

Appendix G

Landside Noise Guideline

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G.1 Overview

This Landside Noise Guideline outlines how port land at Glebe Island and White Bay is managed under an industrial noise precinct and adopts the concepts of noise management for precincts outlined in the EPA Noise Policy for Industry (2017).

The Landside Noise Guideline will assist the port in delivering the following benefits under the Port Noise Policy:

- improved and consistent management of noise from the port
- certainty for residents, industry, regulators and approval authorities about anticipated and acceptable levels of noise collectively from vessel and landside port activities
- enhanced communication about typical port noise emissions to the community and stakeholder through the production of noise maps.

The key outputs from this Guideline are precinct landside noise criteria for individual operators so that overall precinct noise levels can be met and noise maps that identify the likely landside noise levels from the port to surrounding areas. The criteria are presented in the Port Noise Standard – Appendix H.

This document is intended to be used and referenced when:

- undertaking a noise assessment; or
- during periodic reviews of landside noise emission.

This document is intended to be used and referenced by:

- Port Authority
- port tenants and developers
- regulators and approval authorities.

A Noise Management Precinct enables an area with many proponents to operate as a single site that is required to meet the amenity level where feasible and reasonable. This approach simplifies assessment and compliance by setting a single noise goal which all tenants must collectively meet.

The Noise Policy for Industry outlines the essential requirements of a precinct which are addressed in this Landside Noise Guideline:

- be binding on all relevant parties
- have a mechanism for quantifying impacts from new developments in combination with existing noise sources, for example, a noise model
- identify a party or mechanism that is responsible for managing the agreed method of noise quantification
- identify a party or mechanism for recording transactions
- have clear spatial boundaries and be characterised by a common function or activity type as, for example, with ports
- ensure that precinct requirements are enforceable through development consent conditions, licence conditions, conservation agreements or contracts.

The scope of this guideline excludes vessels which are not part of the landside precinct and are separately managed by the Vessel Noise Guideline.

The Glebe Island and White Bay Noise Management Precinct will not include the operations of construction projects and staging support being carried out on Glebe Island and White Bay. This is because these activities are governed by their own separate planning processes and construction noise criteria (not directly related to precinct criteria, but rather EPA's Interim Construction Noise Guideline 2009), and which are not anticipated to continue with port operations in the long term.

G.2 Landside noise

Noise from landside activities is produced by equipment and mechanical plant that is associated with onshore handling or processing of materials and passengers. These noise sources may either be fixed or captive to the site or be on site temporarily to load or unload materials or passengers for transport to other localities.

This guideline aims to achieve the following:

- provide the mechanism to establish industrial noise criteria for each berth within the port
- publication of clear and accessible noise maps from landside activities
- simplified noise management of the port.

2.1. Landside activities

There are two forms of operation undertaken at the port which depend on the needs of the operator. These are:

- onshore handling of materials and passengers to support the loading and unloading of a vessel
- onshore processing and dispatching of materials which is independent of a vessel being at the berth.

A berthed vessel will in many instances provide acoustic shielding and/or masking of noise from landside activities. This leaves onshore processing and dispatching of materials, when a vessel is not at the berth, as the biggest risk for community annoyance.

Onshore handling at all berths includes the use of trucks to handle materials. When vessels are not present at berths, trucks are the main source of noise.

While vessels are being unloaded additional sources of landside noise include hoppers, conveyors and pumps for bulk materials. For cruise vessels additional sources of noise may include baggage handling, buses and carpark noise.

Some operations may include material handling and processing within buildings. These noise sources generally operate at lower noise levels than the truck movements accessing these buildings.

2.2. Time periods

The time periods for assessment of landside industrial noise are defined in the Noise Policy for Industry. The daytime period is from 7am to 6pm, the evening period from 6pm to 10pm and the night time period from 10pm to 7am.

2.3. Noise descriptors

The Landside Noise Guideline uses the descriptors defined in the EPA's Noise Policy for Industry.

Noise levels are assessed using the equivalent continuous A-weighted level (L_{Aeq}) noise level. The L_{Aeq} noise descriptors for the noise precinct are $L_{Aeq,period}$ for the day (11 hours), evening (4 hours) and night (9 hours) time periods. These values are averages over the length of the relevant period. These descriptors form the L_{Aeq} component of the cumulative noise limit that must not be exceeded when all of the landside activities within the port are added together.

Sleep disturbance events are screened against the prevailing background noise level at the time of the disturbance, in accordance with the Noise Policy for Industry, using the L_{Amax} noise descriptor. The magnitude of events should be considered further where they exceed the screening test. For example, further evaluation should be completed relative to an external noise level threshold of 65dBA L_{Amax} which may be assumed to an equivalent internal noise level to 55dBA with windows open. An internal noise level of 55dBA is considered unlikely to cause awakening (EPA Road Noise Policy, 2011).

Noise levels may include correction factors for annoying characteristics present at the receiver location. A penalty for annoying characteristics are applied and included in the overall A-weighted noise level in accordance with the Noise Policy for Industry.

When a vessel is in port the prevailing background will likely be a vessel. At other times it may be noise from the traffic on ANZAC bridge or the rest of the precinct.

2.4. Precinct noise level terminology

Cumulative Noise Limit

The cumulative noise limit is a fixed limit referenced against the industrial amenity criteria specified for an industrial urban interface in the Noise Policy for Industry. It represents the upper noise limit permitted from all current and future landside operations as a combined landside activity noise level.

Collective Benchmark Noise Level

The collective benchmark noise level is the combined noise level from all current operational landside port activities. Approval authorities should consider the collective benchmark noise level against the cumulative noise limit when assessing noise limits for developments. The collective benchmark noise level should not exceed the cumulative noise limit. Ensuring that the collective benchmark noise level does not exceed the cumulative noise limit is important to manage noise impacts on the community.

The collective benchmark noise level is the aggregate sum of the maximum permissible noise level assigned to individual operators.

Maximum Permissible Noise Level

The maximum permissible noise level is the individual noise limit applied to an operator's landside activities and includes three components. These are:

- L_{Aeq} amenity noise level average for each of the day (11 hour), evening (4 hour) and night (9 hour) time periods
- $L_{Aeq,15minute}$ amenity noise level which is the worst case noise level that may be emitted within each time period. The duration of this worst case amenity noise level must be limited to ensure that the average level over the relevant day (11 hour), evening (4 hour) and night (9 hour) time periods are met
- L_{Amax} noise level during the night time to manage sleep disturbance

When a vessel is not present at the berth, the maximum permissible noise level is at a screening limit for L_{Amax} equal to the $L_{Aeq,15minute}$ amenity noise level plus 10dBA during the night time period. This is equivalent to the Noise Policy for Industry's screening criteria of background plus 15dBA.

When a vessel is present at the berth, the maximum permissible noise level for L_{Amax} from landside activities is equal to the L_{Amax} limit set by the Vessel Trigger Noise Level which is $L_{Aeq, ship}$ plus 10dBA. This limits L_{Amax} noise levels to less than 15dBA above typical vessel L_{Aeq} noise levels which range between 5dBA less than the VTNL and the VTNL. For vessels that exceed the VTNL the L_{Amax} limit is conservative and less than background plus 15dBA.

2.5. Environmental noise levels

Environmental noise levels around the port vary throughout a 24 hour period in average terms as there is generally greater activity from the road network and commercial or industrial activities in the day time compared to other daily time periods. These average noise levels during the day, evening and night time are referred to as the ambient noise level in this document.

Noise levels also vary in the shorter term over a 15 minute time period throughout the 24 hour period. For example noise levels may rise and fall due to a vehicle passing nearby on a local street, a distant aircraft or natural sounds and at times drop to a minimum repeatable level due to distant traffic on major roads. The minimum repeatable level is referred to in this document as the rating background noise level. The rating background noise level is defined in the EPA's Noise Policy for Industry.

Current representative ambient and background noise levels around the port are presented in Table 1.

Background noise levels in Balmain and Glebe near the port are typically due to traffic on ANZAC Bridge with ambient noise levels controlled by local traffic and urban noise sources. At Pyrmont near the port ANZAC Bridge is the main consistent source of background and ambient noise.

Table 1 Ambient and background noise levels

Locality	Location	Rating Background Level (RBL), dBA			Ambient L _{Aeq(period)} , dBA		
		Day	Evening	Night	Day	Evening	Night
Balmain	Donnelly St	47	45	40	57	54	51
	Batty St	51	49	42	57	53	47
Pyrmont	Refinery Dr	50	49	47	56	55	53
Glebe	Leichhardt St	46	46	40	58	55	53

Source: SLR Report 610.11854 Interim Exhibition Facility Glebe Island White Bay Wharves 4 and 5 (2012) and SLR Report 610-04309-R51 Glebe Island Wharves 1 and 2 Proposed Multi-User Facility (2013)

These ambient and background noise levels should be used to evaluate potential noise impacts associated with individual maximum permissible noise levels and the cumulative noise level.

The ambient and background noise levels in this table should be reviewed every 5 years or following any significant changes in land use near the port or any significant port redevelopments and new operations.

G.3 Management of landside noise

The Noise Management Precinct is implemented through port tenant leases of Glebe Island and White Bay. Under each lease, each tenant is allocated an individual maximum permissible noise level which collectively meets the benchmark noise level for the precinct. These noise levels are set out in Appendix H - Port Noise Standard

Where tenants are individually subject to either a planning approval or an Environmental Protection Licence (EPL) which specifies noise limits for landside activities, the Port Authority will work with the relevant authority to achieve consistency with EPLs or approval conditions where possible. In any instance the maximum permissible noise level for a tenant will be set at the lower of the limit set by another authority or the levels required to meet the Collective Benchmark Noise Level.

This guideline subsequently sets the processes for undertaking an environmental assessment within the Noise Management Precinct for a proposed port development and equitably allocating the burden of noise mitigation and permissible noise emission for each proponent.

Ongoing compliance requirements and noise monitoring are outlined in Section G.9.

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G.4 Noise mitigation

The requirements for the consideration of noise mitigation is outlined in this document which is in accordance with the noise mitigation requirements in the Noise Policy for Industry.

Port leases incorporate the flexibility required for precincts to apply additional noise mitigation to an existing proponent if noise levels exceed the Cumulative Noise Limit or Collective Benchmark Noise Level. This includes the situation where it is more cost effective and practicable to mitigate existing operators rather than just mitigating noise from a new proponent.

As a result of noise mitigation, the maximum permissible noise level for an existing proponent may change over time if a new proponent, in seeking approval to operate within a port, carries out noise mitigation measures to an existing proponent's operations on the basis that it is more cost effective to additionally mitigate the existing proponent. The permissible noise emission for that existing proponent will be altered to reflect the newly mitigated noise level.

In locations where the Collective Benchmark Noise Level is less than the Cumulative Noise Limit the application of noise mitigation will limit noise level increase to no than permitted under the Noise Policy for Industry where feasible and reasonable. Where the Collective Benchmark Noise Level is equal to or greater than the Cumulative Noise Limit noise levels will be limited to no greater than the Cumulative Noise Limit where feasible and reasonable.

4.1. Noise maps

Communication of overall noise levels shall be provided using noise maps showing landside noise emission and cumulative noise levels with vessels.

The noise maps shall also be used to evaluate the potential noise impact from a proposed port development in the planning stages. The proponent of the new development will be required to mitigate their development or noise from other proponents so that landside port noise levels meet overall noise targets. Noise maps shall be updated as part of the evaluation and approval of any port development.

For future scenarios landside port maps should show the port noise amenity criteria at neighbouring receivers as this reflects the worst case noise level. Actual noise levels may be used for current and historical levels where known. Noise maps may be used to inform:

- community
- residential and commercial developers in the vicinity of the port
- planning processes
- regulators and approval authorities
- triggers for noise mitigation

G.5 Overall landside noise limits

5.1. Cumulative noise limit

The cumulative noise limit is defined by the amenity noise levels outlined for urban industrial interfaces in the Noise Policy for Industry and is summarised below in Table 2.

Table 2 Cumulative Noise Limit - amenity criteria for an industrial urban interface

Time Period	Industrial urban interface criteria, L_{Aeq} , (period)
Day (11 hour)	65
Evening (4 hour)	55
Night (9 hour)	50

5.2. Collective benchmark noise level

The collective benchmark noise level sets the current upper noise limit from landside activities. When this policy was implemented it reflected the aggregate sum of all existing landside operations occurring adjacent to the berths at White Bay and Glebe Island. In some instances, this was less than the Cumulative Noise Limit. The daytime ambient noise levels for example range between 56dBA and 58 dBA (Section 2.5), compared with the significantly higher cumulative noise limit for the day period of 65dBA.

The collective benchmark noise level may increase as new maximum permissible noise levels are assigned to additional operators or upgrades to existing facilities. The collective benchmark noise level should not exceed the cumulative noise limit and any increases evaluated to ensure they do not result in an unreasonable noise impact compared to existing industrial noise levels from the port. Guidance on reasonable increases in industrial noise level will be taken from the Noise Policy for Industry which considers impacts from successive industrial developments.

Sleep disturbance events are not cumulative and do not form part of the cumulative noise limit or collective benchmark noise level.

G.6 Determining a maximum permissible noise level

6.1. Nominal maximum permissible noise level

When determining the maximum permissible noise level for an operator initial guidance may be taken from the nominal values in Table 3 and Table 4.

The nominal maximum permissible noise levels are based on noise levels around the port at the introduction of this noise policy. These nominal levels should be reviewed every 5 years or following the review of background and ambient noise levels in Section 2.5.

The day and evening time periods have been assigned the same criteria as the existing noise levels are not significantly different between the day and evening.

Table 3 Nominal maximum permissible noise level for amenity

Residential (external noise level)							
Locality	Representative Location	Maximum Permissible Noise Level, dBA					
		L _{Aeq(period)}			L _{Aeq(15 minute)}		
		Day	Evening	Night	Day	Evening	Night
Balmain	Donnelly Street	Cumulative noise level limit minus 5dBA				51	45
	Batty Street					55	47
Pymont	Refinery Drive					55	52
Glebe	Leichhardt Street					51	45
Other noise sensitive receivers							
5dBA less than the values defined in the NSW EPA's Noise Policy for Industry, Table 2.2							

Note: These noise levels were set based on the intentions of Sections 2.3 and 2.4 in the Noise Policy for Industry and the port ambient and background noise levels in Table 1. The same 15 minute criteria were set for the day and evening as background noise levels are similar during these time periods and port noise emission is constant over these time periods under worst case operations.

The nominal maximum permissible noise level for sleep disturbance are detailed in Table 4 as screening tests. Further evaluation should be completed of the magnitude of the predicted maximum noise level events where they exceed the screening test.

Table 4 Nominal maximum permissible noise level for night time sleep disturbance (external residential)

No vessel at individual operator berth, 10pm to 7am			
Locality	Location	Screening test limit, dBA	Reference level for further evaluation, dBA
		L _{Amax}	L _{Amax}
Balmain	Donnelly Street	55	65
	Batty Street	57	
Pymont	Refinery Drive	62	
Glebe	Leichhardt Street	55	
Vessel at individual operator berth, 10pm to 7am			
L _{Amax} from Vessel Trigger Noise Level			

6.2. Operator specific considerations

These nominal noise levels should be reviewed to identify the operator specific maximum permissible noise level. This review, amongst other things, should evaluate the following:

- strategic goals and planning by Port Authority
- whether the nominal $L_{Aeq, (period)}$ would result in an exceedance of the cumulative noise limit
- the potential change in collective benchmark noise level with the additional individual operator and whether this is reasonable under the Noise Policy for Industry
- the reasonable level of noise emission that may be expected for the individual operator based on their proposed activity
- existing noise emission from other individual operators
- effectiveness of proposed site management procedures to limit the duration of noise $L_{Aeq(15\text{ minute})}$ levels
- potential noise from other future operations
- the effectiveness of noise mitigation that could be applied to the operator and whether this is reasonable and feasible
- the effectiveness of noise mitigation that could be applied to other operators and whether this is reasonable and feasible.

6.3. Existing operators

Existing operators that predate the Port Noise Policy will be assigned maximum permissible noise levels that are consistent with any current approval conditions and licences for landside activities where appropriate.

Where there are no current criteria or limits assigned to landside activities, then an operator's noise emission relating to current activities will be set as their maximum permissible noise level if these levels do not result in exceedance of the cumulative noise limit.

If the current noise levels from an existing operation result in exceedance of the cumulative noise limit, the operator's noise levels shall be reviewed against the nominal maximum permissible noise level and the operator specific considerations to identify the operator specific maximum permissible noise level. This would be completed in consultation with the operator.

6.4. New operators

New operators shall be reviewed against the nominal maximum permissible noise levels and the operator specific considerations to identify the operator specific maximum permissible noise level.

As an example, the following outlines the process for setting night time noise criteria undertaken for the Multi-User Facility (approved in 2019) and the proposed concrete batching plant at Glebe Island (SSD 8544).

At Jackson's Landing, the only significant sources of industrial noise from landside activity will be the proposed batching and Multi-user facilities. From Table 2 the cumulative noise limit for the precinct is 50dBA.

The nominal maximum permissible noise levels from Table 3 are 45dBA at Balmain, Glebe and Pyrmont.

However, when reviewing the operator specific noise levels, it was identified that the entire night time cumulative noise limit of 50dBA (9 hour) for the precinct at Pyrmont had already been wholly assigned to a previously approved Multi-User Facility (MUF) at Glebe Island. This did not leave any significant operating ability in terms of additional noise levels for the proposed batching plant.

To facilitate enough operating noise level ability for the batching plant proposal, consideration was given to the potential noise reduction achievable by the proposed Multi-User Facility compared with the existing approval. The outcome was the 50dBA assigned to the previously approved MUF was split evenly into two to provide the batching plant and proposed MUF a maximum permissible noise level of 47dBA under the precinct. Mitigation was applied to the newly approved MUF in the form of a building to enclose most significant landside noise sources so that the new criterion of 47dBA could be met.

At Balmain the port is also the only form of industry near adjacent residences. However there are other landside operations and nearby berths that are closer to Balmain than Glebe Island 1 and 2. These are White Bay Berths 3 to 6 and to a limited extent Glebe Island 7 and 8. To provide allowance for other operations, the maximum permissible noise level for each of Hanson and the MUF were each set at the nominal noise level of 45dBA (50-5=45dBA).

A similar approach was taken at Glebe as for Balmain to give 45dBA. While it is unlikely that other port operations will impact Glebe (the port is not a landowner near Glebe), an allowance was given for other land managers and operators outside of the port precinct.

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G.7 Environmental assessment

Environmental assessments undertaken for landside activities must reflect that the operations are proposed to occur within the port noise precinct where there is a collective requirement that all operations together meet the cumulative noise limit, a reasonable total noise limit and do not contribute to sleep disturbance.

The process must also reflect that, unlike many other sites where industrial assessments are completed, the background noise may typically be sporadic week to week from activities by other operators in the broader site.

The following process must be followed for landside environmental noise assessments:

1. Meet with Port Authority to discuss goals and planning.
2. Obtain a copy of Port Authority's current noise model and noise levels.
3. Add into the noise model the proposed activity.
4. Evaluate the potential impact against the cumulative noise limit, the collective benchmark noise level and the nominal maximum permissible noise level. Where relevant also identify any required time limits and how they may be enforced on site to ensure that $L_{Aeq,15min}$ levels will not exceed the $L_{Aeq,period}$ levels.
5. Identify noise mitigation that could be applied so that the cumulative noise limit is met, increases in the collective benchmark noise level minimised and so the proposal does not contribute to sleep disturbance. Note that subject to further approval by the Port Authority, this may also include mitigation to other activities and operators that are not subject to this environmental assessment.
6. Liaise with Port Authority on the results from 4 and 5 above so Port Authority can confirm the operator specific maximum permissible noise level. This should include the updated version of the Port Authority's noise model.
7. Update the noise model and evaluation as required to meet the maximum permissible noise level.
8. Prepare an environmental assessment that outlines the assessment and evaluation from the steps above and other relevant planning requirements.
9. Provide Port Authority with a final version of the proposal's noise model for review and future noise management which reflects the environmental assessment.
10. Following review of the environmental assessment and approval of the proposed development, contracts between Port Authority and the operator will be prepared or, in the case of an existing operator, updated to reflect the maximum permissible noise level for the operator.

G.8 Compliance and licensing

Compliance of the operation with the maximum permissible noise level should be independently verified by an acoustics consultant engaged by the operator. At the discretion of Port Authority or other relevant Authority the independent review(s) may be required at the following times:

- when 'for construction' drawings are finalised and before commencement of construction
- prior to commencement of operations
- within 1 month of commencement of operations
- in response to reasonable community complaints
- detection of excess noise during noise monitoring
- following request by EPA and other regulatory authorities

It is suggested that licensing and planning approval conditions imposed by regulators reference the following:

- the individual operator noise limits specified in their Maximum Permissible Noise Level
- relevant considerations under various meteorological conditions relative to the limits specified in the Maximum Permissible Noise Level
- Port Authority's Port Noise Policy, noise precinct and the principles that may be used to amend an operator's Maximum Permissible Noise Level so Port Authority can manage overall noise emission from the precinct.

G.9 Noise monitoring

Port Authority will undertake noise monitoring of the landside precinct. Noise levels will be compared with the collective benchmark noise level.

Sleep disturbance events will be investigated on a case by case basis through attended measurements and review of monitored data. Sleep disturbance events are less suited for automatic alerts using an unattended monitoring program. This is because many events would be detected that are not due to port operations and are instead caused by other sources close to receivers.

Landside operators will remain responsible for monitoring and reporting noise level exceedances to the relevant Authority. Port Authority may require landside operators to verify and report current noise levels against its maximum permissible noise levels if noise levels from landside activities exceed the collective benchmark noise level or on a case by case basis for sleep disturbance. Port Authority will have the ability to enforce contractual obligations owed to Port Authority to keep noise levels within maximum permissible noise level by each landside operators under its contract with Port Authority.

Under the principles of a noise precinct and contracts between operators and Port Authority, noise reduction, to keep noise levels within approved limits, may be undertaken for an operator's own site or alternatively for another operators site if it is more cost effective and there are no reasonable objections to the proposed works.

9.1. How community complaints will be managed

Port Authority will provide a responsive community information and complaint handling system to respond to queries and noise complaints received from local residents and other sensitive receivers. When reviewing a noise complaint, Port Authority will:

- if sufficient information is provided, establish the location of the resident relative to port operations
- identify which vessels were berthed and which landside operations were occurring at the time of the complaint
- inform the operator so they may take corrective action and contact the regulator in accordance with EPL and approval obligations
- review the noise levels
- Ensure that any noise exceedances are dealt with in accordance with this guideline for landside activities and the appropriate Vessel Noise Operating Protocol if related to vessels
- inform the complainant of the result of the review and who the relevant regulatory authority is.

The community should be consulted on an ongoing basis, and before changes to cumulative total noise level limits.

G.10 Producing noise maps

10.1. General

Noise maps shall be periodically produced and updated following changes to current or future operations within the port and revision of cumulative total noise limits.

The maps shall include those identified in Section 10.2 and when produced they should be updated in Appendix I of this Port Noise Policy.

The maps should include all relevant $L_{eq(15min)}$ and L_{Amax} noise descriptors. Accompanying tables should also outline any $L_{Aeq(15min)}$ noise levels that may be produced by an individual operator and the duration for which they are permitted.

Noise maps should be updated every 5 years or following the approval of new or upgraded operations that are subject to an environmental approval.

10.2. Noise map types

The maps shall be produced to show:

- Representative day, evening and night worst case noise levels for current year
- Representative day and night worst case noise levels for 10 years into the future
- Worst case day and night noise levels for a port with continuous 100% landside utilisation

Worst case and representative worst case noise maps

Current and future representative worst case noise level maps adopt the maximum permissible noise level for each current or expected future operator.

The worst case maps should adopt the cumulative noise limit for the precinct in the night time. For day and evening the worst case noise maps should use the nominal maximum permissible noise level for each landside location.