

Port Noise Management Plan Lyttelton Port of Christchurch

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Annexure A: Port Noise Contour Map

1 Definitions and Interpretation

1.1 Definitions: In this Management Plan unless the context otherwise requires:

A-Weighting means A-frequency weighting and approximates the response of the human ear to sound pressure

Acoustic Treatment means the measures that are to be detailed in the Port Noise Mitigation Plan and includes any design and construction work including any associated expert advice, required to acoustically insulate habitable rooms of a Noise Affected Property to mitigate noise to achieve the internal design sound level or any other method to mitigate noise as agreed by the owner of the Noise Affected Property and the Lyttelton Port of Christchurch

dB_A means A-weighted decibel and it is a scale of measurement that emulates human auditory response. A decibel is a dimensionless unit used to compare the magnitudes of sound pressure squared relative to a reference sound pressure of 20 micropascals (approximately the quietest sound a person can hear)

dB_A L_{dn} Contour Lines means the noise contours shown on the Port Noise Contour Map provided as part of this Port Noise Management Plan in accordance with Annexure A, and that may change over time following the development of noise modelling, monitoring and measurement procedures for the purpose of identifying Noise Affected Properties. The contours shall be determined in accordance with the methodology of *NZS 6809:1999 Port Noise Management and Land Use Planning* but shall exclude noise from the operation of the Dry Dock Facilities

District Plan means the proposed or operative Christchurch Replacement District Plan and any amendments

Dry Dock Facilities means operations at the dry dock, which includes the Patent Slip, grid and boat ramp situated in the western inner harbour area of Lyttelton Port

L_{dn} means the day-night average sound level, or day /night level. That is the time-average sound level, in decibels, over a 24 hour period (from midnight to midnight), obtained after the addition of 10 decibels to sound levels in the night (from midnight to 7.00a.m. and from 10.00p.m. to midnight)

Mechanical Ventilation means a mechanical system or systems designed, installed, and operating so that a habitable room, or habitable rooms (with windows and doors closed) are ventilated with outdoor air in accordance with the Building Code under the Building Act, 2004

Noise Affected Property means any property occupied by an existing dwelling within the Residential Zone or the Residential Conservation Zone of the District Plan that is partly or wholly contained within the area seaward of the 65 dB_A L_{dn} contour line shown on the Port Noise Contour Map attached in Annexure A and then any Port Noise Contour Map as amended from time to time in accordance with the Port Noise Management Plan

Port Noise means noise from:

- i. ships at berth
- ii. handling of cargo and passengers in the Lyttelton Port Zone and in the coastal marine area
- iii. administrative, repair, storage, or maintenance activities, trains, trucks, or other machinery located in the Lyttelton Port Zone

but excludes noise from:

- iv. ships not at berth
- v. construction of permanent port facilities
- vi. designated roads or railway lines
- vii. emergency situations

RMA means the Resource Management Act 1991 as amended or substituted unless expressly referred otherwise

2 Introduction

- 2.1 This plan sets out the long-term commitment of Lyttelton Port of Christchurch (LPC) to assess and manage noise from Port Activities. The Plan seeks to avoid or to reduce the potential for conflict between the activities producing noise within the Port, and residents and other member of the community who live in close proximity to the Port. The Plan also provides a framework for the Port Noise Mitigation Plan.
- 2.2 This is consistent with LPC's duty contained in Section 16 of the RMA which states that: *"Every occupier of land (including any premises in any coastal marine area), and every person carrying out an activity in, on, or under a water body or the coastal marine area, shall adopt the best practicable option to ensure that the emission of noise from that land or water does not exceed a reasonable level."*
- 2.3 New Zealand Standard 6809:1999, "Acoustics - Port Noise Management & Land Use Planning" (Port Noise Standard) provides the framework to manage Port Noise. Following the Standard, a 'model' of noise at the Port is generated. The model assumes that all areas of the Port are operating at an average five-day busy period, based on existing levels of trade. The Noise Model developed by LPC does not include water or grit blasting at the dry dock facilities. This operation is managed by controlling the hours of operation.
- 2.4 Based on the Port Noise model, 'Noise-Affected Properties' have been identified which are adjacent to the Port. These residentially-zoned properties are partly or wholly contained within the area seaward of the '65 dBA L_{dn} contour line' shown on the Port Noise Contour Map, which is derived from the above model.
- 2.5 Whether the Noise-Affected Properties actually experience the noise levels predicted by the model depends on the operations occurring at any one time. Parts of the Inner Harbour may be busy only periodically, depending on trade and operational decisions made over the years, while the container terminal is consistently busy. Predicted noise levels are emissions from potential Port Activities only and do not include noise from other sources (such as night-clubs or noise on public roads).
- 2.6 Following the Port Noise Standard, LPC uses the ' L_{dn} ' parameter as the basis of its management, and is used to develop the noise contours. In recognition of possible sleep interference from the noise, L_{dn} imposes a 10 dBA penalty for noise at night. The noise

contours have also been used to establish the Port Influences Overlay Area and the associated landuse controls contained in the district plan.

- 2.7 While this Noise Management Plan recognises that LPC will continually examine ways to avoid, remedy or mitigate Port Noise, this plan also recognises that LPC can accept new trade and redevelop areas of the Port, which may result in a busier and potentially noisier environment in some particular locations. The key will be to ensure this is managed carefully and with the necessary mitigation steps being introduced.
- 2.8 A key aspect of this mitigation is the provision for acoustic treatment, at the expense of LPC, for existing dwellings in residential zones in particular circumstances, and also the establishment of a Port Liaison Committee. This Committee provides framework for community input into noise management issues at Lyttelton Port.

3. The Objectives of this Plan

- 3.1 The objectives of this plan are set below.
- i. To set out LPC's commitment to avoid, remedy or mitigate Port Noise.
 - ii. To provide a framework for the Port Noise Mitigation Plan.
 - iii. To provide a framework for the monitoring, assessment, and management of Port Noise.
 - iv. To identify those Port Activities which have the potential to generate concerns about Port Noise.
 - v. To provide a framework to record, investigate, report, and respond to Port Noise complainants.
 - vi. To provide a framework for community input into Port Noise management issues through a Port Liaison Committee.

4. Relevant Statutory Documents, Regulations, Standards

- 4.1 The relevant statutory documents that have a bearing on this plan are:
- i. The Resource Management Act 1991
 - ii. The Christchurch Replacement District Plan
 - iii. NZS 6809:1999, "Acoustics- Port Noise Management and Land Use Planning"
 - iv. New Zealand Building Act 2004
 - v. The Health and Safety in Employment Act 1992
 - vi. The Port Companies Act 1988
 - vii. The Health Act 1956

5. Background

5.1 Background

5.1.1 Lyttelton Port was established circa 1850 for servicing trade and transport of passengers to and from Canterbury. Lyttelton is now an international Port and the largest Port in the South Island. The viability and competitiveness of the Port depends on its ability to provide a service that is able to meet the requirements of the cargo owners, shipping lines and Port operators on a round-the-clock basis. The industry norm for most port trades is working seven days per week, and twenty four hours per day.

5.1.2 Noise from Port Activities is however a significant resource management issue that requires a particular form of management. Some Port Activities cannot be managed to avoid adverse effects beyond the boundary of the Port. Furthermore, having various businesses generating Port Noise at the Port creates difficulties in applying the traditional approach of one “user” being responsible for the effects of their own noise generation. For example businesses at the Port, in addition to LPC, include:

- i. Shipping lines
- ii. Cargo owners
- iii. Stevedores
- iv. Ship builders/repairers
- v. Service suppliers
- vi. Transport contractors
- vii. Rail services

5.13 There is also the additional complication of some noise being generated from activities located in the coastal marine area, which is under the jurisdiction of the Canterbury Regional Council, while other noise being generated on land which is under the jurisdiction of the Christchurch City Council.

5.1.4 To address this issue, an approach adapted from NZS 6809:1999, “Acoustics - Port Noise Management & Land Use Planning” has been adopted in the district plan which:

- i. Introduces an area of Lyttelton Township affected by Port operations called a ‘Port Influences Overlay Area’ (that is derived from the 65 dBA L_{dn} contour line);
- ii. Discourages the addition, expansion or intensification of residential activities and other noise sensitive activities within the Port Influences Overlay; except in some specific circumstances; and
- iii. Inserts new methods in the district plan to address Port Noise, which includes the preparation of this plan, and also a Port Noise Mitigation Plan that provides for acoustic treatment at the expense of Lyttelton Port Company Ltd, for existing dwellings in residential zones in particular circumstances, and the establishment of a Port Liaison Committee.

5.2 Sources of Noise

The following sources of noise may be present at Lyttelton Port at any time, either of short duration or for extended periods:

5.2.1 Ships at berth

Ship noise at berth is mainly caused by the generators which provide power to run refrigeration plants, ventilation units, winches, heating and lighting. This is a constant noise for the full duration of a ship's stay at the berth and drives the background port noise level.

5.2.2 Road, Rail and Sea

Trucks and trailers delivering or removing containers and other goods operate twenty four hours, seven day per weeks although container traffic is usually concentrated during the daylight hours. Rail cargo is brought in by diesel locomotive. The line through to the end of Cashin Quay is 'designated' railway in the district plan and is therefore not subject to noise provisions. The same applies to traffic on both the State Highway and on the local roads.

Similarly, the movement of vessels at sea, including the manoeuvring of vessels on and off berths, the moving of vessels between berths and in and out of the dry dock, and tug, pilot launch, and ferry movements, are not subject to port noise provisions.

5.2.3 Cargo Handling Machinery and Equipment

This includes straddle carriers, forklift trucks of various sizes (for container handling), log loaders, tow tractors (for hoppers and trailers), front-end loaders and bulldozers (for stockpiling of coal) and the coal conveyor system that includes a stacker, a reclaimer and a shiploader. Audible warning devices are currently used for safety reasons. Work continues for the whole period that a ship is in Port, although some operations at times may be less intensive at night. Receiving and delivery of cargo can also occur at any time.

5.2.4 Repair and Maintenance Machinery and Equipment

This includes vehicles, forklifts, backhoes, compressors, water blasters, compactors, vibrators, pile drivers, saws (for metal, concrete and timber), grinders, jackhammers, drills, welding machines and dredging plant. Wharf, pavement and seawall maintenance generally takes place during the daytime. Repairs to cargo handling cranes, machinery and equipment can take place at any time. Grit-blasting and water-blasting in the dry dock are the major noise source at the dry dock but their hours of operation have been restricted for that reason.

5.2.5 Integral Refrigerated containers

These are containers where the refrigeration units are built into the containers. This noise is very constant in nature and the numbers of units in port are very dependent on the seasonal throughput of refrigerated containers.

5.2.6 Loading and Unloading of Vessels, Vehicles and Trains

This includes ship and shore-based cranes, moving ship hatches, handling lashings, the lifting of containers in and out of the cells on vessels, and the connecting and disconnecting of containers lifting gear (spreaders and twistlocks). Examples are transfers from ship to landing on wharf, wharf to storage and storage to trucks or rail. These activities can give rise to “bangs” and “knocks”.

5.3 Research into Noise Treatment

5.3.1 The Port Liaison Committee may, when considered necessary, request LPC to perform research, and present findings, on various methods to treat Port Noise, including:

- i. The evaluation of noise ratings or sound power levels for new plant or machinery
- ii. The evaluation of possible engine and exhaust maintenance programmes for existing machinery
- iii. The evaluation of methods to use machinery in a way to reduce noise such as driver training
- iv. The evaluation of the potential for acoustic barriers in specific situations

6. LPC's Obligations

6.1 LPC has a continuing obligation to allocate an annual budget to the Port Liaison Committee for the preparation and implementation of a Port Noise Management Plan and a Port Noise Mitigation Plan, and provide administrative and advisory support for the Committee.

6.2 LPC shall take all practicable steps to provide acoustic treatment for Noise-Affected Properties in accordance with the Port Noise Mitigation Plan.

6.3. LPC's obligations also include:

- i. Appointing an LPC staff member who shall be called, for the purposes of this Plan, the 'PLC Officer.' The PLC Officer shall have the minimum duties of ensuring that the Port Liaison Committee is supported logistically and ensuring communication occurs between the Port Liaison Committee and LPC Management
- ii. Investigating and adopting the best practicable option to ensure that Port noise does not exceed a reasonable level. This obligation does not mean LPC cannot accept new trade or redevelop areas of the Port which may result in a busier and potentially noisier environment, but it does mean LPC needs to adopt the best practicable option to manage noise at source or introduce the necessary mitigation measures
- iii. Monitoring noise and reporting back to the Port Liaison Committee as set out in section 7 of this Plan. LPC shall make available to the Port Liaison Committee,

the Christchurch City Council or the Canterbury Regional Council Port Noise measurements and any associated meteorological conditions

- iv. Dealing with noise complaints in accordance with Section 10 of this Plan
- v. Maintaining an Acoustic Certificate Register in accordance with the Port Noise Mitigation Plan
- vi. Ensuring a copy this plan is to be placed on LPC's web-site accessible by the public and a free copy of this plan and the Port Noise Mitigation Plan can be supplied to any member of the public on request
- vii. Advising the Port Liaison Committee of the outcomes from any recommendations made by the Committee

7. Noise monitoring and contours

- 7.1 The Port Noise Contour Map in Annexure A shows predicted Port Noise levels based on a current busy five-day operating scenario for all areas of the port, based on existing trade-levels. Properties estimated to be receiving levels of 65 dBA L_{dn} or greater will be identified from the Map with contours calculated at 1 dBA L_{dn} intervals
- 7.2 Whenever the Port Liaison Committee has good cause to believe that the Port Noise Contour Map or part thereof no longer provides an accurate model of the effects of Port Noise on a busy five-day operating scenario, then it can request that LPC carry out a monitoring programme designed to verify the model.
- 7.3 The Port Noise Contour Map shall be reviewed at least once every two years. If the Port Noise Contour Map or part thereof no longer provides an accurate model of the effects of Port Noise on a busy five-day operating scenario, then LPC shall prepare a replacement Port Noise Contour Map and forthwith deliver a copy to the Christchurch City Council, the Canterbury Regional Council and the Port Liaison Committee.
- 7.4 LPC shall carry out monitoring as necessary to calibrate and to ensure that the Port Noise Contour Map provides an accurate modelling of Port Noise.
- 7.5 The copy of the Port Noise Contour Map attached to this plan shall be replaced with a new Port Noise Contour Map every time a replacement Port Noise Contour Map is prepared.

8. The Port Liaison Committee: Establishment and Meetings

- 8.1 The Port Liaison Committee is to maintain a balanced representation, with the following parties having the opportunity to be on the Committee:
 - i. LPC
 - ii. Port customers and Port users
 - iii. Residents of Lyttelton Township
 - iv. Christchurch City Council
 - v. Canterbury Regional Council
- 8.2 In undertaking the business of the Port Liaison Committee each member shall make best endeavours to achieve consensus on all issues before the Committee.

- 8.3 The membership shall comprise:
- i. Up to three representatives of LPC
 - ii. Up to two representatives of Port users and cargo owners appointed by LPC
 - iii. Up to four representatives of Lyttelton residents
 - iv. One representative of the Lyttelton Community Association
 - v. One representative of the Diamond Harbour/Harbour basin communities
 - vi. One representative of the Community Board
 - vii. One Christchurch City Council officer
 - viii. One Canterbury Regional Council officer
- 8.3 a. The Diamond Harbour/Harbour basin and Community Board representatives have no duties in relation to the development and implementation of the Port Noise Mitigation Plan
- 8.4 A meeting quorum shall be at least one representative of LPC, Christchurch City Council and Lyttelton Community Association and at least half of the resident's representatives.
- 8.5 Any representative of LPC, Lyttelton Community Association or the Councils shall be considered a member of the Committee providing such a representative has been authorised by their respective organisation.
- 8.6 Any new representative of the Lyttelton residents shall be appointed by the Committee.
- 8.7 Representatives of the Lyttelton residents and the Diamond Harbour basin are limited to a term of three years. A representative may sit on the Port Liaison Committee for one further term of three years provided that the representative is nominated by another member of the Committee and the nomination is carried by the majority of the Committee.
- 8.8 Other LPC or Council staff or advisors may attend a meeting at any time to observe, or to inform or advise the Committee on any relevant matters.
- 8.9 The Port Liaison Committee meetings are not public meetings although by prior arrangement on request any person can attend and listen to any meeting except for those matters deemed confidential under Clause 8.10 below.
- 8.10 With the permission of the Committee, there may be a time set aside during a meeting for any person to speak to the Committee about Port Noise issues.
- 8.11 The Committee shall treat the following matters in confidence:
- i. Any matters of commercial sensitivity associated with any noise issues, whether they involve acoustic mitigation projects of properties in the township or noise issues associated with a business or operation at the Port
 - ii. Any person wishing to speak to the Committee in confidence for either commercial or personal reasons
 - iii. Any other matter the Committee agrees should remain in confidence

- 8.12 Members shall be free to disclose matters discussed at any meeting, other than those matters set out in Clause 8.11.
- 8.13 Any press releases by the Committee, or comments to the media by any members of the Committee, shall only be made with the agreement of the Committee.
- 8.14 LPC will provide logistic support for the Port Liaison Committee. After each meeting a 'summary discussion' of the meeting shall be prepared by LPC and shall circulate to Committee for confirmation at the next meeting. Except for those matters recorded under Clause 8.11, the summary discussion, after confirmation, shall be available to the public.
- 8.15 LPC shall arrange for the Committee to meet not less than four times each year, at a time convenient to members, unless the Committee agrees to an alternative arrangement.
- 8.16 An urgent meeting of the Committee may be convened at an agreed time should a request for an urgent meeting be made by LPC, the Christchurch City Council, the Canterbury Regional Council, the Lyttelton Community Association or by at least three Lyttelton resident representatives.

9. Port Liaison Committee: Functions

- 9.1 The Port Liaison Committee shall oversee the preparation by LPC of a Port Noise Management Plan and a Port Noise Mitigation Plan. The Port Liaison Committee shall carry out the functions given to it by the Port Noise Mitigation Plan.
- 9.2 The Port Liaison Committee shall record all complaints of Port noise received by it and forward them on to LPC.
- 9.3 The Committee shall record any complaints made to LPC, Christchurch City Council or Environment Canterbury, which have been forwarded onto it.
- 9.4 The Committee may seek further information from LPC about the noise source associated with a complaint, and, if necessary, it may recommend further investigations into an issue raised by a complaint, including the actions to prevent a recurrence of the complaint.
- 9.5 The Port Liaison Committee shall examine all noise issues arising from Port Activities taking into consideration:
- i. The contents of this Port Noise Management Plan
 - ii. LPC's acceptance of the obligation to manage noise emanating from Port operations
 - iii. The Port Noise Mitigation Budget
 - iv. The obligations of every person under Section 16 of the Resource Management Act, to adopt the best practicable option to ensure that the emission of noise from either land or water does not exceed a reasonable level
- 9.6 The Port Liaison Committee shall monitor LPC's performance of its obligations under this Port Noise Management Plan and the Port Noise Mitigation Plan and provide where necessary recommendations to assist LPC in the continued fulfilment of such obligations.

10. Complaints

- 10.1 LPC shall maintain a register of noise complaints so that whenever a noise complaint is received, it will:
- i. Record the details of the name and address of the complainant and the time of the complaint
 - ii. Record a description of the noise, the estimated time the noise occurred and identify, if possible, the source of the noise
 - iii. Record any follow up actions taken as a result of the complaint and where required any corrective actions to avoid, mitigate or remedy to the noise
 - iv. Report the details of the complaint and action taken to the next meeting of the Port Noise Liaison Committee

11. Documentation

11.1 Names and Contact Details

LPC shall annually provide a report to the PLC that includes the names and contact details of;

- i. Members of the Port Liaison Committee
- ii. Relevant LPC staff or consultants

11.2 Noise Model and Measurement Details and Procedures

Port Noise is predicted over a busy five-day operating scenario using the Brüel & Kjaer Predictor v9.12 program. To predict Port Noise the model:

- i. Incorporates a digital terrain model using a ground contour interval at 2m
- ii. Assumes a slightly positive meteorological effect (in accordance with ISO 9613-1/2 Acoustics – Attenuation of Sound during Propagation Outdoors)
- iii. Assumes a ground adoption of 0.7 for land and 0 for water
- iv. Assumes a receiver height of 1.5m
- v. Assumes a 4.5m high house
- vi. Assumes a 7.0m high commercial building
- vii. Considers the noise sources from the port at various locations

Attended and unattended monitoring was carried out at selected locations to validate the model.

11.2 Summary of Scenarios tested in the Acoustics Model

The model was rerun in 2014 to incorporate any changes in noise from port activities as a consequence of Port Recovery following the 2010-2011 earthquake sequence. The following is a summary of noise sources, assuming a busy five-day operating period:

- i. Cashin Quay 1 – coal loading 3 days a week plus trains and coal stockyard activities
- ii. Cashin Quay 2 – container vessels loading and unloading 2 days a week
- iii. Cashin Quays 3/4 - container vessels loading and unloading 6 days a week
- iv. No 1 breastwork – cement unloading 3 days per week
- v. No. 2 Wharf East (Inner Harbour) – fertiliser or gypsum 2 days a week
- vi. No. 2 Wharf West Inner Harbour) – logs/fish factory vessels 3 days a week
- vii. No. 3 Wharf East (Inner Harbour) – fish factory vessel 2 days a week
- viii. No. 3 Wharf West (Inner Harbour) – fish factory vessel 3 days a week
- ix. No. 7 Wharf East (Inner Harbour) – general cargo 2 days a week
- x. No. 7 Wharf West (Inner Harbour) – smaller fish factory vessel 7 days a week
- xi Oil Berth – bulk fuel 4 days a week

Plus landside cranes, straddles, gantries, reefer containers, rail and road.

Additional scenarios have also been modelled for a cruise berth located on the south side of Naval Point Reclamation and in the Inner Harbour located at Gladstone Pier. These two scenarios have since been discarded.

11.3 Summary of noise monitoring conducted

LPC shall annually provide a report to the PLC that includes a summary of any noise monitoring carried out during the previous year.

11.4 Summary of Annual Complaints and a description of actions taken to address a complaint

LPC shall annually provide a report to the PLC that includes a summary of any noise complaints and actions taken to address those complaints for during the previous year.

12. Alterations to this Plan

12.1 This Plan may be altered by the Port Liaison Committee.