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Dear Simon,

## Re: Eden Breakwater Wharf MOD 1 - Response to Submissions – Air Quality and Noise

This letter provides a response to the submissions received from regulatory stakeholders and the community in response to the public exhibition of the subject development proposal.

Issues raised that relate to the air quality and acoustics disciplines are reproduced in bold, with a response provided to each in the text below.

A number of responses supported the project and provided comment on management and mitigation measures. These responses have been noted.

We trust that the below responses are adequate to address the concerns raised. Do not hesitate to contact the undersigned if you would like any additional information.

Yours sincerely

A handwritten signature in black ink, appearing to read "D.A. Roddis".

Damon Roddis  
Partner – Air Quality and Greenhouse

A handwritten signature in black ink, appearing to read "Aaron McKenzie".

Aaron McKenzie  
National Acoustics Lead

# 1 Air Quality

## 1.1 NSW Department of Planning and Environment

**Provide information on the meteorological conditions modelled.**

The meteorological input file adopted for the assessment is consistent with that originally used within the EIS. This reflects hourly observations from Merimbula Airport Automatic Weather Station for a representative year, identified as the calendar year 2013 (8,760 individual meteorological hours evaluated).

**Regarding estimated kW demand as a function of passenger numbers. It is noted that cruise ship crew numbers are high, around one crew member for every two or three passengers.**

The method for estimation of hoteling demand as a function of the number of passengers on the vessel has been developed by a third party (Starcrest (2017a; 2017b)). This approach is internationally referenced and has been adopted widely for emission estimation purposes. It is anticipated that this method accounts for standard crewing numbers within the cruise ship industry.

**Re Figure 3-1 in ERM air quality report. Please provide more explanation on what this graph represents. Is this the percentage of days throughout the cruise season that cruise ships are berthed compared to the EIS assumptions that a cruise ship would be berthed every day during the cruise season?**

Figure 3-1 shows a cumulative frequency distribution of estimated hoteling demand (in kW), as based on the 2018/2019 fleet mix (which forms the basis for both Typical Operations and Expanded Operations modelling). This therefore shows the assumptions made around the kW rating of the ships in berth for the purposes of the modification emissions inventory, compared to the EIS modelling hoteling demand value. Essentially, this shows that the kW rating of anticipated fleet mix falls well below the default assumption made within the EIS that all ships are rated at 13,000 kW.

## 1.2 Bega Valley Shire Residents and Ratepayers Association

a) While the BVSRRRA has previously acknowledged that it does not have the expertise to challenge the "technical" information assembled by ERM in support of the submission, it nevertheless believes that that information is simply irrelevant & should not be considered in assessing the submission.

b) The BVSRRRA understands that the ERM modelling is based on observations carried-out in the area where the new wharf & port are being constructed however, given that visiting cruise ships are presently anchoring within the broader confines of Twofold Bay & not the cove area where that construction is being undertaken, means that any such readings are not a factual representation of sulphur emissions that will occur once the wharf & port are completed & visiting cruise ships are actually berthing at the wharf.

**Cruise ships berthed at the new wharf will be immediately adjacent to & below residential areas, with those areas directly exposed to emissions from such vessels, powered as they will be by there on-board oil fired generators.**

**At the same time, prevailing breezes in the immediate area of the new wharf & port will carry emissions over & into the local Eden community, the effect of which has not been captured by the ERM modelling.**

The ERM modelling does not reference air quality observations carried out in the area. While the modelling does reference meteorological observations from Merrimbula Airport Automatic Weather Station, the remainder of the modelling is based around derived estimates of shipping emissions. These emissions data are then fed into an internationally recognised atmospheric dispersion model that makes predictions of down-wind impacts based on the meteorological observations (in this case, those gathered at Merrimbula Airport). In the model the cruise ship exhaust stack was positioned to be representative of a ship at the proposed berth immediately adjacent the residential areas.

It is correct that prevailing breezes will carry emissions from their point of emission; both of which are characterised within the computer modelling completed.

However, ERM does not support the submission that “the effect has not been captured by the ERM modelling” as this is exactly the purpose of the exercise that has been completed.

## 2 Acoustics

### 2.1 NSW Department of Planning and Environment

**In relation to noise, provision of complaint categories, e.g. number of deck announcements not related to safety, length of time music is played on deck, volume of PA system and extent of area where it is audible, together with the type of action that would be taken in response to complaint categories and in what circumstances they would apply.**

**Include a process for determining whether or not a complaint is ‘valid’.**

Noted

**The ERM Noise assessment modelling approach states that, as the PA system would be unlikely to be in operation for a full 15 minute assessment period, the PA sources were normalised to a 15 minute average noise level. Please provide some discussion on impacts for PA noise over a longer period.**

**Please provide some more discussion in relation to PA noise levels being expected to be below the noise level of mechanical noise sources.**

The noise impact from operation of the PA system (refer to Table 1 ERM letter) is presented as a normalised level assuming 30 seconds of PA operation for the  $L_{Aeq}$  15minute results and an

instantaneous  $L_{Aeq}$  level. If the PA was to operate for the full 15 minute period, the PA contribution would be equivalent to the instantaneous level presented in Table 1.

Scenario 1 ship in transit, the PA contribution (assuming continuous operation over a 15 minute period) is expected to be 14 -17 dB less than the contribution from the ship engines and would not further contribute to overall noise levels.

Where PA operations were to occur while a quieter ship (Scenario 2a) is at berth for the full 15 minute period the PA system contribution would be 6-8 dB less than ship engines and ventilation, and would result in a 0.5-2 dB increase in overall noise levels. Where the PA system is operating for half the time it would result in a 0.5 dB increase in noise levels. While a louder ship is in port (scenario 2b) continuous PA contribution is not predicted to result in an increase in noise levels as the contribution is more than 10 dB less than the mechanical noise.

**Although the ERM report notes annoyance from noise is subjective, additional discussion is requested on why annoying characteristic penalties (as per the INP) were not applied when it is stated that due to the frequency and characteristics of PA system operations and the short term noise level, it is expected that PA sources will be audible in both noise catchments NCA1 and NCA2.**

The predicted noise levels from the PA system and ship emissions were assessed against the criteria for modifying correction factors (annoying noise) detailed within Table 4.1 of the NSW INP. Modelling results did not trigger a penalty for either tonal or intermittent noise.

Although the PA system is predicted to be of lower noise levels than the mechanical plant, and in Scenario 1 and Scenario 2b will not contribute to overall noise levels at all, that does not mean that the PA system will be completely inaudible. In these situations it is likely that the system would be faintly audible in the background, and a person listening would be able to detect these sounds due to the characteristics of the PA source compared with the constant mechanical noise emitted from the ship engines and ventilation systems.

Scenario 2a, quiet ship at berth; when comparing the predicted instantaneous noise from the PA system the contribution is not significant enough for a penalty to be triggered, when assessed against INP criteria for annoying characteristics. However, it is expected that an overall noise increase of less than 2dB would occur.