Appendix F Noise Assessment

Bulk Liquids Berth No. 2 - Port Botany

NOISE ASSESSMENT REPORT

- Final
- 7 November 2007

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Contents

1. Introduction

1.1 General Introduction

Vopak Terminals Sydney Pty Ltd (Vopak) on behalf of Sydney Ports Corporation (SPC) is proposing to construct a second Bulk Liquids Berth (BLB2) facility at Port Botany NSW. Sinclair Knight Merz have been engaged to assess the potential for noise from additional shipping and unloading activities and the potential to affect the amenity of residential and other sensitive receivers near the Port. The assessment of noise impacts includes operational scenarios as well as the construction activities related to the new berth.

1.2 Study Objectives

The objectives of the noise study are as follows:

- to establish background noise levels at nearby residential locations;
- identify operational noise limits at receiver locations;
- predict noise levels resulting from the operation of the bulk liquid berth;
- compare predicted operational noise levels to the noise limits at receiver locations;
- predict noise levels from construction noise impacts; and
- identify any mitigation requirements for the proposed facility to meet the required noise limits.

1.3 Overview of the Proposal

The BLB provides services such as storage, transport, bulk handling, packaging and distribution and access to distribution facilities to independent operators and large corporations. These bulk liquids include fuel-based products used for energy and transport functions throughout NSW. Vopak operates two bulk liquid storage terminals in Port Botany, approximately 13 km south of the Sydney CBD. The first is known as the Site A Terminal and is located at 49 Friendship Road. The second facility, known as the Site B Terminal, is located at 20 Friendship Road.

The existing BLB, owned and operated by SPC, is an open access/common user facility available for all potential bulk liquids customers. In order to minimise the duplication of facilities for the two BLB, BLB2 will share some common components of the existing BLB1 infrastructure for access control, administration and port officers accommodation. BLB2 would require a new berth structure and ancillaries (user pipelines, fire protection system, hose handling gantries, berthing and mooring equipment).

BLB2 development would take place adjacent to SPC land on the privately accessed Fishburn Road side (western) of the Site B Terminal, adjacent to the boundary with the Elgas Caverns. Aspects of the BLB2 proposal consist of the following main elements:

- A central working platform providing a work area, with berthing face (including bollards and fenders) and pipe manifold/marine loading arm (MLA) arrangements;
- Adjacent berthing dolphins on each side of working platform designed to accommodate up to the maximum length vessel;
- Two mooring dolphins on each side of the working platform (four in total). Mooring dolphins will be required on the northern side of the working platform, instead of the existing land based mooring point arrangement used for the BLB1 due to the geometry of the existing shoreline.
- Walkways (catwalks) connecting the dolphins and working platform;
- An access bridge connecting the working platform with the shore and providing for pipeline support structures and vehicle access;
- Support infrastructure including fire control facilities (pumps, foam/water monitors and associated tanks, gatehouse and amenities (the need for a gatehouse is dependant on site security arrangement);
- Berth fit out, including fire fighting monitors, services such as water, sewer, electrical and communications, amenities and blast proof Operator Shelter.

Figure 1-1 is an example of the MLA, pipelines and other infrastructure that currently services BLB1 which would be duplicated for BLB2. **Figure 1-2** shows the position of the proposed BLB2 in relation to the existing BLB1 and Elgas site. The ship outline shows the footprint of the maximum 256 metres overall length, LR Class Tankship proposed for the berth.

Figure 1-1 View of equipment infrastructure at BLB1

Figure 1-2 Location of BLB 1 and Proposed BLB2 sites at Port Botany Terminal

2. Existing Noise Environment

The area around Port Botany is subject to high traffic numbers due to the port and nearby industrial activities and as a result, nearby residential locations experience elevated ambient noise levels. In addition to the existing noise in the vicinity of the port, recent approval for an expansion of the port operations by the Department of Planning will produce additional freight movements and therefore a corresponding increase in existing noise levels.

In October 2005, a 51 hectare expansion of the Brotherson Dock North to accommodate additional berths was approved. This expansion included additional dock space, four new berths, container storage and handling, an extension of the Botany Freight Line, two new rail sidings, and a dedicated road link from the new terminal to the heavy truck route on Foreshore Road. In August of 2005, the Department of Planning also approved Stage 2 of the Port Botany expansion, which involves the construction and operation of a fifth shipping berth and associated infrastructure.

Vopak has recently received approval in February 2007 for the construction of additional storage facilities as part of its B3 expansion works. These works include the construction of additional storage tanks, pipelines and a water treatment plant. The proposed BLB2 works include the berthing structure associated with the additional storage capacity generated from the B3 site and as such carry no additional capacity requirements with the proposal. Operational and traffic noise relating to the B3 site were considered as part of the approval for that project.

These recent projects have generated background noise studies as part of the approval process. The assessment of the BLB2 has utilised information from previous background noise levels in the vicinity of the port. **Figure 2-1** shows the areas of future expansion around the port with respect to the proposed BLB2.

Figure 2-1 Expansion in Port Botany

2.1 Background Noise Measurements

When measuring noise levels, the use of statistical descriptors is necessary to understand and describe how variations in the noise environment occur over any given period. A list of common descriptors and their meanings that have been used in this noise assessment are given below.

- L_{A90} – the noise level exceeded for 90 percent of the fifteen minute interval. This is commonly referred to as the background noise level and represents the quietest 90 seconds in a fifteen minute period;
- L_{Aeq} – the noise level having the same energy as the time varying noise level over the fifteen minute interval; and
- L_{Amax} – maximum noise level measured at a given location over the fifteen minute interval.

The Rating Background Level (RBL) is the overall, single-figure, background level representing each of the day, evening or night assessment periods over the whole monitoring period. This level is the tenth percentile of the background noise environment evaluated in the absence of noise from the proposed development, and is the level used for assessment purposes when referring to background noise.

The most detailed information available for noise monitoring studies was identified from a noise monitoring assessment undertaken by Wilkinson Murray (WM) in June 2003, for the Port Botany Expansion[1]. Additional information was also sourced from SPC for a residential location in La Perouse.

Not all locations identified in the WM report are relevant for the assessment of noise impacts in relation to the Vopak BLB2 site due to the distance and the proximity of other noise sources such as aircraft and road traffic. **Table 2-1** lists the locations of the unattended surveys while **Table 2-2** presents the results of attended measurements. These measured noise levels have been used to quantify the existing noise environment at residential receiver locations near the port. **Table 2-3** presents selected results of the unattended background noise monitoring results at residential locations near the proposed BLB2.

[1] Wilkinson Murray Noise report - Report No 02053 Version I, June 2003

Table 2-1 Noise Monitoring Locations

ID	Location Description	Position on the site
• Location 4	Botany Golf Course	Northern boundary
• Location 5	74 Australia Avenue	Centre of front lawn
• Location 6	Eastern Suburbs Crematorium Military Road	North western boundary
Location A[1]	21 Elaroo Avenue, La Perouse	Front Yard

Source: Wilkinson Murray Noise report
[1] Source: Sydney Ports

Table 2-2 Summary of Attended Noise Monitoring

Location	Noise Level dB(A)		Survey Period	Comment
	L_{Aeq}	L_{A90}		
Location 4	51	42	Night	Industrial noise from port operations audible approx. 48
Location 5	49	47	Night	Industrial noise from port operations audible approx. 48
Location 6	-	-	Night	-
Location A[1]	49	36	Night	No audible industrial noise sources

Source: Wilkinson Murray Noise report
[1] Source: Sydney Ports

Table 2-3 Summary of Background Noise Monitoring

ID	Location Description	RBL dB(A)		
		Daytime (7am – 6pm)	Evening (6pm – 10pm)	Night Time (10pm – 7am)
Location 4	North of Golf Course	57	50	43
Location 5	Australia Avenue	42	40	42
Location 6	Military Road	46	46	45
Location A[1]	Elaroo Avenue	38	37	36

Source: Wilkinson Murray Noise report
[1] Source: Sydney Ports

Figure 2-2 shows the unattended noise monitoring locations from **Table 2-2** in relation to the Vopak site that have been adopted for the BLB2 noise assessment.

0 185 370
Metres

1:15,505 At A4

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Figure 2-2 Proposed BLB2 and Sensitive Receiver Locations

GDA 94 MGA Zone 56

Bulk Liquid Berth 2

August 16, 2007
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3. Project Specific Noise Limits

3.1 Assessment Guidelines

The Department of Environment and Climate Change (DECC, formerly EPA) NSW *Industrial Noise Policy* (INP), 2000, provides an assessment process for both scheduled and unscheduled premises under the *Protection of the Environment and Operations Act 1997*. The DECC guidelines provide a method of determining if noise emissions from industrial sources are likely to cause an intrusive noise impact or longer term planning issues concerning noise. These guidelines cover impacts from any industrial noise source to any other potentially affected noise sensitive receiver.

The guidelines are based on an assessment of the pre-existing background noise levels in the absence of industrial noise or a zone based noise goal where industrial noise is already part of the existing environment. The Intrusive Criteria considers the existing environmental or "background" noise when determining the appropriate noise levels for a project, the zone based noise assessment is known as the Amenity Criteria. When assessing noise impacts the more stringent of the Intrusive or Amenity Criteria is used to set project noise limits. The existing noise environment plays an important role in the determination of noise criteria for any new developments, which is quantified by undertaking measurements of background noise levels.

3.2 Intrusive Noise Criteria

A noise source is considered to be non-intrusive if:

- the $L_{Aeq,\ 15\ minute}$ level does not exceed the RBL by more than 5 dB(A) for each of the day, evening and night-time periods,
- the subject noise does not contain tonal, impulsive, or other modifying factors as detailed in Chapter 4 of the INP.

From **Table 2-3,** the RBL noise levels for day, evening and night at each location are to be used in the calculation of the intrusive noise limits. The corresponding intrusive noise criteria for the day, evening and night time periods are presented in **Table 3-2**.

3.3 Amenity Noise Criterion

The amenity criteria apply to the L_{Aeq} noise level determined for the period of assessment of day, evening or night being 11, 4 and 9 hours respectively. The definition of the noise amenity classification for the area surrounding the port is urban based on the description for this type of location in the DECC Industrial Noise Policy. An acceptable amenity criteria for an urban area is given in the INP as $L_{Aeq\ (Period)}$ of 60, 50 and 45 dB(A) for day, evening and night periods respectively.

Residential areas across the bay would have lower amenity criteria that would reflect a suburban situation. The INP recommends that for a residences located in a suburban area, an acceptable amenity criteria would be an $L_{Aeq\ (Period)}$ of 55, 45 and 40 dB(A) for day, evening and night periods respectively.

3.4 Cumulative Noise Impact Criteria

The INP aims to control cumulative noise impacts resulting from the combined effects of a proposed project and existing industrial noise sources by modifying the amenity criteria depending on the level of existing impact. Where there is an existing industrial noise influence, the amenity criteria are decreased in accordance with Table 2.2 of the INP.

To account for cumulative noise impacts resulting from the combined effects of existing and new projects, the INP recommends modifying the above amenity criteria where there is an existing industrial noise influence. The amenity criteria are decreased in accordance with Table 2.2 of the INP. Based and attended measurements from **Table 2-3** and the estimate of existing industrial noise at these locations, the Amenity Criteria noise levels for Locations 4, 5 and 6 will be reduced by 10dB(A). For the residential areas represented by Location A, there was no industrial noise influence identified and therefore there will be no penalty applied to the Amenity Criteria.

3.5 Construction Noise Guidelines

For the construction phase of the project, noise objectives documented in the DECC *Environmental Noise Control Manual* (ENCM, 1994), Chapter 171 Construction Site Noise, are used for assessing the potential impacts. The noise criteria are dependent on the existing background noise levels and the expected duration of the works. The conditions of operation (for construction activity) are expressed in terms of L_{A10} noise levels above the nominated background level and are detailed in **Table 3-1**.

Table 3-1 DECC Construction Criteria Guidelines

No.	Duration Of Works	DEC Noise Guidelines
1	Construction period of 4 weeks and under	The L_{A10} level measured over a period of not less than 15 minutes when the construction site is in operation must not exceed the background level by more than 20 dB(A).
2	Construction period greater than 4 weeks and not exceeding 26 weeks	The L_{A10} level measured over a period of not less than 15 minutes when the construction site is in operation must not exceed the background level by more than 10 dB(A).
3	Construction period greater than 26 weeks	The EPA does not provide noise control guidelines for construction periods greater than 26 weeks duration, however, it is generally accepted that provided L_{A10} noise levels from the construction area do not exceed a level of 5 dB(A) above background, then adverse (intrusive) noise impacts are not likely to be experienced at nearest sensitive receptor locations.

The following time restrictions apply to construction activities:

- Monday to Friday, 7 am to 6 pm;
- Saturday, 7am to 5pm;
- Sunday and Public Holidays (only as the construction schedule requires); and
- No audible work outside these hours unless approval is obtained from the DECC prior to works being undertaken.

3.6 Proposed Works

Construction works would generally follow the program below:

- Preparation of the site;
- Berth construction;
- Pipe work and instrumentation.

The overall BLB2 project would take approximately 22 months in total. Construction of the BLB2 is expected to take approximately 18 months for maritime structures and 10 months for users infrastructure. Offshore maritime work and land-based pipeline work could be undertaken concurrently as they are generally independent. Noise from the works would be generated by activities such as piling, excavators, cranes and truck movement onsite. Piling is to be carried out using bored piles, which is quieter operation than driven piling construction. Other construction activities related to the proposed BLB are not expected to generate significant noise emissions at residential locations.

Based on the berth construction taking 22 months, **Table 3-1** identifies the appropriate L_{A10} noise limit for construction activities, when measured in the vicinity of the most affected noise sensitive receiver, as background +5 dB(A) in accordance with the ENCM.

3.7 Project Specific Noise Criteria

Table 3-2 summarises the noise criteria that would be applicable to the locations to the north and the east of the BLB2 site.

Table 3-2 Derivation of Project Specific Noise Criterion

	Day	Evening	Night-time
Intrusiveness Criteria	**$L_{Aeq15\ min}$**	**$L_{Aeq15\ min}$**	**$L_{Aeq15\ min}$**
Project Intrusiveness Criteria	RBL + 5 dB(A)	RBL + 5 dB(A)	RBL + 5 dB(A)
Project Specific Intrusiveness Criteria			
Location 4	62 dB(A)	55 dB(A)	48 dB(A)
Location 5	47 dB(A)	45 dB(A)	47 dB(A)
Location 6	51 dB(A)	51 dB(A)	50 dB(A)
Location A	43 dB(A)	42 dB(A)	41 dB(A)
Amenity Criteria	**$L_{Aeq\ 11hr}$**	**$L_{Aeq\ 4hr}$**	**$L_{Aeq\ 9hr}$**
Acceptable Amenity Criteria Urban	60 dB(A)	50 dB(A)	45 dB(A)
Acceptable Amenity Criteria Suburban	55 dB(A)	45 dB(A)	40 dB(A)
Project Amenity Criteria			
Location 4 (Modified)	50 dB(A)	40 dB(A)	35 dB(A)
Location 5 (Modified)	50 dB(A)	40 dB(A)	35 dB(A)
Location 6 (Modified)	50 dB(A)	40 dB(A)	35 dB(A)
Location A (Non-Modified)	55 dB(A)	45 dB(A)	40 dB(A)
Project Specific Noise Criteria			
Location 4 Modified Amenity Criteria	50 dB(A) $_{11hr}$	40 dB(A) $_{4hr}$	35 dB(A) $_{9hr}$
Location 5	47 dB(A) $_{11hr}$	40 dB(A) $_{4hr}$	35 dB(A) $_{9hr}$
Location 6	51 dB(A) $_{15\ min}$	40 dB(A) $_{4hr}$	35 dB(A) $_{9hr}$
Location A	43 dB(A) $_{15\ min}$	42 dB(A) $_{15\ min}$	40 dB(A) $_{9hr}$

Construction noise objectives at residential locations for day time construction activities are given in **Table 3-3**.

Table 3-3 Construction Noise Objectives

ID	Location Description	L_{A10} Construction Noise Objectives dB(A)
		Daytime (7.00am – 6.00pm)
Location 4	North of Golf Course	62
Location 5	Australia Avenue	47
Location 6	Military Road	51
Location A	Elaroo Avenue	43

4. Assessment

4.1 Assessment Methodology

A noise model developed using SoundPLAN modelling software was used to predict the noise levels at residential locations resulting from the operations of BLB2. Noise impacts have been predicted using two meteorological scenarios, which represent noise propagation under both neutral and adverse weather conditions with modelling parameters as follows:

1. Neutral weather conditions D class stability conditions winds < 0.5m s^{-1}; and
2. Adverse weather conditions, i.e. F class stability conditions and winds at 2ms^{-1} in the direction of a receiver.

A complete assessment of local weather conditions has not been undertaken for the project as the assessment includes neutral conditions which have no impact on the predicted noise levels and default adverse conditions that are essentially a worst case scenario as identified by the INP.

Predicted noise levels at the receiver locations from the BLB2 activities are not expected to be tonal or impulsive and therefore will not attract an additional penalty for noise impacts with these characteristics.

4.2 Predicted noise levels

The noise levels predicted at receiver locations have been assessed using noise data obtained from the existing operations at BLB1. The noise levels from a ship unloading were measured during a visit to the BLB1 site in July 2007, and incorporated noise from the auxiliary engines and product pumps that were operational during the survey. The noise measurements were converted to a Sound Power Level (SWL) and used as validation for the predictive noise model. The noise level used in the assessment is presented in **Table 4-1**.

Table 4-1 Ship Unloading Sound Power Level

Description	SWL	Comments
MV Jasmine	108 dB(A)	Auxiliary engines audible during the survey. Dominant noise source was from product pumps (gear pumps) operating in the ships hold.

The noise level represents a L_{Aeq} measurement over a 15 minute period however, the operational noise from the Jasmine was observed to be generally constant for the monitoring period. The constant nature of the noise source means that the predicted levels may be taken as either the L_{Aeq}

15 minute intrusiveness or the L_{Aeq} period amenity noise level. The night time noise criteria are used to determine compliance for the BLB2 project as these are the most stringent noise goals throughout the 24 hour period. **Table 4-2** presents the results of noise modelling for the operation of the BLB2 at the selected sensitive receiver locations.

Table 4-2 Predicted Noise Levels BLB2 Only

Residential Location	BLB 2 Neutral Weather	BLB2 Adverse Weather	Night Time Criteria
	$L_{Aeq\ Period}$	$L_{Aeq\ Period}$	$L_{Aeq\ Period}$
Botany Road (north of Golf Club)	23 dB(A)	27 dB(A)	35 dB(A) $_{9hr}$
Australia Avenue	23 dB(A)	28 dB(A)	35 dB(A) $_{9hr}$
Military Road	26 dB(A)	30 dB(A)	35 dB(A) $_{9hr}$
Elaroo Avenue	23 dB(A)	28 dB(A)	40 dB(A) $_{9hr}$

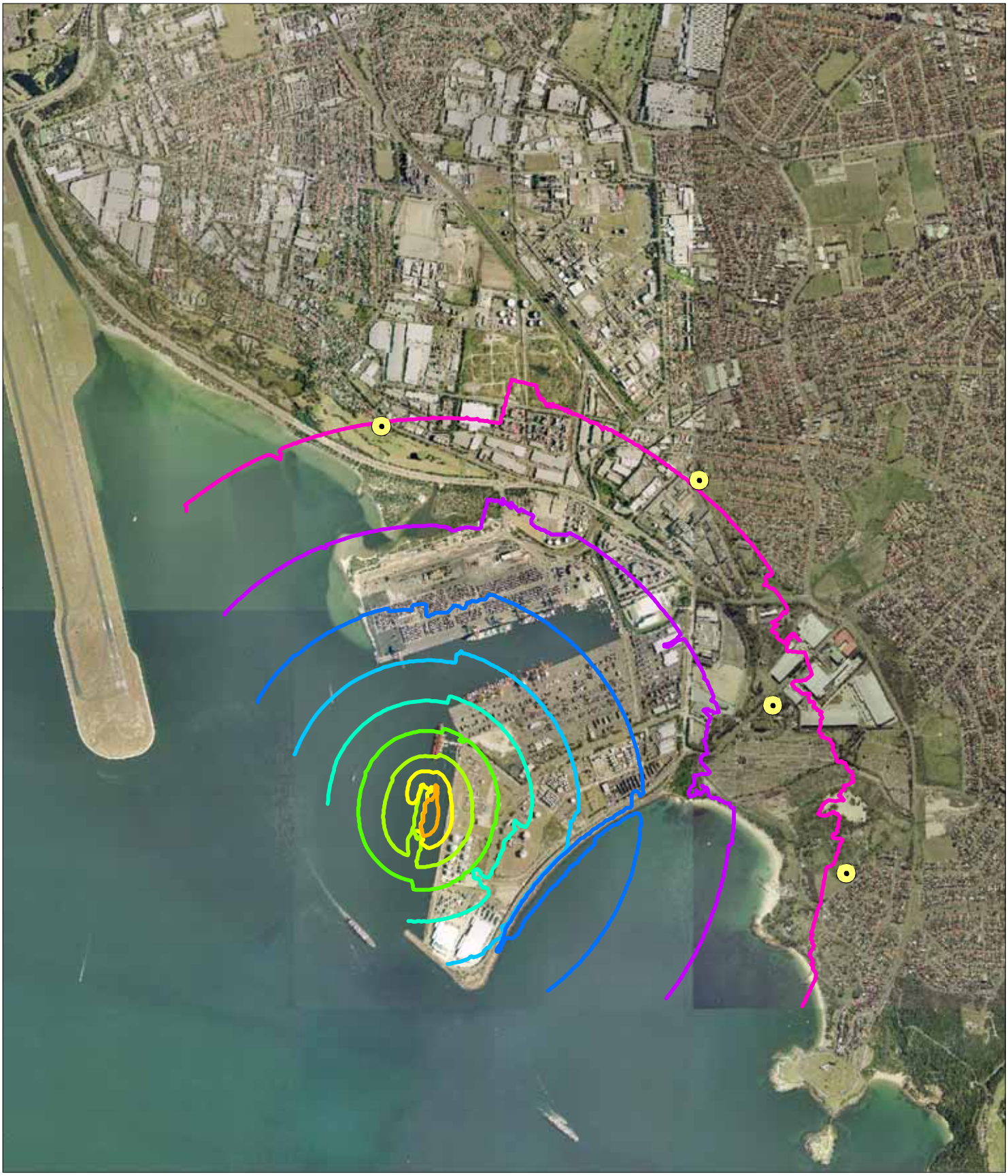
Table 4-3 presents the predicted noise levels resulting from the simultaneous operations of both berths.

Table 4-3 Predicted Noise Levels BLB1 and BLB2 Combined

Residential Location	BLB 1 and BLB2 Neutral Weather	BLB1 and BLB2 Adverse Weather	Night Time Criteria
	$L_{Aeq\ Period}$	$L_{Aeq\ Period}$	$L_{Aeq\ Period}$
Botany Road (north of Golf Club)	28 dB(A)	32 dB(A)	35 dB(A) $_{9hr}$
Australia Avenue	28 dB(A)	32 dB(A)	35 dB(A) $_{9hr}$
Military Road	30 dB(A)	34 dB(A)	35 dB(A) $_{9hr}$
Elaroo Avenue	26 dB(A)	31 dB(A)	40 dB(A) $_{9hr}$

The modelling results indicate that the noise levels from the BLB2 only are lower than the night time noise criteria for both neutral and adverse weather conditions. When the combined operations for the existing berth and the proposed berth are assessed at the nearest sensitive receivers, noise levels are expected to be below the most stringent night time noise criterion of 35 dB(A) at all locations.

Noise levels from road traffic and other nearby industrial noise sources would provide a large contribution to the overall noise environment in the vicinity of the port and therefore the predicted levels from the operation of BLB2 would be inaudible against the background noise levels when observed at the nearest residential locations. **Figure 4-1** shows the noise contours for BLB2 under Neutral conditions and **Figure 4-2** presents the noise contours from the modelling scenario for BLB2 under adverse meteorological conditions. **Figure 4-3** and **Figure 4-4** present the predicted noise contours for the combined operation of BLB1 and BLB2 for neutral and adverse weather conditions.



Legend

- 25dB(A)
- 30dB(A)
- 35dB(A)
- 40dB(A)
- 45dB(A)
- 50dB(A)
- 55dB(A)
- 60dB(A)
- 65dB(A)

0 265 530

Metres

1:25,773 At A4

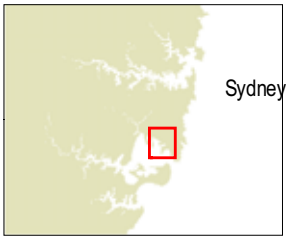


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Figure 4-1 Predicted Noise Levels from BLB2

Neutral Weather Conditions

GDA 94 MGA Zone 56

August 16, 2007

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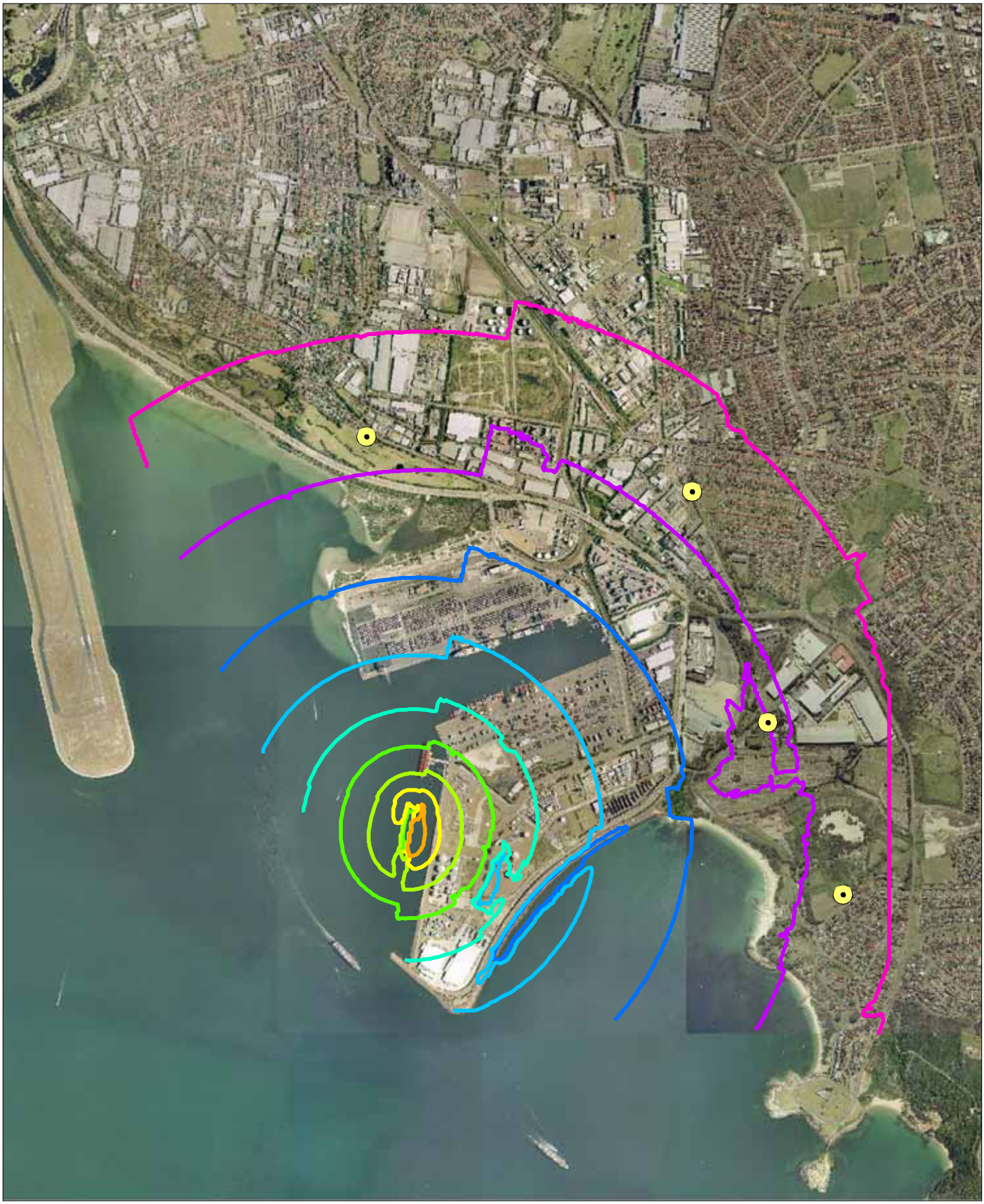

Legend

- 25dB(A)
- 30dB(A)
- 35dB(A)
- 40dB(A)
- 45dB(A)
- 50dB(A)
- 55dB(A)
- 60dB(A)
- 65dB(A)

0 250 500

Metres

1:25,000 At A4

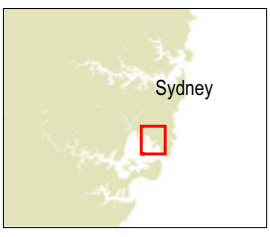

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Figure 4-2 Predicted Noise Levels from BLB2

Adverse Weather Conditions

GDA 94 MGA Zone 56

August 16, 2007

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Legend

- 30dB(A)
- 35dB(A)
- 40dB(A)
- 45dB(A)
- 50dB(A)
- 55dB(A)
- 60dB(A)
- 65dB(A)

0 250 500

Metres

1:25,452 At A4

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Figure 4-3 Predicted Noise Levels from BLB 1 and 2

Neutral Weather Conditions

GDA 94 MGA Zone 56

November 7, 2007

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Figure 4-4 Predicted Noise Levels from BLB 1 and 2

Adverse Weather Conditions

GDA 94 MGA Zone 56

November 7, 2007

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4.3 Construction Impacts

The sound power levels assumed for the noisiest construction equipment are shown in **Table 4-4**. These levels have been extracted from our in-house database and reflect typical L_{A10} noise emissions from similar equipment.

Table 4-4 Sound Power Levels for Construction Activities

Description	Quantity	Sound Power Level L_{A10} dB(A)
Drilling Barge (Compressor, Crane)	1	115
Excavator	1	112
Concrete Pump	1	108

The estimated $L_{A10\ 15\ min}$ noise levels at residential locations from construction activities are presented in **Table 4-5** and show the worst case scenario when all equipment from **Table 4-4** is operational. The predicted noise levels for construction activities is largely due to the use of the drilling barge for piling activities, however noise levels, are expected to be below measured background noise levels at the nearby residential locations.

Table 4-5 Predicted Construction Noise Levels

ID	Location Description	Predicted L_{A10} Construction Noise Levels dB(A)	L_{A10} Construction Noise Objectives dB(A)
		Daytime (7.00am – 6.00pm)	Daytime (7.00am – 6.00pm)
Location 4	North of Golf Course	35	62
Location 5	Australia Avenue	34	47
Location 6	Military Road	36	51
Location A[1]	Elaroo Avenue	35	43

4.4 Mitigation Measures

Operations of the BLB2 are predicted to be below the project specific noise levels which have been determined with respect to existing industrial noise influences. Construction noise levels are predicted to be below the background noise environment at all nearby residential locations. Although noise impacts are not expected to result for the construction activities, noise minimisation strategies during the construction period should be considered for the project and should include the practices listed in **Table 4-6**.

Table 4-6 Management Practices for Construction Activities

Item	Action
1	Ensure compliance with the construction hours identified in Section 3.5
2	Equipment having directional noise characteristics (emits noise strongly in a particular direction) are to be oriented such that noise is directed away from sensitive areas
3	Avoid the coincidence of noisy plant working at the same time where possible
4	Plant with the lowest noise rating which meets the requirement of the task would be selected
5	Ensure that internal combustion engines (all mobile and stationary equipment) are fitted with a suitable muffler in good repair
6	Ensure that tailgates on trucks are securely fitted to avoid unnecessary “clanging” noise, particularly during movement of empty trucks
7	Where using pneumatic equipment, select silenced compressors or use quieter hydraulic equipment
8	Conduct regular inspections and effective maintenance of both stationary and mobile plant and equipment (including mufflers, enclosures etc)
9	Equipment not being utilised as part of the work would not be left standing with engines running for extended periods

5. Conclusions

An assessment of operational and construction noise impacts has been undertaken by Sinclair Knight Merz, for the proposed Bulk Liquid Berth 2. Noise modelling was conducted to assess the potential for impacts from the proposed BLB2 noise emissions.

The noise assessment has considered the effect of noise sources from the BLB2 project at the nearest residential locations by comparing predicted levels to the noise criteria in the DECC INP. The results of noise modelling predictions indicate that the proposed operation of BLB2 will not significantly add to the noise environment at the nearest residential locations. The predicted noise levels at these residential locations are expected to be below the identified noise criteria for operations of an industrial noise source. As predicted noise levels from the BLB2 are within the INP criteria, no noise mitigation measures are expected to be necessary for the operation of BLB2. The noise emissions from the combined operations of BLB1 and BLB2 are below the night time noise criteria at all locations.

The predicted construction noise levels are based on typical impacts from marine piling and land based construction activities associated with the proposed berth. Construction noise during working hours is expected to be below the nominal noise goals for a 22 month construction period.