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Attention: Harry Egan
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121 Woodstock Street
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SLR Project No.: 630.30321.00000

Client Reference No.: L03

RE: Aurizon Port Services NSW Expansion
Noise Model Validation in Response to Feasible Mitigation Measures

1.0 Introduction

Aurizon Operations Limited (Aurizon) has engaged SLR Consulting Australia Pty Ltd (SLR) to conduct additional noise monitoring of container handling operations in response to comments from the NSW Environment Protection Authority (EPA) regarding the proposed expansion of the Aurizon Port Services NSW (APSN) site (the Project) within the Port of Newcastle.

The purpose of this letter is to respond to additional comments from the NSW Environment Protection Authority regarding possible feasible and reasonable mitigation measures to reduce sleep disturbance L_{Amax} noise levels from the unloading, loading and stacking of cement containers in the southern hardstand area of the Project.

The EPA Request for Additional Information dated 21 August 2024 notes the following:

> *After reviewing the additional information provided, the EPA is not satisfied that all feasible and reasonable mitigation measures have been investigated to address the potential night-time 6 dBA exceedances of the SDNL's during container loading and stacking activities.*
>
> *The EPA requests the Applicant undertake further investigations into mitigation options to reach the best achievable noise level from container handling works occurring on the premises at night. These options may include further source and on-site works or operational controls, or offsite measures to reduce potential noise at impacted receptor locations.*

SLR report 630.30321-L01-V1.0 *Aurizon Port Services NSW Expansion Addendum Noise Impact Assessment* dated 26 March 2024, and the letter 630.30321-L02-v0.2 *Aurizon Port Services NSW Expansion Response to Feasible Mitigation Measures* (Addendum 2 NIA) included an analysis of potential noise mitigation of reach stacking activities at the south of the site.

2.0 Noise Monitoring

In order to respond to the latest EPA comments, SLR conducted operator attended noise surveys representative of receivers R3 and R6 as well as concurrent unattended noise monitoring on the APSN site in order to validate maximum noise sound power levels and predicted noise levels from the reach stacker operations presented in Addendum 2 NIA letter.

The monitoring was conducted during the night-time period commencing Sunday 13 October 2024.

In order to obtain a robust data set, during the noise monitoring period the reach stacker conducted multiple repetitive stacks of:

- A full ISO container loading on and off an empty wagon attached as part of the train consist to simulate the loading and unloading of cement ISO containers onto trains.
- Repeated transfer of a full ISO container onto other containers to simulate the stacking of containers.

Operator attended noise monitoring was conducted at the nearest most potentially affected receivers in Carrington (R3) and Stckton (R6) during both the wagon loading/unloading and container stacking operations. In addition, a noise logger was placed onsite to capture the maximum noise levels from each operation.

2.1 Attended Noise Monitoring

Operator-attended noise measurements were conducted across the night-time period commencing Sunday 13 October 2024. The purpose of the monitoring was to measure maximum noise levels from loading/unloading and stacking events from the reach stacker in the southern hardstand area of the site.

Ambient noise levels presented include all noise sources. Weather data during the monitoring period has been obtained from the Bureau of Meteorology weather station located at Williamtown RAAF Base approximately 14 km north east of the site.

The tables below provide the following information on operator-attended noise surveys:

- Date and start time, and measurement duration.
- Monitoring location.
- Wind velocity (m/s) and temperature (ºC) at the measurement location.
- Typical maximum (L_{Amax}) and contributed noise levels.

Results of the operator-attended noise surveys are provided in **Table 1**.

Table 1 Operator-attended Noise Survey Results

Location	Date/ Start Time/ Weather	Primary Noise Descriptor dBA					Modifying Factors Applicable	Description of Noise Emissions and Typical Maximum Noise Levels (dBA)
		L_{Amax}	L_{A1}	L_{A10}	L_{A90}	L_{Aeq}		
R3 Wagon loading / unloading	13/10/2024 22:57 16°C 4.1m/s NE Duration 5:22	54	52	51	49	50	N/A	*Site related noise events:* **Aurizon: Audible** Reach stacker 53 *Other noise events:* Insect noise <30 Industry noise 49-51 Traffic noise 50-54
R3 Container Stacking	13/10/2024 23:20 16°C 4.6m/s NE Duration 7:36	54	52	51	49	50	N/A	*Site related noise events:* **Aurizon: Audible** Reach stacker <50-53 *Other noise events:* Insect noise <30 Industry noise 49-51 Traffic noise 51-54

Location	Date/ Start Time/ Weather	Primary Noise Descriptor dBA					Modifying Factors Applicable	Description of Noise Emissions and Typical Maximum Noise Levels (dBA)
		L_{Amax}	L_{A1}	L_{A10}	L_{A90}	L_{Aeq}		
R6 Wagon loading / unloading	13/10/2024 23:59 16°C 4.1m/s NE Duration 5:26	47	46	45	42	44	N/A	*Site related noise events:* **Aurizon: Audible** Reversing alarm <40 *Other noise events:* Insect noise <30 Industry noise 44-45 Wind in trees 45-47 Extraneous 43-45
R6 Container Stacking	14/10/2024 00:06 16°C 4.1m/s NE Duration 3:07	46	44	44	42	43	N/A	*Site related noise events:* **Aurizon: Inaudible** *Other noise events:* Insect noise <30 Industry noise 42-44 Extraneous 46

The reach stacker operations were only audible at receiver R3 reaching 53 dBA L_{Amax} when unloading/loading the wagon and ranged from <50-53 when conducting container stacking.

This is considerably less than the 61 dBA predicted in the Addendum 2 NIA and below the Sleep Disturbance Noise Level of 55 dBA at R3 and R6. Stacking and loading/unloading maximum events remained inaudible at R6 throughout the monitoring.

2.2 Unattended Noise Monitoring

Unattended noise monitoring was conducted using a SVAN-957 environmental noise logger (serial number 27522) on the APSN site concurrent with operator attended noise monitoring. The noise logger was positioned to record L_{Amax} noise levels of the reach stacker operations from both wagon and a container movements.

The recorded L_{Amax} noise levels were used to calculate the sound power level (SWL) of the reach stacker operations. The noise logger was positioned 1.5 m above ground in free-field, 17 m away from the reach stacker when loading/unloading the wagon, and 20 m away from the reach stacker when stacking containers.

Table 2 shows the absolute maximum SWL from each stacking operation, the 90th percentile of all maximum events (considered the 'typical maximum' noise level) and the 50th percentile. Also included is the maximum SWL obtained from onsite events corresponding to audible events at R3.

Table 2 Unattended Noise Monitoring Results - SWL

Stack Type	Number of Events	L_{Amax} SWL (dBA)			
		Maximum	90th Percentile	50th Percentile	Maximum of Audible Events
Wagon loading / unloading	68	123	120	115	117
Container Stacking	53	116	115	114	115

It should be noted that absolute maximum noise level of 123 dBA from reach stacker operations are consistent with that used in the Addendum 1 and Addendum 2 noise impact assessments, with 'typical maximum' (90th percentile) noise levels in the order of 3 dB to 8 dB less and median maximum (50th percentile) noise levels 8 dB to 9 dB less.

3.0 Noise Modelling Validation and Assessment

3.1 Noise Model Validation

Using the highest audible maximum noise levels, location of the works and the meteorological conditions at the time of the noise monitoring, noise levels were predicted to R3 and R6.

The outcomes of the validation study show that predicted L_{Amax} noise levels are marginally higher than measured noise events, however, are within 1 dB to 2 dB of measured values at R3.

Noise levels of 40 dB to 41 dB were predicted at R6, where events remained inaudible.

Considering the limitations of the study, the validation study indicates there is good correlation between the modeled and measured noise levels, and as such no correction factor for the noise model is warranted and the noise model developed is suitable for predicting noise levels from the Project.

3.2 Noise Modelling and Assessment

Using the calculated absolute maximum and 'typical maximum' (90th percentile) sound power levels of the reach stacker stacking containers on either the wagon, or other containers, the predicted maximum noise levels for the proposed operations of the reach stacker under noise enhancing meteorological conditions in the southern hardstand area is provided in **Table 3**.

Table 3 Detailed Maximum Noise Level Assessment – Future Operations

Receiver	Predicted L_{Amax} Noise Level (dBA) Noise Enhancing Meteorological Conditions			
	Container Stacking		Wagon Loading/Unloading	
	Absolute Maximum	Typical Maximum (90th Percentile)	Absolute Maximum	Typical Maximum (90th Percentile)
R3	53	52	59	56
R6	52	51	60	57

As seen in **Table 3** absolute maximum wagon loading/unloading is predicted to exceed the SDNL by up to 5 dB with 'typical maximum' noise levels predicted to exceed the SDNL by up to 2 dB. Absolute maximum and 'typical maximum' noise levels from container stacking is predicted to be below the SDNL.

In all instances based on guidance contained in the NSW Road Noise Policy, maximum noise levels are not predicted to cause awakening reactions at any residential receiver.

L_{Amax} noise levels from container stacking are predicted to be below 55 dBA at all receivers and as such are below the enHealth Council (2004) guidance that indoor sound pressure levels should not exceed approximately 45 dBA L_{Amax} (equivalent to 55 dBA L_{Amax} externally accounting for 10 dB loss from external to internal with windows open for ventilation) more than 10 or 15 times per night.

Given a train unloading event would generate an average of 12 wagon unloading/loading events in any one night-time period an average of 3 nights per month, it is likely that only a few L_{Amax} events during any one night would actually exceed the SDNL. Furthermore, given the limited number of wagon loading events required, internal noise levels are not expected to exceed 45 dBA more than 10 to 15 times during the course of a night-time period while loading a train.

Notwithstanding the above, Aurizon has investigated further mitigation and management measures to reduce potential noise impacts during the night-time. Due to freight rail network operations, it remains unfeasible to schedule train unloading to not occur during the night time, however the export of cement ISO containers by road is able to be limited to the daytime and evening period only.

This in conjunction with limiting the handling of containers during the night-time period only to occur in response to a train needing to be loaded/unloaded, and the relative infrequent occurrence of maximum noise level events from this activity, maximum noise level events from the Project are unlikely to have an adverse impact on the acoustic amenity of surrounding residential areas.

I trust the above meets current requirements. If you have any questions or require any further information please do not hesitate to contact me on 02 4037 3200 or at pmarshall@slrconsulting.com.

Regards,

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