposed to be used on site?
- What chemicals are to be stored on site and are they hazardous?
- How will they be stored and in what quantities?
- How will they be safely transported to the site?
- Will chemicals be added as anti-corrosion and anti-foulant in the cooling water?
- Where is blowdown water going to be stored and disposed?
- What measures will be taken to reduce risk of polluted water discharges to the catchment through accidental loss, bushfire and vandalism.
- How will leaks & spills will be detected, contained or treated given the remote location of the site?
- How will potentially contaminated stormwater be managed and disposed of?
- How will contaminated firewater be contained in the event of an incident?

Stormwater Management

The existing stormwater management system is to be used to capture sediment laden run-off from the construction site. Minor changes include a modified drain and possible enlargement of sediment basins A & B. The proposed method of stormwater treatment involved Type F retention basins in the Volume 1 and 2E of the Managing Urban Stormwater: Soils & Construction guideline.

The EPA request that the following points be addressed to provide more details of the stormwater system. The quoted page numbers refer to the report's Appendix 1 prepared by Hydro Engineering Consulting.

- Figure 3, page 6: shows all run-off from sub catchment B going to Basin C. The diagram needs to be amended to show the separate flow path to Basin B.

- Section 5.3, page 9: evidence needs to be provided that the soil type corresponds to type F classification.

- Section 5.3, page 10: the report notes that available sediment pond capacity for basin A and B is approximately 0.7 ML but 0.9 ML volume is necessary to meet the guideline. The basins may be enlarged if needed.

- The EPA suggests that if modification of the basin surface area will result in significant additional vegetation clearance, the adopted sediment zone could be reduced in size and more frequent clean out considered. This might be considered acceptable given the relatively short construction time for the project.

- Section 5.3: a description of the discharge arrangement should be given as to whether the water will be pumped out or allowed to drain under gravity after the 5-day settling period.

- Section 5.4: during construction of the vent shaft in 2008, flocculants were found to be necessary to achieve acceptable water quality criteria within an acceptable time (goal for sensitive catchment release is <30 mg/L suspended solids or <60 NTU). An assessment should be made of need for flocculants and what type would be considered acceptable in the drinking water catchment. Alternatively, the use of mobile stormwater treatment facilities should be considered.