ARCADIS Design & Consultancy for natural and built assets

Moorebank Precinct East - Concept Plan Modification 2

(MP10_0193_MOD2)

Noise and Vibration Assessment

SIMTA

SYDNEY INTERMODAL TERMINAL ALLIANCE

November 2016

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ACOUSTICS AND AIR

MPE CONCEPT PLAN MODIFICATION

REVIEW OF NOISE AND VIBRATION IMPACTS

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1 INTRODUCTION

1.1 Report Purpose

This report has been prepared to address the potential noise and vibration impacts associated with proposed changes to the Concept Plan Approval (MP 10_0193) for an intermodal terminal (IMT) facility, warehousing and a freight village at Moorebank at Moorebank, NSW (the Moorebank Precinct East Project (MPE Project) (formerly the SIMTA Project)). This report supports an application to modify the MPE Concept Plan Approval under in section 75W (now repealed) of the Environmental Planning and Assessment Act 1979 (EP&A Act), which continues to apply pursuant transitional provisions.

Due to the large separation distances between the MPE site and nearby sensitive receivers, vibration impacts, during both construction and operation, are considered unlikely. Accordingly, vibration impacts are not considered further in this assessment.

1.2 Proposed Modification

It is noted that since the MPE Concept Plan Approval, a number of design refinements have been made to the MPE Project in response to opportunities to optimise the operation of the IMT, to facilitate drainage and to address matters such as subdivision which were not contemplated at the time of the MPE Concept Plan Approval. The following alterations to the MPE Project are now proposed (hereafter referred to as the Modification Proposal):

- Extend the land to which the MPE Concept Plan Approval applies to recognise works on Moorebank Avenue and drainage works to the south and east of the MPE site.
- Moorebank Avenue upgrade from the northern to the southern extent of the MPE site including alterations to the existing lane configuration, raising of the vertical alignment, some widening and the provision of an on-site detention (OSD) basin for stormwater on the western side of Moorebank Avenue.
- Provision of an interim MPE site access to warehousing.
- Reconfiguration of the internal road network within the MPE Stage 2 site and use of all internal roads by both light and heavy vehicles, rather than light vehicles only for internal road No.2.
- Importation of clean general fill (approximately 600,000m^3) material for bulk earthworks as part of the Moorebank Avenue upgrade works and integrated drainage solution for the site.
- Change to the location of and land uses within the freight village, and provision of warehousing along the Moorebank Avenue frontage.
- Changes to the staging of development, including construction of all warehouses as part of the MPE Stage 2 Project (previously identified as IMT).
- Subdivision of the MPE site

1.3 Noise Outcomes Resulting from the Modification Proposal

The expected noise outcomes resulting from the Modification Proposal are summarised in Table 1-1.

Table 1-1 Noise Outcomes from Modification Proposal

Proposed Change	Noise Outcomes
Extend the land to which the MPE Concept Plan Approval applies to recognise works on Moorebank Avenue and drainage works to the south and east of the MPE site.	This proposed change is considered unlikely to alter noise impacts when compared with the MPE Concept Plan Approval. See below for the impacts associated with changes to Moorebank Avenue.
Moorebank Avenue upgrade from the northern to the southern extent of the MPE site including alterations to the existing lane configuration, raising of the vertical alignment, some widening and the provision of an on-site detention (OSD) basin for stormwater on the western side of Moorebank Avenue.	During construction, this proposed change would result in some construction activities being conducted closer to sensitive residential receivers in Casula. However, other construction activities under the MPE Concept Plan Approval, such as the construction of the rail link, would be conducted significantly closer to receivers in Casula than the proposed works along Moorebank Avenue. The predicted noise levels associated with the proposed works on Moorebank Avenue (as calculated for assessment of the MPE Stage 2 Proposal) comply with the established construction noise management levels (NML) at all receivers, and are within the range of noise levels predicted for the MPE Concept Plan Approval (Wilkinson Murray, 2013). The subject section of Moorebank Avenue is located between the MPE and Moorebank Precinct West (MPW) sites. No sensitive receivers are located adjacent to this section of Moorebank Avenue. Therefore, the proposed upgrade, including changes to the vertical alignment, are unlikely to affect road noise levels at sensitive receivers.
Provision of an interim MPE site access to warehousing.	This proposed change would have a negligible effect on construction and operational noise impacts when compared to the MPE Concept Plan Approval. This change would not significantly alter the nature or location of the construction or operational activities with respect to sensitive receiver locations.
Reconfiguration of the internal road network within the MPE Stage 2 site and use of all internal roads by both light and heavy vehicles, rather than light vehicles only for internal road No.2.	This proposed change would have a negligible effect on construction noise impacts when compared to the MPE Concept Plan Approval. The proposed changes to the MPE internal road network would result in heavy vehicles operating closer to sensitive residential receivers in Wattle Grove and further away from sensitive receivers in Casula. However, the proposed changes to the internal road network are accompanied by a revised warehouse layout that would provide a small amount of additional shielding to sensitive receivers in Wattle Grove, and a substantial amount of additional shielding to sensitive receivers in Wattle Grove North than that originally proposed in the MPE Concept Plan Approval. Accordingly, the proposed changes to the internal road layout, and the associated revised warehouse layout, are expected to have minor effects on operational noise levels at sensitive receivers in Wattle Grove and Casula. Additionally, the revised warehouse layout is expected to result in a significant reduction in operational noise levels at sensitive receivers in Wattle Grove North.

Proposed Change	Noise Outcomes
Importation of clean general fill (approximately 600,000m^3) material for bulk earthworks.	The importation of clean fill, and the associated bulk earthworks, would generate additional construction traffic on the surrounding road network, and would also result in some additional construction works being conducted on the MPE site. The additional construction traffic would have an imperceptible effect on road traffic noise from the surrounding road network. Construction noise levels associated with the additional bulk earthworks would be generally consistent with the range of predicted construction noise levels for the MPE Concept Plan Approval, and would comply with the established NMLs. Noise modelling indicates that the changes in levels associated with bulk earthworks would have a negligible effect on operational noise levels at sensitive receivers. The raising of the site is not expected to influence noise attenuation, between sources and receivers, due to ground effects and barrier effects. Because there are large distances between the site and sensitive receivers, and the changes in levels would be relatively small, ground effects between the site and sensitive receivers would not be significantly altered. The most significant barrier effects, for noise sources on the MPE site, are provided by the proposed warehouses on the MPE site. As the site levels for the warehouses would be raised by approximately the same amount as those for the noise sources on the MPE site, the barrier effects from the MPE warehouses would be maintained.
Change to the location of and land uses within the freight village, and provision of warehousing along the Moorebank Avenue frontage (previously identified as IMT).	This proposed change would have a negligible effect on construction noise impacts when compared to the MPE Concept Plan Approval. The revised warehouse layout, which would establish warehousing along the Moorebank Avenue frontage, would provide a significant amount of additional shielding to sensitive receivers in Wattle Grove North from noise generated by the IMT. Accordingly, this change is expected to result in reduced operational noise impacts at sensitive receivers in Wattle Grove.
Changes to the staging of development, including construction of all warehouses as part of the MPE Stage 2 Project.	This proposed change would have a negligible effect on construction noise impacts when compared to the MPE Concept Plan Approval. The warehouses on the MPE site provide significant beneficial shielding of noise between the site and sensitive receivers in Wattle Grove. The benefits of the shielding from the warehouses far outweigh their associated incremental noise emissions. Accordingly, the construction of all warehouses at an earlier stage would be beneficial for some receivers.
Subdivision of the MPE site	This proposed change would have a negligible effect on construction and operational noise impacts when compared to the MPE Concept Plan Approval. This change would not significantly alter the nature or location of the construction or operational activities with respect to sensitive receiver locations.

As outlined in Table 1-1, the Proposal Modification is anticipated to have the following noise outcomes:

- Small changes to construction noise levels, associated with:
    - Moorebank Avenue upgrades; and,
    - Importation of clean general fill and associated bulk earthworks.
- Imperceptible increases in traffic noise levels within the surrounding public road network; and,
- A range of changes to operational noise impacts, associated with:
    - Changes to the layout and usage of the internal road network; and,
    - A revised warehouse layout.

Section 2 presents detailed assessments of the potential effects of the Modification Proposal on the construction and operational noise impacts associated with the MPE Concept Plan Approval.

2 ASSESSMENT OF NOISE OUTCOMES

The following sections present detailed investigations of the likely noise outcomes of the Modification Proposal. These investigations are based upon the detailed assessments of construction, road traffic, and operational noise impacts for the MPE Concept Plan Approval, and the Modification Proposal as incorporated into the MPE Stage 2 Proposal.

2.1 Most Potentially Affected Receivers

A number of detailed Noise and Vibration Impact Assessments (NVIA) have been conducted for various stages of the MPE Project. In each case, potential noise impacts associated with the construction and operation of each proposal have been assessed at both residential and non-residential receivers. The NVIAs have indicated that the receivers most potentially affected by the MPE Project are residents in the nearby suburbs of Wattle Grove, Casula and, to a lesser extent, Glenfield. Therefore, the investigation of noise outcomes associated with the Modification Proposal, presented herein, is focused on construction and operational noise impacts at residential receivers.

The NIVA for the MPE Concept Plan Approval identified the following four residential noise catchment areas:

- R1 – 500 metres to the east in Wattle Grove (south of Anzac Road)
- R2 – 500 metres to the north/north east in Wattle Grove (north of Anzac Road)
- R3 – 900 metres to the west in Casula; and,
- R4 – 1,600 metres to the south west in Glenfield.

It was considered more useful, when discussing noise impacts, to refer to suburb names, rather than the assigned labels R1 – R4. Therefore, the noise catchments have since been referred to as:

- Wattle Grove;
- Wattle Grove north;
- Casula; and,
- Glenfield.

2.2 Construction Noise Outcomes

2.2.1 Predicted Construction Noise Levels – MPE Concept Plan Approval

The Noise and Vibration Impact Assessment (NVIA) for the MPE Concept Plan (Wilkinson Murray, 2013) presented predicted $L_{Aeq, 15min}$ construction noise levels at sensitive receivers for a range of anticipated construction activities associated with the construction of the MPE Concept Plan. The construction noise assessment was conducted in general accordance with the *Interim Construction Noise Guideline* (ICNG). These predicted noise levels, along with established noise management levels (NML), are summarised in Table 2-1.

Table 2-1 Construction Noise Impacts – MPE Concept Plan Approval

Receiver	Construction works period						NML	Exceedance
	Site Preparation	Earthworks, Drainage & Utilities	Granular Base Construction	Pavement Construction	Buildings	Rail Siding		
Wattle Grove	48	44	36	47	45	46	52	0 dB
Wattle Grove North	45	41	33	44	42	42	46	0 dB
Casula	46	42	34	45	43	60	51	9 dB
Glenfield	34	30	22	43	31	46	54	0 dB

Table 2-1 shows that:

- Due to the wide range of proposed construction activities for the MPE Concept Plan, construction noise levels at the most potentially affected receivers are predicted to vary, typically by more than 10dB over the range of activities;
- Construction noise levels in Wattle Grove, Wattle Grove North and Glenfield are predicted to comply with the established NML for the duration of the works; and,
- Construction noise levels in Casula are predicted to comply for the majority of the works, with the exception of the construction of the Rail Link connection to the Southern Sydney Freight Line, where the NML could be exceeded by up to 9 dB.

2.2.2 Predicted Construction Noise Levels – Modification Proposal

The Noise and Vibration Impact Assessment (NVIA) for the MPE Stage 2 EIS (Wilkinson Murray, 2016) presents predicted $L_{Aeq, 15min}$ construction noise levels at sensitive receivers for a range of anticipated construction activities associated with the construction of the MPE Stage 2 Proposal. The MPE Stage 2 Proposal includes a number of construction works periods which encapsulate the Modification Proposal. The predicted $L_{Aeq, 15min}$ construction noise levels at sensitive residential receivers due to works associated with the Modification Proposal, conducted in standard work hours are presented in in Table 2-2.

Table 2-2 Construction Noise Impacts – Modification Proposal, Standard Hours

Receiver	Construction works period			NML	Exceedance
	Construction of the Moorebank Avenue diversion road	Road and intersection works to facilitate the raising of Moorebank Avenue	Bulk earthworks, drainage and utilities		
Wattle Grove	38	38	49	52	0 dB
Wattle Grove North	35	35	45	46	0 dB
Casula	41	41	47	51	0 dB
Glenfield	30	30	35	54	0 dB

Some construction activities associated with the importation and on-site use of the clean general fill material is proposed to be conducted during the following out-of-hours (OOH) works periods:

- OOH Period 1: 6.00am – 7.00am weekdays;
- OOH Period 2: 6.00pm – 10.00pm weekdays;
- OOH Period 3: 7.00am – 8.00am Saturday; and,
- OOH Period 4: 1.00pm – 6.00pm Saturday.

During OOH period 1, delivery of fill material is the only proposed activity. The predicted $L_{Aeq, 15min}$ construction noise levels at sensitive receivers during OOH period 1 are presented in Table 2-3.

Table 2-3 Construction Noise Impacts – Modification Proposal, OOH Period 1

Receiver	Predicted $L_{Aeq, 15min}$ Noise Level	NML	Exceedance
Wattle Grove	38	42	0 dB
Wattle Grove North	34	41	0 dB
Casula	36	39	0 dB
Glenfield	25	42	0 dB

Table 2-2 shows that the predicted construction noise levels, associated with works for the Modification Proposal, during OOH period 1 comply with the established NML at all sensitive receivers.

During OOH periods 2, 3 4, the following activities are proposed:

- Material Delivery; and,
- Direct Placement of fill, or Stockpiling.

The predicted $L_{Aeq, 15min}$ construction noise levels at sensitive receivers during OOH periods 2, 3 and 4 are presented in Table 2-4.

Table 2-4 Construction Noise Impacts – Modification Proposal, OOH Periods 2, 3 & 4

Receiver	Predicted $L_{Aeq, 15min}$ Noise Level	NML			Exceedance
		OOH Period 2	OOH Period 3	OOH Period 4	
Wattle Grove	43	42	47	47	1 dB
Wattle Grove North	39	41	41	41	0 dB
Casula	41	42	46	46	0 dB
Glenfield	30	49	49	49	0 dB

Table 2-4 indicates that construction noise levels in Wattle Grove, Wattle Grove North and Casula are not predicted to exceed applicable NML at sensitive receivers during OOH Period 2, 3 or 4. Predicted construction noise levels during OOH Periods 2, 3 & 4 are predicted to exceed the NML in Wattle Grove by up to 1 dB. This exceedance is considered negligible, and does not warrant mitigation.

It should be noted that since the construction noise assessment is conservative, whereby all plant items are assumed to be operating simultaneously, and that the works will be conducted under a Construction Noise and Vibration Management Plan, there is a likelihood that the predicted exceedance would not occur.

2.2.3 Comparison of Construction Noise Impacts

Comparison of the predicted construction noise levels presented in Table 2-2, Table 2-3 and Table 2-4 against those in Table 2-1 indicates that the Modification Proposal does not significantly affect the construction noise impacts of the MPE Concept Plan as the predicted noise levels at sensitive receivers are typically within the same range, and are generally compliant with the established NML.

Specific OOH construction activities were not identified in the original MPE Concept Plan. Construction noise levels during the OOH works associated with the Modification Proposal are predicted to comply with the established NML; and therefore, the OOH works for the Modification Proposal are not considered to present significant additional construction noise impacts.

2.3 Road Traffic Noise Outcomes

2.3.1 Applicable Road Noise Criteria

Applicable noise criteria for proposals which have the potential to indefinitely increase traffic on roads are presented in the *NSW Road Noise Policy* (RNP) (DECCW, 2011).

The Modification Proposal would generate additional traffic along the M5 Motorway west of Moorebank Avenue, along Moorebank Avenue from the Proposal site northwards and minor additional traffic along Anzac Road. According to the RNP, the M5 Motorway is classified as a Freeway, while Moorebank Avenue and Anzac Road are classified as sub-arterial roads.

As established in previous assessments for both the MPE and MPW projects, the existing levels of road noise at the most affected residential receivers along the M5 Motorway, Moorebank

Avenue and Anzac Road exceed 60 dBA $L_{Aeq, 15hour}$ and 55 dBA $L_{Aeq, 9hour}$. Therefore, in accordance with the RNP, any increases in road noise levels at sensitive receivers along these roads should be below 2 dB.

2.3.2 Traffic Generated by the Modification Proposal

During the construction works associated with the Modification Proposal, all heavy vehicles, and the majority of light vehicles, will travel to and from the site via the M5 Motorway and Moorebank Avenue. Additionally, a small number of light vehicles will travel along Anzac Road, east of Moorebank Avenue, and along Moorebank Avenue, north of the M5 Motorway. No heavy vehicles, associated with the construction, would travel along Anzac Road, or along Moorebank Avenue, north of the M5 Motorway.

The existing and projected daily traffic volumes along the identified roads, and percentage heavy vehicles, for the construction of the MPE Stage 2 Proposal, are presented in Table 2-5. As the construction traffic associated with the importation of clean general fill and the upgrade of Moorebank Avenue make up the majority of the traffic generated by the MPE Stage 2 Proposal, the traffic volumes in Table 2-5 provide a conservative estimate of the construction traffic generated by the Modification Proposal.

It is not yet known whether heavy construction vehicles would travel to the site, along the M5 Motorway, from the east or the west. This would depend upon factors such as the construction contractor, and the source(s) of fill. Therefore, the projected construction traffic volumes along the M5 Motorway, presented in Table 2-5, are based on all heavy construction vehicles travelling along the M5 Motorway both east and west of Moorebank Avenue. Such a scenario would not eventuate in practice, and therefore, the assessment of construction traffic noise along the M5 Motorway is conservative.

Table 2-5 Construction Traffic Volume and % Heavy Vehicles

Location	Time[1]	Existing (no Development)		Future (with Development)	
		Volume	%Heavy	Volume	%Heavy
M5 Motorway – East of Moorebank Avenue	Day	106,344	9.7	107,370	10.5
	Night	21,060	13.2	21,201	13.5
M5 Motorway – West of Moorebank Avenue	Day	124,264	10.2	125,290	10.8
	Night	24,036	11.5	24,177	11.8
Moorebank Avenue – North of M5 Motorway	Day	26,892	10.0	26,953	10.0
	Night	6,308	10.0	6,345	9.9
Anzac Road – East of Moorebank Avenue	Day	8,991	4.6	9,018	4.6
	Night	2,109	4.6	2,125	4.6

Source: Arcadis

1. Day = 7.00am – 10.00pm, Night = 10.00pm – 7.00am

2.3.3 Predicted Increases in Road Noise Levels

Using the data in Table 2-5, the increases in road noise levels along the M5 Motorway, Moorebank Avenue and Anzac Road, during construction and operation, have been calculated. The calculations have been conducted using the *Calculation of Road Traffic Noise (CORTN)* algorithm, and are based upon the following assumptions:

- Vehicle speeds are 100 km/h along the M5 Motorway and 60 km/h along Moorebank Avenue and Anzac Road.
- Typical receiver setbacks are approximately 25 metres along the M5 Motorway and approximately 12 metres along Moorebank Avenue and Anzac Road. It is important to highlight that receiver setbacks are important when calculating absolute road noise levels, however setbacks are not important when calculating increases in road noise levels due to changes in traffic volume and mix.

The predicted increases in road noise levels, due to the construction of the Proposal, are shown in Table 2-6.

Table 2-6 Increases in Road Noise Levels During Construction

Location	Predicted Increase (dBA)	
	Day[1]	Night[1]
M5 Motorway – East of Moorebank Avenue	0.1	0.0
M5 Motorway – West of Moorebank Avenue	0.2	0.1
Moorebank Avenue – North of M5 Motorway	0.0	0.1
Anzac Road – East of Moorebank Avenue	0.0	0.0

1. Day = 7.00am – 10.00pm, Night = 10.00pm – 7.00am

Table 2-6 shows that increases in road noise levels along the M5 Motorway, Moorebank Avenue, and Anzac Road are considerably less than 2 dB. In accordance with the RNP, no mitigation of traffic noise levels, due to the construction impacts, is warranted. Moreover, the increases in road noise levels presented in Table 2-6 would be imperceptible; and therefore, the Modification Proposal is not anticipated to result in additional road noise impacts.

2.4 Operational Noise Outcomes

2.4.1 Predicted Operational Nosie Levels – MPE Concept Plan Approval

The Noise and Vibration Impact Assessment (NVIA) for the MPE Concept Plan (Wilkinson Murray, 2013) presented the likely operational noise impacts of the MPE Concept Plan. Due to the proposed 24/7 operation of the site, the operational noise assessment was focused upon noise levels at sensitive receivers during the night time period (10:00pm – 7:00am).

Although the MPE Concept Plan Approval limits the intermodal throughput of the site to 250,000 TEU, the NVIA for the Concept Plan presented the predicted operational noise levels for a throughput of 1,000,000 TEU. Therefore, to facilitate an assessment of the effect of the Modification Proposal on operational noise levels, the predicted operational noise levels from the Concept Plan Approval NVIA have been adjusted. It is assumed that the operational noise

emissions from the site would approximately scale with the TEU throughput. Therefore, the predicted $L_{Aeq, 15min}$ operational noise levels at sensitive receivers at 1,000,000 TEU have been reduced by 6 dB to provide an estimate of the $L_{Aeq, 15min}$ operational noise levels at 250,000 TEU. The predicted $L_{Aeq, 15min}$ operational noise levels at sensitive receivers, for the MPE Concept Plan, at 250,000 TEU are presented in Table 2-7.

Table 2-7 Predicted $L_{Aeq, 15min}$ Noise Levels – MPE Concept Plan (250k TEU)

Receiver	Predicted $L_{Aeq, 15min}$ Noise Level (dBA)		Night time[1] Criterion (dBA)	Exceedance (dB)
	Calm[2]	Adverse[3]		
Wattle Grove	28	33	42	0
Wattle Grove North	29	33	41	0
Casula	32	37	39	0
Glenfield	19	25	42	0

1. Night = 10:00pm-7:00am.
2. CONCAWE Category 4.
3. CONCAWE Category 6.

Table 2-7 shows that operational noise levels associated with the MPE Concept Plan operating at 250,000 TEU comply with the established criteria in all receiver catchments.

2.4.2 Predicted Operational Noise Levels – Modification Proposal

Table 2-8 presents predicted $L_{Aeq, 15min}$ operational noise levels for the combined operation of the MPE Stage 1 Proposal, and the MPE Stage 2 Proposal, inclusive of the Modification Proposal.

Table 2-8 also shows the difference in predicted noise levels between the MPE Concept Plan and the Modification Proposal.

Table 2-8 Predicted $L_{Aeq, 15min}$ Noise Levels – MPE Stage 1 & MPE Stage 2

Receiver	Predicted $L_{Aeq, 15min}$ Noise Level (dBA)		Night time[1] Criterion (dBA)	Exceedance (dB)	Difference c/- MPE Concept Plan (dB)	
	Calm[2]	Adverse[3]			Calm[2]	Adverse[3]
Wattle Grove	28	32	42	0	0	-1
Wattle Grove North	<20	23	41	0	-9	-10
Casula	31	35	39	0	-1	-2
Glenfield	20	25	42	0	1	0

1. Night = 10:00pm-7:00am.
2. CONCAWE Category 4.
3. CONCAWE Category 6.

Table 2-8 shows that:

- Operational noise levels associated with the Concept Plan operating at 250,000 TEU comply with the established criteria in all receiver catchments;
- The Modification Proposal is likely to have a negligible effect on operational noise levels at receivers in Wattle Grove, south of Anzac Road, Casula and Glenfield; and,
- The Modification Proposal is likely to result in a significant reduction in operational noise levels at receivers in Wattle Grove north.

The reduction in operational noise levels at receivers in Wattle Grove north is a result of additional shielding to the north and north west. The majority of this additional shielding results from the revised warehouse layout, which would establish warehouses to the north of the intermodal terminal.

Under calm meteorological conditions, operational noise levels in Glenfield are predicted to increase by up to 1 dB, and are well below the criterion. The small increase in noise levels in considered to be a result of the shortening of the intermodal terminal, which slightly "compresses" the intermodal terminal to the south.

The Modification Proposal is likely to have a negligible effect on operational noise impacts at most receivers surrounding the MPE Project, and is likely to reduce operational noise impact at receivers in Wattle Grove north.

3 CONCLUSION

The Modification Proposal includes changes that have the potential to affect the construction and operational noise impacts considered for the MPE Concept Plan Approval. These changes related to:

- Moorebank Avenue upgrade;
- Importation of clean general fill;
- Changes to the layout and usage of the internal road network; and,
- A revised warehouse layout.

Updated modelling, conducted in the context of the MPE Stage 2 Proposal, indicates that the construction and operational noise impacts of the MPE Project would remain within the range of impacts presented in the original MPE Concept Plan Approval and that the MPE Project is still anticipated to comply with the established noise limits.

4 REFERENCES

Wilkinson Murray (2013)

Sydney Intermodal Terminal Alliance – Noise Impact Assessment, Wilkinson Murray Pty Ltd, June 2013

Wilkinson Murray (2016)

Moorebank Precinct East, Stage 2 – Noise & Vibration Impact Assessment, Wilkinson Murray Pty Ltd, November 2016

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