MOOREBANK LOGISTICS PARK

Moorebank Precinct East:
Six-Monthly Operations Compliance Report

Report: #8

Period: Nov 2023 – Apr 2024

19 JULY 2024

MOOREBANK INTERMODAL PRECINCT

November 2023 – April 2024

Author	Richard Mason	Richard Mason
Checker	Mark Howley	Mark Howley
Approver	Richard Mason	
Date	19/07/2024	
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Author Details

Author Details	Qualifications and Experience
Richard Mason	BSc Environmental Science

REVISIONS

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KEY TERMS AND ACRONYMS

Acronym/Term	Meaning
CNBMP	Container Noise Barrier Management Plan
CoC	Conditions of Consent
DPE	Department of Planning and Environment
DPH&I	Department of Planning, Housing and Infrastructure
EPBC Act	Environmental Protection and Biodiversity Conservation Act 1999
ERP	Emergency Response Plan which includes the Bushfire Emergency and Evacuation Plan (BEEP), Bushfire Management Plan (BMP) and Flood Emergency Management Plan (FEMP)
IMEX	Import Export
MIP	Moorebank Intermodal Precinct
MPE	Moorebank Precinct East
MPW	Moorebank Precinct West
OAQMP	Operational Air Quality Management Plan
OCR	Six Monthly Operational Compliance Report
OCCS	Operational Community Communication Strategy
OEMP	Operational Environmental Management Plan
ONVMP	Operational Noise and Vibration Management Plan
OTAMP	Operational Traffic and Access Management Plan
OWRMP	Operational Waste and Resource Management Plan
POCR	Pre-operations Compliance Report
POPD	Program for Operational Phase Delivery
SIOMP	Operational Stormwater Infrastructure and Operation and Maintenance Plan
SSD	State Significant Development
UDLP	Urban Design and Landscape Plan
WTP	Workplace Travel Plan
SSD 6766	Stage 1 of the MPE Concept Approval (MP 10_0193) as approved under SSD 6766. It involves the construction and operation of an IMEX terminal and associated Rail Link.

Acronym/Term	Meaning
SSD 7628	Stage 2 of the MPE Concept Approval (MP 10_0193) as approved under SSD 7628. It involves the construction and operation of warehousing and distribution facilities on the MPE site and upgrades to approximately 1.5 kilometres of Moorebank Avenue from approximately 35 metres south of the northern boundary of the MPE site to approximately 185 metres south of the southern MPE site boundary.

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1 EXECUTIVE SUMMARY

In accordance with SSD 7628 Condition of Consent (CoC) C21(c)(iii), a Six-monthly operational compliance report (OCR) must be prepared.

The Department approved the Program for Operational Phase Delivery (POPD) on 21 May 2019 which outlined the staged submission of operational documents under condition A14 of SSD 7628. The Department also considered the combining of strategies, plans or programs to be acceptable, provided that all relevant conditions across both SSD 6766, and SSD 7628 are met.

Regular reviews of compliance against the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC 2011/6229) Conditions of Approval are undertaken but are not the subject of this compliance report.

This OCR has been prepared in accordance with the requirements of the *Compliance Reporting Post Approval Requirements (NSW DP&E, June 2018)* and has been prepared to outline the progress of compliance for all operational requirements against the Project Approvals from November 2023 to April 2024.

1 INTRODUCTION

1.1 Project Overview

Application Number	
Project name:	Moorebank Logistics Park – Operational Area 1 and 2
Proponent	Moorebank Intermodal Precinct
Site Address	Moorebank Precinct East site, Moorebank Avenue, Moorebank
Project Phase	Six Monthly Operation Compliance Report (OCR)
Project Activity	Operation of an import-export terminal, rail link and warehouse and distribution facilities and associated infrastructure.
Report date	Friday, 19 July 2024

1.2 Project Approvals

Approval for the construction and operation of the Moorebank Precinct East was obtained progressively as follows:

- The Project obtained (EPBC 2011/6229) approval dated 6 March 2014
- Moorebank Precinct East (MPE) Concept Approval – 10_0193
- MPE Stage 1 – SSD 6766
- MPE Stage 2 – SSD 7628
- MPE Stage 2 – SSD 7628 – Subdivision partial development consent
- MPE Stage 2 – SSD 7628_MOD 1 – Modification 1
- MPE Stage 2 – SSD 7628_MOD 2 – Modification 2
- MPE Stage 2 – SSD 7628_MOD 3 – Modification 3
- MPE Stage 2 – SSD 7628_MOD 4 – Modification 4
- MOD 5 Stage 2 – SSD 7628_MOD 5 – Modification 5 approved on 4 September 2023
- MOD 6 Stage 2 – SSD 7628_MOD 6 – Modification 6 approved on 22 February 2024

1.3 Scope and Purpose

In accordance with SSD 7628 Condition C21 (c) (iii), a Six-Monthly Operation Compliance Report (OCR) is required to outline progress of compliance for all operation requirements against the MPE Stage 1 and Stage 2 approval.

There is no specific requirement under SSD 6676 for the submission of an OCR, however this report has been prepared to address the operational requirements for both SSD 6766 and SSD 7628 and has been prepared in accordance with the requirements of the *Compliance Reporting Post Approval Requirements* (NSW DP&E, June 2018).

2 PROJECT DESCRIPTION

2.1 Site Location

The Moorebank Intermodal Precinct (MIP) is an integral component of the Freight, Ports and Transport strategies of both the NSW and Commonwealth governments to help manage the challenges of an expected tripling of freight volumes at Port Botany by 2031.

The MIP aims to streamline the freight logistics supply chain from port to store, deliver savings to businesses and consumers, and help service the rapidly growing demand for imported goods in south-west Sydney. It is located approximately 27 kilometres (km) south-west of the Sydney Central Business District and approximately 26 km west of Port Botany within the Liverpool Local Government Area. The MIP is divided into an East Precinct and a West Precinct, located east and west of Moorebank Avenue, respectively.

The Moorebank Precinct East (MPE) commenced operations in May 2020 and is the subject of this Operation Compliance Report (OCR). The Moorebank Precinct West (MPW) Stage 2 is located west of Moorebank Avenue and is currently under construction, with one warehouse now operational. MPW Stage 2 is a separate project and operates under a different approval (SSD 7709) to MPE. MPW Stage 2 has been granted approval to receive imported material outside of standard construction hours, along with specific types of work.

Figure 1: Site Layout

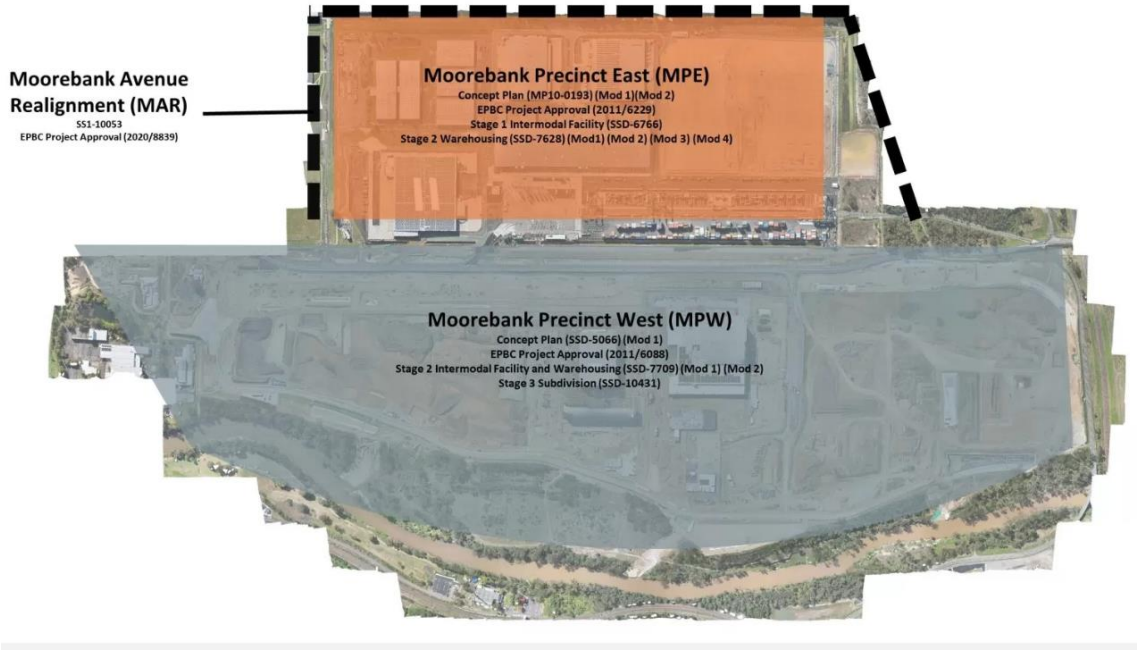

Figure 1 Moorebank Precinct East Layout – sourced https://moorebankintermodalprecinct.com.au/

2.2 Scope of Works

The main features of the Moorebank Precinct East include:

- The Import Export (IMEX) Terminal. The IMEX Terminal comprises:
  - Truck processing, holding, and loading areas with an entrance and exit from Moorebank Avenue.
  - Rail loading and container storage areas serviced by container handling equipment.
  - An Administration facility and associated car parking with light vehicle access from Moorebank Avenue.
- A Rail Link connecting the IMEX terminal and the Southern Sydney Freight Line (SSFL) traversing Moorebank Avenue, Anzac Creek and Georges River.
- Associated ancillary infrastructure including signage, lighting, landscaping, water management.
- Warehouse and distribution facilities including warehousing up to 21 m in height, typically ranging in size from 20,000 m^2 to 62,000 m^2. Individual warehouses typically comprise the following:
  - Office and administration facilities
  - Amenities
  - Car parking
  - Truck loading/unloading docks
  - Internal parking for pick-up and delivery vehicles (PUD)
  - Specialised sortation and conveyor equipment
  - Hardstand areas that provide trailer parking spaces, external PUD parking spaces, vehicle manoeuvring areas and access to the main internal site road
  - Signage for business identification purposes, including backlit illuminated signage on each warehouse
  - Internal fit out, comprising racking and storage.
- A freight village including a mix of retail, commercial and light industrial spaces typically up 15 m in height and varying in size and design.
- An internal road network to enable efficient movement of vehicles, dispatch of freight from the warehouses and transport of containers between the IMEX Terminal and warehouse and distribution facilities.
- Security and Administration offices and demountable.

2.3 Operational activities undertaken

Documents can be submitted in stages as permitted by CoC A14 and CoC A15. The application of the operational documents will be staged to take progressive affect across the Moorebank Precinct East (MPE) site as construction is completed and operations commences was detailed in the POPD approved by the DPIE on 21 May 2019.

This OCR has been prepared in accordance with the requirements of the Compliance Tracking Program (CTP) to outline progress of compliance for all operation requirements against both SSD 6766 and SSD 7628. This OCR covers the period from November 2023 – April 2024.

The MPE operates 24 hours, 7 days a week. This currently includes operation of the IMEX terminal, Rail Link, Warehouse 1, Warehouse 3, Warehouse 4, Warehouse 5 and Warehouse 7a and 7b. Warehouse 6 is occupied but not currently operating. No major construction related activities are expected to occur in 2024, with only internal fit-out and preparation for operations occurring.

The following works have been undertaken:

- Movement and storage of containers in and out of the terminal via rail
- Truck processing, holding, and loading areas.
- Primary and secondary container loading/ unloading areas.
- Transfer of containers between terminal and warehouses vis internal transfer vehicles
- Pickup and delivery of goods to warehouses via truck movements.
- Warehouses 1, 3a, 3b, 4a, 4b,5, 7a and b are occupied and operational.
- Warehouse 6 (currently vacant)
- Warehousing and Administrative Activities
- Security, maintenance and monitoring of all infrastructure and equipment related to the above activities.

Project Compliance Summary

This OCR outlines the progress of compliance for all operational requirements against Project Approvals. Compliance against the project CoC and the Final Compilation of Mitigation Measures (FCMM) are outlined in SSD 6766 Conditions of Consent and SSD 7628 Conditions of Consent, Appendix A and B respectively.

A declaration of compliance is available in **Appendix J**.

3 ENVIRONMENTAL MONITORING

In accordance with the CoC and OEMP, environmental monitoring activities are required to be undertaken for the operation phase of the MPE Stage 1 and Stage 2 project. These activities include air quality monitoring, noise monitoring, storm water infrastructure and water quality monitoring, Biodiversity Monitoring, and Biannual trip and origin destination reports. A summary of the monitoring results required for this reporting period is addressed in the following sections. The full reports for each of these monitoring requirements are available in the Appendices Section.

4 AIR QUALITY MONITORING

Air quality monitoring and compliance results are summarised in the section below for the last reporting period:

4.1.1 Dust deposition

Dust deposition data from seven DDGs located around the site is provided by SERS and have been provided for incorporation into the monitoring program since May 2021.

DPE has set the criteria for dust deposition rates, and these are provided in Table 1.

Table 1 Dust deposition criteria

Averaging Period	Maximum increase in deposited dust* level	Maximum total deposited dust level
Annual	2 g/m^2/month (incremental)	4 g/m^2/month (cumulative)

* Deposited dust is assessed as insoluble solids. This is the mass of the insoluble portion of the deposited matter, as defined under AS 3580.10.1: 2016.

7 https://www.environment.nsw.gov.au/topics/air/understanding-air-quality-data/standards-and-goals

4.1.2 Dust deposition gauge results

The results of the collection period 6 October 2023 to 6 May 2024 as provided by SERS is shown in Table 2 Dust deposition (insoluble solids g/m2/month) results from 6 October 2023 to 6 May 2024.

Date	Stage 1 DDG 1	Stage 2 DDG 1	Stage 2 DDG 2	Stage 2 DDG 3	Stage 2 DDG 4	Stage 2 DDG 5	Stage 2 DDG 6	Average
November 2023***	1.2	**3.5**	**2.5**	1.8	0.6	1.7	0.8	1.7
	0.2	N/A*	**3.0**	1.9	1.8	3.1	N/A*	2.0
December 2023	<0.1	N/A*	1.4	0.9	0.8	1.4	N/A*	1.1
January 2024**	<0.1	N/A*	1.4	0.9	0.8	1.4	N/A*	1.1
February 2024**	1.0	0.5	1.0	1.7	0.2	0.9	<0.1	0.9
March 2024	0.4	**3.7**	**2.8**	1.5	0.7	0.9	1.6	1.7
April 2024**	**2.7**	0.4	0.5	1.3	0.5	0.6	1.0	1.0

NOTE: Bold/grey indicates an exceedance of the criteria.

* Stage 2 DDG 1 and Stage 2 DDG 6 were damaged and inaccessible so were not included in the sampling period between 10 November 2023 and 2 February 2024.

** These months include data from two different SERS DDG reports to ensure the entire month was covered. This due to collection periods ending during the month rather than at the beginning or end of the month and sometimes covered over two months' worth of data.

*** Two lines are shown for November 2023, as one of the SERS DDG reports from the previous 6-month period also included data for November 2023, therefore it is included to cover the reporting period.

As shown in Table 2 there were six individual gauge exceedances between November 2023 and April 2024. However, no monthly average exceedances of the dust deposition (insoluble solids) 2 g/m2/month (incremental) and 4 g/m2/month (cumulative) criteria occurred between 6 October 2023 and 6 May 2024.

4.1.3 Annual exceedances

Twelve months of air quality monitoring are provided graphically and in table form in Appendix C. It should be noted that AQM03 did not record any data between June 2023 and 19 September 2023 and has had low data availability between 33% and 88% for each month since October 2023. See Table 2-1 for the monitoring station availability (%) over a 12-month period. It should be noted, that due to the sensors and monitoring software being swapped out in mid-April 2024, monthly and annual averages are unable to be calculated for April 2024. However, daily, and hourly (1hr/8hr) exceedances were calculated and are described in further detail below.

4.1.4 PM2.5 and PM10 Monitoring

The 12-month rolling annual average for the period March 2023 to April 2024 for all four monitors combined was below the annual average criteria (i.e. 8.0 µg/m^3 for $PM_{2.5}$ and 25.0 µg/m^3 for PM_{10}) for each month (See Arcadis report Appendix C A.1 and A.2 for more details). As of April 24, the 12-month rolling annual average for all four monitors was 2.1 µg/m^3 for $PM_{2.5}$ and 5.8 µg/m^3 for PM_{10}.

4.1.5 NO_2 Monitoring

The 12-month rolling annual average for all four monitors for the period March 2023 to April 2024 was below the annual average criteria (0.03 ppm) for each month.

As of April 2024, the 12-month rolling annual average for NO_2 for all four monitors is 0.011 ppm, below the annual average criteria of 0.03 ppm.

4.1.6 CO

CO does not require annual reporting.

4.1.7 24-hour exceedances

As discussed above, AQM03 had 77% availability over the 6-month monitoring period (excluding April 2024).

4.1.8 PM2.5 Monitoring

A review of the data for the reporting period identified one exceedance of the 24-hour average criteria (25 µg/m3) for PM2.5 at monitor AQM03 located just west of MPW. The exceedance is summarised in Table 3. The table includes the 24-hour average for PM2.5 recorded at the Liverpool monitoring station for comparison and includes analysis of the exceedance.

Table 3 - Summary of exceedance of the PM2.5 25 µg/m3/day limit

Date of exceedance	AQM01 µg/m^3	AQM02 µg/m^3	AQM03 µg/m^3	AQM04 µg/m^3	Liverpool average[7]	Analysis of exceedance	Train operation
30/11/2023	-	-	44.9	-	3.5	The exceedance occurred mainly between midnight and 8 am. Out of hours works along Moorebank Avenue and Anzac Road may have been occurring during the time of exceedance.	Trains were arriving/ departing the terminal on this day during times of exceedance. However, AQM03 is located approximately one kilometre to the northwest of where the trains operate.

4.1.9 PM_{10} Monitoring

Ten exceedances of the 50 µg/m3/day limit for PM10 were recorded during the 6-month reporting period. These are summarised in Table 4- of Appendix C The table includes the 24-hour average for PM10 recorded at the Liverpool monitoring station for comparison and includes analysis of the exceedance.

All (ten) exceedances of the PM10 24-hour average and one exceedance of the PM2.5 24-hour average occurred at AQM03. AQM03 is located on the western extent of MPW Stage 2, therefore the exceedances could be the result of construction activities being undertaken at the MPW site or potentially related to out of hours works occurring along Moorebank Avenue, Anzac Road and Bapaume Road.

4.1.10 NO_2 1-hour exceedances

No exceedance of NO_2 1-hour criteria (0.12 ppm / 120 ppb) were observed during the 6-month reporting period.

4.1.11 CO 8-hour exceedances

No 8-hour criteria exceedances for CO occurred during the 6-month reporting period.

4.1.12 Complaints (Air Quality)

No complaints were made relating to air quality during this reporting period.

4.1.13 Ad-hoc monitoring

No ad-hoc monitoring was undertaken during this reporting period.

5 NOISE MONITORING

Noise monitoring measurements have been performed, consistent with the requirements of SSD 6766 and SSD 7628 and the Operational Noise and Vibration Management Plan. During this reporting period that following noise measurements were undertaken:

- **Warehouse Noise Monitoring**

Warehouse noise monitoring is required to be undertaken following the occupation of each warehouse. Noise monitoring was undertaken during May 2024 for MPE Warehouse E7 where valid data could be obtained. Processing and analysis of this monitoring data is currently being undertaken and will be reported as part of the 2024-2025 annual review. No additional warehouses commenced operations where valid monitoring data can be measured within the reporting period.

- **Continuous Noise Monitoring**
    - The next annual report is due in November 2024.
    - No exceedances of the planning approval noise limits were measured during the period. 3 complaints were received during the period in relation to operational noise levels. These complaints were managed in accordance with the complaints reporting procedure and are summarised in the following section.
- **Noise Complaints**

In the current reporting period, 3 complaints relating to operational noise levels were reported by residents in Wattle Grove and Casula. The complaints related to terminal activities, with container handling noise, and general evening and night-time noise events in the direction of MPE (related to hours of operation). The number of operational noise-related complaints each month is summarised in the below table, for the period of 1 November 2023 to 2 May 2024. The number of noise complaints were highest in April 2024 (3), with no other months recording a complaint.

Period	Number of operational noise-related complaints
November 2023	0
December 2023	0
January 2024	0
February 2024	0
March 2024	0
April 2024	3

Table 4 - - Noise Complaints

Renzo Tonin and Associates were also engaged to undertake a noise measurement program to review the facility noise emissions, as well as to consider the following noise mitigation measures that were implemented by the development:

a) Commencement of container stacking to east of the IMEX terminal, forming a defacto noise barrier as the container stacks provide a natural mitigation barrier for noise to the east from the rail activities.

b) The commencement of electric cranes, with all rail loading and container stacking performed by the electric cranes with reach stackers only required for truck container handling.

c) 'Quackers' or broadband reversing alarms were fitted to all reach stackers and combilifts onsite.

d) IMEX truck briefings were undertaken reminding drivers of noise management obligations and will be ongoing as part of regular reminders.

This noise monitoring program was undertaken during 2023, with periods of attended and unattended noise monitoring undertaken on 3 occasions at night, during periods when IMEX operations were taking place. The noise monitoring surveys determined that the noise emissions from IMEX operational works were lower than the SSD 6766 Conditions of Consent (CoC) LAeq15min noise limits at all surrounding receiver locations for all monitoring periods. Typically, the maximum noise levels from the IMEX operations were compliant with the LA1,1minute noise limits, however, five periods were identified during the third monitoring round where the LA1,1minute noise levels were above the LA1,1minute noise limit for residences in Wattle Grove.

The sources of these noise events were further investigated, and mitigation measures identified. Recommend mitigation and management measures to be implemented based upon the noise monitoring investigation were incorporated into the updated F5A management plan (PREC-QPMS-ENPLN-0004, Rev 08, 22/1/2023) (formerly Container Noise Barrier Management Plan) to address Condition F5A of SSD 6766 for the IMEX terminal, including the sources of high noise events. Additionally, the plan was updated to cover the operational change to electrified automatic night-time stacking of containers (quieter compared to manual process) via the use of Cantilever Automated Stacking Cranes for yard stacking and electrified Automated Stacking Cranes for rail servicing.

Noise management measures were also included to address the approval of the increase of the operational capacity of the IMEX facility, from up to 250,000 twenty-foot equivalent units (TEU containers) p.a to 500,000 TEU p.a. This included management measures based upon the noise monitoring undertaken and observations and understanding of onsite operations. The F5A management plan was provided to DPHI and was approved 13 May 2024.

Annual noise monitoring reports will be in **Appendix D** of this report. Actioning requirements and recommendations raised from the report are consistently being addressed as a part of daily operations.

- **Angle of Attack Rail Noise Report**
  The commissioned report covers rail movements between November 2023 and May 2024. A summary of the key statistics is provided below:
    - Number of days in monitoring period - 183 days.
    - Number of valid train passby events – 197
    - Number of train passby events where the measure AoA values on one or more axles were above the acceptable level defined in Section 2.7.1 of Asset Standards Authority Standard T HR RS 00400 ST – 1, representing less than 1% of passbys.

The missing AoA data between 2 November 2023 and 31 November 2023 occurred because there was a rake of wagons stabled on the north track between MT4 and MT11 (i.e. the same track as the AoA measurement equipment).

In addition, there does not appear to be any obvious trend in the measured LAFmax noise levels during the monitoring period. The maximum noise levels are consistent with the Year 3 noise monitoring results (see Appendix D).

6 WATER QUALITY MONITORING

The baseline monitoring forms the basis for the ongoing Biodiversity Monitoring Strategy (BMS) to assess stream health in accordance with CoC B106, to determine any change in stream health or water quality throughout the life of the Project and to ascertain whether these changes can be attributed to the Project works. The BMS outlines monitoring requirements and includes the Stormwater Monitoring Strategy required by CoC B43 and B44.

Examination of the results from the 2024 surveys found no evidence of changes in the indicator variables (bed and bank stability, water quality, assemblages of aquatic macroinvertebrates and fish) that could be attributed to the Project works. Thus, in accordance with the Biodiversity Monitoring Strategy, no adaptive management contingency measure was triggered.

Water quality monitoring in the reporting period found that concentrations of Nitrogen (DP 1 and IP3), Phosphorous (IP3) and Zinc (IP3) exceeded ANZECC guidelines. Monitoring levels from the samples may represent a statistical anomaly due to the extremely high concentration values provided during testing. Correlation with future samples at the site require close examination to identify whether exceedance values are trending consistently, therefore raising valid concern for further specific and detailed analysis.

To retain increased water levels the detention basin system under drought or prolonged dry periods It is recommended that a sluice gate of 100mm in height is added to DP1 discharge box culvert to ensure that a minimum 100mm of water is retained to the swale – soli infiltration layers to aid in dilution of nitrogen by active process function of the plants (reeds – sedges) via nutrient cycling processes and retain moisture within the swale for uptake by the aquatic plants growing within.

This affected increase in base moisture levels will also ensure that the wetland species within the swale have a longer activation and growth period after each rainfall event, which will aid in the uptake of nutrients within the runoff water as by design of the system.

To ensure that the water quality levels within the site are a statistical outlier we recommend that an additional water quality check for IP1, IP3 & DP1 are carried out after a rainfall event of a minimum 20mm event to the local catchment.

If after testing under improve water volumes to the discharge site, nitrogen levels remain high then additional interventions or investigations may be required to ensure that nitrogen levels reduce to below exceedance trigger values.

Water quality monitoring report and infrastructure inspection reports are available in **Appendix E** of this report. Actioning requirements and recommendations raised from the report are consistently being addressed as a part of daily operations.

7 STORM WATER INFRASTRUCTURE

Stormwater infrastructure managed under the Stormwater Infrastructure Operation and Maintenance Plan were inspected and assessed during the period. No significant actions were required for the operation of Stormwater infrastructure at the site.

The annual independent audit was undertaken in September by a suitably qualified WSUD professional.

The audit found that:

1) In general, the WSUD infrastructure is being diligently maintained in accordance with CoC51.

2) The condition of the systems are generally good with clear evidence of rectification works undertaken where there was active erosion. This especially relevant given the very rainfall depths experienced in the last 2 years. The high rainfall and effort by Apical has also seen excellent vegetation growth within OSD 1 which is now well established and likely to be performing as a best practice.

3) It is very likely that the constructed elements of the system are working as intended to deliver best practice WSUD.

4) The systems are being cleaned and maintained so they remain functional and the maintainer has a good understanding of the systems.

5) No excessive build-up of material is evident.

6) OSD 10 (swale alongside Moorebank Avenue) has been removed, Warehouses (WH) 6 and 7 were constructed during this last audit period. There have been some observed impacts on the OSD and water quality basins (OSD 2) to the south of the precinct. Monitoring will continue.

During the Period - MID plumbing undertook the following activities in accordance with CoC51 and the Sites stormwater management plan;

- Inspections of Stormwater infrastructure, Maintenance and Management activities;
- Rubbish Removal - swale drains and embankments
- Inspect for invasive aquatic weeds - such as ludwigia peruviana
- Spot spray annual and herbaceous weeds

8 FLORA AND FAUNA MONITORING

Management of flora and fauna values within the MPE operational facility and associated lands is reviewed annually following a series of detailed monitoring surveys. The core objectives of flora and fauna monitoring are to:

- Monitor protected threatened flora species
- Monitor protected vegetated areas adjacent to the operational facility (including EPBC offset areas)
- Monitoring to minimise harm to fauna and maintain habitat offsets (nest boxes)
- Monitor works to protect and improve riparian and aquatic environments
- Monitor for weed occurrence and recruitment within the operational site

The results and reports of flora and fauna monitoring across the MPE operational facility can be found in Appendix G.

A series of recommendations are included to rectify any management issues identified during monitoring and enhance the biodiversity values within the MPE operational facility. The methodologies and results of the nest box and EPBC offset site surveys have not been included in the body of this report. Both monitoring components have been described in separate documents, which have been included as appendices to this report:

- EPBC offset sites - Annual monitoring report
- Nest box monitoring report

9 Surveys undertaken in the period included:

Date	Survey Type
3 November 2023	Monitoring condition of threatened flora adjacent to the Rail Link within BA341 lands, Deployment of connectivity cameras at Georges River Corridor Rail Link
7 November 2023	EPBC offset site monitoring (Small flower Grevillea, Nodding Geebung)
1 December 2023	Supervision of remediation works in the Rail Link
19 December 2023	EPBC offset site monitoring (Small flower Grevillea, Nodding Geebung) Collection Of connectivity cameras at Georges River Corridor rail link, Anzac Creek, and feral vertebrate cameras at Wattle Grove
10 January 2024	Riparian vegetation monitoring
12 January 2024	Riparian vegetation monitoring
15 January 2024	Monitoring condition vegetation adjacent to the Rail Link within BA341
14 March 2024	Bi-monthly weed inspection of the operational facility and Rail Link
15 May 2024	Bi-monthly weed inspection of the operational facility and Rail Link

Table 5 - Surveys undertaken in the period

Results during this reporting period:

Lands adjoining the Rail Link (BA341 Boot Land)

- Native vegetation on either side of the Rail Link is Plant Community Type (PCT) 883 Castlereagh Scribbly Gum woodland. Assemblages on either side of the Rail Link are in good condition with low levels of weed occurrence restricted to the fence line, and a diversity of native plant species. Both patches of native woodland are fully structured, including trees, shrubs, and groundcover vegetation. No signs of natural dieback were observed during monitoring surveys, nor were any signs observed to suggest that operations within the Rail Link are having a negative impact on native vegetation. Vegetation was observed to be gaining biomass in comparison to last year.
- Two vegetation quadrats were conducted within the lands adjoining the Rail Link, one on the eastern side and one on the western side. Seven species of exotic plants were recorded during quadrat monitoring, including *Senecio madagascariensis* (Fireweed), *Verbena bonariensis* (Purpletop), *Paspalum dilatatum* (Paspalum), and *Conyza sp.* (Fleabane). Exotic species accounted for a low cover across both quadrats.
- Parallel field transect identified three threatened plant species within 10 metres of the Rail Link corridor fencing. All species had been recorded during previous monitoring surveys.
- There are no signs to suggest current management practices within the Rail Link (or lack) of has negatively impacted on native vegetation or threatened species.

Riparian vegetation management (RVMP reporting)

- The 2023/2024 survey marked the sixth time monitoring has occurred for revegetated areas on the eastern side of the Georges River management site. A total of 31 exotic species and 38 native species were recorded across the management site.
- Survey results demonstrate an increase in exotic cover at three of the monitoring quadrats (MR12, MR15, MR16, and MR19), and a decrease in exotic cover at six sites (MR09, MR10, MR11, MR13, MR14 and M18).
- Revegetated areas continue to grow and colonise bare areas, specifically on the floodplain and lower batters. However the average native cover for the entire management site was 17%, which was less than what was recorded during the 2022/2023 monitoring event (29.4%).The average weed cover for the entire management site was 17.6%, which was less than what was recorded during the 2022/2023 monitoring event (24.3%). The eastern side had an average cover of 16.6% and the western side 21.4%. Monitoring will continue in the next period.

Koala management & fencing

- Arcadis ecologists traversed the fence line separating the Wattle Grove offset area from the MPE operational facility on 7 November 2023.
- To date, no Koala bridges or grids have been constructed as per the MIP Koala Management Plan (KMP) (Cumberland Ecology 2020). Fauna ramps were located at Anzac Creek culvert, which are providing connectivity between patches of bushland for Koala. Fauna ramps were observed to be in good condition.
- The condition of perimeter fencing separating the Wattle Grove offset area from the MPE operation facility varied in condition. The northern and western perimeters facing the MPE facility were in good condition, however, the perimeter fencing on the southern and eastern sides of Wattle Grove offset area were found to be defective in several areas. Issues identified included encroachment of vegetation on fencing, absence of barbed wire, gaps under the fence and an area of collapsed fencing spanning approximately 15 meters.
- At least one Koala was recorded in the Wattle Grove offset area, with detection on a remote camera on the north of the central access track on 25 October 2023, and on two separate cameras at the Anzac Creek culverts on 17 and 23 November 2023 respectively.

Feral animals

- Remote camera monitoring identified three feral animal species within Wattle Grove offset area, immediately adjacent to the MPE operational facility. Feral animals recorded included, Domestic Cat (Fells catus), Red Fox (Vulpes vulpes) and Black Rat (Rattus rattus) (Plate 3-6). It is anticipated that these feral animals are using the MPE operational facility when moving around the local landscape. Brown Hare (Lepus europaeus) was also incidentally observed during surveys in the northern extent of the facility.
- Remote cameras targeting feral animals were deployed at six locations along the north and western boundaries of the Wattle Grove offset area, nearest to the operational facility.
- Monitoring of feral animals will continue into the next reporting period.

Nest Box Monitoring

- In August 2023 to assess the 217 functional nest boxes in the Bootland and Georges River Corridors were undertaken. The team identified that 43 nest boxes required maintenance and were repaired and reinstalled on the same tree at a lower more management height.
- Nest Box Monitoring will occur in Spring 2024.

Fauna connectivity

- Remote infra-red cameras captured a suite of native and introduced fauna utilising the Anzac Creek culvert to move between patches of bushland within Wattle Grove offset area.
- Native terrestrial fauna recorded included Koala (Phascolarctos cinereus), listed as Endangered under the BC Act and EPBC Act, as well as common native species such as Swamp Wallaby (Wallabia bicolor). Introduced fauna recorded included Red Fox (Vulpes vulpes) and Black Rat (Rattus rattus).
- Three terrestrial fauna species were recorded on remote cameras moving beneath the Rail Link bridge (on the eastern side of Georges River), including two native species, Swamp Wallaby and Short-beaked Echidna (Tachyglossus aculeatus) and one pest species, Red Fox. No cameras captured fauna using the woody debris to cross the ballast.

Annual EPBC Offset Site Monitoring

- A Threatened Species Offset Management Plan (TFOMP) and undertook surveys to assess impacts for the 2 species listed, Grevillea parviflora subsp. parviflora (Small-flower Grevillea) and Persoonia nutans (Nodding Geebung), in the reporting period.
- The 2023 monitoring survey saw an increase in the number of stems of Grevillea parviflora subsp. parviflora within offset site G1. The population has increased from 112 to 146 stems, marking an increase of 77 percent. An overall increase in Grevillea parviflora subsp. parviflora was observed across the site, with greater densities observed in the northwest and southeast. It is recommended that the population be monitored for another year prior to implementing any management actions to increase the population.
- A total of 36 individuals of Persoonia nutans were identified across offset sites P1, P2 and P3 during the 2023 monitoring event in comparison to 37 individuals recorded in 2022, Across all sites, the number of Persoonia nutans individuals has decreased from 92 (2021) to 68 individuals recorded during the 2023 surveys. A conservative methodology will be developed for each offset site considering all present biodiversity values prior to implementation. The methodology and results of experimental disturbance plots will be presented in the 2023 -2024 annual monitoring report for the EPBC offset sites.

Weeds

- Weed cover across the MPE operation facility is generally low and has been effectively managed across the monitoring period. During operational monitoring, two outbreaks of exotic flora were incidentally observed in the Wattle Grove offset area. A small outbreak *Rubus fruticosus* sp. agg. (Blackberry) was observed in the northeast of the site on the edge of the P4 *Persoonia nutans* EPBC offset area. A second outbreak was identified along the eastern fence line with Blackberry and *Crataegus* sp. (Hawthorn) present. Five additional priority weed species, as listed for the Greater Sydney Local Land Services Region, were identified on the MPE operational facility and Rail Link during the monitoring year, including *Lantana camara* (Lantana), *Ludwigia peruviana* (Ludwigia), *Nassella neesiana* (Chilean Needle Grass), *Olea europaea* subsp. *cuspidata* (African Olive), and *Senecio madagascariensis* (Fireweed). Priority weeds were sparsely scattered, mainly located within the Rail Link corridor. As of May 2024 all Priority weeds along the rail corridor were removed except for Fireweed which requires ongoing control to eradicate.
- Works are ongoing to suppress weeds and promote the germination and establishment of native species,Each bi-monthly weed monitoring survey site is included in the weed monitoring report.

9 BIANNUAL TRIP AND ORIGIN DESTINATION REPORT

The BTODR has been undertaken for the 2023/24 reporting period and addresses the relevant requirements of the Project Approvals and other guidelines and standards applicable during operations of MPE. The BTODR is proposed to keep an accurate record of the shipping containers and vehicle arrivals / departures against approved volumes.

The data provided within this report has been collected in accordance with the BTODR Framework report and enables a comparative assessment of traffic accessing the Site and future growth in operational activities. The full report can be found in Appendix H.

During a previous reporting period of the BTODR (Period 4: 1 May 2022 – 31 October 2022), concerns were raised by the Department of Defence (DoD). DoD owns and manages sensitive properties within proximity of the Moorebank Intermodal (IMT) and were concerned about the potential for security issues for their propertyand/or personnel arising from traffic survey data that is routinely collected for the IMT using video camera technology. The main concern of DoD relates to the security of personnel arriving/departing from their landsand the potential for the driver and/or their vehicles being identified from the video footage. Ason Group were instructed to remove OD and CIC survey from both intersections, therefore for this reporting period of the BTODR, OD8 and OD 11 have been removed.

All data is a fair and accurate representation of the operational traffic for MPE and its surrounding road network. The Biannual trip and origin destination report has been completed for this period and has been provided to Secretary for information in accordance with B28.

10 PREVIOUS REPORT ACTIONS

The previous Six-Monthly Operational Compliance Report had no actions identified. Ongoing actions being tracked will be reported in the next Six-Monthly Operational Compliance Report.

10.1 Incidents

There were no operational incidents reported in MPE operations in the reporting period.

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Moorebank Intermodal Precinct

APPENDIX A - SSD 6766 CONDITIONS OF CONSENT

COMPLIANCE REQUIREMENT	UNIQUE (ID)	COMPLIANCE REQUIREMENT2	DEVELOPMENT PHASE	COMPLIANCE STATUS	MONITORING METHODLOGY	EVIDENCE AND COMMENTS 30/04/2024
SSD 6766	G1	Within 6 weeks of commencement of operation, unless otherwise agreed by the Secretary, the Applicant shall undertake road pavement deflection testing of the truck routes as defined by Condition E34(a). If the deflection tests show an increase in defection as a result of the truck routes associated with construction, the Applicant shall undertake pavement rehabilitation of the affected road pavements to achieve the pavement deflection that existing prior to the commencement of works.	operation	**Not Triggered**	OTMP	Interview with auditees 8-9/05/24
SSD 6766	G2	Within 3 months of commencement of operation, unless otherwise agreed by the Secretary, the Applicant shall carry out rectification work to the extent of the damage resulting from the construction works at the Applicant's expense and to the reasonable requirements of the owners.	operation	**Not Triggered**	OTMP	Interview with auditees 8-9/05/24
SSD 6766	G3	Within 3 months of commencement of operation, the Applicant shall provide to the Certifying Authority evidence that all easements required by this approval, and other licences, approvals and consents, have been lodged for registration or registered at the NSW Land and Property Information.	operation	**Compliant**	OTMP	Memo, Tactical to DPIE, 030319 Interim Occupation Certificate, 19/124050-7, McKenzie Group, 16/07/19) Interface Deed – Moorebank Logistics Precinct, between Qube RE Services (Terminal Assets Co & Terminal Operations Co) and the Trust Company (Warehouse Development Co), 3/12/2021
SSD 6766	G4	Signage shall be installed in accordance with Drawing A3001 Issue C (Terminal – Signage Details) dated 14/04/2015, unless otherwise agreed by the Secretary.	operation	**Compliant**	Road Pavement Deflection Report	Urban Design and Landscape Plan Moorebank Precinct East Stage 1, SIMTA, 19/12/18 Design Certification Statement, CPB Contractors, 02/05/19 RALP Fencing, Gate & Signage as Built Plans, 14/10/19. IMEX Road Signage, Linemarking & Furniture, Work as executed Plans, 23/10/20 Drawings: - Intermodal Terminal Facility (Stage 1), Terminal - Signage Details No. A3001, 23/03/2015 Issue C - Wayfinding Signage – Site Location Plan, No. 5697.SL1, 22/08/2018 Issue B - Concept Design – Signage Locations, No. PRECRCG-AR-DWG-ASK-106, 10/10/2018, Issue A
SSD 6766	G5	The quantities of Dangerous Goods present at any time on the site or transported from and to the terminal site shall be kept below the screening threshold quantities listed in the Hazardous and Offensive Development Guidelines Applying SEPP 33, (DP&E 2011). The screening threshold quantities for each Dangerous Goods shall be defined in accordance with Table 1: Screening Methods of Applying SEPP 33.	operation	**Compliant**	Road Pavement Deflection Report	No Dangerous Goods have been transported during this reporting period Interview and site inspection with auditees 8-9/05/24 Email from Qube Logistics dated 8/5/24 Terminal Operating System N4 DG Report from Riskcon Engineering, 27/4/22 Rev.1 Preliminary Hazard Analysis from Riskcon Engineering, 11/10/2022, WOEMP for WH7 DG Report May 2021-April 2024
SSD 6766	G6	Port shuttle operations must use: a) Locomotives that incorporate available best practice noise and emission technologies. Prior to the construction of the rail link connecting to the site, the Applicant must submit a report to the Secretary for consideration and approval that has been prepared in consultation with TfNSW and the EPA that justifies the technology proposed and how it meets the objective of best practice noise and emission technologies; and b) Wagons that incorporate available best practice noise technologies such as "one- piece" freight bogies or three-piece freight bogies fitted with cross-bracing or steering arms; and including as a minimum permanently coupled 'multi-pack' steering wagons using Electronically Controlled Pneumatic (ECP) braking with a wire based distributed power system (or better practice technology). Prior to the commencement of operation, the Applicant must submit a report to the Secretary for consideration and approval that has been prepared in consultation with TfNSW and the EPA that justifies the technology proposed and how it meets the objective of best practice noise technologies.	operation	**Compliant**	Best practice noise technologies	Operational Air Quality Management Plan Rev 12, SIMTA, 23/01/23 (OAQMP) Post Approval Submission (DPHI portal) undated: submission of OAQMP to DPHI Letter DPHI to Logos, 7/9/23 (approval of OMPs) Best Practice Wagon Report (Condition G6B), Renzo Tonin, 05/11/19 (Rev.10). Letter DPIE to Qube, 16/08/19 (approval of F5A, G6(b), G7A, and G7 reports) Email DPIE to Qube, 31/10/19 Container Noise Barrier Management Plan, SIMTA, 19/03/20 (The CNBMP), 28/03/2023 Rev.07 updated 22/11/2023 Rev.8 Best Practice Progress review 2022, 28/7/2022 (report no.2), Rev.3 from Arcadis Best Practice Progress review 2023, 26/7/23023 (report no.3), Rev.2 from Arcadis

SSD 6766	G7	The Applicant shall install and maintain a rail noise monitoring system on the rail link at the commencement of operation to continuously monitor the noise from rail operations on the rail link. The system shall capture the noise from each individual train pass by noise generation event, and include information to identify: a) Time and date of freight train passbys; b) Imagery or video to enable identification of the rolling stock during day and night; c) LAeq(15hour) and LAeq(9hour) from rail operations; and d) LAF(max) and SEL of individual train passbys, measured in accordance with ISO3095; or e) Other alternative information as agreed with the Secretary. The results from the noise monitoring system shall be publicly accessible from a website maintained by the Applicant. The noise results from each train shall be available on the website ideally within 24 hours of it passing the monitor. The LAeq(15hour) and LAeq(9hr) results from each day shall be available on the website within 24 hours of the period ending. Prior to the commencement of operation, the applicant shall submit for the approval of the Secretary, justification supporting the appropriateness of the location for rail noise monitoring including details of any alternative options considered and reasons for these being dismissed. The rail noise monitoring system shall not operate until the Secretary has approved the proposed monitoring location. The Applicant shall provide an annual report to the Secretary with the results of monitoring for a period of 5 years, or as otherwise agreed with the Secretary, from the commencement of operation of the IMEX terminal. The Secretary shall consider the need for further reporting following a review of the results for year 5.	operation	**Compliant**	Rail noise monitoring system	Angle of Attack and Rail Noise Monitoring System - G7, G7A, Renzo Tonin, (Revision 06 16/07/19) Functional and Performance Specification for Permanent Noise Monitor and Proposed Noise and AOA Monitoring Locations, Renzo Tonin, 16/10/19 (RNMS report), Rev.9 Letter DPIE to Qube, 16/08/19 (approval of F5A, G6(b), G7A, and G7 reports) Email DPIE to Qube, 31/10/19 DPIE post approval lodgement record 12/05/21 (Rail Link Noise Monitoring Report submission). Six Monthly Review of AoA – November 2023 from Renzo Tonin, Rev.1 Moorebank Intermodal Terminal - Six Monthly Review of AoA: - November 2021 (rail movements between 15 May 2021 and 25 October 2021) - May 2022 (rail movements between 26 October 2021 and 28 April 2022) - May 2023 (rail movements between 1 December 2022 and 30 April 2023) Annual Noise Review Reports (ANRR) from Renzo Tonin for: - From Feb 2020 to Mar 2021 (Y1 Ops), 21/6/2021, Issue 2 - From Apr 2021 to Apr 2022 (Y2 Ops), 23/05/2022, Issue 2 - From Apr 2022 to Apr 2023 (Y3 Ops), 6/07/2023, Issue 2 Post Approval Form, 29/5/2022 re. Annual Noise Report (Y2 Ops - 23/5/2022) Six-Monthly Compliance Reports from Renzo Tonin include the ANRR, sighted for: - Compliance Report 3: May 21 – Nov 21: Post Approval Form_20211222232311
SSD 6766	G7A	The applicant shall install and maintain a wayside angle of attack monitoring system on the rail link at the commencement of operation to continuously monitor the angle of attack to the rail of rolling stock wheels. The system shall capture the angle of attack from a wheel on each axle of every train, and include information to identify: a) Time and date of each axle pass by; and b) The identification number of each item of rolling stock. The results from the angle of attack monitoring system shall be: • accessible by train operators from a website maintained by the Applicant. Angle of attack results from each train shall be available on the website within 24 hours of it passing the monitor, unless unforeseen circumstances have occurred. • included in a six-monthly report to the Secretary. The report should at least identify the number of wagons with wheels that exceed the ASA standard angle of attack and the action taken by operators to improve steering performance. Prior to the commencement of operation, the Applicant shall submit for the approval of the Secretary, justification supporting the appropriateness of the location for angle of attack monitoring, the format of the information to be accessible to operators and the format of the public report. The angle of attack monitoring system shall not operate until the Secretary has approved the proposed monitoring location and reporting arrangements.	operation	**Compliant**	Angle of attack monitoring system	Angle of Attack and Rail Noise Monitoring System - G7, G7A (Revision 06 16/07/19) Letter DPIE to Qube, 16/08/19 (approval of F5A, G6(b), G7A, and G7 reports) Email DPIE to Qube, 31/10/19 https://moorebanknoisemonitoremsbk.trackiq.net/NoiseMonitor/ current to May 2024 DPIE post approval lodgement record 12/05/21 (Rail Link Noise Monitoring Report submission) Moorebank Intermodal Terminal - Six Monthly Review of AoA: - November 2021 (rail movements between 15 May 2021 and 25 October 2021) - May 2022 (rail movements between 26 October 2021 and 28 April 2022) - May 2023 (rail movements between 1 December 2022 and 30 April 2023) Annual Noise Review Reports from Renzo Tonin for: - From Feb 2020 to Mar 2021 (Y1 Ops), 21/6/2021, Issue 2 - From Apr 2021 to Apr 2022 (Y2 Ops), 23/05/2022, Issue 2 - From Apr 2022 to Apr 2023 (Y3 Ops), 6/07/2023, Issue 2 Post Approval Form, 29/5/2022 re. Annual Noise Report (Y2 Ops - 23/5/2022) Container Noise Barrier Management Plan, SIMTA, 19/03/20 (The CNBMP), 28/03/2023 Rev.07 updated 22/11/2023 Rev.8

SSD 6766	G7B	The Applicant shall: (a) not less than three months and not more than twelve months from commencement of operation, engage an appropriately qualified and experienced acoustic engineer to undertake a night-time noise survey at Glenfield Farm (or an equivalent location if access is denied). (b) the noise survey shall be conducted in accordance with the EPA's Rail Infrastructure Noise Guideline 2013 to determine: (i) the contribution of any new rail traffic travelling to and from the development; and, (ii) the increase in the total rail traffic noise level caused by any new rail traffic to and from the development. (c) the noise survey shall be conducted for not less than 12 contiguous days in the winter months (July, August or September). (d) if as a result of the noise survey there is a sustained increase in the total rail traffic noise level due to the noise level from rail traffic travelling to and from the development of more than 2dB(A) for more than 30% of nights surveyed, the Applicant shall within twelve months, construct a noise barrier along the relevant sections of rail link in accordance with the specifications provided by an appropriately qualified and experienced acoustic engineer so as to limit the increase in the total rail traffic noise level at Glenfield Farm caused by any new rail traffic to and from the development to not exceed 2dB(A). (e) the report of the noise survey including the results and recommendations shall be provided to the Secretary.	operation	**Compliant**	Best Practice Review (BPR)	The Locomotive Best Practice Review was developed in consultation with EPA and TfNSW and a final document has been issued, with confirmation from both parties that consultation comments have been closed out in the final report. This was approved by DP&E on 17/09/2017 The Moorebank Intermodal Terminal Project Best Practice Wagon Report (Condition G6B) was published on 16 April 2019 by Renzo Tonin and is currently in consultation with TfNSW Report submitted in 12 May 2021 Operational Noise and Vibration Management Plan Rev 13, SIMTA, 24/01/23 (ONVMP) Post Approval Submission (DPHI portal) undated re: submission of ONVMP to DPHI Rail operations noise monitoring report from Renzo Tonin for rail movements during: - Year 1 - between 1 November 2019 and 8 April 2021 - Year 2 - between 9 April 2021 and 9 May 2022 - Year 3 - between 10 May 2022 and 9 May 2023 DPIE post approval lodgement record 12/05/2021 (Rail Link Noise Monitoring Report submission - Y1) Annual Noise Review Reports from Renzo Tonin for: - From Feb 2020 to Mar 2021 (Y1 Ops), 21/6/2021, Issue 2 - From Apr 2021 to Apr 2022 (Y2 Ops), 23/05/2022, Issue 2 - From Apr 2022 to Apr 2023 (Y3 Ops), 6/07/2023, Issue 2
SSD 6766	G8	The following measures must be implemented during operation: a) The use of top of rail friction modifiers and automatic rail lubrication equipment in accordance with ASA Standard T HR TR 00111 ST Rail Lubrication, where required; and b) Measures to ensure the rail cross sectional profile is maintained in accordance with ETN–01-02 Rail Grinding Manual for Plain Track to ensure the correct wheel / rail contact position and hence to encourage proper rolling stock steering.	operation	**Compliant**	Best Practice Review (BPR)	Interview with auditees 8-9/05/24 K48 Monthly Track Patrol, Laing O'Rourke Site inspection 8/05/24 Email Qube logistics 9/5/2024 confirmation on inspection of lubricators Daily Site Inspection Report (DSR), Taylor Rail, 10/8/2023 for refilling greasespots Rail grinding April 2023 Defects report April and May 2023, JMDR Guidelines for Tracks Lubrication (ARTC), March 2006 Rev.0 Issue A Inspection Certification, Taylor Rail for: - May 2023 (6/4/23) - June 2023 (15/5/23) - February 2024 (22/1/24) - March 2024 (22/2/24) - April 2024 (18/3/24) - May 2024 (30/4/24)
SSD 6766	G10	Containers must be transferred between the site and Port Botany predominantly by rail, unless where unforeseen circumstances have occurred (e.g. an incident, breakdown, derailment or emergency maintenance on the rail line). The Secretary may at any time request the Applicant to demonstrate that the transport of containers between the site and Port Botany container terminals is by rail. This is to be demonstrated upon request by the Secretary for the prior 12 month period.	operation	**Compliant**	Trip Origin Destination	Containers are to be transferred by rail unless there is track maintenance or unforeseen circumstances See report 1065r08v1_BTODR Nov 2023 Interview with auditees 8-9/05/24 Biannual Trip Origin Destination Report (MPE1 and MPE2), Ason Group for: - Nov 2020, 15/02/21 - May 2021, 08/06/2021 - Nov 2021, 16/12/2021 - May 2022, 11/10/2022 - Nov 2022, 19/01/2023 - May 2023, 09/08/2023 - Nov 2023, 26/02/2024 IMEX KPI FY 2024 Letter from Ason group to Logos 7/2/23 re. further changes to the BTODR survey data collection methodology for MPE Turning Movement Survey from Trains Traffic Survey, 18/3/24
SSD 6766	G11	The Applicant shall prepare a six-monthly report to the Secretary with the results of container and vehicle monitoring for a period of 3 years, or as otherwise agreed with the Secretary, from the commencement of operation of the IMEX terminal. The Secretary shall consider the need for further reporting following a review of the results for year 3. The report shall include: a) The number of twenty foot equivalent units dispatched and received during the period; b) A record of heavy vehicle entry by date and approximate time; and c) The number of light vehicles turning right into the terminal site from Moorebank Avenue and turning left from the terminal site onto Moorebank Avenue for a representative day.	operation	**Compliant**	container and vehicle monitoring	Biannual Trip Origin Destination Report (MPE1 and MPE2), Ason Group for: - Nov 2020, 15/02/21 - May 2021, 08/06/2021 - Nov 2021, 16/12/2021 - May 2022, 11/10/2022 - Nov 2022, 19/01/2023 - May 2023, 09/08/2023 - Nov 2023, 26/02/2024 DPHI post approval portal lodgement 24/02/21 for Nov 2020 report DPHI post approval portal lodgement for the BTODR for Nov 2023, 29/2/2024 DPHI post approval portal lodgement for the BTODR for May 2023, 9/8/2023

SSD 6766	G12	All containers handling equipment, purchased after 2019 must meet US EPA Tier 4 or EU Stage IV emission standard or achieve an equivalent emission control performance to those standards listed in this condition.	operation	**Compliant**	OAQMP	Operational Air Quality Management Plan, SIMTA, 23/01/23 (OAQMP), Rev. 12 Interview with auditees 8-9/05/24 Kalmar FastCharge Straddle Carrier Email Qube Project Manager 9/5/24
SSD 6766	G13	The Applicant must carry out any activity, or operate any plant, in or on the premises by such practicable means as may be necessary to prevent or minimise air pollution.	operation	**Compliant**	Prevent or minimise air pollution	See report MIP PE Internal Monthly Air Quality Report December 2023 FINAL and MIP PE Internal Monthly Air Quality Report January 2024 FINAL Operational Air Quality Management Plan Rev 12, SIMTA, 23/01/23 (OAQMP) Interview with auditees 8-9/05/24 Monthly Air Quality Monitoring Reports from Arcadis for 2021, 2022 and 2023 Monthly Air Quality Monitoring report - March 2024, 14/5/24, Arcadis Dust Monitoring Summary Reports from SERS for 2021, 2022 and 2023. MPE Operational Air Quality Six Monthly Compliance Report from Arcadis for: - Nov 2020 to Apr 2021, No.2, 4/6/2021 - May to Oct 2021, No.3, 16/12/2021 - Nov 2021 to Apr 2022, No,4, 6/6/2022 - May to Oct 2022, No.5, 11/1/2023 - Nov 2022 to Apr 2023, No.6, 11/7/2023 - May to Oct 2023, No.7, 13/12/2023 Remote Console Operation Manual from Kalmar, 9/4/2021, Rev.0. Sighted Calibration Certificates from Airpol for COV0100008267, COV0100008268 on the 27/01/21 and CNB0100008403, CNB0100008404 and CNB0100008405 on the 25/02/21.
SSD 6766	G14	Heavy road freight vehicles are not permitted to use Moorebank Avenue south of the East Hills Railway corridor. A main gate monitoring system (e.g. CCTV) shall be installed to identify heavy vehicles turning left from the terminal site onto Moorebank Avenue, or turning right from Moorebank Avenue to the terminal site. The Secretary may at any time request the Applicant to provide a heavy vehicle monitoring report for the prior 12 month period.	operation	**Compliant**	Heavy road freight vehicles monitoring report	No heavy road freight vehicle from the project has been identified usng the East Hills Railway Corridor Biannual Trip Origin Destination Report (MPE1 and MPE2), Ason Group for: - Nov 2020, 15/02/21 - May 2021, 08/06/2021
SSD 6766	G16	Within 12 months of the commencement of operation, and thereafter at any other stage bi-annually if required by the Secretary, the Applicant shall commission and pay the full cost of an Independent Environmental Audit of the SSD. This audit shall: be conducted by a suitably qualified, experienced and independent team of experts whose appointment has been endorsed by the Secretary; include consultation with the relevant agencies and local Councils; assess the environmental performance of the SSD and assess whether it is complying with the requirements in this approval, and any other relevant approvals (including any assessment, plan or program required under these approvals); review the accuracy of predicted environmental outcomes discussed in the documents listed in condition A1 review the adequacy of any approved strategy, plan or program required under the abovementioned approvals; and recommend measures or actions to improve the environmental performance of the SSD, and/or any strategy, plan or program required under these approvals. Within 60 days of commissioning this audit, or as otherwise agreed by the Secretary, the Applicant shall submit a copy of the audit report to the Secretary and relevant public authorities, together with its response to any recommendations contained in the audit report. The audit report and response to any recommendations shall be published on the Project website.	operation	**Compliant**	External audit	Undertaken on 10 May 2021. Report submitted 28/06/21 Moorebank Precinct East Operations Independent Audit Program, WolfPeak, 24/02/20 Email, Tactical to WolfPeak, 12/10/2023 (commissioning of audit) Letter DPHI to Tactical, 22/4/2024 (approval of audit team) Email DPHI to Tactical 22/4/2024 re. endorsement of auditors Interview with auditees 8-9/05/24 Consultation records (attached to this audit report)

Moorebank Intermodal Precinct

APPENDIX B - SSD 7628 CONDITIONS OF CONSENT

COMPLIANCE REQUIREMENT	UNIQUE (ID)	COMPLIANCE REQUIREMENT2	DEVELOPMENT PHASE	COMPLIANCE STATUS	MONITORING METHODLOGY	EVIDENCE AND COMMENTS
SSD 7628	A8	The container freight road volume must not exceed 250,000 TEUs p.a., subject to the exception identified in condition A9, which may only be considered under condition A9 after the facility has been in operation.	Operation	**Compliant**	Item 1 – Surveys 1.01 Coordinate with the Survey to obtain Classified Intersection Counts for the following intersections. - I1: Moorebank Avenue/ M5 South Western Motorway interchange (full interchange survey to include M5 South Western Motorway through lanes) - I2: Moorebank Avenue/ Defence Joint Logistics Unit (DJLU) access - I4: Moorebank Avenue/ Main MPE & IMT access - I7: Moorebank Avenue/ Newbridge Road - I8: M5 South Western Motorway/ Hume Highway. - I9: Moorebank Avenue / Anzac Road 1.02 In addition to Item 1.01, coordinate with the Survey company to obtain Origin and Destination Surveys for the following intersections. - OD1: Moorebank Avenue, about 350 metres north of the M5 South Western Motorway - OD2: On eastbound off-ramp of M5 Interchange - OD3: On eastbound on-ramp of M5 Interchange - OD4: On westbound on-ramp of M5 Interchange - OD5: On westbound off-ramp of M5 Interchange - OD6: Moorebank Avenue, about 300 metres south of the M5 South Western Motorway - OD7: Anzac Road - OD9: IMT Main Access - OD10: Cambridge Avenue 1.03 Assist Survey company (if needed) to ensure the safe and efficient movement within the Site by attending Site during installation and removal of cameras. The scope of the surveys is based on the current network configuration, which assumes a single access to MPE for all warehouse & intermodal traffic. This includes the survey of a single internal MPE intersection to 'separate' warehouse traffic from intermodal traffic as required.	Biannual Trip Origin Destination Report (MPE1 and MPE2), Ason Group for: - Nov 2020, 15/02/21 - May 2021, 08/06/2021 - Nov 2021, 16/12/2021 - May 2022, 11/10/2022 - Nov 2022, 19/01/2023 - May 2023, 09/08/2023 - Nov 2023, 26/02/2024
SSD 7628	A9	The movement of container freight by road may exceed the 250,000 TEU limit p.a. by up to a further 250,000 TEU p.a., if the Secretary is satisfied that traffic monitoring and modelling of the operation of the facility demonstrate that traffic movements resulting from the proposed increase in TEU will achieve the objective of not exceeding the capacity of the transport network.	Operation	**Not triggered**	Item 1 – Surveys 1.01 Coordinate with the Survey to obtain Classified Intersection Counts for the following intersections. - I1: Moorebank Avenue/ M5 South Western Motorway interchange (full interchange survey to include M5 South Western Motorway through lanes) - I2: Moorebank Avenue/ Defence Joint Logistics Unit (DJLU) access - I4: Moorebank Avenue/ Main MPE & IMT access - I7: Moorebank Avenue/ Newbridge Road - I8: M5 South Western Motorway/ Hume Highway. - I9: Moorebank Avenue / Anzac Road 1.02 In addition to Item 1.01, coordinate with the Survey company to obtain Origin and Destination Surveys for the following intersections. - OD1: Moorebank Avenue, about 350 metres north of the M5 South Western Motorway - OD2: On eastbound off-ramp of M5 Interchange - OD3: On eastbound on-ramp of M5 Interchange - OD4: On westbound on-ramp of M5 Interchange - OD5: On westbound off-ramp of M5 Interchange - OD6: Moorebank Avenue, about 300 metres south of the M5 South Western Motorway - OD7: Anzac Road - OD9: IMT Main Access - OD10: Cambridge Avenue 1.03 Assist Survey company (if needed) to ensure the safe and efficient movement within the Site by attending Site during installation and removal of cameras. The scope of the surveys is based on the current network configuration, which assumes a single access to MPE for all warehouse & intermodal traffic. This includes the survey of a single internal MPE intersection to 'separate' warehouse traffic from intermodal traffic as required.	As above
SSD 7628	A11	The maximum GFAs for the following uses apply: (a) 300,000m2 for the warehousing and distribution facilities; and (b) 8,000m2 for the freight village.	Operation	**Compliant**	GFA monitoring	Interview with auditees 8-9/05/24 Site inspection 8/05/24 Precinct Master Plan – Ultimate, Drawing No. 0006, Rev.AL_25 May 2023, Watson Young.
SSD 7628	A12	The warehousing and distribution facilities must only be used for activities associated with freight using the MPE Stage 1 rail intermodal terminal.	Operation	**Compliant**	Occupation Environmental	Interview with auditees 9/05/24 Site inspection 8/05/24 Warehouse Operational Environmental Management Plans (various) (WOEMP) as identified in Condition C6. Biannual Trip Origin Destination Report (MPE1 and MPE2), Ason Group for: - Nov 2020, 15/02/21 - May 2021, 08/06/2021 - Nov 2021, 16/12/2021 - May 2022, 11/10/2022 - Nov 2022, 19/01/2023 - May 2023, 09/08/2023 - Nov 2023, 26/02/2024

SSD 7628	B28	The Applicant is to prepare a **Biannual Trip Origin and Destination Report** each six months following commencement of any operation (in a format agreed with TfNSW and RMS) that advises: (a) the number of actual and standard twenty foot equivalent shipping containers despatched and received during the period; (b) the number of days in the period that the truck gate was open for despatching trucks 24 hours a day, 7 days a week and detail any exceptions to this and advise actual hours of operation; (c) records of vehicle numbers accessing the site; and (d) representative vehicle origins and destinations, based on a cordon in the surrounding network. A framework for recording and reporting on the data required for the report, prepared to the satisfaction of TfNSW and RMS, is to be submitted to the Secretary three months prior to the commencement of operation. The report is to be submitted within one month of its preparation throughout operation of the project, starting six months from the commencement of operation, unless otherwise agreed by the Secretary, TfNSW and RMS. The cordon count at (d) above will: • apply to all classes of vehicles; and • cover the intermodal terminal, the warehousing facility and any other uses such as the freight village.	Operation	**Not Compliant**	Item 1 – Surveys 1.01 Coordinate with the Survey to obtain Classified Intersection Counts for the following intersections. - I1: Moorebank Avenue/ M5 South Western Motorway interchange (full interchange survey to include M5 South Western Motorway through lanes) - I2: Moorebank Avenue/ Defence Joint Logistics Unit (DJLU) access - I4: Moorebank Avenue/ Main MPE & IMT access - I7: Moorebank Avenue/ Newbridge Road - I8: M5 South Western Motorway/ Hume Highway. - I9: Moorebank Avenue / Anzac Road 1.02 In addition to Item 1.01, coordinate with the Survey company to obtain Origin and Destination Surveys for the following intersections. - OD1: Moorebank Avenue, about 350 metres north of the M5 South Western Motorway - OD2: On eastbound off-ramp of M5 Interchange - OD3: On eastbound on-ramp of M5 Interchange - OD4: On westbound on-ramp of M5 Interchange - OD5: On westbound off-ramp of M5 Interchange - OD6: Moorebank Avenue, about 300 metres south of the M5 South Western Motorway - OD7: Anzac Road - OD9: IMT Main Access - OD10: Cambridge Avenue 1.03 Assist Survey company (if needed) to ensure the safe and efficient movement within the Site by attending Site during installation and removal of cameras. The scope of the surveys is based on the current network configuration, which assumes a single access to MPE for all warehouse & intermodal traffic. This includes the survey of a single internal MPE intersection to 'separate' warehouse traffic from intermodal traffic as required.	MPE Biannual Trip Origin Destination Report Framework, Arcadis, 17/09/19 (including consultation records) Biannual Trip Origin Destination Report (MPE1 and MPE2), Ason Group for: - May 2022, 11/10/2022 - Nov 2022, 19/01/2023 - May 2023, 09/08/2023 - Nov 2023, 26/02/2024 - May 2024, 3/6/2024 DPHI post approval portal lodgement for the BTODR for May 2022, 24/10/2022 DPHI post approval portal lodgement for the BTODR for May 2023, 9/8/2023 DPHI post approval portal lodgement for the BTODR for Nov 2023, 29/2/2024 DPHI post approval portal lodgement for the BTODR for May 2024, 5/6/2024
SSD 7628	B30	The Applicant must ensure that the **Workplace Travel Plan** is implemented for the life of the development.	Operation	**Compliant**	Workplace Travel Plan	Workplace Travel Plan, SIMTA, 13/11/19 and 26/03/20 (the WTP) Warehouse Operational Environmental Management Plans (various) (WOEMP) as identified in Condition C6. 4 Start Green Star rating for Warehouse 1 – Moorebank Logistics park, 2/8/2021 4 Start Green Star rating for Warehouse 3 and 4 – Moorebank Logistics park, 11/06/2021 4 Start Green Star rating for Warehouse 5 – Moorebank Logistics park, 6/8/2021 Emails from Kight Frank and Logos dated 15/11/21 and 31/8/2023 Shuttle bus demand survey of MPE tenants, 18/10/2022 Site inspection 8/05/24
SSD 7628	B51	The annual independent audit must be undertaken by a suitably qualified WSUD professional. The audit is to verify the condition of the treatment system(s), verify and document that the system(s) is working as intended, verify the system(s) has been cleaned adequately, verify there is no excessive build-up of material in the system(s) and identify any issues with the treatment system(s) which require rectification for the system(s) to adequately perform its intended function.	Operation	**Compliant**	Audit	Moorebank Precinct East – Stage 2 WSUD Independent Audit, June 2021 from Sustainability Workshop (Mark Liebman). Moorebank Precinct East – Stage 2 WSUD Independent Audit, October 2022 from Sustainability Workshop. Moorebank Precinct East – Stage 2 WSUD Independent Audit, September 2023 from Sustainability Workshop.
SSD 7628	B64	Continuous **noise monitoring** at sensitive receivers must be undertaken during early works, fill importation, construction and for at least 12 months following occupation of the entire site.	Operation	**Not triggered**	Noise report	-
SSD 7628	B79	The permitted hours of warehouse and distribution operation are detailed in **Table 4**.	Operation	**Compliant**	Ocupation environmental management plan	Operational Noise and Vibration Management Plan Rev 13, SIMTA, 24/01/23 (ONVMP) Approved WOEMPs include the permitted hours

SSD 7628	B80	Noise generated by operation of the development inclusive of MPE Stage 1 operations must not exceed the noise limits in **Table 5**.	Operation	**Compliant**	noise monitoring	Operational Noise and Vibration Management Plan Rev.13, SIMTA, 24/01/23 (ONVMP) Container Noise Barrier Management Plan, SIMTA, 19/03/20 (The CNBMP) updated 28/03/2023 Rev.07 Annual Noise Review Reports from Renzo Tonin for: - From Feb 2020 to Mar 2021 (Y1 Ops), 21/6/2021, Issue 2 - From Apr 2021 to Apr 2022 (Y2 Ops), 23/05/2022, Issue 2 - From Apr 2022 to Apr 2023 (Y3 Ops), 6/07/2023, Issue 2 Warehouse 5 Operational Compliance Measurement, Renzo 09/04/21 Warehouse 4A Operational Compliance Measurement, Renzo 06/04/21 Warehouse 3B Operational Compliance Measurement, Renzo 06/04/21 Logos MPE WH6 and WH7 – Acoustic Design Report from PWNA, Rev.5 28/3/2023
SSD 7628	B85	The Applicant must carry out **noise monitoring of mechanical plant and other noisy equipment** for a minimum period of one week where valid data is collected following occupation of each warehouse. The monitoring program must be carried out by a suitably qualified and experienced person(s) and a Monitoring Report for Mechanical Plant must be submitted to the Secretary within two months of occupation or each tenancy to verify predicted mechanical plant and equipment noise levels.	Operation	**Not Compliant**	noise monitoring	Warehouse 5 Operational Compliance Measurement, Renzo 09/04/21 Warehouse 4A Operational Compliance Measurement, Renzo 06/04/21 Warehouse 3B Operational Compliance Measurement, Renzo 06/04/21 Warehouse 1 (Catch) Operational Compliance Measurement, Renzo 19/5/2022 Annual Noise Review – April 2021 to April 2022, Renzo Tonin & Associates, 23/5/2022 Annual Noise Review – April 2022 to April 2023, Renzo Tonin & Associates, 6/7/2023
SSD 7628	B86	Within 12 months of occupation of the first warehouse, 50% occupation of the site and 100% occupation of the site, or as otherwise agreed by the Secretary, the Applicant must undertake **operational noise monitoring** to compare actual noise performance of the project against predicted noise performance, and prepare an **Operational Noise Report** to document this monitoring. The Report must include, but not necessarily be limited to: a) noise monitoring to assess compliance with the predicted operational noise levels and the noise limits specified in Table 5; b) a review of the operational noise levels in terms of criteria and noise goals established in the NSW RNP (EPA, 2011); c) sleep disturbance impacts compared to those determined in documents specified under condition A2; d) impacts associated with annoying characteristics such as prominent tonal components, impulsiveness, intermittency, irregularity and dominant low-frequency content; e) methodology, location and frequency of noise monitoring undertaken, including monitoring sites at which project noise levels are ascertained, with specific reference to locations indicative of impacts on sensitive receivers; f) details of any complaints and enquiries received in relation to operational noise generated by the project between the date of commencement of operation and the date the report was prepared; g) any required recalibrations of the noise model taking into consideration factors such as actual traffic numbers and heavy vehicle proportions; and h) an assessment of the performance and effectiveness of applied noise mitigation measures together with a review and if necessary, reassessment of all feasible and reasonable mitigation measures.	Operation	**Compliant**	Annual noise monitoring	Annual Noise Review Reports from Renzo Tonin for: - From Feb 2020 to Mar 2021 (Y1 Ops), 21/6/2021, Issue 2 - From Apr 2021 to Apr 2022 (Y2 Ops), 23/05/2022, Issue 2 - From Apr 2022 to Apr 2023 (Y3 Ops), 6/07/2023, Issue 2

SSD 7628	B87	The Applicant must provide the Secretary and the EPA with a copy of the Operational Noise Report within 60 days of completing the operational noise monitoring referred to in (a) above or as otherwise agreed by the Secretary.	Operation	**Not Compliant**	noise monitoring	Annual Noise Review Reports from Renzo Tonin for: - From Feb 2020 to Mar 2021 (Y1 Ops), 21/6/2021, Issue 2 - From Apr 2021 to Apr 2022 (Y2 Ops), 23/05/2022, Issue 2 - From Apr 2022 to Apr 2023 (Y3 Ops), 6/07/2023, Issue 2 Submission to DPHI of Y1 ANRR, 23/06/2021 (via planning portal) Email Tactical to EPA, 24/6/2021 re. submission of Annual Noise Review for April 2021 Operational Noise Monitoring Reports from Renzo Tonin for Q1 2021, 8/6/2021 Letter from DPHI to Qube, 14/09/2021 re. acceptance of Operational Noise Report Six-monthly Operations Compliance Report: - No.1 – May to Nov 2020, 30/3/2021. Post Approval Form, 5/4/2021 - No.2 – Nov 2020 to May 2021, 15/06/2021. - No.3 – May to Nov 2021, 20/12/2021. Post Approval Form, 22/12/2021 - No.4 – Nov 2021 to May 2022, 1/6/2022 (ANRR not included) -No.5 - May to Nov 2022, 16/02/2023. Post Approval Form, 27/2/2023. - No.7 - Jun to Oct 2023, 3/4/2024. - No.8 - Nov 2023 to Apr 2024, 3/4/2024
SSD 7628	B88	To ensure the operational noise impacts are appropriately managed, the following measures apply: a) use of best practice plant; and b) preparation of a risk assessment to determine if non-tonal reversing alarms can be fitted as a condition of site entry. Alternatively, site design may include traffic flow that does not require or precludes reversing of vehicles	Operation	**Compliant**	noise monitoring	Plan Rev.13, SIMTA, 24/01/23 (ONVMP) Warehouse 3A Operational Compliance Measurement, Renzo 01/12/20220 Warehouse 4B (ATS) Operational Compliance Measurement, Renzo 01/12/20220 Warehouse 5 Operational Compliance Measurement, Renzo 09/04/21 Warehouse 4A Operational Compliance Measurement, Renzo 06/04/21 Warehouse 3B Operational Compliance Measurement, Renzo 06/04/21 Warehouse 1 (Catch) Operational Compliance Measurement, Renzo 19/5/2022 Caesarstone WH3: - Daily pre-operational inspection checklist: forklifts and attachments, 30/4/2024 - Forklift Service Schedule Work Order 5/4/2024 - Daily pre-operational inspection checklist: crane and attachments, 15/5/2024 - Service report for Hoist, 3/5/2024 - Caesarstone forklift plant checklist, K24166 and #67 - Caesarstone overhead crane checklist, CSA-EH-022a - Certificate for Base Station Model No. 4463-D, 19/3/2024 Mainfreight WH7 -Risk assessment for mobile plant 22/2/24 including forklift and reach lifts. - Forklift Maintenance history (12 months)
SSD 7628	B89	For the duration of operation heavy road freight vehicles are not permitted to use Moorebank Avenue south of the East Hills Railway corridor. A main gate monitoring system (e.g. CCTV) must be installed to identify heavy vehicles turning left from the terminal site onto Moorebank Avenue, or turning right from Moorebank Avenue to the terminal site. The Secretary may at any time request the Applicant to provide a **heavy vehicle monitoring report** for the prior 12 month period.	Operation	**Compliant**	heavy vehicle monitoring report	Biannual Trip Origin Destination Report (MPE1 and MPE2), Ason Group for: - Nov 2020, 15/02/21 - May 2021, 08/06/2021 - Nov 2021, 16/12/2021 - May 2022, 11/10/2022 - Nov 2022, 19/01/2023 - May 2023, 09/08/2023 - Nov 2023, 26/02/2024 DPHI post approval portal lodgement 24/02/21 for Nov 2020 report DPHI post approval portal lodgement for the BTODR for Nov 2023, 29/2/2024 DPHI post approval portal lodgement for the BTODR for May 2023, 9/8/2023 Interview with auditees 8-9/05/24 Complaints Register current to 31 May 2024

SSD 7628	B90	For the duration of operation, the Applicant must: a) continue to implement all reasonable and feasible best practice noise mitigation measures; b) continue to investigate ways to reduce the noise generated by the development, including maximum noise levels which may result in sleep disturbance; and c) report on these investigations and the implementation and effectiveness of these measures in the Annual Review to the satisfaction of the Secretary.	Operation	**Compliant**	heavy vehicle monitoring report	Operational Noise Monitoring for MLP, Renzo Tonin, 23/04/21 Warehouse 3A Operational Compliance Measurement, Renzo 01/12/20220 Warehouse 4B (ATS) Operational Compliance Measurement, Renzo 01/12/20220 Warehouse 5 Operational Compliance Measurement, Renzo 09/04/21 Warehouse 4A Operational Compliance Measurement, Renzo 06/04/21 Warehouse 3B Operational Compliance Measurement, Renzo 06/04/21 Warehouse 1 (Catch) Operational Compliance Measurement, Renzo 19/5/2022 Annual Noise Review Reports from Renzo Tonin for: - From Feb 2020 to Mar 2021 (Y1 Ops), 21/6/2021, Issue 2 - From Apr 2021 to Apr 2022 (Y2 Ops), 23/05/2022, Issue 2 - From Apr 2022 to Apr 2023 (Y3 Ops), 6/07/2023, Issue 2 Letter from DPHI to Qube, 14/09/2021 re. acceptance of Operational Noise Report Six-monthly Operations Compliance Report: - No.1 – May to Nov 2020, 30/3/2021. Post Approval Form, 5/4/2021 - No.2 – Nov 2020 to May 2021, 15/06/2021. - No.3 – May to Nov 2021, 20/12/2021. Post Approval Form, 22/12/2021 - No.4 – Nov 2021 to May 2022, 1/6/2022 (ANRR not included) - No.5 - May to Nov 2022, 16/02/2023. Post Approval Form, 27/2/2023. - No.7 - Jun to Oct 2023, 3/4/2024. - No.8 - Nov 2023 to Apr 2024, 3/4/2024
SSD 7628	B112	The Applicant (the operator/occupant of each premises) must store and handle all chemicals, fuels and oils, including Dangerous Goods as defined in the Australian Code for the Transport of Dangerous Goods by Road & Rail, in accordance with: (a) the requirements of all relevant Australian Standards; and (b) the NSW EPA's Storing and Handling of Liquids: Environmental Protection – Participants Handbook if the chemicals are liquids. In the event of an inconsistency between the requirements listed above, the most stringent requirement shall prevail to the extent of the inconsistency.	Operation	**Compliant**	Dangerous Good Audit	Interview with auditees 8-9/05/24 Site inspection 8/05/24 Warehouse Operational Environmental Management Plans (various) (WOEMP) Warehouse Operational Environmental Management Plan for WH7 (Mainfreight), 1/3/2024, Rev. 2
SSD 7628	B114	The quantities of Dangerous Goods present at any time within the development or transported to and from the development must not exceed the screening threshold quantities in the Department's Hazardous and Offensive Development Guidelines Application Guidelines Applying SEPP 33 except Warehouse 7. The storage of Dangerous Goods and combustible materials in Warehouse 7 must not exceed the quantities listed in Table 3-1 of the Preliminary Hazard Analysis prepared by Riskcon dated 11 October 2022 at all times.	Operation	**Compliant**	Dangerous Good	Interview with auditees 8-9/05/24 Site inspection 8/05/24 Warehouse Operational Environmental Management Plans (various) (WOEMP). Warehouse Operational Environmental Management Plan for WH7 (Mainfreight), 1/3/2024, Rev. 2 Standard Dangerous Good Register current to May 2024 DG Coordinator Monthly Checklist for 10/5/2024 and 18/04/2024 Emergency Response Plan for WH7 from Riskcon Engineering, 16/8/2023 Dangerous Goods Report for WH7 from Riskcon, 27/4/2022, Rev.1 Preliminary Hazards Analysis for WH7 from Riskcon, 11/10/2022, Rev.1
SSD 7628	B114A	The Applicant must prepare the studies set out under subsections (a) and (b). Storage of Dangerous Goods in Warehouse 7, must not commence until study recommendations have been considered and, where appropriate, acted upon. The Applicant must submit the studies to the Planning Secretary no later than one month prior to the commencement of the storage of Dangerous Goods in Warehouse 7, or within such further period as the Planning Secretary may agree. (a) FIRE SAFETY STUDY A Fire Safety Study for Warehouse 7. The study must cover the relevant aspects of the Department's Hazardous Industry Planning Advisory Paper No. 2, 'Fire Safety Study' and the New South Wales Government's Best Practice Guidelines for Contaminated Water Retention and Treatment Systems. The study must also satisfy the operational requirements of Fire and Rescue NSW, and include documentary evidence that a suitably qualified and experienced person is satisfied that the Applicant constructed Warehouse 7 in accordance with the fire safety systems and proposed designs assessed in the Fire Safety Study. (b) FINAL HAZARD ANALYSIS A Final Hazard Analysis for Warehouse 7 with the Department's Hazardous Industry Planning Advisory Paper No. 6, 'Hazard Analysis'.	Operation	**Not compliant**	Dangerous Good	Interview with auditees 8-9/05/24 Site inspection 8/05/24 Standard Dangerous Good Register current to May 2024 DG Coordinator Monthly Checklist for 10/5/2024 and 18/04/2024 Dangerous Goods Report for WH7 from Riskcon, 27/4/2022, Rev.1 Preliminary Hazards Analysis for WH7 from Riskcon, 11/10/2022, Rev.1 Emergency Response Plan for WH7 from Riskcon Engineering, 16/8/2023 Fire Safety Study from WH7 from Riskcon Engineering, 12/12/2023 Letter from NSW Fire and Rescue to Mainfreight Distribution, 21/12/2023 re. Review of Fire Safety Study (FSS) for MPE Warehouse 7
SSD 7628	B114B	Prior to the storage of Dangerous Goods in Warehouse 7, the Applicant must develop and implement the plans and systems set out under subsections (a) and (b). The Applicant must submit to the Planning Secretary documentation describing the plans and systems no later than two months prior to the commencement of the storage of Dangerous Goods in Warehouse 7, or within such further period as the Planning Secretary may agree. (a) EMERGENCY PLAN A comprehensive Emergency Plan and detailed emergency procedures for Warehouse 7. This plan must include consideration of the safety of all people outside of the development who may be at risk from the development. The plan must be consistent with the Department's Hazardous Industry Planning Advisory Paper No. 1, 'Emergency Planning'. (b) SAFETY MANAGEMENT PLAN A document setting out a comprehensive Safety Management System, covering all on-site operations and associated transport activities involving hazardous materials for Warehouse 7. The document must clearly specify all safety related procedures, responsibilities and policies, along with details of mechanisms for ensuring adherence to the procedures. Records must be kept on-site and must be available for inspection by the Planning Secretary upon request. The Safety Management System must be consistent with the Department's Hazardous Industry Planning Advisory Paper No. 9, 'Safety Management'.	Operation	**Not compliant**	Emergency Plan	Interview with auditees 8-9/05/24 Site inspection 8/05/24 Dangerous Goods Report for WH7 from Riskcon, 27/4/2022, Rev.1 Preliminary Hazards Analysis for WH7 from Riskcon, 11/10/2022, Rev.1 Emergency Response Plan for WH7 from Riskcon Engineering, 16/8/2023

SSD 7628	B114C	HAZARD AUDIT Twelve months after the commencement of operations of Warehouse 7 and every five years thereafter, or at such intervals as the Planning Secretary may agree, the Applicant must carry out a comprehensive Hazard Audit of Warehouse 7 and within one month of each audit submit a report to the Planning Secretary. The audits must be carried out at the Applicant's expense by a qualified person or team, independent of the development, approved by the Planning Secretary prior to commencement of each audit. Hazard Audits must be consistent with the Department's Hazardous Industry Planning Advisory Paper No. 5, 'Hazard Audit'. The audit report must be accompanied by a program for the implementation of all recommendations made in the audit report. If the Applicant intends to defer the implementation of a recommendation, reasons must be documented.	Operation	Not triggered	Hazard Audit	Interview with auditees 8-9/05/24 Site inspection 8/05/24
SSD 7628	B114D	FURTHER REQUIREMENTS The Applicant must comply with all reasonable requirements of the Planning Secretary in respect of the implementation of any measures arising from the reports submitted in respect of conditions 114A to 114D inclusive, within such time as the Planning Secretary may agree.	Operation	Not triggered	Hazard Audit	Interview with auditees 8-9/05/24 Site inspection 8/05/24
SSD 7628	B121	Waste must be secured and maintained within designated waste storage areas at all times and must not leave the site or be deposited on or otherwise enter neighbouring public or private properties.	Operation	Compliant	Waste Management Strategy	Operational Waste and Resources Management Plan Rev.11, SIMTA, 23/01/23 (the OWRMP) Warehouse Operational Environmental Management Plans (various) (WOEMP) Site inspection 8/05/24 Mainfreight (WH7) Waste Report April 2024 Caesarstone (WH3) Waste Register for 2021, 2022 and from Jan to Apr 2023
SSD 7628	B126	The collection of waste generated during operation of the development must be undertaken between 7 am to 10 pm Monday to Friday	Operation	Compliant	Waste Management Strategy	Operational Waste and Resources Management Plan Rev.11, SIMTA, 23/01/23 (the OWRMP) Warehouse Operational Environmental Management Plans (various) (WOEMP) Complaints Register current to 31 May 2024
SSD 7628	B127	The Applicant must: (a) take all reasonable steps to manage pests and vermin on the site; (b) manage declared noxious weeds on the site in accordance with the requirements of the Noxious Weeds Act 1993; and (c) inspect the site on a regular basis, no less than every 3 months, to ensure that these measures are working effectively, and that pests, vermin or noxious weeds are not present on site in sufficient numbers to pose an environmental hazard, or cause the loss of amenity in the surrounding area. Note: For the purposes of this condition, noxious weeds are those species subject to an order declared under the Noxious Weed Act 1993.	Operation	Compliant	Biodiversity Management Implementation Plan	Operational Waste and Resources Management Plan Rev.11, SIMTA, 23/01/23 (the OWRMP) Arcadis reports for 2022 and 2023 Weeding Reports for: - April to 2021 - for Jan and Feb 2024 MPE Operational – Weed Monitoring Report February 2021, Arcadis, 26/02/21 MPE Operational – Weed Monitoring Report April 2021, Arcadis, 11/05/21 Site inspection 8/05/24
SSD 7628	B153	The Applicant must obtain a certificate from a suitable qualified tradesperson, certifying that kitchen, food storage and food preparation areas have been fitted in accordance with Australian Standard AS4674. The Applicant must provide evidence of receipt of the certificate to the satisfaction of the Certifying Authority prior to occupation.	Operation	Not triggered	certificate from a suitable qualified tradesperson	Interview with auditees 8-9/05/24 Site inspection 8/05/24
SSD 7628	B156	The Applicant must: (a) not commence construction until the Community Communication Strategy is approved by the Secretary; (b) implement the approved Community Communication Strategy for the duration of the development and for 24 months following the completion of operation.	Operation	Compliant	Community Communication Strategy	Operation Community Communication Strategy, Moorebank Logistics Park – East Precinct, 23/01/2023 Rev.6 (the OCCS) Post Approval Form 27/03/2023 Letter DPHI to Qube, 08/04/20 (MPE S1 and S2 operational document approval) Letter DPHI to Qube, 10/05/21 (acknowledgment of updated OEMP and OCCS) Letter DPHI to Logos, 7/9/23 (approval of OMPs) https://moorebankintermodalprecinct.com.au/community/
SSD 7628	B157	The Complaints Register must be provided to the Secretary within 7 days upon request, for the period detailed within the request.	Operation	Compliant	Complaints Register	https://moorebankintermodalprecinct.com.au/wp-content/uploads/2024/04/MoorebankIntermodal-Precinct-Online-Complaintsdocument-toJun24.pdf Email to DPHI, 23/08/21, 15/11/21, 29/11/21, (issue of the complaints register) Six-monthly Compliance Reports (Appendix)

SSD 7628	C5	Overall responsibility of the development, including the freight village environmental management during operation, must be by the entity responsible for the Precinct environmental management.	Operation	**Compliant**	OEMP and associated sub-plans are reviewed annually ensuring that: • Any changes to Government Agencies and legislation are captured • Management practices are updated to respond to any incidents (whether they are minor or major) or as a result of complaints from the local community • Changes required to address the findings of third-party audits, including Department of Planning and Environment (DPE) or Department of Climate Change, Energy, the Environment and Water (DCCEEW) • Changes as a result of any Modifications that have been approved.	Site inspection 8/05/24 Operational Environmental Management Plan Moorebank Logistics Park – East Precinct Rev.18, 13/01/23, SIMTA (the OEMP)
SSD 7628	C8	At least one month prior to the commencement of a new phase of the development, the CEMP or OEMP and applicable subplans must be reviewed and submitted to the Secretary for approval.	Operation	**Compliant**	CEMP/ OEMP	As Above
SSD 7628	C9	Within three months of: (a) the submission of an annual review under condition C10; (b) the submission of an incident or non-compliance notification under condition C13; (c) the submission of an audit under condition C18; (d) the approval of any modification of the conditions of this consent; or (e) the issue of a direction of the Secretary under condition A2; the strategies, plans and programs required under this consent must be reviewed, and if necessary to either improve the environmental performance of the development, cater for a modification or comply with a direction, must be revised, to the satisfaction of the Secretary. Where revisions are required, the revised document must be submitted to the Secretary for approval within six weeks of the review. Note: The purpose of this condition is to ensure that strategies, plans and programs are regularly updated to incorporate any measures recommended to improve the environmental performance of the development.	Operation	**Compliant**		Moorebank Precinct East (SSD 7628) Stage 2: Annual Review #04 January – December 2021 Post Approval Form re. Submission of Annual Review #4 (Jan to Dec 2021) for SSD 7628, 7/6/2022 Email from Aspect to LCC re. submission of Annual Review #04, 9/6/2022 Moorebank Precinct East (SSD 7628) Stage 2: Annual Review #05 January – December 2022, 31/08/23 Post Approval Form re. Submission of Annual Review #5 (Jan to Dec 2021) for SSD 7628, 31/8/2023 Letter from DPHI to Aspect re. approval of Annual Review #05, 17/10/2023 Email from Aspect to LCC re. submission of Annual Review #05, 1/9/2023 Interview with auditees 8-9/05/24 This audit Modification 5, approved 4/9/2023 Modification 6, approved 22/2/2024 Operational Environmental Management Plan Moorebank Logistics Park – East Precinct Rev.18, 13/01/23, SIMTA (the OEMP). Post Approval Submission (DPHI portal) undated re: submission of OEMP Rev 18 to DPHI Letter DPHI to Tactical/Logos, 7/9/23 (approval of OMPs)
SSD 7628	C11	The Department must be notified in writing to compliance@planning.nsw.gov.au immediately after the Applicant becomes aware of an incident. The notification must identify the development (including the development application number and the name of the development if it has one), and set out the location and nature of the incident.	Operation	**Not triggered**		Operational Environmental Management Plan Moorebank Logistics Park – East Precinct Rev.18, 13/01/23, SIMTA (the OEMP) Warehouse Operational Environmental Management Plans (various) (WOEMP) Interview with auditees 8-9/05/24
SSD 7628	C12	A written incident notification addressing all requirements for such notification set out in Appendix D of this consent, must also be emailed to the Department at the following address: compliance@planning.nsw.gov.au within 7 days after the Applicant becomes aware of an incident. Notification is required to be given under this condition even if the Applicant fails to give the notification required under condition or, having given such notification, subsequently forms the view that an incident has not occurred.	Operation	**Not triggered**		As above Interview with auditees 8-9/05/24
SSD 7628	C13	Within 30 days of the date on which the incident occurred or as otherwise agreed to by the Secretary the Applicant must provide the Secretary and any relevant public authorities (as determined by the Secretary) with a detailed report on the incident addressing all requirements for such reporting set out in Appendix D of this consent, and such further reports as may be requested.	Operation	**Not triggered**		As above. Interview with auditees 8-9/05/24
SSD 7628	C14	Any written requirements of the Secretary or relevant public authority (as determined by the Secretary) which may be given at any point in time, to address the cause or impact of an incident must be complied with and within any timeframe specified by the Secretary or relevant public authority.	Operation	**Not triggered**		As above. Interview with auditees 8-9/05/24
SSD 7628	C15	If statutory notification is provided to EPA as required under the POEO Act in relation to the development, such notification must also be provided to the Secretary within 24 hours after the notification was provided to EPA.	Operation	**Not triggered**		As above. Interview with auditees 8-9/05/24
SSD 7628	C16	The Department must be notified in writing to compliance@planning.nsw.gov.au within 7 days after the Applicant becomes aware of any non-compliance.	Operation	**Compliant**		Interview with auditees 8-9/05/24 First Operational Independent Audit, WolfPeak, 21/6/2021
SSD 7628	C17	The notification must identify the development and the application number for it, set out the condition of consent that the development is non-compliant with, the way in which it does not comply, the reasons for the non-compliance (if known), and what actions have been, or will be, undertaken to address the non-compliance.	Operation	**Compliant**		Interview with auditees 8-9/05/24 First Operational Independent Audit, WolfPeak, 21/6/2021

SSD 7628	C21	The Proponent must prepare and implement a **Compliance Tracking Program** to track compliance with the requirements of this approval. The **Compliance Tracking Program** must be submitted to the Secretary for approval prior to the commencement of construction. The Compliance Tracking Program must include, but not be limited to: (a) provision for the notification of the Secretary prior to the commencement of construction and prior to the commencement of operation of the development (including prior to each stage, where works are being staged); (b) provision for periodic review of the compliance status of the development against the requirements of this approval and the environmental management measures committed to in the documents referred to in condition A2; (c) provision for periodic reporting of compliance status to the Secretary, including but not limited to: (i) a **Pre-Construction Compliance Report** prior to the commencement of construction, (ii) quarterly Construction Compliance Reports, for the duration of construction, and (iii) a **Pre-Operation Compliance Report** prior to the commencement of operation, and **six monthly operational compliance reports**; (d) a program for independent environmental auditing; (e) mechanisms for recording environmental incidents during construction and actions taken in response to those incidents; (f) provision for reporting environmental incidents to the Secretary during construction; (g) procedures for rectifying any non-compliance identified during environmental auditing, review of compliance or incident management; and (h) provision for ensuring all employees, contractors and sub-contractors are aware of, and comply with, the conditions of this approval relevant to their respective activities.	Operation	**Compliant**	OEMP and subplans	Compliance Tracking Program Moorebank Precinct East Stage 2, 24/05/18 Program for Operational Phase Documentation (POPD), 22/3/2019 Pre-Operational Compliance report, 13/7/2020 Rev.06 (Area 1 – WH1 and IMEX) Pre-Operational Compliance report, 25/6/2021 Rev.04 (Area 2 – WH3, WH4, and WH5) Pre-Operational Compliance report, 9/8/2023 Rev.03 (Area 3 – WH6 and WH7) Moorebank Logistics Park, MPE Six-monthly Operations Compliance Report: - No.1 – May to Nov 2020, 30/3/2021. Post Approval Form, 5/4/2021 - No.2 – Nov 2020 to May 2021, 15/06/2021. - No.3 – May to Nov 2021, 20/12/2021. Post Approval Form, 22/12/2021 - No.4 – Nov 2021 to May 2022, 1/6/2022 (ANRR not included) - No.5 - May to Nov 2022, 16/02/2023. Post Approval Form, 27/2/2023. - No. 6 – Nov 2022 to May 2023, 8/9/2023. - No.7 - Jun to Oct 2023, 3/4/2024. No.8 - Nov 2023 to Apr 2024, 3/4/2024Independent Audit Program, WolfPeak 2020, updated version 25/6/2024. Compliance Tracker, current to 30/4/2024 Letter DPHI to Logos, 7/9/23 (approval of OMPs) Email from Tactical re. latest OEMPs, 28/3/2023 Email Knight Frank to Tenants re. latest OEMPs and sub-plans, no date

Moorebank Intermodal Precinct

APPENDIX C – AIR QUALITY MONITORING COMPLIANCE REPORT

ARCADIS Design & Consultancy for natural and built assets

MOOREBANK INTERMODAL PRECINCT – EAST PRECINCT

Operational Air Quality Six Monthly Compliance Report #8

November 2023 – April 2024

20 JUNE 2024

CONTACT

SAMUEL BROWN
Environmental Consultant

T +61 2 8907 2684
M +61431 941 703
E sam.brown@arcadis.com

Arcadis
Level 16
580 George Street
Sydney NSW 2000

MOOREBANK INTERMODAL PRECINCT – EAST PRECINCT

Operational Air Quality Six Monthly Compliance Report #8

November 2023 – April 2024

Author	Samuel Brown	
Checker	Heather Tilley	
Approver	Heather Tilley	

Report No	PREC-ARC-EN-RPT-0014
Date	19/06/2024
Revision Text	002

REVISIONS

Revision	Date	Description	Prepared by	Approved by
001	19/06/2024	Submitted draft to client for review	SB	HT
002	20/06/2024	Final issued	SB	HT

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1 INTRODUCTION

1.1 Background

The Moorebank Logistics Park[1] – Precinct East Operational Air Quality Monitoring Programme Framework (OAQMPF - dated 19/03/2020) provides a framework to monitor air quality during operation of the Moorebank Intermodal Precinct (MIP) East Precinct and has been developed to support the implementation of the Operational Air Quality Management Plan (OAQMP - Revision 18 dated 20/01/2023) monitoring and reporting requirements. In 2022, LOGOS Property took over the management of the warehouse and distribution facilities, as well as the overall management of the Moorebank Precinct East (MPE). Qube Logistics will continue to maintain responsibility for the IMEX (Import Export Rail Terminal) and the Rail Link. This change in ownership does not impact the current reporting period or the current reporting requirements.

The OAQMP includes requirements of the:

- EPBC Act Approval (2011/6229) Condition of Approval (CoA) 8(f) which requires the implementation of a comprehensive air quality monitoring program (including locations, frequency, and duration)
- Moorebank East Precinct Stage 1 (SSD 6766):
  - Condition of Consent (CoC) F4(f)(iv) which requires measurement of air emissions generated by the Facility.
  - Final Compilation of Mitigation Measures (FCMM) 2C which requires the implementation of an air quality monitoring programme during operation for nuisance dust and air emissions [PM_{10}[2] and nitrogen dioxide (NO_2)].
- Moorebank East Precinct Stage 2 (SSD 7628):
  - CoC C21(c)(iii) which requires the submission of six-monthly operational compliance reports for the life of the project.
  - CoC B59(d)(i), (ii), (iii), (iv) and (vii) which require the identification of air quality monitoring methods and implementation of compliance monitoring for all emissions associated with operations of the Facility.
  - FCMM 3C which requires real-time boundary monitoring be undertaken during operation of the Facility.

1.2 Site operation

The MIP Operational Environmental Management Plan (OEMP - Revision 18 dated 20/01/2023) and sub-plans are applicable to the entire MPE. The MPE operates 24 hours, 7 days a week. This currently includes operation of the IMEX terminal, Rail Link, Warehouse 1, Warehouse 3, Warehouse 4, Warehouse 5 and Warehouse 7a and 7b. Warehouse 6 is occupied but not currently operating. No major construction related activities are expected to occur in 2024, with only internal fit-out and preparation for operations occurring. These activities would be undertaken during standard working hours, unless stated otherwise.

Moorebank Precinct West (MPW) Stage 2 is located west of Moorebank Avenue and is currently under construction, with one warehouse now operational. MPW Stage 2 is a separate project and operates under a different approval (SSD 7709) to MPE. MPW Stage 2 has been granted approval to receive imported material outside of standard construction hours, along with specific types of work.

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[1] With LOGOS purchasing the MLP, the MLP will now be referred to as Moorebank Intermodal Precinct (MIP).

[2] PM_{10} - Particles with a diameter of 10 micrometres or less, which are small enough to pass through the throat and nose and enter the lungs.

There are also works and activities that occur outside of standard construction hours under specific approvals processes from time-to-time. These can include construction works and activities associated with both MPE and MPW.

Table 1-1 summarises the works, activities and material importation undertaken outside of standard construction hours during the six-monthly reporting period.

Table 1-1: Summary of works outside of standard construction hours

Dates	Activities undertaken
1 October 2023 to 31 December 2023	Moorebank Avenue upgrade (Including Anzac Road)
30 October 2023 to 6 November 2023	General works
13 December 2023	Deliveries
8 January 2024 to 31 March 2024	Moorebank Avenue upgrade (Including Anzac and Bapaume Roads)
13 January and 20 January 2024	Helicopter lifting
24 January 2024	General works
25 January 2024	Helicopter lifting
15 March to 18 March 2024	Traffic works
22 March to 25 March 2024	Traffic works
1 April 2024 to 30 June 2024	Moorebank Avenue upgrade (Including Anzac and Bapaume Roads)

1.3 Purpose of the report

This six-monthly air quality report has been prepared to meet reporting requirements of CoC C21(c)(iii) of SSD 7628 as outlined in Section 5 of the OAQMPF.

This six-monthly air quality report includes:

- A background to the air quality monitors and their locations (Section 2)
- Weather data and regional air quality (Section 3)
- Analysis of the raw data and comparison against identified criteria / trigger level, identification of exceedances, complaints or ad hoc monitoring undertaken (Section 4)
- An overview of any investigations undertaken to determine the cause of the exceedance or complaint (Sections 4.2, 4.3, 4.4 and 4.5).
- A high-level overview of the dust deposition data (Section 4.2).
- Conclusions and recommendations based on the 6-month's data (Section 5)
- Summarised data in graphs and tables (Appendix A).

1.4 Reporting period

The MPE operations commenced on 13 May 2020.

This six-monthly internal air quality report has been prepared to provide an overview of operational air quality results for the six-month operational period from 1 November 2023 to 30 April 2024 (inclusive) to inform the six-monthly operational compliance reports required for the life of the project.

This report will be the eighth report for MPE since operations began in May 2020.

1.5 Limitations

All findings contained in this report are based on downloaded monitoring data at the time of writing the monthly reports and information relating to air quality provided by Tactical Group, Envirosuite and Site Environmental and Remediation Services (SERS) who manage the dust deposition gauges (DDG). Arcadis do not take responsibility for the accuracy or limitations of the downloaded and provided DDG data.

2 OVERVIEW OF AIR QUALITY MONITORING

2.1 Air quality monitors

The dust and air quality monitoring system installed at the time MPE operation commenced comprises four Cairnet air quality units integrated with Sentinel™ software, which is hosted in the cloud. The system has been provided by EMS Brüel & Kjaer.

The Cairnet unit measures the following dust and air quality parameters:

- NO_2 (range: 0-25 ppb)
- PM_{10} (particles with have a diameter less than 10 microns)
- $PM_{2.5}$ (range: 0-1000 µg/m^3)
- CO (installed since March 2020).

These monitors where replaced in mid-April 2024 with the Kunak AIR Lite sensors which have been integrated with the Omnis software, hosted in the cloud. The system measures the above parameters as well as PM_1 ie particulates of less than one micron in size.

2.2 Dust deposition gauges

Seven DDG which are provided and serviced by SERS. The gauges consist of 5-litre glass bottles with 150 mm diameter glass funnels and silicone bungs. The purpose of this sampling is to determine which particles settle from the ambient air over an approximate 31-day sampling period. This equipment is compliant with the Australian Standard AS/NZS 3580.10.1:2016.

The DDGs were installed in May 2021 and are currently managed and monitored by SERS. SERS provide monthly to quarterly DDG reports which are used to inform the monthly Air Quality Reports.

2.3 Monitoring locations

The locations of the continuous air quality monitoring stations are identified on Figure 2-1 and the DDG locations are shown on Figure 2-2.

The site boundary is considered representative of the closest receptors (including the adjacent commercial premises). The locations of the continuous air quality monitors means that the construction and operation activities for both MPE and MPW Stage 2 have been captured.

DDG locations were also chosen so that a true representation of dust generated from operational activities at MPE could be established and to a slightly lesser extent, the construction activities of MPW Stage 2.

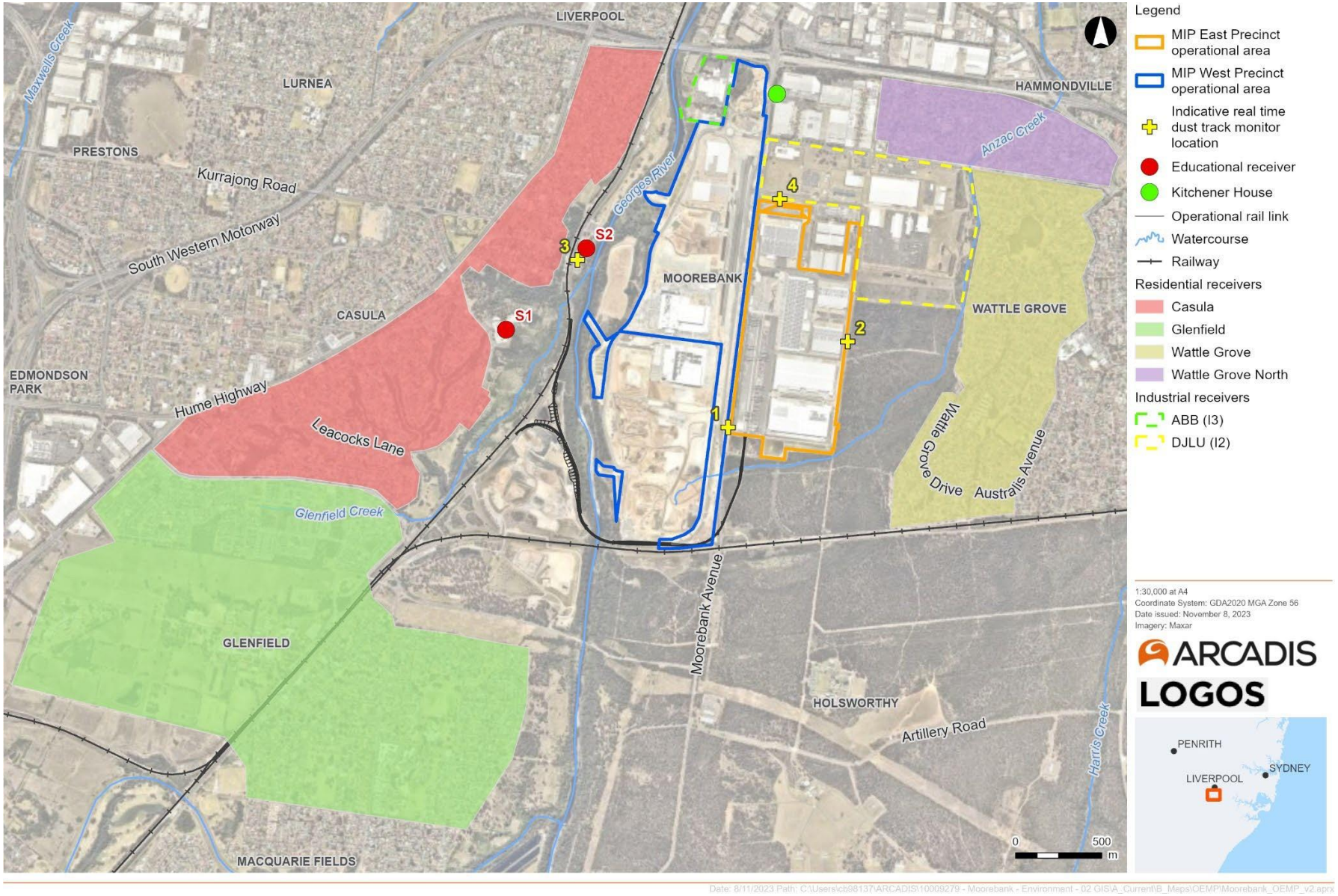


Figure 2-1: Continuous real-time air quality monitors (Source: Arcadis, 2023)

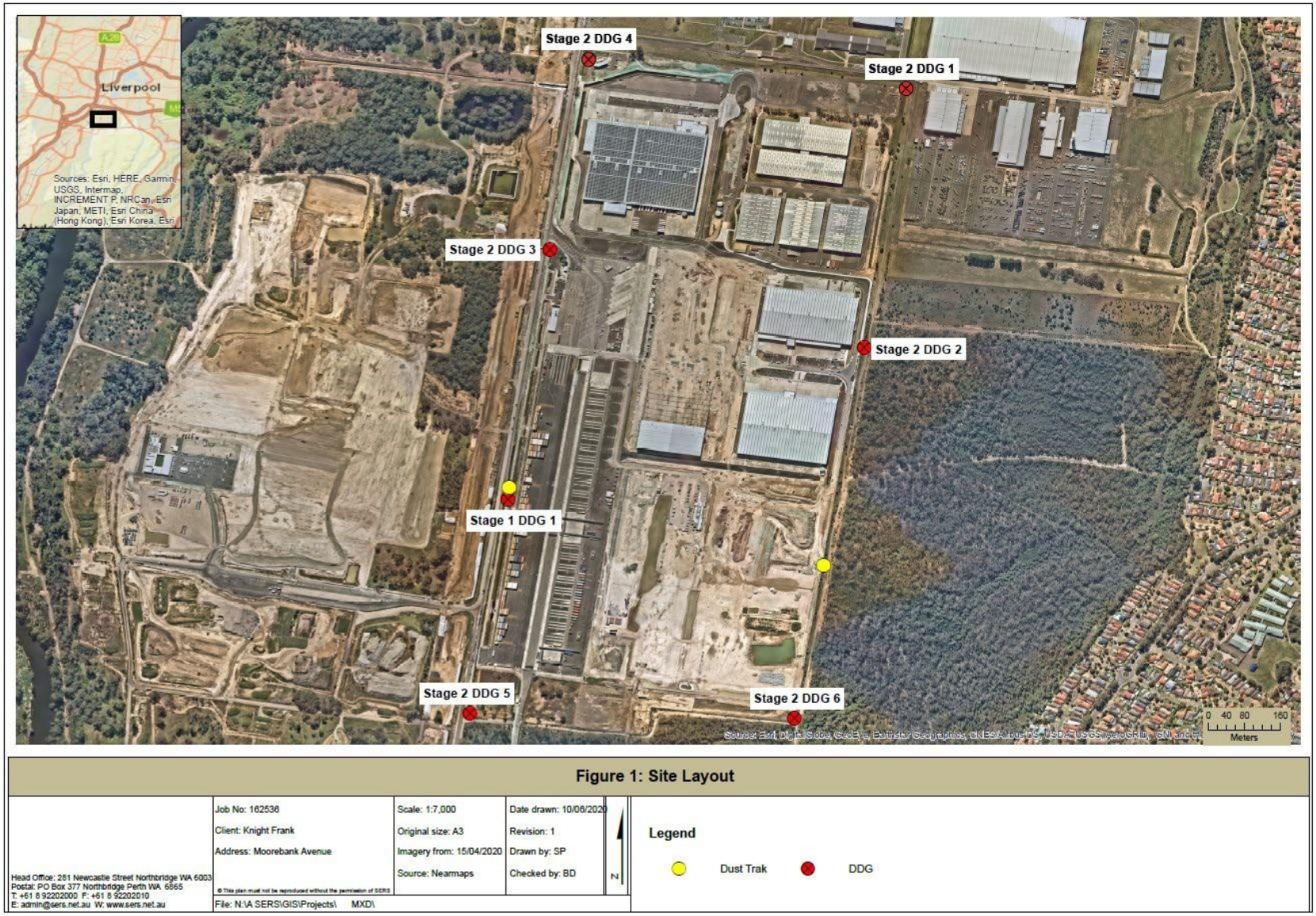


Figure 2-2: Location of Dust Deposition Gauges (Source: SERS, May 2024). Stage refers to approval stages for MPE.

2.4 Air quality monitoring station availability

A summary of availability (time of operation) of the continuous air quality monitoring stations for this reporting period is summarised in Table 2-1, with the most recent calibration date also stated.

Table 2-1: Monitoring station availability (%)

Monitoring station	Nov 2023	Dec 2023	Jan 2024	Feb 2024	Mar 2024	Apr 2024	Average	Latest calibration date
	% availability each month							
AQM01	100	100	100	100	100	NA	100	Sep 2023**, Oct 2023^, Jan 2024*
AQM02	100	100	100	99	100	NA	100	Sep 2023**, Oct 2023^, Jan 2024*
AQM03	74	88	74	78	69	NA	77	Sep 2023**, Oct 2023^, Jan 2024*
AQM04	100	100	100	100	100	NA	100	Sep 2023**, Oct 2023^, Jan 2024*

^ NO_2 was calibrated.

* CO was calibrated.

** $PM_{2.5}$ and PM_{10} were calibrated.

All monitors were replaced around mid-April 2024. The older existing monitoring system (Sentinel) was also replaced with Omnis to support operations of the new monitors. Due to the change in monitors and reporting system, the continuity of data was impeded for April 2024 and therefore an accurate availability is unable to be determined for this month.

Monitors AQM01, AQM02 and AQM04 were available and recorded data for the majority of the 6-month period. There has been significant variability in monitor availability throughout this reporting period for monitor AQM03 i.e. Monitor AQM03 had between 69% and 88% availability throughout the 6-months of monitoring. It is expected that the availability of AQM03 will improve following the installation of the new monitors and the new operating system. This will be confirmed in the next reporting period.

3 WEATHER

3.1 Meteorological Conditions

3.1.1 Prevailing wind conditions

Prevailing winds influence the dispersion of dust, and other air emissions potentially generated by the Facility. A weather station is located adjacent to Moorebank Avenue to capture representative conditions at the site. The prevailing wind speed and direction is discussed in more detail below.

3.1.2 Observed wind data

3.1.2.1 Site weather station

The average wind speed and direction data from the site weather monitor from November 2023 to April 2024 is summarised below in Table 3-1.

Table 3-1: Site weather station average wind direction for November 2023 to April 2024

Month	Wind speed (m/s)	Beaufort Wind scale category	Wind direction
November 2023	1.3	Light air	South (177°)
December 2023	1.9	Light breeze	South-southwest (192°)
January 2024	1.9	Light breeze	South (176°)
February 2024	1.7	Light breeze	South-southwest (197°)
March 2024	1.4	Light air	South-southwest (193°)
April 2024	1.3	Light air	Southwest (217°)

3.1.3 Ambient temperature and rainfall

The site weather station does not record the ambient temperature and rainfall. This data is recorded at the Bankstown Airport Automatic weather Station (AWS) and is used for the purposes of ambient temperature and rainfall reporting for the site. Based on the AWS, the monthly mean temperatures (minimum and maximum) and rainfall (long-term monthly average and total) for the reporting period are summarised in Table 3-2.

Rainfall for the reporting period was mixed throughout the 6-month period. However, December 2023 and April 2024 were well above the long-term monthly average rainfall and March 2024 was well below the long-term monthly average.

Table 3-2: Temperature and rainfall recorded at the Bankstown Airport AWS for the reporting period

Month	Mean minimum temperature (°C)	Mean maximum temperature (°C)	Total rainfall (mm)	Long-term monthly average rainfall (mm)
November 2023	16.3	25.8	98.6	76.0
December 2023	18.7	29.4	102.8	67.1

Month	Mean minimum temperature (°C)	Mean maximum temperature (°C)	Total rainfall (mm)	Long-term monthly average rainfall (mm)
January 2024	19.9	29.2	53.0	91.9
February 2024	19.3	29.5	107.2	109.9
March 2024	17.0	28.4	30.0	111.8
April 2024	13.2	24.5	171.6	82.6

Source: Bankstown, NSW - April 2024 - Daily Weather Observations (bom.gov.au)

3.2 Ambient Air Quality

The NSW Department of Climate Change, Energy, the Environment and Water (NSW DCCEEW) uses air quality categories (AQC) for NSW. These categories are based on air quality data readings which are taken continuously from the various monitoring sites throughout NSW and are averaged to give hourly and daily air quality information. NSW DCCEEW use minute data, and report concentrations as hourly and daily averages. All averages are arithmetic means. Air quality data is updated hourly, and a daily air quality forecast is made for the Greater Sydney Metropolitan Region at 4 pm each day.

The AQC is generally used by government agencies to communicate to the public how polluted the air currently is or how polluted it is forecast to become. The AQC ranges from 'Good' to 'Extremely Poor' and is summarised in Figure 3-1[3].

			Air quality categories (AQC)				
Air pollutant	Averaging period	Units	GOOD	FAIR	POOR	VERY POOR	EXTREMELY POOR
Ozone O_3	1-hour	pphm	<6.7	6.7–10.0	10.0–15.0	15.0–20.0	20.0 and above
	4-hour rolling	pphm	<5.4	5.4–8.0	8.0–12.0	12.0–16.0	16.0 and above
Nitrogen dioxide NO_2	1-hour	pphm	<8	8–12	12–18	18–24	24 and above
Visibility Neph	1-hour	bsp	<1.5	1.5–3.0	3.0–6.0	6.0–18.0	18.0 and above
Carbon monoxide CO	8-hour rolling	ppm	<6.0	6.0–9.0	9.0–13.5	13.5–18.0	18.0 and above
Sulfur dioxide SO_2	1-hour	pphm	<13.3	13.3–20.0	20.0–30.0	30.0–40.0	40.0 and above
Particulate matter < 10 µm PM_{10}	1-hour	µg/m^3	<50	50–100	100–200	200–600	600 and above
Particulate matter < 2.5 µm $PM_{2.5}$	1-hour	µg/m^3	<25	25–50	50–100	100–300	300 and above

Figure 3-1: Air quality categories

[3] https://www.environment.nsw.gov.au/topics/air/understanding-air-quality-data/air-quality-categories

The PM_{10}, $PM_{2.5}$, NO_2, Visibility and CO air quality data from the Liverpool[4] monitoring station is reviewed monthly and is summarised for the six-month reporting period in Table 3-3.

Table 3-3: Summary of AQC from the Liverpool monitoring station for the reporting period

Month	Average for Reporting Period	Comment for reporting period
NO_2 (ppm) maximum 1 hourly average	Good.	Good every day
CO (ppm) maximum rolling 8 hourly average	Good.	Good every day
PM_{10} 24-hour average	Mostly good, with 9 days fair.	'Good' every day except for: • Sunday 12 November 2023 had 'fair' PM_{10} (36.5 µg/m^3) • Monday 18 December 2023 had 'fair' PM_{10} (35.2 µg/m^3) • Tuesday 19 December 2023 had 'fair' PM_{10} (37.8 µg/m^3) • Thursday 25 January 2024 had 'fair' PM_{10} (36.7 µg/m^3) • Saturday 3 February 2024 had 'fair' PM_{10} (46.0 µg/m^3) • Sunday 4 February 2024 had 'fair' PM_{10} (38.8 µg/m^3) • Friday 1 March 2024 had 'fair' PM_{10} (40.8 µg/m^3) • Thursday 7 March 2024 had 'fair' PM_{10} (34.1 µg/m^3) • Wednesday 17 April 2024 had 'fair' PM_{10} (40.8 µg/m^3).
$PM_{2.5}$ 24-hour average	Mostly good, with 1 day fair.	'Good' every day except for: • Tuesday 19 December 2023 had 'fair' $PM_{2.5}$ (18.9 µg/m^3).
Visibility[5],	Mostly good, with 1 day fair and 1 day poor.	'Good' every day except for: • Tuesday 19 December 2023 had 'poor' Visibility (3.58 10^{-4}m^{-1}) • Saturday 27 April 2024 had 'fair' Visibility (1.53 10^{-4}m^{-1}).

[4] Data download facility | NSW Dept of Planning, Industry and Environment

[5] In NSW, visibility (or NEPH) is reported in units of 10^{-4} m^{-1}. This means that a NEPH value of 1.5 should be read as 1.5x10^{-4} m^{-1}. NSW has adopted a 1-hour visibility standard of 2.1x10^{-4} m^{-1}, which corresponds to a visual distance of approximately 18.6 km. This means that NEPH > 2.1 will trigger 'POOR' (or worse) air quality due to reduced visual range (<18.6 km)

4 MONITORING RESULTS

4.1 Air quality criteria

4.1.1 Criteria for $PM_{2.5}$, PM_{10}, NO_2 and CO

The National Environment Protection Measure for Ambient Air (Air NEPM)[6] has established new national standards for assessment of air quality for NO_2 and CO, which came into effect 13 May 2021. These criteria are detailed in Table 4-1. The air quality data at MPE was assessed against the new criteria from June 2021.

Table 4-1: Monitoring criteria (applied from June 2021)

Monitoring focus	Averaging period	Criteria / Trigger
$PM_{2.5}$	24-hour average	25 µg/m^3
	Annual average	8 µg/m^3
PM_{10}	24-hour average	50 µg/m^3
	Annual average	25 µg/m^3
NO_2	1-hour average	0.12 ppm
	Annual average	0.03 ppm
CO	1-hour average	NA
	8 -hour average	9.0 ppm

It is also worth noting that in 2025, the criteria for $PM_{2.5}$ will change to 20 µg/m^3 for the 24-hour averaging period and 7 µg/m^3 for the annual average.

4.1.2 Dust deposition

Dust deposition data from seven DDGs located around the site is provided by SERS and have been provided for incorporation into the monitoring program since May 2021.

DPE has set the criteria for dust deposition rates, and these are provided in Table 4-2.

Table 4-2 Dust deposition criteria

Averaging Period	Maximum increase in deposited dust* level	Maximum total deposited dust level
Annual	2 g/m^2/month (incremental)	4 g/m^2/month (cumulative)

* Deposited dust is assessed as insoluble solids. This is the mass of the insoluble portion of the deposited matter, as defined under AS 3580.10.1: 2016.

[6] https://www.environment.nsw.gov.au/topics/air/understanding-air-quality-data/standards-and-goals

4.2 Dust deposition gauge results

The results of the collection period 6 October 2023 to 6 May 2024 as provided by SERS is shown in Table 4-3.

Table 4-3: Dust deposition (insoluble solids g/m^2/month) results from 6 October 2023 to 6 May 2024

Date	Stage 1 DDG 1	Stage 2 DDG 1	Stage 2 DDG 2	Stage 2 DDG 3	Stage 2 DDG 4	Stage 2 DDG 5	Stage 2 DDG 6	Average
November 2023***	1.2	**3.5**	**2.5**	1.8	0.6	1.7	0.8	1.7
	0.2	N/A*	**3.0**	1.9	1.8	3.1	N/A*	2.0
December 2023	<0.1	N/A*	1.4	0.9	0.8	1.4	N/A*	1.1
January 2024**	<0.1	N/A*	1.4	0.9	0.8	1.4	N/A*	1.1
February 2024**	1.0	0.5	1.0	1.7	0.2	0.9	<0.1	0.9
March 2024	0.4	**3.7**	**2.8**	1.5	0.7	0.9	1.6	1.7
April 2024**	**2.7**	0.4	0.5	1.3	0.5	0.6	1.0	1.0

NOTE: Bold/grey indicates an exceedance of the criteria.

* Stage 2 DDG 1 and Stage 2 DDG 6 were damaged and inaccessible so were not included in the sampling period between 10 November 2023 and 2 February 2024.

** These months include data from two different SERS DDG reports to ensure the entire month was covered. This due to collection periods ending during the month rather than at the beginning or end of the month and sometimes covered over two months' worth of data.

*** Two lines are shown for November 2023, as one of the SERS DDG reports from the previous 6-month period also included data for November 2023, therefore it is included to cover the reporting period.

As shown in Table 4-3, there were six individual gauge exceedances between November 2023 and April 2024. However, no monthly average exceedances of the dust deposition (insoluble solids) 2 g/m^2/month (incremental) and 4 g/m^2/month (cumulative) criteria occurred between 6 October 2023 and 6 May 2024.

4.3 Continuous monitor results

Monitoring data for $PM_{2.5}$, PM_{10}, NO_2 and CO for the reporting period have been summarised into tables and graphs and are provided in Appendix A. The following sections summarise the results for this 6-month reporting period.

4.3.1 Annual exceedances

Twelve months of air quality monitoring are provided graphically and in table form in Appendix A. It should be noted that AQM03 did not record any data between June 2023 and 19 September 2023 and has had low data availability between 33% and 88% for each month since October 2023.

See Table 2-1 for the monitoring station availability (%) over a 12-month period.

It should be noted, that due to the sensors and monitoring software being swapped out in mid-April 2024, monthly and annual averages are unable to be calculated for April 2024. However, daily, and hourly (1hr/8hr) exceedances were calculated and are described in further detail below.

4.3.1.1 $PM_{2.5}$ and PM_{10} Monitoring

The 12-month rolling annual average for the period May 2023 to April 2024 for all four monitors combined was below the annual average criteria (i.e. 8.0 µg/m^3 for $PM_{2.5}$ and 25.0 µg/m^3 for PM_{10}) for each month (See Appendix A.1 and Appendix A.2 for more details). As stated above, April 2024 was not included in this calculation.

As of April 2024, the 12-month rolling annual average for all four monitors (excluding April 2024) was 2.4 µg/m^3 for $PM_{2.5}$ and 7.3 µg/m^3 for PM_{10}.

4.3.1.2 NO_2 Monitoring

The 12-month rolling annual average for all four monitors for the period May 2023 to April 2024 was below the annual average criteria (0.03 ppm) for each month.

As of April 2024, the 12-month rolling annual average (excluding April 2024) for NO_2 for all four monitors is 0.011 ppm, below the annual average criteria of 0.03 ppm.

4.3.1.3 CO

CO does not require annual reporting.

4.3.2 24-hour exceedances

As discussed above, AQM03 had 77% availability over the 6-month monitoring period (excluding April 2024).

4.3.2.1 $PM_{2.5}$ Monitoring

A review of the data for the reporting period identified one exceedance of the 24-hour average criteria (25 µg/m^3) for $PM_{2.5}$ at monitor AQM03 located just west of MPW. The exceedance is summarised in Table 4-5. The table includes the 24-hour average for $PM_{2.5}$ recorded at the Liverpool monitoring station for comparison and includes analysis of the exceedance.

Table 4-4 Summary of exceedance of the $PM_{2.5}$ 25 µg/m^3/day limit

Date of exceedance	AQM01 µg/m^3	AQM02 µg/m^3	AQM03 µg/m^3	AQM04 µg/m^3	Liverpool average[7]	Analysis of exceedance	Train operation
30/11/2023	-	-	44.9	-	3.5	The exceedance occurred mainly between midnight and 8 am. Out of hours works along Moorebank Avenue and Anzac Road may have been occurring during the time of exceedance.	Trains were arriving/ departing the terminal on this day during times of exceedance. However, AQM03 is located approximately one kilometre to the northwest of where the trains operate.

[7] Liverpool average: The 24-hour average is the average of the 1-hour averages recorded for the day (i.e., between 01:00 and 24:00)

4.3.2.2 PM_{10} Monitoring

Ten exceedances of the 50 µg/m³/day limit for PM_{10} were recorded during the 6-month reporting period. These are summarised in Table 4-5. The table includes the 24-hour average for PM_{10} recorded at the Liverpool monitoring station for comparison and includes analysis of the exceedance.

All (ten) exceedances of the PM_{10} 24-hour average and one exceedance of the $PM_{2.5}$ 24-hour average occurred at AQM03. AQM03 is located on the western extent of MPW Stage 2, therefore the exceedances could be the result of construction activities being undertaken at the MPW site or potentially related to out of hours works occurring along Moorebank Avenue, Anzac Road and Bapaume Road.

4.3.3 NO_2 1-hour exceedances

No exceedance of NO_2 1-hour criteria (0.12 ppm / 120 ppb) were observed during the 6-month reporting period.

4.3.4 CO 8-hour exceedances

No 8-hour criteria exceedances for CO occurred during the 6-month reporting period.

4.4 Complaints

No complaints were made relating to air quality during this reporting period.

4.5 Ad-hoc monitoring

No ad-hoc monitoring was undertaken during this reporting period.

Table 4-5: Summary of exceedances of the PM_{10} 50 µg/m³/day limit

Date of exceedance	AQM01 µg/m³	AQM02 µg/m³	AQM03 µg/m³	AQM04 µg/m³	Liverpool average[8]	Analysis of exceedance	Train operation
25/11/2023	-	-	77.0	-	10.9	Exceedance occurred mainly between midnight and 10 am. Out of hours works along Moorebank Avenue and Anzac Road may have been occurring during the time of exceedance. However, the monitor was located over a kilometre to the west of the work areas.	Trains were arriving/ departing the terminal on this day during times of exceedance. However, AQM03 is located approximately one kilometre to the northwest of where the trains operate.
29/11/2023	-	-	61.8	-	N/A	Exceedance occurred mainly between midnight and 9 am and again from 4 pm until midnight. Out of hours works along Moorebank Avenue and Anzac Road may have been occurring during the time of exceedance. However, the monitor was located over a kilometre to the west of the work areas.	Trains were arriving/ departing the terminal on this day during times of exceedance. However, AQM03 is located approximately one kilometre to the northwest of where the trains operate.
30/11/2023	-	-	291.8	-	N/A	This exceedance was a lot higher than others and occurred mainly between midnight and 8 am. Out of hours works along Moorebank Avenue and Anzac Road may have been occurring during the time of exceedance. However, the monitor was located over a kilometre to the west of the work areas.	Trains were arriving/ departing the terminal on this day during times of exceedance. However, AQM03 is located approximately one kilometre to the northwest of where the trains operate.
3/12/2023	-	-	67.1	-	10.6	Exceedance occurred mainly between 1 am and 6 am. Out of hours works along Moorebank Avenue and Anzac Road may have been occurring during the time of exceedance. However, the monitor was located over a kilometre to the west of the work areas.	Trains were arriving/ departing the terminal on this day during times of exceedance. However, AQM03 is located approximately one kilometre to the northwest of where the trains operate.
15/01/2024	-	-	59.4	-	19.3	Exceedance occurred mainly between 1 am and 6 am. Out of hours works along Moorebank Avenue, Anzac Road and Bapaume Road may have been occurring during the time of exceedance. However, the monitor was located over a kilometre to the west of the work areas.	Trains were arriving/ departing the terminal on this day during times of exceedance. However, AQM03 is located approximately one kilometre to the northwest of where the trains operate.
17/01/2024	-	-	57.0	-	16.3	Exceedance occurred mainly between 1 am and 6 am. Out of hours works along Moorebank Avenue, Anzac Road and Bapaume Road may have been occurring during the time of exceedance. However, the monitor was located over a kilometre to the west of the work areas.	Trains were arriving/ departing the terminal on this day during times of exceedance. However, AQM03 is located approximately one kilometre to the northwest of where the trains operate.

[8] Liverpool average: The 24-hour average is the average of the 1-hour averages recorded for the day (i.e., between 01:00 and 24:00)

Date of exceedance	AQM01 µg/m^3	AQM02 µg/m^3	AQM03 µg/m^3	AQM04 µg/m^3	Liverpool average[8]	Analysis of exceedance	Train operation
18/01/2024	-	-	135.7	-	12.0	This exceedance was a lot higher than others and occurred mainly between 1 am and 6 am. Out of hours works along Moorebank Avenue, Anzac Road and Bapaume Road may have been occurring during the time of exceedance. However, the monitor was located over a kilometre to the west of the work areas.	Trains were arriving/ departing the terminal on this day but not during times of exceedance. However, AQM03 is located approximately one kilometre to the northwest of where the trains operate.
3/02/2024	-	-	50.2	-	46.0	The exceedance occurred mainly between midnight and 11 am. This exceedance coincided with a 'fair' reading of PM_{10} at the Liverpool monitoring station, suggesting the exceedance may have been a broader source of exceedance. Out of hours works along Moorebank Avenue, Anzac Road and Bapaume Road may have been occurring during the time of exceedance. However, the monitor was located over a kilometre to the west of the work areas.	No trains were arriving/departing the terminal on this day.
19/03/2024	-	-	69.8	-	17.6	The exceedance occurred mainly between midnight and 6 am. Out of hours works along Moorebank Avenue, Anzac Road and Bapaume Road may have been occurring during the time of exceedance. However, the monitor was located over a kilometre to the west of the work areas.	Trains were arriving/ departing the terminal on this day during times of exceedance. However, AQM03 is located approximately one kilometre to the northwest of where the trains operate.
5/04/2024	-	-	93.2	-	11.5	The exceedance occurred throughout the day and night. Out of hours works along Moorebank Avenue, Anzac Road and Bapaume Road may have been occurring during the time of exceedance. However, the monitor was located over a kilometre to the west of the work areas.	

5 CONCLUSION

This six-monthly operational air quality report covers the period November 2023 to April 2024 (inclusive).

The following summarises the monitoring results for this reporting period:

- The rolling annual average for all four monitors combined was below the annual average criteria (8.0 µg/m^3 for $PM_{2.5}$ and 25.0 µg/m^3 for PM_{10}) for each month during the reporting period (excluding April 2024).
- There was one exceedance of the $PM_{2.5}$ 24-hour average criteria (25 µg/m^3) during the 6-month reporting period.
  - The exceedance was recorded at AQM03.
  - The exceedance coincided with higher readings overnight and during the early morning period.
  - Out of standard hours work occurred during times of the $PM_{2.5}$ exceedance. These activities could potentially have influenced the exceedance recorded; however, the monitor was located over a kilometre to the west of the work areas and further investigation would be needed to determine the exact cause.
  - The exceedance occurred on a day when trains where entering/exiting MPE, although based on the location of the monitor from the trains (~1km) it is considered unlikely to be attributed to these.
- There were ten (10) exceedances (out of 182 days) of the PM_{10} 24-hour average criteria (50 µg/m^3) during the 6-month reporting period (about 5.5%).
  - All exceedances were recorded at AQM03.
  - All exceedances except for one coincided with higher readings overnight and during the early morning periods.
  - The 3 February 2024 exceedance coincided with a ‘fair’ reading at the Liverpool station possibly indicating more regional alterations to air quality (e.g. hazard reduction burns).
  - January, February and March 2024 were drier months compared to long-term averages, which may have contributed to exceedances in these months.
  - Out of standard hours work occurred during times of PM_{10} exceedance. These activities could potentially have influenced the higher values recorded; however, the monitor was located over a kilometre to the west of the work areas and further investigation would be needed to determine the exact cause.
  - The exceedances occurred on days when trains where entering/exiting MPE, although based on the location of the monitors from the trains (~1km) it is considered unlikely to be attributed to these.
- There were no exceedances of NO_2 1-hour criteria (0.12 ppm / 120 ppb) during the 6-month reporting period.
- There were no exceedances of the CO criteria (9.0 ppm) at AQM02 and AQM04 (the only monitors that record CO) during the 6-month reporting period.
- There were six individual gauge exceedances of the dust deposition (insoluble solids) 2 g/m^2/month (incremental) criteria between November 2023 and April 2024. However, no monthly average exceedances of the dust deposition (insoluble solids) 2 g/m^2/month (incremental) and 4 g/m^2/month (cumulative) criteria occurred between 6 October 2023 and 6 May 2024 as reported by SERS.
- There has been variability in AQM03 monitor availability throughout this reporting period. To maintain accurate data for reporting, monitors should be checked regularly for damage or faults and repaired, maintained, or replaced promptly. However, it is also noted that all four monitors and the operating

systems was swapped out in April 2024. This should improve the availability of this monitor and will be monitored over the coming reporting period.

- During the reporting period, AQM03 data is consistently higher than the other monitors and may be influenced by works at MPW. This will be monitored following the installation of the new monitors.
- It was over a year between calibration of monitors, however the new monitors that replaced the old monitors in April 2024 have been calibrated. It is recommended that monitors continue to be calibrated annually as per operational requirements and device specifications.

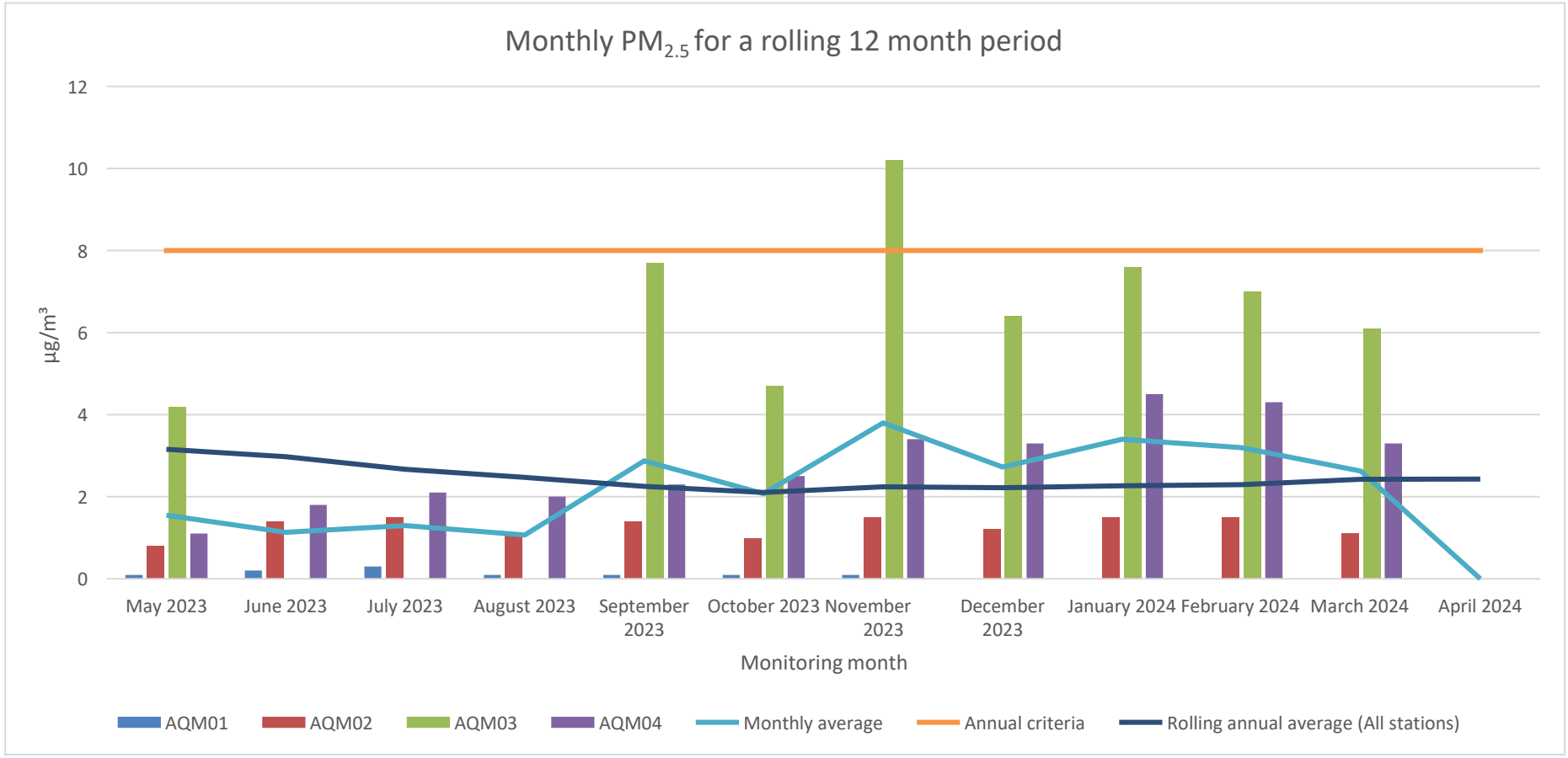
APPENDIX A

Appendix A.1: Rolling 12-month particulate data ($PM_{2.5}$)

Month	Average AQM01	Average AQM02	Average AQM03	Average AQM04	Months Average All stations	Rolling annual average All stations	Annual average criteria	Comments
	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	
May 2023	0.1	0.8	4.2	1.1	1.6	3.2	8.0	No exceedance of annual average criteria.
June 2023	0.2	1.4	**No reading**	1.8	1.1	3.0	8.0	No exceedance of annual average criteria.
July 2023	0.3	1.5	**No reading**	2.1	1.3	2.7	8.0	No exceedance of annual average criteria.
August 2023	0.1	1.1	**No reading**	2.0	1.1	2.5	8.0	No exceedance of annual average criteria.
September 2023	0.1	1.4	7.7	2.3	2.9	2.3	8.0	No exceedance of annual average criteria. AQM03 only started recording data from 20 September 2023.
October 2023	0.1	1.0	4.7	2.5	2.1	2.1	8.0	No exceedance of annual average criteria. AQM02 only started recording data from 15 October 2023.
November 2023	0.1	1.5	**10.2**	3.4	3.8	2.2	8.0	No exceedance of annual average criteria. AQM03 had sporadic recording of data through the month.
December 2023	0.0	1.2	6.4	3.3	2.7	2.2	8.0	No exceedance of annual average criteria.
January 2024	0.0	1.5	7.6	4.5	3.4	2.3	8.0	No exceedance of annual average criteria. AQM03 had sporadic recording of data through the month.
February 2024	0.0	1.5	7.0	4.3	3.2	2.3	8.0	No exceedance of annual average criteria. AQM03 had sporadic recording of data through the month.
March 2024	0.0	1.1	6.1	3.3	2.6	2.4	8.0	No exceedance of annual average criteria. AQM03 had sporadic recording of data through the month.
April 2024	N/A	N/A	N/A	N/A	N/A	2.4	8.0	Sensors and monitoring systems were swapped half-way through April, therefore data is inconsistent, and averages aren't available for the month.
Rolling 12 month average	0.1	1.3	6.7	2.7	-	-	8.0	No exceedance of annual average criteria.
All months^	0.7	3.0	6.8	2.7	3.2	-	8.0	No exceedance of annual average criteria.

Bold/grey indicates an exceedance of the criteria.

^ All months since May 2020

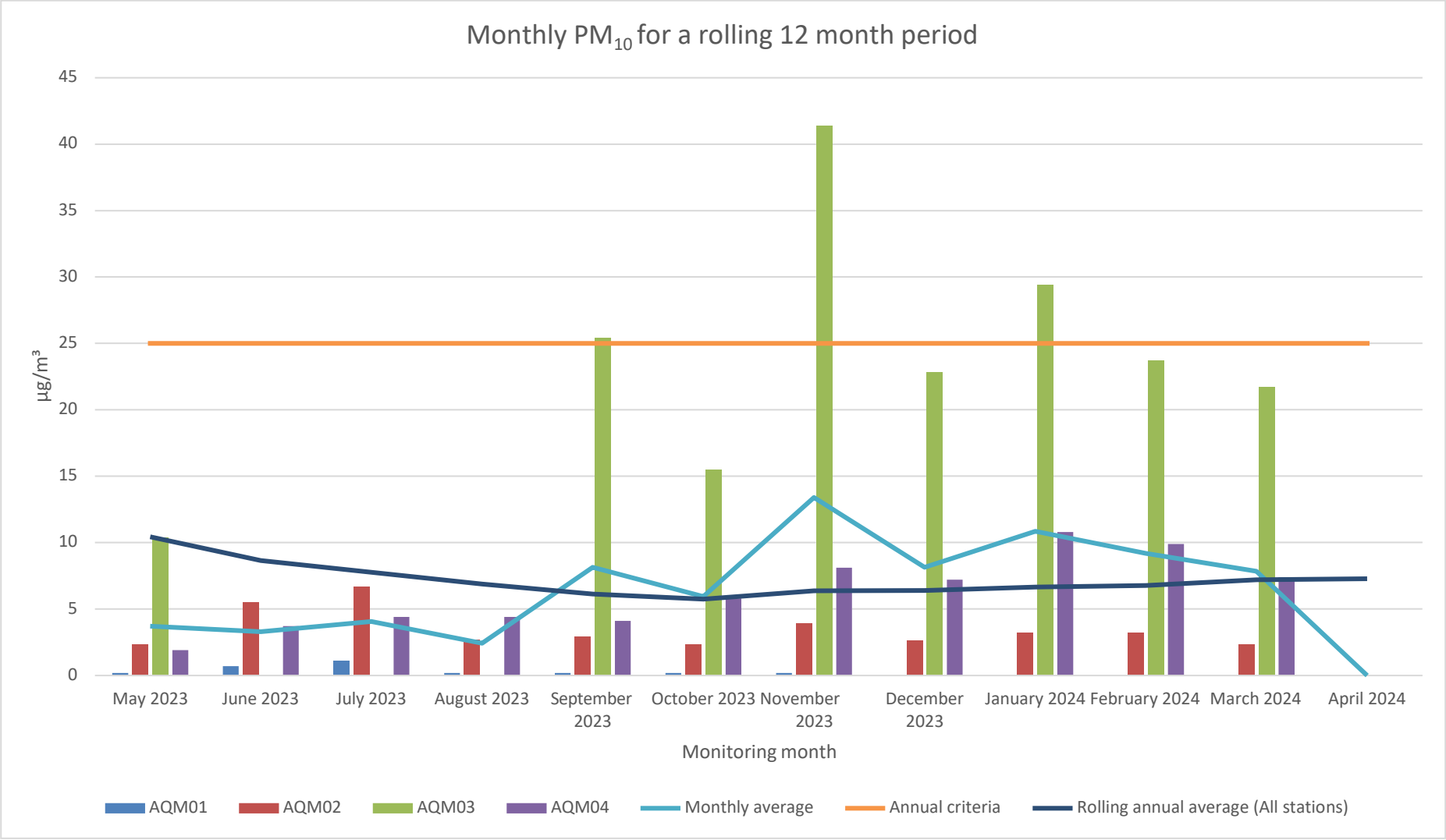


Monthly $PM_{2.5}$ over 12 months including the 6-months for this report

Appendix A.2: Rolling 12-month particulate data (PM_{10})

Month	Average AQM01	Average AQM02	Average AQM03	Average AQM04	Months Average All stations	Rolling annual average All stations	Annual average criteria	Comments
	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	
May 2023	0.2	2.3	10.4	1.9	3.7	10.4	25.0	No exceedance of annual average criteria.
June 2023	0.7	5.5	**No reading**	3.7	3.3	8.7	25.0	No exceedance of annual average criteria.
July 2023	1.1	6.7	**No reading**	4.4	4.1	7.8	25.0	No exceedance of annual average criteria.
August 2023	0.2	2.7	**No reading**	4.4	2.4	6.9	25.0	No exceedance of annual average criteria.
September 2023	0.2	2.9	**25.4**	4.1	8.2	6.1	25.0	No exceedance of annual average criteria. AQM03 only started recording data from 20 September 2023.
October 2023	0.2	2.3	15.5	5.8	6.0	5.8	25.0	No exceedance of annual average criteria. AQM02 only started recording data from 15 October 2023.
November 2023	0.2	3.9	**41.4**	8.1	13.4	6.4	25.0	No exceedance of annual average criteria. AQM03 had sporadic recording of data through the month.
December 2023	0.0	2.6	22.8	7.2	8.2	6.4	25.0	No exceedance of annual average criteria.
January 2024	0.0	3.2	**29.4**	10.8	10.9	6.7	25.0	No exceedance of annual average criteria. AQM03 had sporadic recording of data through the month.
February 2024	0.0	3.2	23.7	9.9	9.2	6.8	25.0	No exceedance of annual average criteria. AQM03 had sporadic recording of data through the month.
March 2024	0.0	2.3	21.7	7.4	7.9	7.2	25.0	No exceedance of annual average criteria. AQM03 had sporadic recording of data through the month and a very high maximum.
April 2024	N/A	N/A	N/A	N/A	N/A	7.2	25.0	Sensors and monitoring systems were swapped half-way through April, therefore data is inconsistent, and averages aren't available for the month.
Rolling 12 month average	0.3	3.4	23.3	6.0	-	-	25.0	No exceedance of annual average criteria.
All months^	1.9	9.3	23.9	5.6	9.9	-	25.0	No exceedance of annual average criteria.

Bold/grey indicates an exceedance of the criteria, ^ All months since May 2020



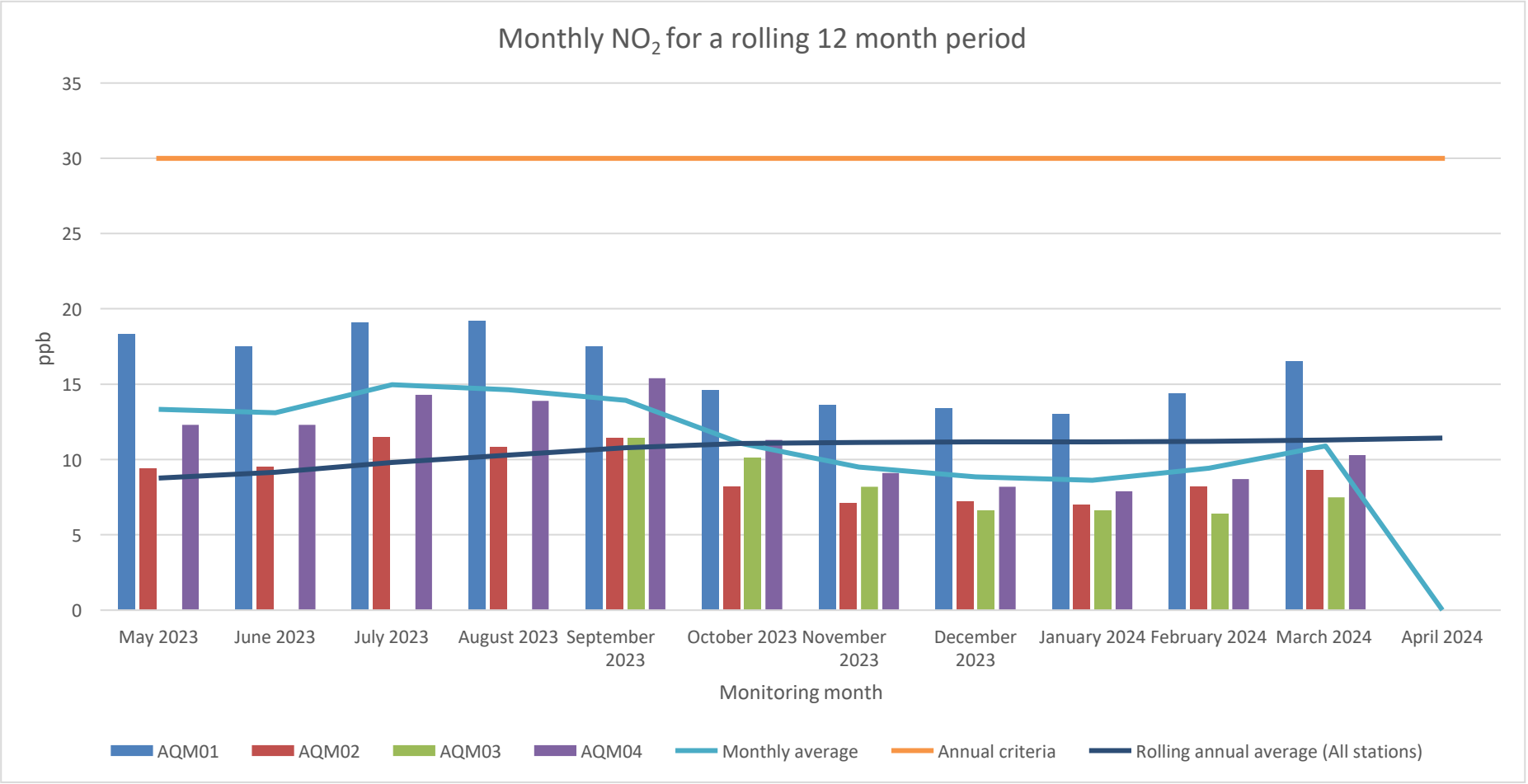
Monthly PM_{10} over 12 months including the 6-months for this report

Appendix A.3: Rolling monthly and annual particulate data (NO_2)

Month	Average AQM01	Average AQM02	Average AQM03	Average AQM04	Months Average All stations	Rolling annual average All stations	Annual average criteria	Comments
	ppb	ppb	ppb	ppb	ppb	ppb	ppm / ppb*	
May 2023	18.3	9.4	**No reading**	12.3	13.3	8.8	0.03 / 30.0	No exceedance of annual average criteria.
June 2023	17.5	9.5	**No reading**	12.3	13.1	9.2	0.03 / 30.0	No exceedance of annual average criteria.
July 2023	19.1	11.5	**No reading**	14.3	15.0	9.8	0.03 / 30.0	No exceedance of annual average criteria.
August 2023	19.2	10.8	**No reading**	13.9	14.6	10.3	0.03 / 30.0	No exceedance of annual average criteria.
September 2023	17.5	11.4	11.4	15.4	13.9	10.8	0.03 / 30.0	No exceedance of annual average criteria. AQM03 only started recording data from 20 September 2023.
October 2023	14.6	8.2	10.1	11.3	11.1	11.1	0.03 / 30.0	No exceedance of annual average criteria. AQM02 only started recording data from 15 October 2023.
November 2023	13.6	7.1	8.2	9.1	9.5	11.1	0.03 / 30.0	No exceedance of annual average criteria. AQM03 had sporadic recording of data through the month.
December 2023	13.4	7.2	6.6	8.2	8.9	11.2	0.03 / 30.0	No exceedance of annual average criteria.
January 2024	13.0	7.0	6.6	7.9	8.6	11.2	0.03 / 30.0	No exceedance of annual average criteria. AQM03 had sporadic recording of data through the month.
February 2024	14.4	8.2	6.4	8.7	9.4	11.2	0.03 / 30.0	No exceedance of annual average criteria. AQM03 had sporadic recording of data through the month.
March 2024	16.5	9.3	7.5	10.3	10.9	11.3	0.03 / 30.0	No exceedance of annual average criteria. AQM03 had sporadic recording of data through the month.
April 2024	N/A	N/A	N/A	N/A	N/A	11.3	0.03 / 30.0	Sensors and monitoring systems were swapped half-way through April, therefore data is inconsistent, and averages aren't available for the month
Rolling 12 month average	0.016 ppm / 15.9 ppb	0.009 ppm / 8.8 ppb	0.008 ppm / 8.1 ppb	0.011 ppm / 11.0 ppb	-	-	0.03 / 30.0	No exceedance of annual average criteria.
All months^	0.008 ppm / 7.7 ppb	0.006 ppm / 6.0 ppb	**0.044 ppm / 44.4 ppb**	0.011 ppm / 11.1 ppb	0.016 ppm / 16.4 ppb	-	0.03 ppm / 30.0 ppb	No exceedance of average criteria for all sites for all months. However, AQM03 has exceeded the annual average for the period since monitoring began.

Bold/grey indicates an exceedance of the criteria.

*Results are shown in ppb due to reporting output, however the criteria is set in ppm and therefore the equivalent criteria in ppb is also shown. ^ All months since May 2020



Monthly NO_2 over 12 months including the 6-months for this report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APPENDIX D – NOISE MONITORING REPORTS

RENZO TONIN & ASSOCIATES
inspired to achieve

Acoustics
Vibration
Structural Dynamics

MOOREBANK INTERMODAL PRECINCT EAST

Annual Noise Review - April 2023 to April 2024

17 July 2024

The Trust Company (Australia) Limited (ACN 000 000 993) as trustee of the Moorebank Industrial Warehouse Trust

TL116-05F23 MPE Annual Review 2024 (r4).docx

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Sydney Melbourne Brisbane Gold Coast Kuwait Singapore
Renzo Tonin & Associates ABN 29 117 462 861
Level 1/418A Elizabeth St SURRY HILLS NSW 2010 | PO Box 877 STRAWBERRY HILLS NSW 2012
P (02) 8218 0500 F (02) 8218 0501 sydney@renzotonin.com.au www.renzotonin.com.au

aaac Association of Australian Acoustical Consultants

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27/06/2024	Initial issue	0	1	S. Dixit	-	C. Weber / A. Leslie
02/07/2024	Final	-	2	A. Leslie / S. Dixit /	-	C. Weber / A. Leslie
09/07/2024	Final (minor update)	-	3	A. Leslie / S. Dixit /	-	C. Weber / A. Leslie
17/07/2024	Final (minor update)	-	4	A. Leslie / S. Dixit /	-	C. Weber / A. Leslie

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1 Introduction

The Sydney Intermodal Terminal Alliance (SIMTA) received approval for the construction and operation of Stages 1 and 2 of the Moorebank Precinct East (MPE) Project (SSD 6766 and SSD 7628 respectively), which together comprise the two stages of development under the MPE Concept Approval (MP10_0193).

This **Annual Noise Review** report **for Year 4 Operations (April 2023 to April 2024)** has been prepared to address the requirements of Approval Condition B90 of SSD 7628 as follows:

> *For the duration of operation, the Applicant must:*
>
> *a) continue to implement all reasonable and feasible best practice noise mitigation measures;*
>
> *b) continue to investigate ways to reduce noise generated by the development, including maximum noise levels which may result in sleep disturbance; and*
>
> *c) report on these investigations and the implementation and effectiveness of these measures in the Annual Review to the satisfaction of the Secretary.*

Table 1 provides a summary of the noise-related Approval Conditions and how these are addressed in this Annual Noise Review.

Appendix A contains a glossary of acoustic terms used in this report.

Appendix B contains a copy of the reports referred to in this report that are not publicly available on the SIMTA website.

2 Compliance Matrix

Table 1 provides a summary of the Approval Conditions which relate to operational noise emission monitoring for Year 4 operations, and a discussion of the operational noise monitoring results. Where required, additional information is provided in later sections of this report or the appendices.

Table 1 Compliance matrix

Condition ID	Condition	Comments on compliance	Reference for further information
SSD 6766			
G7	The Applicant shall install and maintain a rail noise monitoring system on the rail link at the commencement of operation to continuously monitor the noise from rail operations on the rail link. The system shall capture the noise from each individual train passby noise generation event, and include information to identify: a) Time and date of freight train passbys; b) Imagery or video to enable identification of the rolling stock during day and night; c) $L_{Aeq(15hour)}$ and $L_{Aeq(9hour)}$ from rail operations; and d) $L_{AF(max)}$ and SEL of individual train passbys, measured in accordance with ISO3095; or e) Other alternative information as agreed with, or required by, the Secretary. The results from the noise monitoring system, shall be publicly accessible from a website maintained by the Applicant. The noise results from each train shall be available on the website within 24 hours of it passing the monitor, unless unforeseen circumstances (i.e. a system malfunction) have occurred. The $L_{Aeq(15hour)}$ and $L_{Aeq(9hr)}$ results from each day shall be available on the website within 24 hours of the period ending. Prior to the commencement of operation, the Applicant shall submit for the approval of the Secretary, justification supporting the appropriateness of the location for rail noise monitoring, including details of any alternative options considered and reasons for these being dismissed. The rail noise monitoring system shall not operate until the Secretary has approved the proposed monitoring location. The Applicant shall provide an annual report to the Secretary with the results of monitoring for a period of 5 years, or as otherwise agreed with the Secretary, from the commencement of operation of the IMEX terminal. The Secretary shall consider the need for further reporting following a review of the results for year 5.	The commencement of IMT operations occurred in May 2020. The new rail link was commissioned in November 2019. A description of the noise monitoring systems are provided in Section 5 and capture the information required by this approval. A Functional and Performance Specification for the permanent noise monitoring system and angle of attack monitoring system was prepared for approval by the Secretary before the rail link commissioning. A summary of the noise monitoring results for Year 4 operations is provided in Section 5.1.	https://moorebankintermodalprecinct.com.au/wp-content/uploads/2023/04/TJ741-04F04-AoA-and-Functional-Spec-for-Permanent-Noise-Monitor-r9_redacted.pdf https://moorebanknoisemonitor-emsbk.trackiq.net/NoiseMonitor/ Section 5

Condition ID	Condition	Comments on compliance	Reference for further information
G7A	The applicant shall install and maintain a wayside angle of attack monitoring system on the rail link at the commencement of operation to continuously monitor the angle of attack to the rail of rolling stock wheels. The system shall capture the angle of attack from a wheel on each axle of every train, and include information to identify: a) Time and date of each axle passby; and b) The identification number of each item of rolling stock. The results from the angle of attack monitoring system shall be: • accessible by train operators from a website maintained by the Applicant. Angle of attack results from each train shall be available on the website within 24 hours of it passing the monitor, unless unforeseen circumstances have occurred. • included in a six-monthly report to the Secretary. The report should at least identify the number of wagons with wheels that exceed the ASA standard angle of attack and the action taken by operators to improve steering performance. Prior to the commencement of operation, the Applicant shall submit for the approval of the Secretary, justification supporting the appropriateness of the location for angle of attack monitoring, the format of the information to be accessible to operators and the format of the public report. The angle of attack monitoring system shall not operate until the Secretary has approved the proposed monitoring location and reporting arrangements.	An Angle of Attack (AoA) monitoring system was installed on the new rail link in May 2020. The monitoring system captures the AoA of each axle passby and compares the measured values with the acceptable value in the applicable Asset Standards Authority minimum operating standard. The AoA values for each axle are available to operators in accordance with the approval condition. A Functional and Performance Specification for the permanent noise monitoring system and angle of attack monitoring system was prepared for approval by the Secretary before the rail link commissioning. A summary of the AoA noise monitoring results of the Year 4 operations is provided in Section 6.1. The monitoring identified 1 train where the maximum AoA value exceeded the alarm level. The single exceedance of the AoA alarm levels was viewed as a one-off instance, occurring irregularly.	Section 6
G8	The following measures must be implemented during operation: a) The use of automatic rail lubrication equipment in accordance with ASA Standard T HR TR 00111 ST Rail Lubrication and top of rail friction modifiers, where required; and b) Measures to ensure the rail cross sectional profile is maintained in accordance with ETN–01-02 Rail Grinding Manual for Plain Track to ensure the correct wheel / rail contact position and hence to encourage proper rolling stock steering.	Two rail friction modifier systems were installed on the rail link on 22 November 2019 per ASA Standard. These are positioned on the MIMT North Track at Chainage 39.739 km and the MIMT South Track at Chainage 39.860 km. Monthly track inspections and maintenance is undertaken by Qube's maintenance contractor, Taylor Rail, to ensure alignment with maintenance standards. Rail grinding has been performed so that the rail profile is consistent with maintenance standards.	FCMM 3B
SSD 7628			
B79	The permitted hours of warehouse and distribution operation as detailed in Table 4. Table 4: Hours of Operation **Activity** / **Day** / **Time** Operation / Monday to Sunday / 24 hours	MPE operates 24 hours per day, 365 days per year, consistent with the permitted hours of operation.	n/a

Condition ID	Condition	Comments on compliance	Reference for further information
B80	B80. Noise generated by operation of the development inclusive of MPE Stage 1 operations must not exceed the noise limits in Table 5. Table 5: Noise Limits dB(A) Notes: To determine compliance with the LAeq,15 minute noise limits, noise from the development is to be measured at the most affected point within the residential boundary, or at the most affected point within 30 metres of a dwelling where the dwelling is more than 30 metres from the boundary. Where it can be demonstrated that direct measurement of noise from the project is impractical, the EPA may accept alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy). The modification factors in Section 4 of the NSW Industrial Noise Policy must also be applied to the measured noise levels where applicable. To determine compliance with the LA1,1 minute noise limits, noise from the project is to be measured at 1 metre from the dwelling façade. Where it can be demonstrated that direct measurement of noise from the project is impractical, the EPA may accept alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy). The noise emission limits identified above apply under meteorological conditions of: (i) wind speeds of up to 3 m/s at 10 metres above ground level; or (ii) 'F' atmospheric stability class.	For each new warehouse and when noise monitoring is undertaken in response to complaints, the measured noise levels are compared with the noise limits in this condition This condition specifies the operational noise limits for MPE operations. However, when undertaking any compliance assessment, it is noted that the SSD 7628 B80 noise limit table states "*…inclusive of MPE Stage 1 operations*" therefore was intended to apply to the cumulative noise emissions of noise generating activities in SSD 6766 and SSD 7628. However, MPE Stage 1, has specific noise limits included in SSD 6766, approved as part of L&EC Proceedings (No 2017/81889) which are higher than these levels. This requirement presents a consistency issue, as the requirement is inconsistent with the EIS derived noise limits in accordance with NSW EPA policy, the expected noise emission performance from MPE, and previous approvals. As part of Modification 1 to SSD 7709 (MPW Stage 2), which identifies cumulative noise limits for MPW + MPE, EPA agreed there was an inconsistency issue. Following which, it was agreed that MPW + MPE should achieve the cumulative noise limits in SSD 7709 B131.	Section 3 – Warehouse noise monitoring Section 7 - Noise monitoring in response to complaints
B85	The Applicant must carry out noise monitoring of mechanical plant and other noisy equipment for a minimum period of one week where valid data is collected following occupation of each warehouse. The monitoring program must be carried out by a suitably qualified and experienced person(s) and a Monitoring Report for Mechanical Plan must be submitted to the Secretary within two months of occupation or each tenancy to verify predicted mechanical plant and equipment noise levels.	Warehouse noise monitoring is required to be undertaken following the occupation of each warehouse. Warehouse noise monitoring was undertaken during May 2024 for MPE Warehouse E7 where valid data could be obtained, with data analysis currently being undertaken.	Section 3

Condition ID	Condition	Comments on compliance	Reference for further information
B88	To ensure the operational noise impacts are appropriately managed, the following measures apply: a) use of best practice plant; and b) preparation of a risk assessment to determine if non-tonal reversing alarms can be fitted as a condition of site entry. Alternatively, site design may include traffic flow that does not require or precludes reversing of vehicles.	The following additional best practice plant / measures have been implemented within the current reporting period: 1. The use of electric cranes commenced so that all rail loading and container stacking is performed by the electric cranes, with reach stackers now only required for truck loading. The cranes have non-tonal movement alarms. 2. 'Quackers' or broadband reversing alarms were fitted to all reach stackers and combilifts. 3. IMEX staff briefings were undertaken, reminding staff and drivers of noise management obligations and will be ongoing as part of regular reminders. The risk assessment relating to the use of non-tonal reversing alarms is addressed in the Table 2-3 B88 of the ONVMP. Further measures have been identified in the F5A management plan, which include both mitigation and management measures, including container handling and truck operations.	Operational Noise and Vibration Management Plan (Rev 013, 23/01/2023) (ONVMP) https://moorebankintermodalprecinct.com.au/wp-content/uploads/2023/09/ONVMP_V13_clean_compiled_Redacted-compressed.pdf Section 7
B90	For the duration of operation, the Applicant must: a) continue to implement all reasonable and feasible best practice noise mitigation measures; b) continue to investigate ways to reduce noise generated by the development, including maximum noise levels which may result in sleep disturbance; and c) report on these investigations and the implementation and effectiveness of these measures in the Annual Review to the satisfaction of the Secretary.	The following additional best practice plant / measures have been implemented within the current reporting period: 1. The use of electric cranes commenced so that all rail loading and container stacking is performed by the electric cranes, with reach stackers now only required for truck loading. 2. 'Quackers' or broadband reversing alarms were fitted to all reach stackers and combilifts. 3. IMEX staff briefings were undertaken, reminding staff and drivers of noise management obligations and will be ongoing as part of regular reminders. The permanent rail noise monitoring results (Section 5) for Year 4 operations indicate similar passby noise levels to Year 1 operations and increased L_{Aeq} noise levels consistent with the rail link usage. The AoA monitoring data for train axles is reviewed by operators to identify wagons that may require maintenance to improve steering performance. Noise monitoring as part of a Noise Measurement Program was undertaken on three occasions during 2023. A range of mitigation and management recommendations were then identified and incorporated into the updated F5A management plan to manage operational noise emissions from the IMEX terminal (Section 7).	Sections 3, 4, 5, 6 and 7

Condition ID	Condition	Comments on compliance	Reference for further information
Final Compilation of Mitigation Measures (FCMM) for MPE Stage 1 and Stage 2			
Stage 2 2D	In the event of any noise or vibration related complaint or adverse comment from the community, noise and ground vibration levels (as relevant) would be investigated. Remedial action would be implemented where feasible and reasonable. The procedures for managing complaints would be provided within the Community Information and Awareness Strategy.	Noise monitoring as part of a Noise Measurement Program was undertaken on three occasions during 2023. A range of mitigation and management recommendations were then identified and incorporated into the updated F5A management plan to manage operational noise emissions from the IMEX terminal (Section 7).	Section 7
Operational Noise and Vibration Management Plan – Section 4.1.1 Summary of Monitoring Requirements			
Table 4.1 Rail noise monitoring	Continuous rail noise monitoring will be undertaken from the commencement of operations of the IMEX terminal. The monitoring system will capture the following information: • Noise from each train passby • Time and date of each train passby • Imagery or video recording to identify rolling stock • $L_{AF(max)}$ and Sound Exposure Level (SEL) of individual train passbys, measured in accordance with ISO 3095:2013 • $L_{Aeq(15hour)}$ and $L_{Aeq(9hour)}$ noise levels for each 24-hour period, which will be calculated based on the number of train passbys during the day and night periods and the corresponding SEL noise levels, consistent with the procedure in Clause 3.4.1.1 of the Rail Infrastructure Noise Guideline (EPA, 2013). • Other information as required by the Secretary	Refer comments related to SSD 6766 G7	SSD 6766 G7
Wayside Angle of Attack Monitoring	Continuous wayside angle of attack monitoring will be undertaken from the commencement of operations of the IMEX terminal. The monitoring system will capture the following information: • Angle of attack from a wheel on each axle of every train • Time and date of each axle passby • Identification number of each item of rolling stock	Refer comments related to SSD 6766 G7A	SSD 6766 G7A
Brake Squeal Noise	Continuous (unattended monitoring system) from the commencement of operations of the IMEX terminal – to assess potential noise impacts of rail link at western receivers	Refer comments related to SSD 6766 G7. The permanent noise monitoring system is positioned at a location on the rail link where it can capture noise levels associated with curve brake squeal should this occur.	SSD 6766 G7
Operational Noise Monitoring	Noise monitoring to compare actual noise performance of the MIP East Precinct against the noise management levels will be undertaken as follows: • Regular performance monitoring • Within 12 months of the commencement of operation of the IMEX terminal and Warehouse 1 Precinct • Within 12 months of occupation of the first warehouse, 50% occupation of the site and 100% occupation of the site, or as otherwise agreed by the Secretary • For a minimum of 12 months following occupation of the entire site	Sections 3, 4, 5, 6 and 7	Sections 3, 4, 5, 6 and 7

Condition ID	Condition	Comments on compliance	Reference for further information
Operational Noise Monitoring	Attended noise monitoring will be undertaken to determine compliance against the noise management levels upon receipt of a noise complaint	Noise monitoring as part of a Noise Measurement Program was undertaken on three occasions during 2023. A range of mitigation and management recommendations were then identified and incorporated into the updated F5A management plan to manage operational noise emissions from the IMEX terminal (Section 7).	Section 7
Noise Assessment of Mechanical Plant and other equipment	Conducted for the freight village and each warehouse for a period of 1 week after construction and submitted to secretary within 2 weeks of occupation. Compliance against the noise management levels.	Refer comments related to SSD 7628 B85	SSD 7628 B85
Continuous Unattended Noise Monitoring	Continuous noise monitoring will be conducted at the following locations for a period of twelve months following the occupation of the entire site: • CM1: 10 Talbot Court, Wattle Grove • CM2: 24 Glenelg Court, Wattle Grove North • CM3: 14 Dunmore Crescent, Casula • CM4: 26 Goodenough Street, Glenfield	Refer comments related to SSD 7628 B64 (refer Section 4)	SSD 7628 B64 Section 4

3 Warehouse noise monitoring

Warehouse noise monitoring is required to be undertaken following the occupation of each warehouse.

Noise monitoring was undertaken during May 2024 for MPE Warehouse E7 where valid data could be obtained. Processing and analysis of this monitoring data is currently being undertaken and will be reported as part of the 2024-2025 annual review.

No additional warehouses commenced operations where valid monitoring data can be measured within the reporting period.

4 Continuous noise monitoring in residential areas

Continuous noise monitoring at sensitive receivers is required to be undertaken at sensitive receivers in accordance with the approval conditions for MPE Stage 2 (SSD 7628 Condition B64). Whilst this condition relates to construction noise, the noise monitoring results can also be utilised to measure operational noise and to investigate noise complaints (if required).

Details of the continuous noise monitoring and measurement locations (CM1 to CM4) are provided in Section 4.1.2 and Figure 3-1 of the MPE ONVMP (Rev 13, 24/01/2023). The measurement systems comprise four Envirosuite permanent noise monitors. The monitoring locations are:

- CM1: 10 Talbot Court, Wattle Grove
- CM2: 24 Glenelg Court, Wattle Grove North
- CM3: 14 Dunmore Crescent, Casula
- CM4: 26 Goodenough Street, Glenfield

The primary purpose of the permanent noise monitoring systems is to measure construction-related noise in accordance with the requirements of SSD 7628 Condition B64. This noise monitoring is ongoing.

5 Continuous rail link noise monitoring

The commencement of Intermodal Terminal operations occurred in May 2020. The new rail link was commissioned earlier in November 2019. In conjunction with the rail link commissioning, a temporary rail noise monitoring system (RNMS) was established to quantify the passby noise levels in accordance with the requirements of SSD6766 Condition G7.

The temporary RNMS was positioned at a location near one of the small radius curves and where freight trains are likely to be braking. The microphone of the RNMS monitoring system was positioned on the western side of rail link at a distance of 10.5 m from the near track centreline (Up track) and 15.5 m from the far track centreline (Down track).

The temporary RNMS was operational between 1 November 2019 and 8 July 2020. During this period, procurement of a permanent noise monitoring system occurred, compliant with the requirements of the *Functional and Performance Specification for Permanent Noise Monitor and Proposed Noise and AoA Monitoring Locations*. This functional specification provided justification supporting the appropriateness of the proposed monitoring location and was approved by the Secretary.

The permanent noise monitoring system was commissioned on 9 July 2020 at the same location as the temporary RNMS. The permanent system incorporates two microphones, one adjacent to each track, at a distance of 7.5 m from the track centreline. Noise measurement results of all passbys are provided here[1].

Below is a summary of the noise monitoring results for Year 4 operations.

5.1 Year 4 rail operations noise monitoring report

This report covers rail movements between 30 April 2023 and 2 May 2024. A summary of the key statistics are provided below:

- Number of days in monitoring period - 368 days.
- Number of valid train passby events – 1040 (day), 564 (night), 1604 (day + night)
- Number of days that included one or more train events – 307, representing 84% of days (5.9 days per week)
- Number of nights that included one or more train events – 256, representing 70% of nights (4.9 nights per week)

[1] Available https://moorebanknoisemonitor-emsbk.trackiq.net/NoiseMonitor/

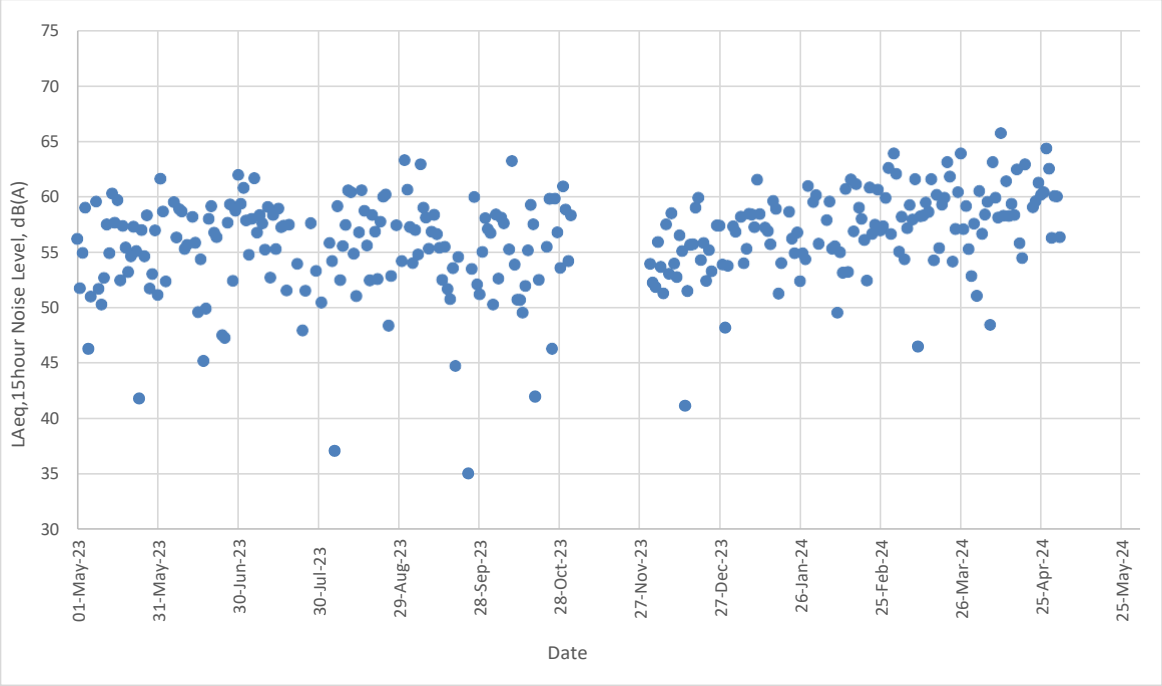
For each train passby, the noise monitoring system recorded the L_{AFmax} and SEL[2] noise levels at a measurement distance of 7.5 m from the track centreline. The SEL noise levels are utilised to calculate the $L_{Aeq(15hour)}$ daytime and $L_{Aeq(9hour)}$ noise levels each day. A summary of the measured $L_{Aeq(15hour)}$ daytime noise levels, normalised to a measurement distance of 30 m is provided in Figure 1. The corresponding noise levels for the night-time period are provided in Figure 2.

It is noted that the nearest residential receiver (Glenfield Farm) is approximately 400 m from the rail link at the closest point and approximately 850 m from the noise monitoring system. The noise levels at Glenfield Farm are estimated to be approximately 14 dB(A) or more below the values in Figure 1 and Figure 2.

Based on the results in Figure 1 and Figure 2, the measured $L_{Aeq(15hour)}$ and $L_{Aeq(9hour)}$ noise levels appear to be approximately 3 dB(A) higher than the Year 3 noise monitoring results (see Reference 3). This increase is mostly related to the increased usage of the rail link between Year 3 and Year 4 (i.e. additional trains), and may also be due to an increase in the average length of the train consists.

The missing AoA data between 2 November 2023 and 31 November 2023 occurred because there was a rake of stationary wagons stabled on the north track between MT4 and MT11 (i.e. the same track as the AoA measurement equipment).

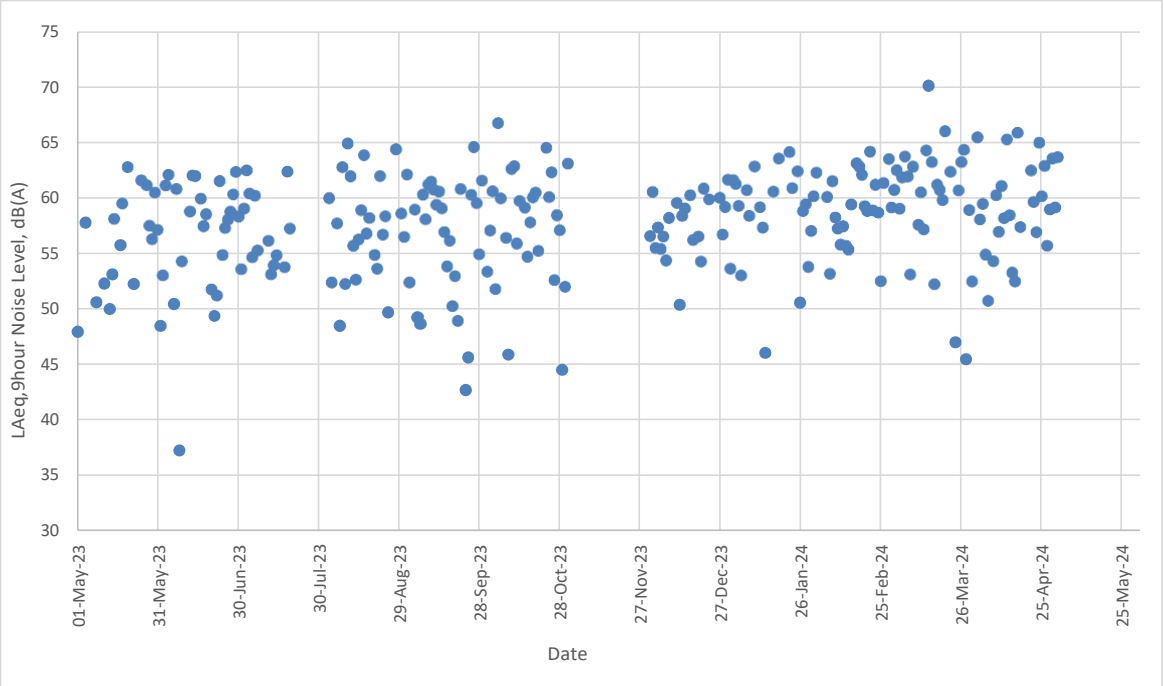
Figure 1 Measured $L_{Aeq(15hour)}$ daytime noise levels at 30 m from track centreline



[2] SEL represents the single-event Sound Exposure Level of the train passby. This represents the total noise energy of the train passby event, normalised to a measurement interval of one second. The SEL is expressed as a dB(A) noise level.

[3] Moorebank Intermodal Terminal Annual Noise Review - May 2023, Renzo Tonin & Associates Report TL116-05F21 Annual Review May 2023 (r2) dated 6 May 2023

Figure 2 Measured $L_{Aeq(9hour)}$ night-time noise levels at 30 m from track centreline



A summary of the measured L_{AFmax} daytime noise levels at a measurement distance of 7.5 m is provided in Figure 3. The corresponding noise levels for the night-time period are provided in Figure 4.

Figure 3 Measured L_{AFmax} daytime noise levels at 7.5 m from track centreline

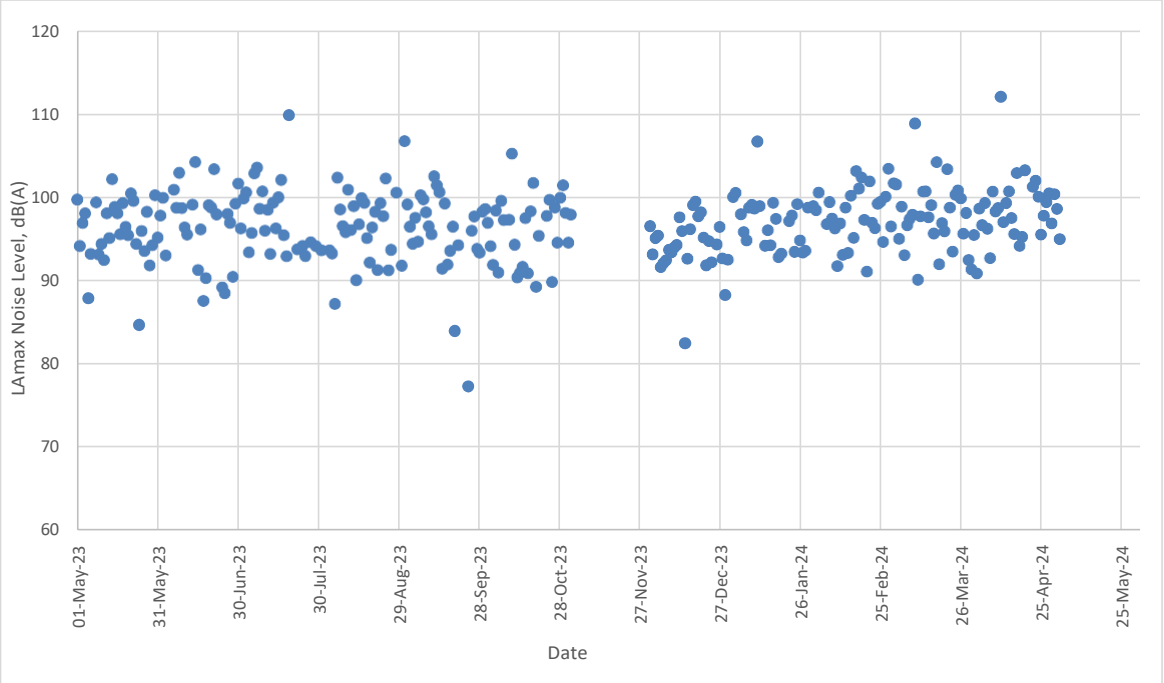
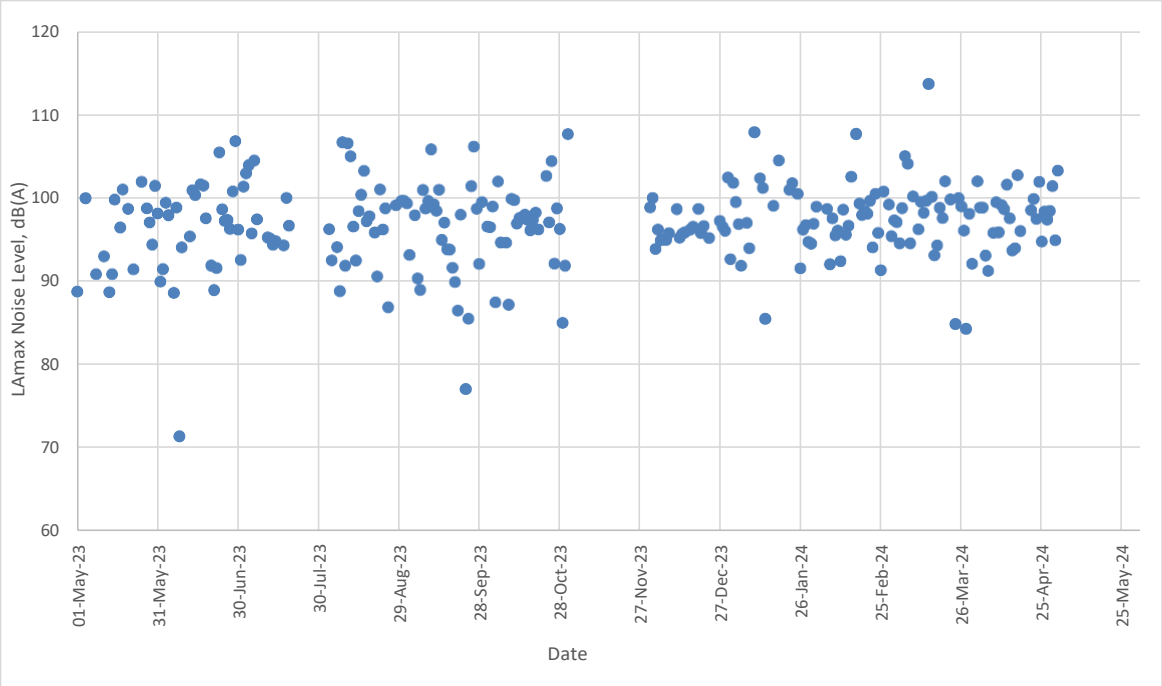


Figure 4 Measured L_{AFmax} night-time noise levels at 7.5 m from track centreline



Based on the results in Figure 3 and Figure 4, there does not appear to be any obvious trend in the measured L_{AFmax} noise levels during the monitoring period. The maximum noise levels are consistent with the Year 3 noise monitoring results (see Reference 3).

6 Rail link angle of attack (AoA) monitoring

The performance of wagon bogies and their ability to negotiate small radius curves without generating curve squeal, is assessed in terms of the angle of attack (AoA) of the wheelset. Acceptable AoA values are defined in Section 2.7.1 of Asset Standards Authority Standard T HR RS 00400 ST[4] and are a function of the curve radius and wheel base.

An AoA measurement system was installed on the rail link and partially commissioned on 13 May 2020. The system was fully commissioned on 9 July 2020 at the same time as the permanent noise monitoring system. The AoA system is installed on the eastern track.

Justification supporting the appropriateness of the proposed monitoring location is provided in the *Functional and Performance Specification for Permanent Noise Monitor and Proposed Noise and AoA Monitoring Locations*[5], and was approved by the Secretary.

As stated above, there was no AoA data for the period between 02 November 2023 and 31 November 2023 due to a parked rate of stationary wagons. AoA measurement data for Year 4 operations is available in the following six monthly report:

- Moorebank Intermodal Terminal - Six Monthly Review of AoA – November 2023 (rail movements between 1 May 2023 and 31 October 2023)

In accordance with the requirements of the SSD 6766 Condition G7A, the AoA of a wheel of each axle of each train is captured by the measurement system. This data is accessible by train operators on a website maintained by QUBE.

Below is a summary of the noise monitoring results for Year 4 operations.

6.1 Year 4 rail operations AoA monitoring

A summary of the key statistics are provided below:

- 1 November 2023 and 2 May 2024
    - Number of valid train passby events – 197
    - Number of train passby events where the measure AoA values on one or more axles were above the acceptable level defined in Section 2.7.1 of Asset Standards Authority Standard T HR RS 00400 ST – 1, representing less than 1% of passbys.

A summary of the maximum AoA value measured for each train is provided in Figure 5. As stated above, there was no AoA data for the period between 02 November 2023 and 31 November 2023 due to a

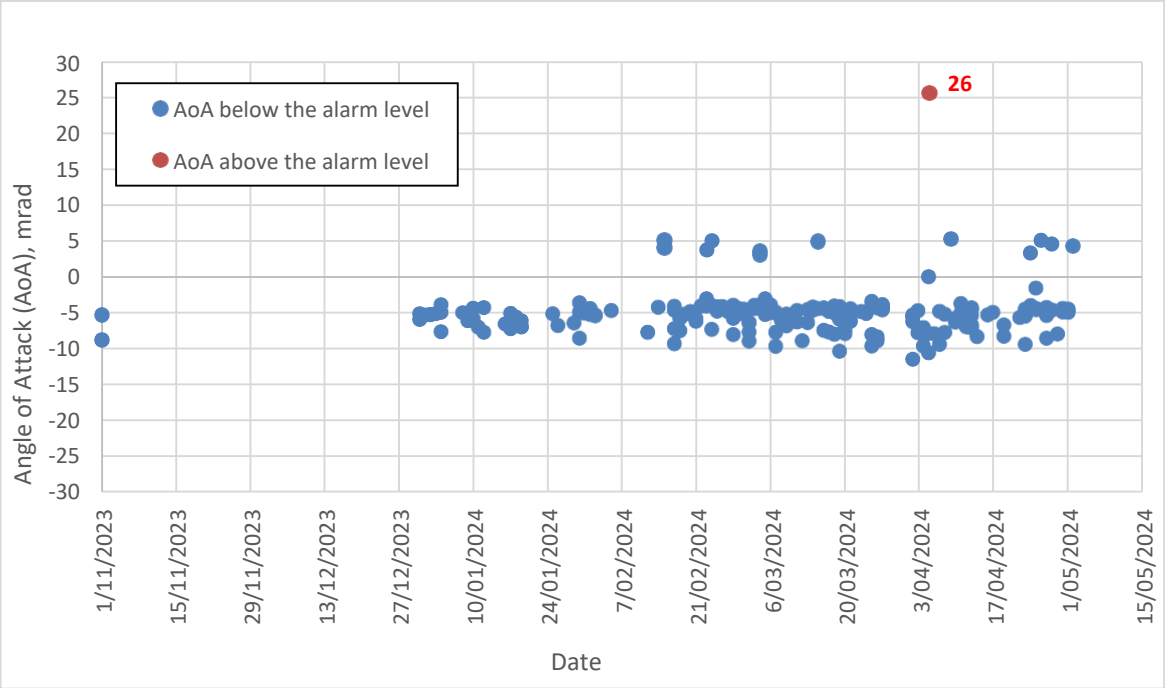
[4] Transport for NSW Asset Standards Authority T HR RS 00400 ST *RSU 400 Series – Minimum Operating Standards for Rolling Stock – Freight Vehicle Specific Interface Requirements* Version 2.0 dated 24 August 2017

[5] Renzo Tonin & Associates Report TJ741-04F04 AoA and Functional Spec for Permanent Noise Monitor (r8)

parked rate of stationary wagons . The results show that the maximum AoA value is typically less than 10 mrad. 1 train passby had maximum AoA value greater than the established alarm level of approximately 26 mrad.

The single AoA alarm event did not result in elevated noise levels at the permanent noise monitoring location (refer Section 5.1). The single exceedance of the AoA alarm levels was viewed as a one-off instance.

Figure 5 Maximum AoA value for each train - 1 November 2023 to 2 May 2024



7 Noise monitoring in response to complaints

In the current reporting period, a small number of complaints (4) relating to operational noise levels were reported by residents in Wattle Grove and Casula. The complaints referenced terminal activities, with container handling noise, and general evening and night-time noise events in the direction of MPE (related to hours of operation).

The number of operational noise-related complaints each month is summarised in the below table, for the period of 30 April 2023 to 2 May 2024. The number of noise complaints were highest in April 2024. Only one noise complaint was received in the 11 months prior months to April 2024 during the current reporting period.

Period	Number of operational noise-related complaints
May 2023	0
June 2023	0
July 2023	0
August 2023	1
September 2023	0
October 2023	0
November 2023	0
December 2023	0
January 2024	0
February 2024	0
March 2024	0
April 2024	3

Following previous complaint investigation noise monitoring in August 2022 in the previous reporting period, QUBE committed to undertaking further noise monitoring in the community to review the ongoing implementation of noise mitigation and management measures at the IMEX terminal.

Renzo Tonin and Associates were subsequently engaged to undertake a noise measurement program to review the facility noise emissions, also considering the following noise mitigation measures that were implemented by the development:

a) Commencement of container stacking to east of the IMEX terminal, forming a defacto noise barrier as the container stacks will provide a natural mitigation barrier for noise to the east from the rail activities.

b) The commencement of electric cranes, with all rail loading and yard container stacking performed by the electric cranes with reach stackers only required for truck container handling.

c) 'Quackers' or broadband reversing alarms were fitted to all reach stackers and combilifts onsite.

d) IMEX truck briefings were undertaken reminding drivers of noise management obligations and will be ongoing as part of regular reminders.

This noise monitoring program was undertaken during 2023, with periods of attended and unattended noise monitoring undertaken on 3 occasions, during periods when IMEX operations were taking place.

The noise monitoring surveys determined that the noise emissions from IMEX operational works were lower than the SSD 6766 Conditions of Consent (CoC) $L_{Aeq15min}$ noise limits at all surrounding receiver locations for all monitoring periods. Typically, the maximum noise levels from the IMEX operations were compliant with the $L_{A1,1minute}$ noise limits, however, five periods were identified during the third monitoring round where the $L_{A1,1minute}$ noise levels were above the $L_{A1,1minute}$ noise limit for residences in Wattle Grove.

The sources of these noise events were further investigated, and mitigation measures identified. Recommend mitigation and management measures to be implemented based upon the noise monitoring investigation were incorporated into the updated F5A management plan (PREC-QPMS-EN-PLN-0004 , Rev 08, 22/1/2023) (formerly Container Noise Barrier Management Plan) to address Condition F5A of SSD 6766 for the IMEX terminal, including the sources of high noise events.

Additionally, the plan was updated to cover the operational change to electrified automatic night-time stacking of containers (quieter compared to manual process) via the use of Cantilever Automated Stacking Cranes for yard stacking and electrified Automated Stacking Cranes for rail servicing.

Noise management measures were also included to address the increase of the operational capacity of the IMEX facility, from up to 250,000 twenty-foot equivalent units (TEU containers) p.a to 500,000 TEU p.a. This included management measures based upon the noise monitoring undertaken and observations and understanding of onsite operations.

The F5A management plan was provided to DPHI and was approved 13 May 2024.

8 Other noise-related tasks

8.1 IMEX operations

The preparation of a noise impact assessment was undertaken June-August 2023 to support an application for a Complying Development Certificate (CDC) under the State Environmental Planning Policy (SEPP) (Transport and Infrastructure) 2021 (TISEPP), to increase the operational capacity of the IMEX facility from 250,000 twenty-foot equivalent units (TEU containers) p.a up to 500,000 TEU.

This included a detailed quantitative noise assessment, with consideration of MPE and MPW cumulative noise emissions, and recommended a suite of mitigation and management measures to be implemented as part of the IMEX facility operations.

These mitigation and management measures were also then incorporated into the updated F5A management plan (PREC-QPMS-EN-PLN-0004, Rev 08, 22/1/2023) (formerly Container Noise Barrier Management Plan) to address Condition F5A of SSD 6766 for the IMEX terminal.

The CDC application for the increased throughput was approved 6 March 2024. The F5A management plan was provided to DPHI and was approved 13 May 2024.

8.2 Moorebank Cumulative Noise Management

Planning work is continuing for the management of cumulative noise from the Moorebank Intermodal Precinct (MIP). This work currently aims to manage cumulative noise emissions from the various noise generating components (eg. warehouse and IMEX operations), to manage overall cumulative noise emissions against the applicable consent requirements.

9 Conclusion

This **Annual Noise Review** report **for Year 4 Operations** has been prepared to address the requirements of Approval Condition B90 of SSD 7628.

The following operational noise monitoring has been performed in accordance the Approval Conditions in SSD 6766 and 7628:

- Continuous rail noise and angle of attack (AoA) monitoring on the rail link to monitoring rail traffic noise and to assist in identifying potential high noise events (e.g. excessive locomotive noise, brake squeal or curve squeal).
- Noise monitoring as part of a noise measurement program was undertaken on three occasions during 2023 to review the ongoing implementation of noise mitigation and management measures at the IMEX terminal in response to noise complaints from 2022. A range of mitigation and management recommendations were then identified and incorporated into the updated F5A management plan, to manage operational noise emissions from the IMEX terminal. This plan was provided to DPHI and was approved 13 May 2024.
- Warehouse noise monitoring was undertaken during May 2024 for MPE Warehouse E7 where valid data could be obtained, with data analysis currently being undertaken.

APPENDIX A Glossary of terminology

The following is a brief description of the technical terms used to describe noise to assist in understanding the technical issues presented.

Absorption Coefficient α	The absorption coefficient of a material, usually measured for each octave or third-octave band and ranging between zero and one. For example, a value of 0.85 for an octave band means that 85% of the sound energy within that octave band is absorbed on coming into contact with the material. Conversely, a low value below about 0.1 means the material is acoustically reflective.
Adverse weather	Weather effects that enhance noise (particularly wind and temperature inversions) occurring at a site for a significant period of time. In the NSW INP this occurs when wind occurs for more than 30% of the time in any assessment period in any season and/or temperature inversions occurring more than 30% of nights in winter.
Air-borne noise	Noise which is fundamentally transmitted by way of the air and can be attenuated by the use of barriers and walls placed physically between the noise source and receiver.
Ambient noise	The all-encompassing noise associated within a given environment at a given time, usually composed of sound from all sources near and far.
AoA	Angle of Attack - As the wheels on a bogie negotiate a tight curve, the leading wheelset typically presents an Angle-of-Attack (AoA) to the rail. The AoA of a leading wheelset with good steering performance can be calculated from AoA = wheelbase (m) / curve radius (m). AoA is normally measured in milliradian (mrad).
Amenity	A desirable or useful feature or facility of a building or place.
AS	Australian Standard
ASA	Asset Standards Authority
Assessment period	The time period in which an assessment is made. e.g. Day 7am-10pm & Night 10pm-7am.
Assessment Point	A location at which a noise or vibration measurement is taken or estimated.
Attenuation	The reduction in the level of sound or vibration.
Audible Range	The limits of frequency which are audible or heard as sound. The normal hearing in young adults detects ranges from 20 Hz to 20 kHz, although some people can detect sound with frequencies outside these limits.
A-weighting	A filter applied to the sound recording made by a microphone to approximate the response of the human ear.
Background noise	Background noise is the term used to describe the underlying level of noise present in the ambient noise, measured in the absence of the noise under investigation. It is described as the average of the minimum noise levels measured on a sound level meter and is measured statistically as the A-weighted noise level exceeded for ninety percent of a sample period. This is represented as the LA90 noise level if measured as an overall level or an L90 noise level when measured in octave or third-octave bands.
Barrier (Noise)	A natural or constructed physical barrier which impedes the propagation of sound and includes fences, walls, earth mounds or berms and buildings.
Berm	Earth or overburden mound.
Buffer	An area of land between a source and a noise-sensitive receiver and may be an open space or a noise-tolerant land use.
Bund	A bund is an embankment or wall of brick, stone, concrete or other impervious material, which may form part or all of the perimeter of a compound.
BS	British Standard

CoRTN	United Kingdom Department of Environment entitled "Calculation of Road Traffic Noise (1988)"		
Decibel [dB]	The units that sound is measured in. The following are examples of the decibel readings of common sounds in our environment:		
	threshold of hearing	0 dB	The faintest sound we can hear, defined as 20 micro Pascal
		10 dB	Human breathing
	almost silent	20 dB	
		30 dB	Quiet bedroom or in a quiet national park location
	generally quiet	40 dB	Library
		50 dB	Typical office space or ambience in the city at night
	moderately loud	60 dB	CBD mall at lunch time
		70 dB	The sound of a car passing on the street
	loud	80 dB	Loud music played at home
		90 dB	The sound of a truck passing on the street
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		110 dB	Operating a chainsaw or jackhammer
	extremely loud	120 dB	Jet plane take-off at 100m away
	threshold of pain	130 dB	
		140 dB	Military jet take-off at 25m away
dB(A)	A-weighted decibel. The A- weighting noise filter simulates the response of the human ear at relatively low levels, where the ear is not as effective in hearing low frequency sounds as it is in hearing high frequency sounds. That is, low frequency sounds of the same dB level are not heard as loud as high frequency sounds. The sound level meter replicates the human response of the ear by using an electronic filter which is called the "A" filter. A sound level measured with this filter is denoted as dB(A). Practically all noise is measured using the A filter.		
dB(C)	C-weighted decibels. The C-weighting noise filter simulates the response of the human ear at relatively high levels, where the human ear is nearly equally effective at hearing from mid-low frequency (63Hz) to mid-high frequency (4kHz), but is less effective outside these frequencies. The dB(C) level is not widely used but has some applications.		
Diffraction	The distortion of sound waves caused when passing tangentially around solid objects.		
DIN	German Standard		
ECRTN	Environmental Criteria for Road Traffic Noise, NSW, 1999		
ENMM	Environmental Noise Management Manual, Roads and Maritime Services (Transport for NSW)		
EPA	Environment Protection Authority		
Field Test	A test of the sound insulation performance in-situ. See also 'Laboratory Test' The sound insulation performance between building spaces can be measured by conducting a field test, for example, early during the construction stage or on completion. A field test is conducted in a non-ideal acoustic environment. It is generally not possible to measure the performance of an individual building element accurately as the results can be affected by numerous field conditions.		
Fluctuating Noise	Noise that varies continuously to an appreciable extent over the period of observation.		
Free-field	An environment in which there are no acoustic reflective surfaces. Free field noise measurements are carried out outdoors at least 3.5m from any acoustic reflecting structures other than the ground.		
Frequency	Frequency is synonymous to pitch. Sounds have a pitch which is peculiar to the nature of the sound generator. For example, the sound of a tiny bell has a high pitch and the sound of a bass drum has a low pitch. Frequency or pitch can be measured on a scale in units of Hertz or Hz.		

Ground-borne noise	Vibration propagated through the ground and then radiated as noise by vibrating building elements such as wall and floor surfaces. This noise is more noticeable in rooms that are well insulated from other airborne noise. An example would be vibration transmitted from an underground rail line radiating as sound in a bedroom of a building located above.
Habitable Area	Includes a bedroom, living room, lounge room, music room, television room, kitchen, dining room, sewing room, study, playroom, family room, home theatre and sunroom. Excludes a bathroom, laundry, water closet, pantry, walk-in wardrobe, corridor, hallway, lobby, photographic darkroom, clothes drying room, and other spaces of a specialised nature occupied neither frequently nor for extended periods.
Heavy Vehicle	A truck, transporter or other vehicle with a gross weight above a specified level (for example: over 8 tonnes).
IGANRIP	Interim Guideline for the Assessment of Noise from Rail Infrastructure Projects, NSW DEC 2007
Impulsive noise	Having a high peak of short duration or a sequence of such peaks. A sequence of impulses in rapid succession is termed repetitive impulsive noise.
INP	NSW Industrial Noise Policy, EPA 1999
Intermittent noise	The level suddenly drops to that of the background noise several times during the period of observation. The time during which the noise remains at levels different from that of the ambient is one second or more.
Intrusive noise	Refers to noise that intrudes above the background level by more than 5 dB(A).
ISEPP	State Environmental Planning Policy (Infrastructure), NSW, 2007
ISEPP Guideline	Development Near Rail Corridors and Busy Roads - Interim Guideline, NSW Department of Planning, December 2008
L1	The sound pressure level that is exceeded for 1% of the time for which the given sound is measured.
L10	The sound pressure level that is exceeded for 10% of the time for which the given sound is measured.
L10(1hr)	The L10 level measured over a 1 hour period.
L10(18hr)	The arithmetic average of the L10(1hr) levels for the 18 hour period between 6am and 12 midnight on a normal working day.
L90	The level of noise exceeded for 90% of the time. The bottom 10% of the sample is the L90 noise level expressed in units of dB(A).
LAeq or Leq	The "equivalent noise level" is the summation of noise events and integrated over a selected period of time, which would produce the same energy as a fluctuating sound level. When A-weighted, this is written as the LAeq.
LAeq(1hr)	The LAeq noise level for a one-hour period. In the context of the NSW EPA's Road Noise Policy it represents the highest tenth percentile hourly A-weighted Leq during the period 7am to 10pm, or 10pm to 7am (whichever is relevant).
LAeq(8hr)	The LAeq noise level for the period 10pm to 6am.
LAeq(9hr)	The LAeq noise level for the period 10pm to 7am.
LAeq(15hr)	The LAeq noise level for the period 7am to 10pm.
LAeq (24hr)	The LAeq noise level during a 24 hour period, usually from midnight to midnight.
Lmax	The maximum sound pressure level measured over a given period. When A-weighted, this is usually written as the LAmax.
Lmin	The minimum sound pressure level measured over a given period. When A-weighted, this is usually written as the LAmin.
Loudness	A rise of 10 dB in sound level corresponds approximately to a doubling of subjective loudness. That is, a sound of 85 dB is twice as loud as a sound of 75 dB which is twice as loud as a sound of 65 dB and so on. That is, the sound of 85 dB is four times or 400% the loudness of a sound of 65 dB.

Microphone	An electro-acoustic transducer which receives an acoustic signal and delivers a corresponding electric signal.
MPE	Moorebank Precinct East
NCA	Noise Catchment Area. An area of study within which the noise environment is substantially constant.
NCG	Noise Criteria Guideline, Roads and Maritime Services (Transport for NSW)
NMG	Noise Mitigation Guideline, Roads and Maritime Services (Transport for NSW)
Noise	Unwanted sound
Pre-construction	Work in respect of the proposed project that includes design, survey, acquisitions, fencing, investigative drilling or excavation, building/road dilapidation surveys, minor clearing (except where threatened species, populations or ecological communities would be affected), establishing ancillary facilities such as site compounds, or other relevant activities determined to have minimal environmental impact (e.g. minor access roads).
Reflection	Sound wave reflected from a solid object obscuring its path.
RING	Rail Infrastructure Noise Guideline, NSW, May 2013
RMS	Root Mean Square value representing the average value of a signal.
Rw	Weighted Sound Reduction Index A measure of the sound insulation performance of a building element. It is measured in very controlled conditions in a laboratory. The term supersedes the value STC which was used in older versions of the Building Code of Australia. Rw is measured and calculated using the procedure in ISO 717-1. The related field measurement is the DnT,w. The higher the value the better the acoustic performance of the building element.
R'w	Weighted Apparent Sound Reduction Index. As for Rw but measured in-situ and therefore subject to the inherent accuracies involved in such a measurement. The higher the value the better the acoustic performance of the building element.
RNP	Road Noise Policy, NSW, March 2011
Sabine	A measure of the total acoustic absorption provided by a material. It is the product of the Absorption Coefficient (alpha) and the surface area of the material (m2). For example, a material with alpha = 0.65 and a surface area of 8.2m2 would have 0.65 x 8.2 = 5.33 Sabine. Sabine is usually calculated for each individual octave band (or third-octave).
SEL	Sound Exposure Level (SEL) is the constant sound level which, if maintained for a period of 1 second would have the same acoustic energy as the measured noise event. SEL noise measurements are useful as they can be converted to obtain Leq sound levels over any period of time and can be used for predicting noise at various locations.
Sound	A fluctuation of air pressure which is propagated as a wave through air.
Sound absorption	The ability of a material to absorb sound energy by conversion to thermal energy.
Sound Insulation	Sound insulation refers to the ability of a construction or building element to limit noise transmission through the building element. The sound insulation of a material can be described by the Rw and the sound insulation between two rooms can be described by the DnT,w.
Sound level meter	An instrument consisting of a microphone, amplifier and indicating device, having a declared performance and designed to measure sound pressure levels.
Sound power level	Ten times the logarithm to the base 10 of the ratio of the sound power of the source to the reference sound power of 1 pico watt.
Sound pressure level	The level of noise, usually expressed in decibels, as measured by a standard sound level meter with a microphone referenced to 20 mico Pascal.
Spoil	Soil or materials arising from excavation activities.

SSFL	Southern Sydney Freight Line
STC	Sound Transmission Class A measure of the sound insulation performance of a building element. It is measured in controlled conditions in a laboratory. The term has been superseded by Rw.
Structure-borne Noise	Audible noise generated by vibration induced in the ground and/or a structure. Vibration can be generated by impact or by solid contact with a vibrating machine. Structure-borne noise cannot be attenuated by barriers or walls but requires the isolation of the vibration source itself. This can be achieved using a resilient element placed between the vibration source and its support such as rubber, neoprene or springs or by physical separation (using an air gap for example). Examples of structure-borne noise include the noise of trains in underground tunnels heard to a listener above the ground, the sound of footsteps on the floor above a listener and the sound of a lift car passing in a shaft. See also 'Impact Noise'.
Tonal Noise	Sound containing a prominent frequency and characterised by a definite pitch.
Transmission Loss	The sound level difference between one room or area and another, usually of sound transmitted through an intervening partition or wall. Also the vibration level difference between one point and another. For example, if the sound level on one side of a wall is 100dB and 65dB on the other side, it is said that the transmission loss of the wall is 35dB. If the transmission loss is normalised or standardised, it then becomes the Rw or R'w or DnT,w.
Wheelbase	The wheelbase is the distance between the centres of the front and rear wheels on a 2-axle bogie.

APPENDIX B Detailed noise monitoring/ assessment/ management reports

B.1 Angle of Attack Monitoring Report - 1 May 2023 and 31 October 2023

Renzo Tonin Report TL116-05F22 AoA Report November 2023 (r1)

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Sydney Melbourne Brisbane Gold Coast Kuwait Singapore
Renzo Tonin & Associates ABN 29 117 462 861
Level 1/418A Elizabeth St SURRY HILLS NSW 2010 | PO Box 877 STRAWBERRY HILLS NSW 2012
P (02) 8218 0500 F (02) 8218 0501 sydney@renzotonin.com.au www.renzotonin.com.au

aaac Association of Australian Acoustical Consultants

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1 Introduction

1.1 Project overview

The Sydney Intermodal Terminal Alliance (SIMTA) received approval for the construction and operation of Stages 1 and 2 of the Moorebank Precinct East (MPE) Project (SSD 6766 and SSD 7628 respectively), which together comprise the two stages of development under the MPE Concept Approval (MP10_0193).

This report has been prepared to address the requirements of Approval Condition G7A of SSD 6766, which requires the submission of a six-monthly report to the Secretary, which identifies the number of wagons with wheels that exceed the ASA standard angle of attack and the action taken by operators to improve steering performance.

Appendix A contains a glossary of acoustic terms used in this report.

2 Compliance Matrix

Table 1 provides a summary of the Approval Conditions which relate to this report.

Table 1 Compliance matrix

Condition ID	Condition	Comments on compliance	Reference for further information
SSD 6766			
G7	The Applicant shall install and maintain a rail noise monitoring system on the rail link at the commencement of operation to continuously monitor the noise from rail operations on the rail link. The system shall capture the noise from each individual train passby noise generation event, and include information to identify: a) Time and date of freight train passbys; b) Imagery or video to enable identification of the rolling stock during day and night; c) $L_{Aeq(15hour)}$ and $L_{Aeq(9hour)}$ from rail operations; and d) $L_{AF(max)}$ and SEL of individual train passbys, measured in accordance with ISO3095; or e) Other alternative information as agreed with, or required by, the Secretary. The results from the noise monitoring system, shall be publicly accessible from a website maintained by the Applicant. The noise results from each train shall be available on the website within 24 hours of it passing the monitor, unless unforeseen circumstances (i.e a system malfunction) have occurred. The $L_{Aeq(15hour)}$ and $L_{Aeq(9hr)}$ results from each day shall be available on the website within 24 hours of the period ending. Prior to the commencement of operation, the Applicant shall submit for the approval of the Secretary, justification supporting the appropriateness of the location for rail noise monitoring, including details of any alternative options considered and reasons for these being dismissed. The rail noise monitoring system shall not operate until the Secretary has approved the proposed monitoring location. The Applicant shall provide an annual report to the Secretary with the results of monitoring for a period of 5 years, or as otherwise agreed with the Secretary, from the commencement of operation of the IMEX terminal. The Secretary shall consider the need for further reporting following a review of the results for year 5.	This condition is not directly related to this report. It is referenced herein on the basis that noise levels from the rail noise monitoring system provides information that may correlate with the Angle of Attack measurement results.	https://moorebankintermodalprecinct.com.au/wp-content/uploads/2023/04/TJ741-04F04-AoA-and-Functional-Spec-for-Permanent-Noise-Monitor-r9_redacted.pdf https://moorebanknoisemonitor-emsbk.trackiq.net/NoiseMonitor/

Condition ID	Condition	Comments on compliance	Reference for further information
G7A	The applicant shall install and maintain a wayside angle of attack monitoring system on the rail link at the commencement of operation to continuously monitor the angle of attack to the rail of rolling stock wheels. The system shall capture the angle of attack from a wheel on each axle of every train, and include information to identify: a) Time and date of each axle passby; and b) The identification number of each item of rolling stock. The results from the angle of attack monitoring system shall be: • accessible by train operators from a website maintained by the Applicant. Angle of attack results from each train shall be available on the website within 24 hours of it passing the monitor, unless unforeseen circumstances have occurred. • included in a six-monthly report to the Secretary. The report should at least identify the number of wagons with wheels that exceed the ASA standard angle of attack and the action taken by operators to improve steering performance. Prior to the commencement of operation, the Applicant shall submit for the approval of the Secretary, justification supporting the appropriateness of the location for angle of attack monitoring, the format of the information to be accessible to operators and the format of the public report. The angle of attack monitoring system shall not operate until the Secretary has approved the proposed monitoring location and reporting arrangements.	An Angle of Attack (AoA) monitoring system was installed on the new rail link in May 2020. The monitoring system captures the AoA of each axle passby and compares the measured values with the acceptable value in the applicable Asset Standards Authority minimum operating standard. The AoA values for each axle are available to operators in accordance with the approval condition. A Functional and Performance Specification for the permanent noise monitoring system and angle of attack monitoring system was prepared for approval by the Secretary before the rail link commissioning. A summary of the AoA noise monitoring results for the current six month period is provided in Section 3.1. The monitoring identified 12 trains where the maximum AoA value exceeded the alarm level. None of these events resulted in elevated noise levels at the permanent noise monitoring location.	Section 3

3 Rail link angle of attack (AoA) monitoring

The performance of wagon bogies and their ability to negotiate small radius curves without generating curve squeal, is assessed in terms of the angle of attack (AoA) of the wheelset. Acceptable AoA values are defined in Section 2.7.1 of Asset Standards Authority Standard T HR RS 00400 ST[1] and are a function of the curve radius and wheel base.

An AoA measurement system was installed on the rail link and partially commissioned on 13 May 2020. The system was fully commissioned on 9 July 2020 at the same time as the permanent noise monitoring system. The AoA system is installed on the eastern track.

Justification supporting the appropriateness of the proposed monitoring location is provided in the *Functional and Performance Specification for Permanent Noise Monitor and Proposed Noise and AoA Monitoring Locations*[2], and was approved by the Secretary.

This report provides a summary of the AoA measurement data for the period between 1 May 2023 and 31 October 2023. In accordance with the requirements of the SSD 6766 Condition G7A, the AoA of a wheel of each axle of each train is captured by the measurement system. This data is accessible by train operators on a website maintained by QUBE.

Below is a summary of the monitoring results.

3.1 AoA monitoring results for current six-month period

This report covers rail movements between 1 May 2023 and 31 October 2023. A summary of the key statistics is provided below:

- Number of valid train passby events – **274**
- Number of train passby events where the measure AoA values on one or more axles were above the acceptable level defined in Section 2.7.1 of Asset Standards Authority Standard T HR RS 00400 ST – **12** (representing 4% of passbys).

A summary of the maximum AoA value measured for each train is provided in Figure 1. The results show that the maximum AoA value is typically less than 10 mrad. Twelve train passbys had maximum AoA values greater than the established alarm level of approximately 19 mrad.

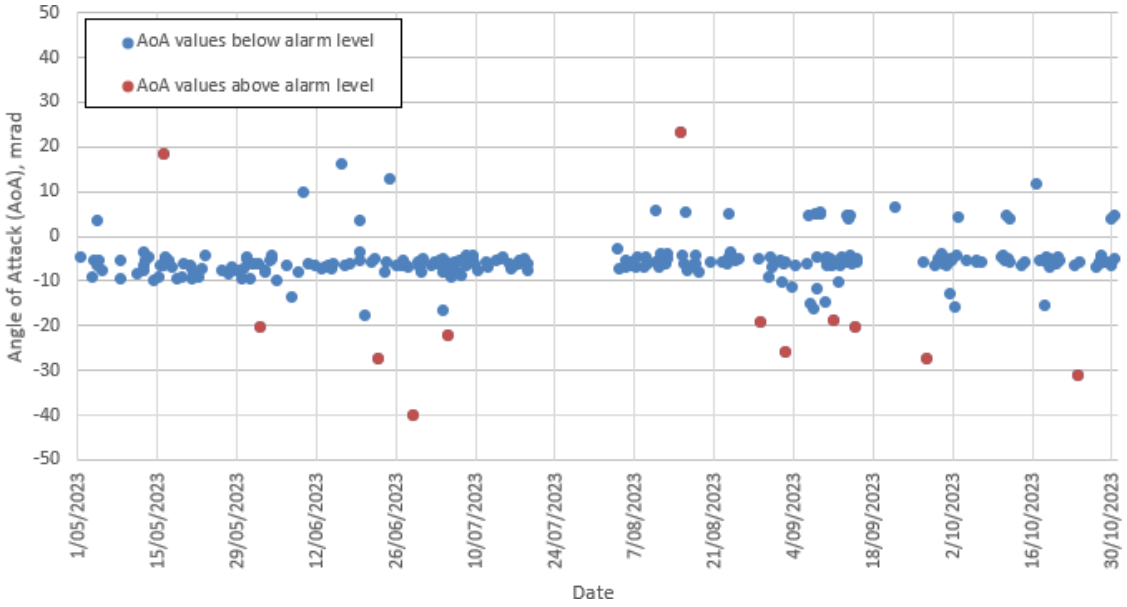
[1] Transport for NSW Asset Standards Authority T HR RS 00400 ST *RSU 400 Series – Minimum Operating Standards for Rolling Stock – Freight Vehicle Specific Interface Requirements* Version 2.0 dated 24 August 2017

[2] Renzo Tonin & Associates Report TJ741-04F04 AoA and Functional Spec for Permanent Noise Monitor (r8) – available https://moorebankintermodalprecinct.com.au/wp-content/uploads/2023/04/TJ741-04F04-AoA-and-Functional-Spec-for-Permanent-Noise-Monitor-r9_redacted.pdf

A detailed review of the AoA exceedances identified that Wagon ID CQMY 003099 exceeded the AoA alarm level on seven occasions. The owner of this wagon has been notified of these exceedances and is in the process of determining the required rectification works.

None of the twelve train passby events with AoA alarm levels resulted in elevated noise levels at the permanent noise monitoring location [i.e. where the calculated $L_{Aeq(9hour)}$ noise levels at 30 m were above 60 dB(A)].

Figure 1 Maximum AoA value for each train passby



4 Conclusion

This report has been prepared to address the requirements of Approval Condition G7A of SSD 6766, which requires the submission of a six-monthly report to the Secretary, which identifies the number of train passbys and wagons with wheels that exceed the ASA standard angle of attack and the action taken by operators to improve steering performance.

For rail movements between 1 May 2023 and 31 October 2023, twelve train passbys had maximum AoA values greater than the established alarm level of approximately 19 mrad. Wagon ID CQMY 003099 exceeded the AoA alarm level on seven occasions. The owner of this wagon has been notified of these exceedances and is in the process of determining the required rectification works.

None of twelve train passby events with AoA alarm levels caused elevated noise levels at the permanent noise monitoring location [i.e. where the calculated $L_{Aeq(9hour)}$ noise levels at 30 m were above 60 dB(A)].

APPENDIX A Glossary of terminology

The following is a brief description of the technical terms used to describe noise to assist in understanding the technical issues presented.

Absorption Coefficient α	The absorption coefficient of a material, usually measured for each octave or third-octave band and ranging between zero and one. For example, a value of 0.85 for an octave band means that 85% of the sound energy within that octave band is absorbed on coming into contact with the material. Conversely, a low value below about 0.1 means the material is acoustically reflective.
Adverse weather	Weather effects that enhance noise (particularly wind and temperature inversions) occurring at a site for a significant period of time. In the NSW INP this occurs when wind occurs for more than 30% of the time in any assessment period in any season and/or temperature inversions occurring more than 30% of nights in winter.
Air-borne noise	Noise which is fundamentally transmitted by way of the air and can be attenuated by the use of barriers and walls placed physically between the noise source and receiver.
Ambient noise	The all-encompassing noise associated within a given environment at a given time, usually composed of sound from all sources near and far.
AoA	Angle of Attack - As the wheels on a bogie negotiate a tight curve, the leading wheelset typically presents an Angle-of-Attack (AoA) to the rail. The AoA of a leading wheelset with good steering performance can be calculated from AoA = wheelbase (m) / curve radius (m). AoA is normally measured in milliradian (mrad).
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AS	Australian Standard
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Attenuation	The reduction in the level of sound or vibration.
Audible Range	The limits of frequency which are audible or heard as sound. The normal hearing in young adults detects ranges from 20 Hz to 20 kHz, although some people can detect sound with frequencies outside these limits.
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Barrier (Noise)	A natural or constructed physical barrier which impedes the propagation of sound and includes fences, walls, earth mounds or berms and buildings.
Berm	Earth or overburden mound.
Buffer	An area of land between a source and a noise-sensitive receiver and may be an open space or a noise-tolerant land use.
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dB(C)	C-weighted decibels. The C-weighting noise filter simulates the response of the human ear at relatively high levels, where the human ear is nearly equally effective at hearing from mid-low frequency (63Hz) to mid-high frequency (4kHz), but is less effective outside these frequencies. The dB(C) level is not widely used but has some applications.		
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Habitable Area	Includes a bedroom, living room, lounge room, music room, television room, kitchen, dining room, sewing room, study, playroom, family room, home theatre and sunroom. Excludes a bathroom, laundry, water closet, pantry, walk-in wardrobe, corridor, hallway, lobby, photographic darkroom, clothes drying room, and other spaces of a specialised nature occupied neither frequently nor for extended periods.
Heavy Vehicle	A truck, transporter or other vehicle with a gross weight above a specified level (for example: over 8 tonnes).
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L1	The sound pressure level that is exceeded for 1% of the time for which the given sound is measured.
L10	The sound pressure level that is exceeded for 10% of the time for which the given sound is measured.
L10(1hr)	The L10 level measured over a 1 hour period.
L10(18hr)	The arithmetic average of the L10(1hr) levels for the 18 hour period between 6am and 12 midnight on a normal working day.
L90	The level of noise exceeded for 90% of the time. The bottom 10% of the sample is the L90 noise level expressed in units of dB(A).
LAeq or Leq	The "equivalent noise level" is the summation of noise events and integrated over a selected period of time, which would produce the same energy as a fluctuating sound level. When A-weighted, this is written as the LAeq.
LAeq(1hr)	The LAeq noise level for a one-hour period. In the context of the NSW EPA's Road Noise Policy it represents the highest tenth percentile hourly A-weighted Leq during the period 7am to 10pm, or 10pm to 7am (whichever is relevant).
LAeq(8hr)	The LAeq noise level for the period 10pm to 6am.
LAeq(9hr)	The LAeq noise level for the period 10pm to 7am.
LAeq(15hr)	The LAeq noise level for the period 7am to 10pm.
LAeq (24hr)	The LAeq noise level during a 24 hour period, usually from midnight to midnight.
Lmax	The maximum sound pressure level measured over a given period. When A-weighted, this is usually written as the LAmax.
Lmin	The minimum sound pressure level measured over a given period. When A-weighted, this is usually written as the LAmin.
Loudness	A rise of 10 dB in sound level corresponds approximately to a doubling of subjective loudness. That is, a sound of 85 dB is twice as loud as a sound of 75 dB which is twice as loud as a sound of 65 dB and so on. That is, the sound of 85 dB is four times or 400% the loudness of a sound of 65 dB.

Microphone	An electro-acoustic transducer which receives an acoustic signal and delivers a corresponding electric signal.
MPE	Moorebank Precinct East
NCA	Noise Catchment Area. An area of study within which the noise environment is substantially constant.
NCG	Noise Criteria Guideline, Roads and Maritime Services (Transport for NSW)
NMG	Noise Mitigation Guideline, Roads and Maritime Services (Transport for NSW)
Noise	Unwanted sound
Pre-construction	Work in respect of the proposed project that includes design, survey, acquisitions, fencing, investigative drilling or excavation, building/road dilapidation surveys, minor clearing (except where threatened species, populations or ecological communities would be affected), establishing ancillary facilities such as site compounds, or other relevant activities determined to have minimal environmental impact (e.g. minor access roads).
Reflection	Sound wave reflected from a solid object obscuring its path.
RING	Rail Infrastructure Noise Guideline, NSW, May 2013
RMS	Root Mean Square value representing the average value of a signal.
Rw	Weighted Sound Reduction Index A measure of the sound insulation performance of a building element. It is measured in very controlled conditions in a laboratory. The term supersedes the value STC which was used in older versions of the Building Code of Australia. Rw is measured and calculated using the procedure in ISO 717-1. The related field measurement is the DnT,w. The higher the value the better the acoustic performance of the building element.
R'w	Weighted Apparent Sound Reduction Index. As for Rw but measured in-situ and therefore subject to the inherent accuracies involved in such a measurement. The higher the value the better the acoustic performance of the building element.
RNP	Road Noise Policy, NSW, March 2011
Sabine	A measure of the total acoustic absorption provided by a material. It is the product of the Absorption Coefficient (alpha) and the surface area of the material (m2). For example, a material with alpha = 0.65 and a surface area of 8.2m2 would have 0.65 x 8.2 = 5.33 Sabine. Sabine is usually calculated for each individual octave band (or third-octave).
SEL	Sound Exposure Level (SEL) is the constant sound level which, if maintained for a period of 1 second would have the same acoustic energy as the measured noise event. SEL noise measurements are useful as they can be converted to obtain Leq sound levels over any period of time and can be used for predicting noise at various locations.
Sound	A fluctuation of air pressure which is propagated as a wave through air.
Sound absorption	The ability of a material to absorb sound energy by conversion to thermal energy.
Sound Insulation	Sound insulation refers to the ability of a construction or building element to limit noise transmission through the building element. The sound insulation of a material can be described by the Rw and the sound insulation between two rooms can be described by the DnT,w.
Sound level meter	An instrument consisting of a microphone, amplifier and indicating device, having a declared performance and designed to measure sound pressure levels.
Sound power level	Ten times the logarithm to the base 10 of the ratio of the sound power of the source to the reference sound power of 1 pico watt.
Sound pressure level	The level of noise, usually expressed in decibels, as measured by a standard sound level meter with a microphone referenced to 20 mico Pascal.
Spoil	Soil or materials arising from excavation activities.

SSFL	Southern Sydney Freight Line
STC	Sound Transmission Class A measure of the sound insulation performance of a building element. It is measured in controlled conditions in a laboratory. The term has been superseded by Rw.
Structure-borne Noise	Audible noise generated by vibration induced in the ground and/or a structure. Vibration can be generated by impact or by solid contact with a vibrating machine. Structure-borne noise cannot be attenuated by barriers or walls but requires the isolation of the vibration source itself. This can be achieved using a resilient element placed between the vibration source and its support such as rubber, neoprene or springs or by physical separation (using an air gap for example). Examples of structure-borne noise include the noise of trains in underground tunnels heard to a listener above the ground, the sound of footsteps on the floor above a listener and the sound of a lift car passing in a shaft. See also 'Impact Noise'.
Tonal Noise	Sound containing a prominent frequency and characterised by a definite pitch.
Transmission Loss	The sound level difference between one room or area and another, usually of sound transmitted through an intervening partition or wall. Also the vibration level difference between one point and another. For example, if the sound level on one side of a wall is 100dB and 65dB on the other side, it is said that the transmission loss of the wall is 35dB. If the transmission loss is normalised or standardised, it then becomes the Rw or R'w or DnT,w.
Wheelbase	The wheelbase is the distance between the centres of the front and rear wheels on a 2-axle bogie.

B.2 Condition F5A Management Plan, Moorebank Intermodal Precinct– East Precinct

Noise management plan: PREC-QPMS-EN-PLN-0004, Rev 08, 22/11/2023)

Department of Planning, Housing & Infrastructure

Our ref: SSD-6766-PA-63

Richard Johnson
Director
Aspect Environmental Pty Limited
Suite 117, 25 Solent Circuit
BAULKHAM HILLS, NSW 2153

Via Email: richard@aspectenvironmental.com.au

13/05/2024

Dear Mr Johnson

Moorebank Intermodal Precinct East (MPE)– Stage 1 (SSD-6766)
Container Noise Barrier Management Plan, Condition F5A

I refer to the updated Container Noise Barrier Management Plan (CNBMP): Moorebank Intermodal Precinct – East Precinct submitted for the approval of the Planning Secretary of the Department of Planning, Housing and Infrastructure (the Department) under condition F5A of SSD-6766. I also acknowledge and thank you for your response to the Department's review comments and request for additional information.

I note the updated CNBMP:

- has been prepared by Arcadis (project consultant), Renzo Tonin & Associates (acoustics consultants), and revised by Aspect (environmental consultant);
- was reviewed by the Applicant and no issues were raised to the Department; and
- contains the information required by conditions F5A.

I also note that the CNBMP has been updated to cover the operational shift to electrified automatic (quieter compared to manual process) night-time stacking of containers via the use of Cantilever Automated Stacking Cranes for yard stacking and electrified Automated Stacking Cranes for rail servicing.

The updated CNBMP states that the plan has also been updated to consider noise management measures for the increase of the operational capacity of the IMEX facility. The Department has been advised that increase in container volume operational capacity from up to 250,000 twenty-foot equivalent units (TEU containers) p.a as per SSD-6766 to 500,000 TEU is to be via a Complying Development Certificate under the *State Environmental Planning Policy (SEPP) (Transport and Infrastructure) 2021* (TISEPP). As the Department's decision-making powers for the CNBMP are set under the SSD-6766 consent, the Department's assessment of the CNBMP covers updates made to the CNBMP to the extent relevant to 250,000 TEU throughput.

Accordingly, as nominee of the Planning Secretary, I approve the updated CNBMP: Moorebank Intermodal Precinct – East Precinct, Revision 08 dated 22 November 2023 under condition F5A of SSD-6766.

Please note that if there are any inconsistencies between the updated CNBMP and the conditions of consent, the conditions will prevail.

Also, please ensure you make the CNBMP available for public access on the project website at the earliest convenience.

If you have any questions, please contact Swati Sharma at swati.sharma@planning.nsw.gov.au.

Yours sincerely

Dominic Crinnion
Director
Infrastructure Management

As nominee of the Planning Secretary

Condition F5A MANAGEMENT PLAN

Moorebank Intermodal Precinct– East Precinct

MOOREBANK INTERMODAL PRECINCT

Moorebank Intermodal Precinct – East Precinct

Condition F5A Management Plan

Authors	[redacted]
Checker	[redacted]
Approver	[redacted]
Report No	PREC-QPMS-EN-PLN-0004
Date	22/11/2023
Revision	08

Original Author Details

Author/Reviewer Details	Qualifications and Experience
[redacted] Arcadis Level 16/580 George Street Sydney NSW 2000	MSc BSC (hons) [redacted] has 14 years of environmental management experience in post approval roles including the development of construction and operational environmental management plans, auditing, compliance and on-site environmental management. [redacted] has completed the Certificate of Competence in Environmental Noise Measurement issued by the Institute of Acoustics (UK)
[redacted] Renzo Tonin & Associates Level 1, 418a Elizabeth Street Surry Hills NSW 2010	FIEAust, CPEng, BEng, MAAS [redacted] has more than 20 14 years of NSW experience as a noise and vibration consultant and assessing the potential impacts and mitigation required for large infrastructure projects

This Revision Author Details

Author/Reviewer Details	Qualifications and Experience
[redacted] Aspect Environmental	BEnvSc (Hons1), GradCert EnvPl [redacted] has 16 years of experience in environmental planning, assessment and management.
[redacted] Aspect Environmental	BAE., MAE., Phd.EnvSc [redacted] has 5 years of experience in environmental research, planning and assessment.

REVISIONS

Revision	Date	Description	Prepared by	Approved by
001	16/04/2019	Draft – issued for Client Review	[redacted]	[redacted]
002	23/04/2019	Draft- Addressed Client Comments	[redacted]	[redacted]
003	24/05/2019	Update to address DP&E Comments	[redacted]	[redacted]
004	19/06/2019	Update to address further DP&E Comments	[redacted]	[redacted]
005	03/02/2020	Update to include Area 2 as an operational area	[redacted]	[redacted]
006	19/03/2020	Update to address Mod 2	[redacted]n	[redacted]
007	28/03/2023	Updated for change in ownership, Department changes and warehouse layout changes		[redacted]
008	22/11/2023	Update to address IMEX Terminal TEU increase capacity	[redacted]	[redacted]

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ACRONYMS AND DEFINITIONS

Acronym / Term	Meaning
C-ASC	Cantilever automated stacking cranes
CoC	Condition(s) of Consent
dB(A)	A-weighted decibel. The A- weighting noise filter simulates the response of the human ear at relatively low levels, where the ear is not as effective in hearing low frequency sounds as it is in hearing high frequency sounds. That is, low frequency sounds of the same dB level are not heard as loud as high frequency sounds. The sound level meter replicates the human response of the ear by using an electronic filter which is called the “A” filter. A sound level measured with this filter is denoted as dB(A). Practically all noise is measured using the A filter.
DCCEEW	Department of Climate Change, Energy, the Environment and Water (formerly DotEE)
DotEE	Commonwealth Department of the Environment and Energy (now DCCEEW)
DPE	Department of Planning and Environment
EIS	Environmental Impact Statement
EP&A Act	Environmental Planning and Assessment Act 1979
EPA	NSW Environment Protection Authority
EPBC Act	Environmental Protection and Biodiversity Conservation Act 1999
Facility	The MPE Concept (MP10_0193), MPE Stage 1 (SSD 6766) and MPE Stage 2 (SSD 7628) Project, including the operation of the IMEX Terminal, warehousing and distribution facilities. A rail link is included as part of MPE Stage 1 (SSD 6766) and connects the Facility to the Southern Sydney Freight Line.
FCMM	Final Compilation of Mitigation Measures
IMEX Terminal	Import Export Terminal. Includes the following key components: • Truck processing, holding and loading areas with entrance and exit from Moorebank Avenue • Rail loading and adjacent container storage areas serviced by container handling equipment • Administration facility and associated car parking with light vehicle access from Moorebank Avenue.
L_{Aeq} or L_{eq}	The “equivalent noise level” is the summation of noise events and integrated over a selected period of time, which would produce the same energy as a fluctuating sound level. When A-weighted, this is written as the LAeq.
$L_{Aeq,15min}$	The Laeq noise level for over a period of 15 minutes.
L1	The sound pressure level that is exceeded for 1% of the time for which the given sound is measured.
L_{max}	The maximum sound pressure level measured over a given period.
MIP	Moorebank Intermodal Precinct (formerly Moorebank Logistics Park)

Acronym / Term	Meaning
MIP East Approvals	• Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) Approval (No. 2011/6229), March 2014 • MPE Concept Approval received 29 September 2014 (MP10_0193). • MPE Stage 1 approved 12 December 2016 (SSD 6766) as modified by Appeal Number 2017/81889 Stage 1 Approval (SS 6766) outcome dated 13 March 2018
MIP East Precinct	The term referred to the operations of MPE Stage 1 and MPE Stage 2 Projects under the MPE Concept Approval (MP 10_0193) including the operation of a rail link to the Southern Sydney Freight Line, IMEX and warehousing and distribution facilities.
MPE	Moorebank Precinct East
MPW	Moorebank Precinct West
NCA	Noise Catchment Area
NML	Noise Management Level
NIA	Noise Impact Assessment
OEMP	Operational Environmental Management Plan
PUD	Pick-up and delivery vehicles
Rail link	Part of MPE Stage 1 (SSD 6766), connecting the MPE Site to the Southern Sydney Freight Line. The Rail link is to be utilised for the operation of the Facility.
RtS	Response to Submissions
SHEQ	Safety, Health, Environment and Quality
SSD	State significant development
TEU	Twenty-foot equivalent unit
TISEPP	State Environmental Planning Policy (Transport and Infrastructure) 2021

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1 INTRODUCTION

The approval for the construction and operation of the Moorebank Intermodal Precinct (MIP) (formerly Moorebank Logistics Park) was obtained progressively as follows:

- Moorebank Precinct East (MPE) Concept Approval (MP10_0193) on 29 September 2014
- MPE Stage 1 (Stage significant development (SSD) 6766) on 12 December 2016
- MPE Stage 2 (SSD 7628) on 31 January 2018, as modified
- Department of Climate Change, Energy, the Environment and Water (DCCEEW) *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) Approval and Mitigation Measures (No. 2011/6229) on 6 March 2014.

A management plan addressing Condition F5A of SSD 6766 was originally prepared by Arcadis (Container Noise Barrier Management Plan Rev 4, June 2019) to outline the management practices and procedures that would be implemented during night-time operations of the MPE Stage 1 Import Export (IMEX) Terminal.

This revised Condition F5A Management Plan continues to address the relevant requirements of CoC F5A for the management of container stacking during night-time operations of the IMEX Terminal. This management plan now also includes consideration of the operational shift to electrified automatic night-time stacking via the use of Cantilever Automated Stacking Cranes (C-ASC) (large gantry cranes) for yard stacking and electrified Automated Stacking Cranes (ASC) for rail servicing. This system, which is quieter than manual operations has only recently been implemented onsite and so has not previously been considered as part of the measures to mitigate potential noise impacts associated with night-time container stacking.

Approval to increase the operational capacity of the IMEX has also recently been sought (Section 1.2). In support of the application, a Noise Impact Assessment (NIA) (Renzo Tonin & Associates, August 2023) was prepared to identify any potential adverse acoustic impacts associated with the operational capacity increase, and outline management measures required to mitigate these impacts. This management plan has been updated to include these measures.

The title of the plan has been amended to reflect the dynamic, transient, and temporary nature of container placement on site. Additionally, it removes any undue perceptions of a singular permanent structure being in place on the MPE 1 Site to mitigate and manage noise emissions, which does not reflect the actual nature of onsite container operations and working container management or the required outcomes of CoC F5A. Recent modelling completed by Renzo Tonin & Associates (RTA) (August 2023) has found that noise emissions generated by operations at the IMEX requires mitigation via a number of measures working in parallel, along with consideration of prevailing meteorological conditions. Container stacks acting as noise barriers were found to be only one potential component of a wider strategy that can more effectively manage the impacts of noise emissions on sensitive receivers.

1.1 Background

The MIP is an integral component of the Freight, Ports and Transport strategies of both the NSW and Commonwealth governments to help manage the challenges of an expected tripling of freight volumes at Port Botany by 2031.

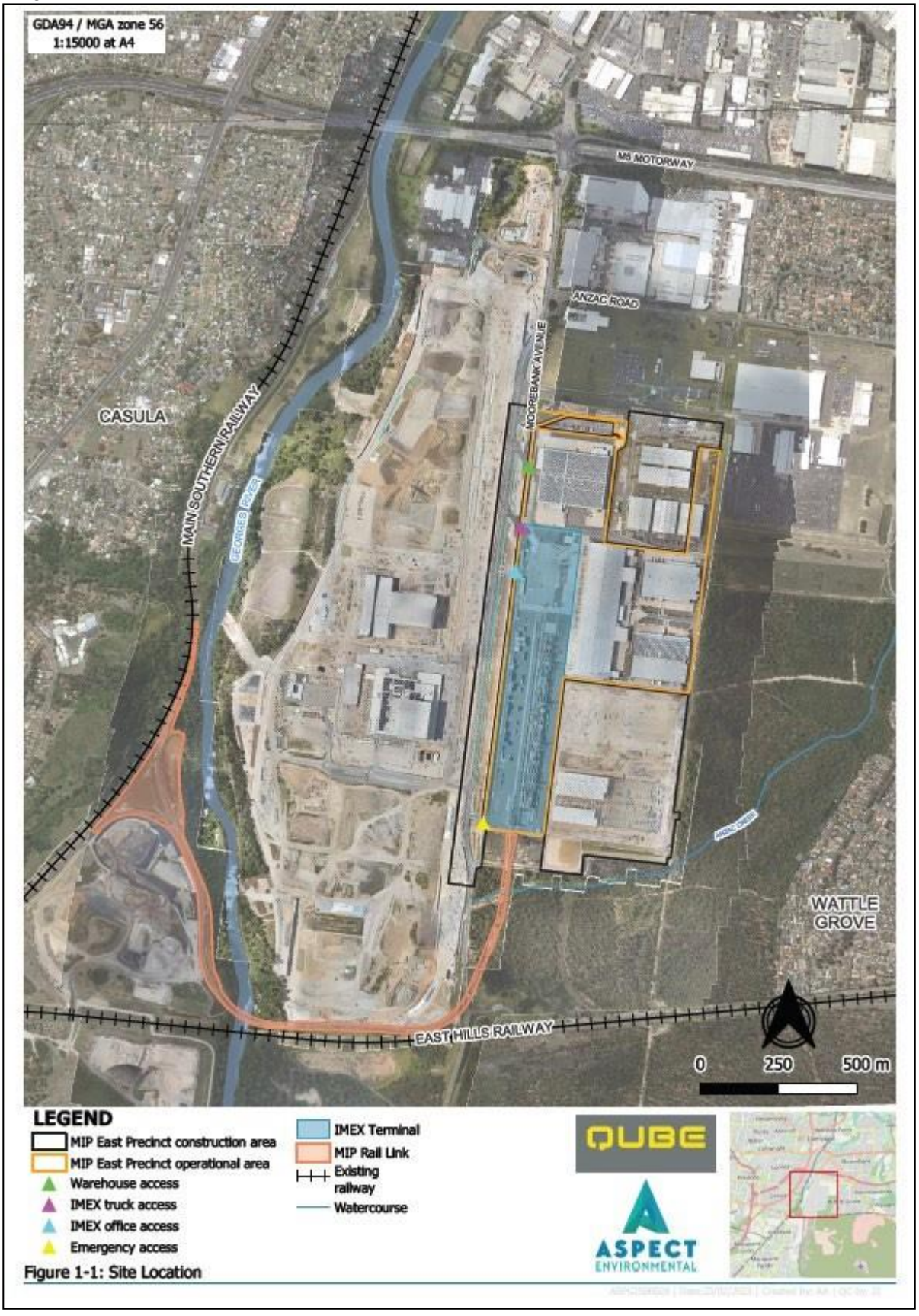
The MIP aims to streamline the freight logistics supply chain from port to store, deliver savings to businesses and consumers, and help service the rapidly growing demand for imported goods in south-west Sydney. It is located approximately 27km south-west of the Sydney Central Business District and approximately 26km west of Port Botany within the Liverpool Local Government Area. The MIP is divided into an East Precinct (MPE) and a West Precinct (MPW), located east and west of Moorebank Avenue respectively, (Figure 1-1).

The main features of the MIP East Precinct include:

- The IMEX Terminal comprised of:
  - Truck processing, holding and loading areas with an entrance and exit from Moorebank Avenue
  - Rail loading and container storage areas serviced by container handling equipment
  - An administration facility and associated car parking with light vehicle access from Moorebank Avenue
- A rail link connecting the IMEX Terminal and the Southern Sydney Freight Line
- Warehouse and distribution facilities
- A freight village including a mix of retail, commercial and light industrial spaces
- An internal road network to enable efficient movement of vehicles, dispatch of freight from the warehouses and transport of containers between the IMEX Terminal and warehouse and distribution facilities.

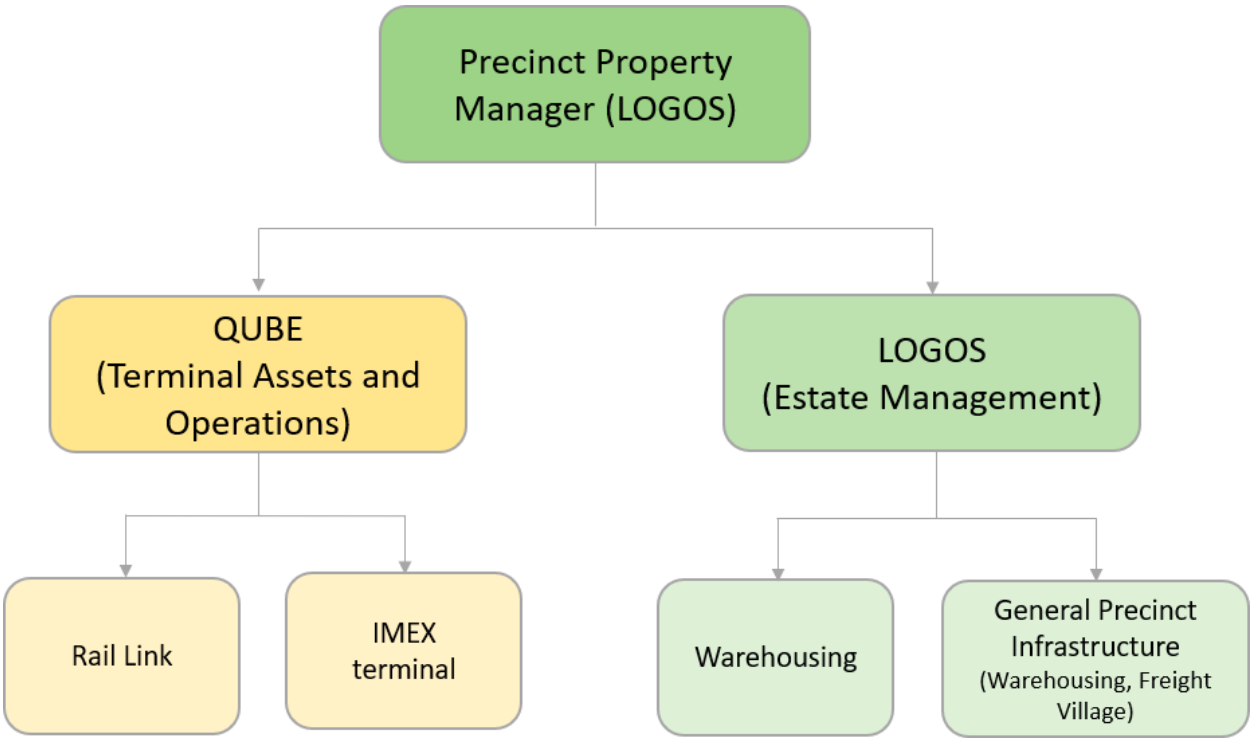
The location of the MIP East Precinct is shown in Figure 1-1.

Figure 1-1: Site location



In 2022, LOGOS Property took over the management of the warehouse and distribution facilities, as well as the overall management of the MIP East Precinct. Qube Logistics will continue to maintain responsibility for the IMEX and the Rail Link. Section 2 of the OEMP describes the operational areas of responsibilities for LOGOS Property and Qube Logistics. This is summarised in Figure 1-2.

Figure 1-2: Environmental Management Structure



1.2 IMEX Terminal Capacity Increase

The increase in IMEX Terminal capacity from 250,000 TEU to 500,000 TEU, is subject to a complying development certificate (CDC) under Chapter 6 of the *State Environmental Planning Policy (Transport and Infrastructure) 2021* (TISEPP). A NIA to support the application was prepared by RTA (August 2023).

The NIA assessed operational noise impacts associated with the increase in TEU capacity and identified the anticipated impact of the TEU increase on baseline noise conditions. The NIA considered noise generated by additional trains at the terminal, terminal activities and increased vehicle movements and included measures to mitigate the potential increases in noise from these operational activities. These measures were identified to control noise emissions, with consideration of other potential noise emissions from other MIP (MPW & MPE) activities along with the acoustic shielding provided by the overall MIP design, including the MPE and MPW warehousing build out adjacent to the IMEX both east and west. This assessment, also considered the interim stage while this is being constructed.

This Plan now presents mitigations and management for any potential adverse noise impacts associated with the TEU increase - including electrified automated stacking and other NIA recommend mitigation and management measures.

1.3 Purpose and Application

The purpose of this management plan is to outline the management practices and procedures to be followed during night-time operations and the methodology for stacking of containers during these night-time operations to manage noise emissions to the nearest residential receivers, where required.

This Condition F5A Management Plan has been developed to address the requirements of MPE Stage 1 CoC F5A (SSD 6766) which requires the preparation of a Management Plan, to the satisfaction of the Secretary of the Department of Planning and Environment (DPE) prior to the commencement of operation. The specific CoC and FCMMs relevant to the development of this plan are identified in Section 2.2.

The IMEX Terminal is approved for 24/7 operation and will include following noise generating activities:

- Container truck movements
- Crane operations
- Reach stacker operations
- Train operations
- Combi lift operations/ straddle carrier operations.

It will receive and dispatch containers on a 24/7 basis which will result in a varying number of stored transient working containers onsite at any one time. The most recent, approved version of this plan will be implemented to manage the Facility activities.

1.4 Objectives and Targets

Table 1-1 outlines the objectives and targets set out for IMEX Terminal for the management of container noise during night-time operations. These objectives and targets were developed by the Principal's Representative based on collective industry experience and best practice.

Table 1-1: Objective and targets

Objective	Target	Timeframe	Accountability
Minimise night-time operational noise impacts on residents through the implementation of management measures	No exceedances of noise criteria	Duration of Operations	IMEX Terminal Manager
Comply with relevant CoCs, applicable legislative and other requirements	No written warnings or infringement notices	Duration of Operations	Site Safety, Health, Environment and Quality (SHEQ) Manager/Advisor for MPE
Promptly investigate any complaints made by the surrounding residents and implement appropriate mitigation measures as required	No validated complaints from the community regarding night-time noise	Duration of Operations	IMEX Area Manager Community Liaison[1] Manager Site SHEQ Manager/Advisor for MPE

[1] Community complaints are managed by the Precinct Operator.

1.5 Approval

The CNBMP Rev 4 (Arcadis June 2019) was approved by DPE (16/08/2019).

This Condition F5A Management Plan will be submitted to the Secretary as an update to the previously approved Plan.

2 STATUTORY REQUIREMENTS

2.1 Legal and Other Obligations

The legislation, planning instruments and guidelines considered during development of this plan are listed below, with specific details provided in the Legislation Register within Appendix B of the Operational Environmental Management Plan (OEMP).

- *Environmental Planning and Assessment Act 1979*
- *Environmental Planning and Assessment Regulation 2000*
- *Environment Protection and Biodiversity (EPBC) Act 1999*
- *Protection of the Environment Operations (Noise Control) Regulation 2017*
- *State Environmental Planning Policy (Transport and Infrastructure) Amendment (Moorebank Freight Intermodal Precinct) 2022 (Moorebank SEPP)*

Additional legislation, standards and guidelines relating to the management of container noise during night-time operations include:

- *Industrial Noise Policy 2000* (NSW Environment Protection Authority (EPA))
- *Noise Policy for Industry 2017* (EPA)

2.2 Development Consent

The operation of the MIP East Precinct was approved under both the *Environmental Planning and Assessment Act 1979* (EP&A) Act) and the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Both these approvals have environmental conditions relevant to the operational works for the MIP East Precinct, which are discussed below.

The operational requirements for the Facility, including consultation, impact mitigation and management, is documented in the following suite of documents.

This Condition F5A Management Plan has been prepared in accordance with:

- EPBC Act Approval (No. 2011/6229), March 2014
- MPE Concept (MP 10_0193), 29 September 2014
- MPE Stage 1 (SSD 6766), as modified by Appeal Number 2017/81889 Stage 1 Approval (SS 6766) outcome dated 13 March 2018
- MPE Stage 1 – EIS (Arcadis Australia Pacific Pty Limited, May 2015)
- MPE Stage 1 – RtS (Arcadis Australia Pacific Pty Limited, September 2015).

The EP&A Act and EPBC Act approval requirements are discussed in the following section.

2.2.1 EPBC Act Approval

The EPBC Act approval for the MPE Concept was granted by DCCEEW (formerly DotEE) in March 2014 (No. 2011/6229).

The operation of the MIP East Precinct has been designed to be consistent with the EPBC Act approval conditions. Specific conditions and commitments that are required to be addressed in this plan are identified within Table 2-1.

Table 2-1: EPBC Act Conditions of Approval

Commonwealth	Requirement	Document Reference
Annexure A – Summary of Mitigation Measures	**Operation** To reduce noise and vibration impacts of the SIMTA proposal during operation,the following recommendations as presented within Wilkinson Murray (2013) would be implemented: SIMTA would make provisions for a potential noise barrier along the western boundary of the SIMTA site. The requirement for the barrier will be confirmed during detailed assessments at each development application stage for approval under the NSW State planning approval process.	This Plan In response to updated noise monitoring and modelling in support of the increase in IMEX Terminal capacity from 250,000 to 500,000 TEU, the Condition F5A Management Plan has been revised to implement recommendations for the mitigation and management of night-time noise levels arising from container placement at nearby residential receivers. Additionally, this Plan reflects the progressive development of the MPW Precinct to the west of Moorebank Avenue and the presence of new, large warehousing and distribution facilities which provide acoustic shielding to residences in Casula, to the west of the MPE 1 facility. This Plan focuses on providing noise mitigation for night-time container placement.

2.2.2 EP&A Act Approval

Approval for MPE Stage 1 was originally received on 12 December 2016 (SSD 6766) and subject to appeal, with revised CoC issued from the Land and Environment Court on 13 March 2018.

The CoC include requirements to be addressed in this plan and delivered during operation of the IMEX Terminal. These requirements, and how they are addressed are summarised within Table 2-2 and Table 2-3 for MP10_0193 and SSD 6766 respectively.

The MPE Stage 2 consent (SSD 7628), at Condition B80, includes LAeq noise management levels that represent a cumulative set of noise criteria for MPE 1 and MPE 2. However, as identified by RTA in their most recent Noise Impact Assessment (August 2023, Section 2.1.2), this set of criteria is inconsistent with the EIS derived noise limits derived in accordance with NSW EPA policy, the expected noise emission performance from MPE as detailed in the EIS, and former approvals.

As part of the MPW Stage 2 (SSD 7709) Modification 1, a review of the applicable operational noise requirements across MIP was undertaken (Renzo Tonin, June 2020). The review identified operational noise requirements are inconsistent across the MIP and not aligned with EPA or DPE methodologies for regulating industrial noise emissions. As a result, the updated MPW Stage 2 consolidated consent now includes, at Condition B131, a set of cumulative noise criteria applicable to operations across MPE and MPW (Table 2-4).

When assessing noise emission for IMEX operations, the noise limits specified in Condition F5B of SSD 6766 and Condition B131 of SSD 7709 would be applicable for this plan.

Table 2-2: MPE Concept CoC (MP10_0193)

Condition	Requirement	Sections or documents where requirements addressed
2.1	Under section 75P(2)(c) of the Act, the following environmental assessment requirements apply with respect to future development that is subject to Part 4 Division 4.1 Act:	Note
	Any future Development Application shall include an updated assessment of noise and vibration impacts. The assessment shall: a) The assessment shall: …	-
Noise and Vibration	ii. assess operational noise and vibration impacts and identify feasible and reasonable measures proposed to be implemented to minimise operational noise impacts of the intermodal facility and rail link, including the preparation of an Operational Noise Management and Monitoring Plan; and	Section 3
	iii. be prepared in accordance with: NSW Industrial Noise Policy (EPA 2000), Interim Construction Noise Guideline (DECC 2009), Assessing Vibration: a technical guide (DEC 2006), the Rail Infrastructure Noise Guideline (EPA 2013), Development Near Rail Corridors and Busy Roads Interim Guideline (DoP 2008), and the NSW Road Noise Policy 2011.	Section 2.1

Table 2-3: MPE Stage 1 CoC (SSD 6766)

CoC	Requirement	Sections or documents where requirements addressed
F5A	The Applicant shall prepare and implement (following approval) a **Container Noise Barrier Management Plan** (CNBMP). The plan shall be prepared by a suitably experienced and qualified acoustics consultant and shall outline the management practices and procedures that are to be followed during night-time operation of the site and for the stacking of containers to be used as noise barriers. The plan shall include, but not necessarily be limited to:	This Plan Refer to authors details on Page (i) Section 3.5
F5A(a)	the preparation of a specification for the stacking of containers to achieve the required level of noise reduction so as to comply with the project specific noise levels** and the sleep disturbance trigger levels*** for the night-time period* at the nearest affected residential receivers and which is to include such details as the minimum numbers of containers, their locations, stacking heights, orientation and maximum gap between containers. The Plan shall include any restrictions on stacking of containers above two high if this is found necessary.	Section 3
F5A(b)	The measurement of noise from operation of the site and an assessment of compliance with the project specific noise levels and the sleep disturbance trigger levels at the nearest affected residential receivers at the following times: i) not less than 3 months and not more than 6 months after commencement of operation, noise surveys shall be conducted on three separate nights for a period of not less than 2 hours whilst train wagons are being loaded with containers; ii) thereafter for 6 months on one night per month for a period of not less than 2 hours whilst train wagons are being loaded with containers. Noise measurements shall be conducted in accordance with the EPA's Industrial Noise Policy.	Section 2.1 Section 3.5 Section 4
F5A(c)	the details of each noise survey shall be documented in a report with a drawing showing the observed location of containers which are subject to the Plan, the measurement equipment used, its calibration status, environmental conditions, receiver locations, methodology, a detailed description of the activities on site, the results obtained and whether or not compliance has been achieved with the project specific noise levels and the sleep disturbance trigger levels at the nearest affected residential receivers.	Section 4
F5A(d)	if the report concludes that the project specific noise levels and the sleep disturbance trigger levels for the night-time period at the nearest affected residential receivers are not being complied with, then recommendations shall be made by the acoustic consultant to amend the Plan accordingly and the Applicant shall implement those recommendations as soon as practical provided they are feasible and reasonable.	Section 4

<table>
<tr><th>CoC</th><th>Requirement</th><th>Sections or documents where requirements addressed</th></tr>
<tr><td>F5A(e)</td><td>the Plan shall include a description of the roles and responsibilities for relevant employees involved in the operation of the CNBMP, including relevant training and induction provisions for ensuring that employees are aware of their environmental and compliance obligations under the Plan.</td><td>Section 2.3
Section 2.4</td></tr>
<tr><td></td><td>The Plan shall be submitted for the approval of the Secretary no later than one month prior to the commencement of operation. Copies of the detailed reports and the Plan (as amended) shall be provided to the Secretary and made available on the Project Website.</td><td>Section 1.5
Section 4</td></tr>
<tr><td></td><td>* The night-time period is defined as 10pm-7am Mon-Sat and 10pm-8am Sundays and Public Holidays
** Contained within the LAeq (15 min) column in Table A in Condition F5B
*** Contained within the Review of Operational Sleep Disturbance Impacts</td><td>-</td></tr>
<tr><td>F5B</td><td>Industrial noise (excluding activities covered by the NSW Rail Infrastructure Noise Guideline) generated by the development is to be measured and evaluated for compliance generally in accordance with the relevant requirements of the NSW Industrial Noise Policy (as may be updated from time to time).
Table A: Noise Criteria dB(A)
<table>
<tr><th>Sensitive receiver</th><th>Day (LAeq (15 min))</th><th>Evening (LAeq (15 min))</th><th>Night (LAeq (15 min))</th><th>Night (LA1 (1 min))</th></tr>
<tr><td>Wattle Grove (NCA 1)</td><td>43</td><td>42</td><td>42</td><td>52</td></tr>
<tr><td>Wattle Grove (NCA 2)</td><td>41</td><td>41</td><td>41</td><td>51</td></tr>
<tr><td>Casula (NCA 3)</td><td>45</td><td>42</td><td>38</td><td>47</td></tr>
<tr><td>Glenfield (NCA 4)</td><td>46</td><td>46</td><td>40</td><td>50</td></tr>
</table>
Note: References to sensitive receivers should be read in conjunction with the description of sensitive receivers in the EIS noting that Casula includes Glenfield Farm.</td><td>Section 3.4
Section 4 details noise monitoring and reporting requirements which will assess compliance with noise criteria</td></tr>
<tr><td>F5C</td><td>The noise criteria in Table A of condition F5B are to apply under all meteorological conditions except the following:
a) wind speeds greater than 3 m/s at 10 metres above ground level; or
(b) stability category F temperature inversion conditions and wind speeds greater than 2 m/s at 10 m above ground level; or
(c) stability category G temperature inversion conditions.</td><td>Section 3.2</td></tr>
</table>

Table 2-4: MPW Stage 2 CoC (SSD 7709)

<table>
<tr><th>CoC</th><th>Requirement</th><th>Sections or documents where requirements addressed</th></tr>
<tr><td>B131</td><td>The noise generated by the development must not exceed the noise limits in Table 4 which are generated by the overall precinct operations (defined as all activities approved for MPW and MPE).
Table 4: Operational Noise Limits dB(A)
<table><tr><th>Location (residential receivers)</th><th>Day $L_{Aeq,15\ minute}$</th><th>Evening $L_{Aeq,15\ minute}$</th><th>Night $L_{Aeq,15\ minute}$</th><th>Night L_{AFmax} Sleep Arousal Screening Level</th></tr><tr><td>Casula</td><td>46 dB</td><td>44 dB</td><td>39 dB</td><td>52 dB</td></tr><tr><td>Glenfield</td><td>49 dB</td><td>46 dB</td><td>42 dB</td><td>52 dB</td></tr><tr><td>Wattle Grove</td><td>44 dB</td><td>42 dB</td><td>42 dB</td><td>52 dB</td></tr><tr><td>Wattle Grove North</td><td>41 dB</td><td>41 dB</td><td>41 dB</td><td>52 dB</td></tr></table>Notes:
To determine compliance with the $L_{Aeq,15\ minute}$ noise limits, noise from the development is to be measured at the most affected point within the residential boundary, or at the most affected point within 30 m of a dwelling where the dwelling is more than 30 m from the boundary. Where it can be demonstrated that direct measurement of noise from the project is impractical, the EPA may accept alternative means of determining compliance (see Chapter 7 of the NPI). The modification factors in Fact Sheet C of NPI must also be applied to the measured noise levels where applicable.
To determine compliance with the LAFmax Sleep Arousal Screening Level in Table 4 above, noise from the project is to be measured at 1 m from the dwelling façade. Where it can be demonstrated that direct measurement of noise from the project is impractical, the EPA may accept alternative means of determining compliance (see Chapter 7 of the NPI).
The noise emission limits identified above apply under meteorological conditions of:
(i) wind speeds of up to 3 m/s at 10 m above ground level; or
(ii) 'F' atmospheric stability class.</td><td>Section 3.3, Table 3-4
The noise limit requirements detailed within Condition B131 are applicable to operations within MPE Stage 1 (i.e. of the IMEX terminal) as the condition applies to the cumulative noise emissions of all noise generating activities in the MIP (MPE & MPW), SSD 6766, SSD 7628 and SSD 7709.
Section 4 details noise monitoring and reporting requirements which will assess compliance with noise criteria.</td></tr>
</table>

2.3 Roles and Responsibilities

Key roles and responsibilities applicable to this Condition F5A Management Plan are presented in Table 2-6.

Table 2-5: Roles and responsibilities

Roles	Responsibilities
IMEX Terminal Manager	• Co-ordinate induction and training of IMEX Terminal staff on the requirements of this Plan
Site HSEQ Manager/Advisor for MPE	• Monitoring the implementation of this Plan, including compliance with relevant CoC • Undertake the monitoring and reporting requirements of this Plan
Qualified Acoustic Consultant	• Will be engaged to undertake the noise surveys required by this Plan
Shift Supervisor	• Monitoring of weather conditions during the night-time period • Implementing this Plan, in particular the actions and activities detailed in Section 4.2 in the event that noise criteria are exceeded during night time operations.
All other personnel	• Comply with applicable requirements of this Plan • Follow instructions of Shift Supervisor, in relation to container placement during night-time operations

2.4 Training

All staff, contractors and sub-contractors shall undergo site-specific induction training which will include container handling noise mitigation and management training developed with an emphasis on understanding and managing noise impacts arising from night-time operation of the IMEX Terminal.

This site-specific induction training will include:

- The location of sensitive receivers and monitoring locations
- Relevant noise mitigation measures and procedures
- Identifying the specifications for the placement and stacking of containers during night-time operations to manage and minimise noise emissions.
- Any limitations on high noise-generating activities
- Designated loading/unloading areas and procedures
- Details of the complaints handling procedure (complaints are received by Precinct Operator)
- Details of the environmental incident procedures
- Non-conformance, preventative and corrective action procedures
- An outline of the consequences of not complying with these measures
- Plant and equipment maintenance requirements
- Operation of vehicles to minimise noise and vibration impacts, e.g., use of designated container handling areas/locations, use of non-tonal reversing beepers, using alternate

onsite signaling systems to horns, and turning off plant, equipment and vehicles when not in use.

Personnel directly involved in implementing container handling noise control measures will be given specific training in the various measures to be implemented as per Section 3, including stacking times and locations, allocated areas, priorities of containers, orientation and placement.

3 IMPLEMENTATION

This section addresses the key night-time period operational noise risks associated with operation of the IMEX Terminal in respect of container placement and stacking. In accordance with CoC F5A(a), the night-time period is defined as 10pm-7am Monday to Saturday and 10pm-8am Sundays and Public Holidays.

3.1 Existing Environment

The IMEX terminal is surrounded by the residential suburbs of Wattle Grove, Casula and Glenfield.

Background noise levels at the nearby residences were established through long-term background noise monitoring during the approval process. The noise monitoring was undertaken by Wilkinson Murray (now RWDI) for the *SIMTA Concept Plan Noise Impact Assessment* (NIA) [*Wilkinson Murray, Report No. 12186-C, Version C, 2 August 2013* (MPE Concept NIA)] in addition to further monitoring undertaken related to the Land and Environment Court Appeal No. 2017/81889.

These monitored noise levels then informed the operational noise limits identified in SSD 6766 F5B Table A.

The Rating Background Levels (RBLs) were then defined for each of the four defined residential noise catchment areas surrounding the IMEX terminal.

3.2 Meteorological Conditions

At relatively large distances from a source, the resultant noise levels at sensitive receivers can be influenced by meteorological conditions, particularly temperature inversions and winds; and can therefore vary from hour to hour and night to night.

As further explained in the NPfI, certain meteorological/weather conditions may increase noise levels at receiver locations by focusing sound-wave propagation paths at a single point. Such refraction of sound waves can occur during temperature inversions (atmospheric conditions where temperatures increase with height above ground level), and where there is a wind gradient (that is, wind velocities increasing with height) with wind direction from the source to the receiver.

As per the NPfI, these noise-enhancing meteorological conditions need to be considered when predicting the likely levels of noise emission for an industrial activity. Subject to the distance and meteorological conditions, noise-enhancing meteorological conditions can typically increase noise levels by up to 5 dB(A) at distances similar to that of receivers around MIP.

The night-time noise management levels are applicable under the meteorological conditions as outlined in CoC F5C (SSD 6766) and CoC B131 (SSD 7709), and so are applicable for all weather conditions except those detailed below:

- Wind speeds greater than 3m/s at 10m above ground level
- Stability category F temperature inversion conditions and wind speeds greater than 2m/s at 10m above ground level

- Stability category G temperature inversion conditions.

To properly manage noise emissions from the IMEX terminal, these noise-enhancing conditions require monitoring and consideration, so that the appropriate recommended management measures are adopted where required. When noise-enhancing conditions are not certain management measures would not be needed for noise emissions to achieve the noise requirements at nearby residences.

3.3 Prevailing Meteorological Conditions

3.3.1 Meteorological Station

Todoroski Air Sciences was engaged to supply and install a meteorological station on the MPE Stage 1 (required under condition A54 of SSD 7709 (MPW Stage 2)) to record weather conditions. Previous versions of this Plan identified a requirement for installation of a temporary meteorological station prior to commencement of MPE operations. The MPW Stage 2 meteorological station was utilised for this purpose and is also appropriate for use with the MPE Stage 1 requirements.

The following information is monitored by the meteorological station:

- Wind speed
- Sigma-theta (the standard deviation of wind direction)

Weather data is being stored to allow for post-processing in the event of complaints, or noise exceedances.

3.3.2 Project specific meteorological forecasting

Todoroski Air Sciences has also been engaged to provide a forecasting and monitoring tool, whereby the forecast wind and temperature inversion risks in coming days can be identified. The appropriate mitigation and management measure can be implemented as required as part of operational planning, in response to the forecast conditions.

Night-time Shift Supervisors would have access to the outputs from the meteorological station and would be aware in advance of the predicted weather conditions, to enable implementation of the applicable noise mitigation measures and operational practices.

Noise management measures, combined with the applicable prevailing meteorological conditions, are summarised in Section 3.5.

3.4 Sensitive Receivers

The residential receivers in the vicinity of the IMEX Terminal with the greatest potential for being adversely impacted by noise are located in the suburbs of Casula, Glenfield and Wattle Grove.

Table 3-1 and Figure 3-1 identifies these residential receiver noise catchment areas Figure 3-1 also identifies key potentially noise-affected receivers from IMEX terminal operations in each noise catchment area (NCA), which are where attended measurements would typically be conducted, subject to the operational activity being monitored.

Alternate monitoring locations may be appropriate subject to the operational activity being monitored. Any monitoring locations should be appropriately justified.

Table 3-1: Sensitive receivers and approximate distance from IMEX Terminal

Noise Catchment Area (NCA)	Typical Monitoring Location	Approximate distance (m) from IMEX Terminal
NCA 1: Wattle Grove	AM1	770
NCA 2: Wattle Grove North	AM2	1,050
NCA 3: Casula	AM3	960
NCA 4: Glenfield	AM4	1,750

Noise monitoring at nearby residential receivers for the Precinct noise emissions are managed by the Precinct Operator in line relevant conditions of consent, compliance monitoring requirements, and requirements of both the Construction Noise and Vibration Management Plan (CNVMP) and Operational Noise and Vibration Management Plan (ONVMP).

Figure 3-1: Noise catchment areas and typical noise monitoring locations

Figure 3-1: Noise Catchment areas and noise monitoring locations

3.5 Noise Management Criteria

As detailed in Section 2.2.2, the noise limits specified by SSD 6766 CoC F5C and SSD 7709 CoC B131 are applicable for the operation of IMEX Terminal and have therefore been adopted for this management plan.

Table 3-2 and Table 3-3 identify the operational noise limits for the operations of the IMEX Terminal during the night-time period. These noise limits apply under the meteorological conditions as outlined in CoC F5C (SSD 6766) and CoC B131 (SSD 7709).

Table 3-2: Noise criteria, dB(A) (SSD 6766)

Sensitive receiver	Day ($L_{Aeq,15\ min}$)	Evening ($L_{Aeq,15\ min}$)	Night ($L_{Aeq,15\ min}$)	Night ($L_{A1,1\ min}$)
Wattle Grove (NCA 1)	43	42	42	52
Wattle Grove North (NCA 2)	41	41	41	51
Casula (NCA 3)	45	42	38	47
Glenfield (NCA 4)	46	46	40	50

Table 3-3: Operational noise limits, dB(A) (SSD 7709)

Sensitive receiver	Day ($L_{Aeq,15\ min}$)	Evening ($L_{Aeq,15\ min}$)	Night ($L_{Aeq,15\ min}$)	Night (L_{AFmax})
Wattle Grove (NCA 1)	44	42	42	52
Wattle Grove North (NCA 2)	41	41	41	52
Casula (NCA 3)	46	44	39	52
Glenfield (NCA 4)	49	46	42	52

3.6 Noise Management

3.6.1 Application strategies

Based on the recently completed NIA by RTA (August 2023) and in accordance with NPfI, measures for reducing noise impacts from industrial activities should follow three main control strategies:

- reducing noise at source
- reducing noise in transmission to the receiver
- reducing noise at the receiver.

These control strategies should be considered in a hierarchical way so that all the measures that reduce noise for a large number of receivers (that is, source controls) are exhausted before more localised mitigation measures are considered.

The NIA by RTA (August 2023) identified that due to the actual nature of onsite container handling operations and working container management, alternate noise control strategies to the implementation of a single permanent noise barrier were required to achieve the required outcomes of CoC F5A.

In the context of the MIP, due to the distance between the IMEX terminal and the nearby residences, the prevailing meteorological conditions can result in noise enhancing conditions, which will increase the noise levels from IMEX noise generating activities at nearby receivers. Noting that this can substantially change the noise level at the potentially impacted receivers, it is important to take this into consideration when developing a noise control strategy (Section 3.2).

In accordance with CoC F5A of SSD 6766, container stacking is implemented at the IMEX Terminal to reduce noise impacts to sensitive receivers during night-time operations when required. However, the NIA prepared by RTA in support of the IMEX TEU capacity increase proposal, has found that various container yard container stack heights can alter the noise emissions to nearby receivers, through both shielding or reflection. Furthermore, the numbers of containers present onsite at any given time is variable depending on operational activities. Additionally, not all potentially impacted residential receivers may be located such that the container yard is located in between the noise sources and the receivers, where it can act as a noise barrier. As such, increasing container stacks and/or container heights does not provide a holistic solution to noise emissions mitigation.

A series of management and mitigation strategies have been developed for the IMEX operations – utilising a combination of noise control measures both ‘at source’ and ‘in the noise transmission path’ approaches. These strategies include implementation of container stacking at selected locations (depending on the location of operational activities). The level of mitigation required is driven by the prevailing meteorological conditions, which are monitored by IMEX operations staff.

With the implementation of this strategy (Section 3.5.2), the IMEX operations (up to a maximum capacity of 500,000 TEU) are then predicted to achieve the applicable noise emissions criteria. By achieving these criteria, operations will also aid the MIP in achieving the overall applicable cumulative noise limits as part of the final MIP arrangement.

3.6.2 Mitigation and Management Measures

3.5.2.1 Mitigation and Management Measures – Noise Impact Assessment Recommendations

The NIA prepared by RTA (August 2023) in support of the IMEX capacity increase to 500,000 TEU concluded that with the implementation of a number of mitigation and management measures, with consideration of the prevailing meteorological conditions, operations are predicted to achieve noise emissions criteria at sensitive receivers.

Figure 3-2, Figure 3-3, Figure 3-4 and Figure 3-5 identify the mitigation measures, the triggers for their implementation and the locations within the IMEX footprint to which they should be applied.

The measures include both general ‘at source’ treatment measures (for implementation across all conditions), requirements for container stacking and other operational-based measures to reduce night-time noise emissions to nearby residences (M1 – M12).

Figure 3-2: Recommended mitigation measure (NIA, RTA, August 2023)

Table 3-9: Recommended noise mitigation measures – Noise controls

Applicable activity / noise source	Details	Mitigation control type	Applicable for	NCAs benefiting from mitigation measure
Reach stackers	5 dB(A) of mitigation to reach stackers is required, comprising the installation of residential grade mufflers to achieve a maximum pass-by noise level of 108 dB(A).	Noise source control	Noise emissions $L_{Aeq\ 15min}$	All NCAs
Cranes - broadband movement alarms	Broadband movement alarms would be shifted to the ground level.	Noise source control	Noise emissions $L_{Aeq\ 15minute}$	All NCAs

Table 3-10: Recommended additional management measures during applicable meteorological conditions

Item	Applicable activity / noise source	Applicable assessment periods Evening: 6pm – 10pm Night: 10pm – 7am	Applicable when meteorological conditions include temperature inversions OR wind as per below		Applicable for	Details	NCAs benefiting from mitigation measure
			Temperature inversion	Wind[1]			
General noise management							
M1	Minimise truck idle time on arrival/departure	Night	All met conditions	All met conditions	Noise emissions $L_{Aeq\ 15minute}$	If trucks are to wait for extended periods of time at arrival area (ie. greater than 2 minutes) they are to turn off their engine.	All NCAs
M2	Truck and reach stacker horns	Night	All met conditions	All met conditions	Noise emissions $L_{Aeq\ 15minute}$	Horns are not to be used as part of the loading process at night.	All NCAs
M3	Warehouse container operation (reach stacker)	Night	Inversion risk conditions medium or greater (ie. Class E/F)	0.5 – 3m/s (all directions)	Noise emissions $L_{Aeq\ 15minute}$	Containers are taken to warehouses combi lifts or straddle carriers only.	All NCAs
Casula noise management							
M4	Container truck loading activity noise emissions	Evening	Inversion risk conditions medium or greater (ie. Class E/F)	0.5 – 3m/s (NE to S)	Noise emissions $L_{Aeq\ 15min}$	Schedule trucks loading/unloading activities so that the number of trucks that would be loaded/unloaded within a 15-minute period would be limited to 9 truck movements. Other trucks to wait at the truck arrival area with engine switched off. When truck movements are greater than 6 movements in a 15-minute period (and no more than 9) in the evening, see M5 for warehouse container operations linked mitigation.	Casula

Figure 3-3: Recommended mitigation measure (NIA, RTA, August 2023)

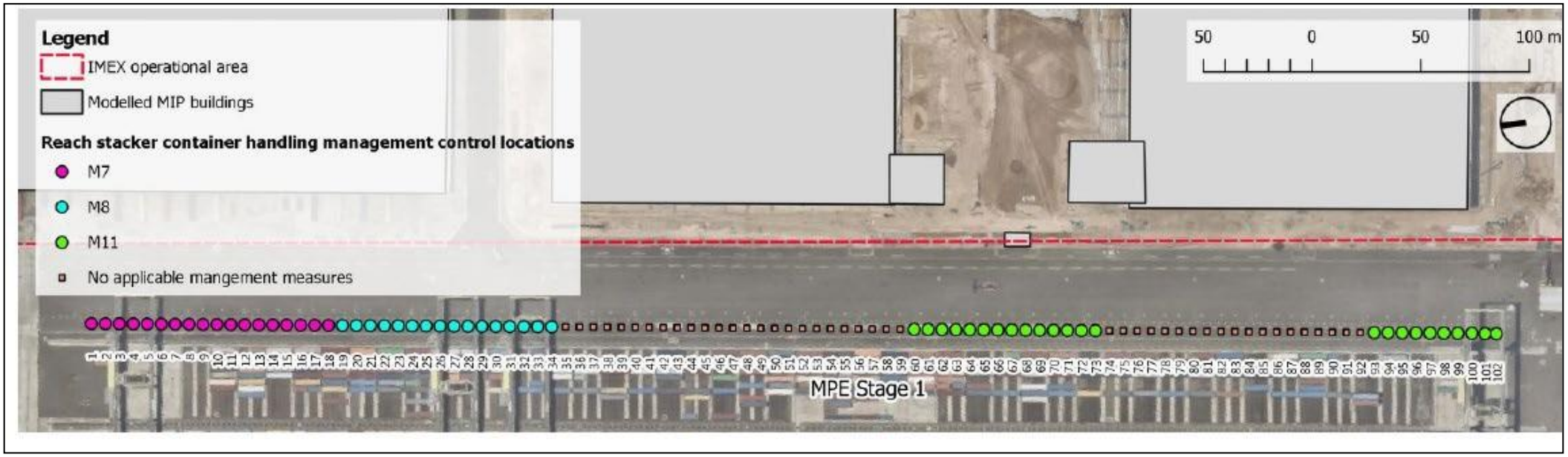
Item	Applicable activity / noise source	Applicable assessment periods Evening: 6pm – 10pm Night: 10pm – 7am	Applicable when meteorological conditions include temperature inversions OR wind as per below		Applicable for	Details	NCAs benefiting from mitigation measure
			Temperature inversion	Wind[1]			
M5	Warehouse container operations	Evening	Inversion risk conditions medium or greater (ie. Class E/F)	0.5 – 3m/s (NE to S)	Noise emissions $L_{Aeq\ 15min}$	When truck movements through the facility are greater than 6 movements in a 15-minute period, container movements to warehouses are not permitted. There should be no more than 9 truck movements in a 15-minute period (as per M4). Container movements to warehouses can only happen when truck movements through the facility are 6 trucks or less in a 15-minute period, and they are to be moved by combi lift or straddle carriers.	Casula
M6	Container truck loading activity noise emissions	Night	Inversion risk conditions low (ie. Class D)	All wind up to 3m/s (NE to S)	Maximum noise levels events (L_{Amax}) Noise emissions $L_{Aeq\ 15min}$	**Strategic container stacking (where no containers)** Where truck container loading/unloading is to take place in a location where there are no containers in the yard in the immediate vicinity of the operations, containers should be placed there to a minimum 2 containers high. These containers are to extend either side north/south of where container loading will take place for a minimum 4 containers in length. See note 2.	Casula
M7	Container handling high noise events	Night	Inversion risk conditions medium or greater (ie. Class E/F)	0.5 – 3m/s (NE to S)	Maximum noise levels events (L_{Amax})	**Strategic container stacking (yard containers up to 2 high)** Assuming the container yard is a minimum 2 containers high in the immediate night operations area (as per M6), truck container loading/unloading is to take place outside of the following locations during the night: • Slots 1 to 18 (inclusive)	Casula
M8	Container handling noise emissions	Night	Inversion risk conditions medium or greater (ie. Class E/F)	0.5 - 3m/s (NE to S)	Maximum noise levels events (L_{Amax}) Noise emissions $L_{Aeq\ 15min}$	**Strategic container stacking (yard containers up to 2 high)** Where truck container loading/unloading is proposed for: • Slot 19 to 34 (inclusive), and • existing containers are up to 2 high (per M6), the yard containers are to be increased to a minimum 4 high and extend either side of where container loading will take place for a minimum 4 containers in length. See note 2.	Casula

Figure 3-4: Recommended mitigation measure (NIA, RTA, August 2023)

Item	Applicable activity / noise source	Applicable assessment periods Evening: 6pm – 10pm Night: 10pm – 7am	Applicable when meteorological conditions include temperature inversions OR wind as per below		Applicable for	Details	NCAs benefiting from mitigation measure
			Temperature inversion	Wind[1]			
M9	Container truck loading activity noise emissions	Night	Inversion risk conditions medium or greater (ie. Class E/F)	0.5 – 3m/s (NE to S)	Noise emissions $L_{Aeq\ 15min}$	Schedule trucks loading/unloading activities so that up to 6 trucks are loaded/unloaded within a 15-minute period. Other trucks to wait at the truck arrival area with engine switched off. When truck movements are greater than 4 movements in a 15 minute period (and no more than 6) in the night, please see M10 for warehouse container operations linked mitigation.	Casula
M10	Warehouse container operations	Night	Inversion risk conditions medium or greater (ie. Class E/F)	0.5 – 3m/s (NE to S)	Noise emissions $L_{Aeq\ 15min}$	When truck movements through the facility are 4 or greater within a 15-minute period, container movements to warehouses are not permitted. There should be no more than 6 truck movements in a 15-minute period (as per M9). Container movements to warehouses can only happen when truck movements through the facility are 4 trucks or less in a 15-minute period, and they are to be moved by combi lift or straddle carriers.	Casula
Wattle Grove noise management							
M11	Container handling noise emissions and high noise events	Night	Inversion risk conditions medium or greater (ie. Class E/F)	0.5 - 3m/s (NW to SW)	Maximum noise levels events (L_{Amax}) Noise emissions $L_{Aeq\ 15min}$	Assuming the eastern container yard is a minimum 2 containers high, truck container loading/unloading is to take place outside of the following locations during the night period: • Slots 60 to 73 • Slots 93 to 102	Wattle Grove
M12	Warehouse container operation (WH7)	Evening and Night	Inversion risk conditions medium or greater (ie. Class E/F)	0.5 – 3m/s (NW to SW)	Noise emissions $L_{Aeq\ 15minute}$	Containers to be taken to WH7 only by combi lifts or straddle carriers during the evening and night.	Wattle Grove

Notes
1. Wind directions apply to + or minus 22.5 degrees from the indicated wind direction.
2. In all cases, the containers being used to shield for noise are to be located no further than 1 metre apart, and a minimum of 2 containers deep is required. If this is not the case containers will not provide an effective barrier for the majority of receivers it is protecting.
3. LAeq15minute management measures assume that all MPW (north) warehouses will be constructed, when determining measures to achieve a suitable contribution to Casula receivers.

Figure 3-5: Reach stacker container handling high noise events management - management zones (RTA, NIA, August 2023)



3.5.2.1 Additional Mitigation Measures

A number of additional management measures have been identified to be implemented to manage noise emissions during night-time operations. These measures are based on the requirements of the CoC, as well as Qube's Environmental Management System requirements and standards. These measures are summarised in Table 3-5.

Table 3-4 Management measures during night-time operations of the IMEX Terminal

ID	Management Measure	Timing	Responsibility	Reference
CN-1	A specific induction will be provided to all staff, contractors and sub-contractors working within the IMEX Terminal with an emphasis on understanding the requirements of this Plan and managing noise impacts during night-time operation of the IMEX Terminal.	Duration of Operations	Site SHEQ Manager/Advisor for MPE IMEX Terminal Manager Shift Supervisor All personnel	F5A (SSD 6766) F5B (SSD 6766) F5C (SSD 6766)
CN-2	Meteorological conditions will be monitored during the night-time period.	Duration of Operations	Shift Supervisor	F5C (SSD 6766)
CN-3	In the event of a monitored exceedance during night-time periods further investigation would be undertaken to confirm. Where appropriate the suspected noise source works would cease or reduce and an investigation would be undertaken to determine potential sources and/or causes, plant and machinery would be checked and verified for noise levels and weather conditions would be recorded. In the event that an investigation does not identify any potential sources and/or causes for the exceedance, the following alternative mitigation measures would be implemented, where reasonable and feasible. • revisiting management measures/practices/sequencing etc to reduce noise levels and minimise impacts on receivers • If the noise surveys identify noise exceedances, Qube would engage a qualified acoustic consultant to provide recommendations to amend this Plan accordingly. • Recommendations made by the acoustic consultant would be implemented as soon as practical, where feasible and reasonable.	Duration of Operations	IMEX Terminal Manager Shift Supervisor All personnel	F5A (SSD 6766)
CN-4	To minimise container stacking and loading noise, manual handling (reach stacker, combilift, straddle carrier) operators would use work practices to ensure to place containers and not drop them onto the	Duration of Operations	IMEX Terminal Manager Shift Supervisor All personnel	F5A(a) (SSD 6766)

ID	Management Measure	Timing	Responsibility	Reference
	hardstand, vehicles or container stacks.			
CN-5	All plant and equipment used at the IMEX Terminal would be maintained in a proper and efficient condition, and operated in a proper and efficient manner.	Duration of Operations	IMEX Terminal Manager Shift Supervisor All personnel	F5A(a) (SSD 6766)
CN-6	In the event of any night-time noise related complaint or adverse comment from the community as managed by the Precinct Operator, noise emission levels would be investigated. Remedial action would be implemented where feasible and reasonable in accordance with this management plan. The procedures for managing complaints is provided within the Community Communication Strategy managed by the Precinct Operator.	Duration of Operations	IMEX Terminal Manager Shift Supervisor All personnel	F5A(b) (SSD 6766) F5A(d) (SSD 6766)
CN-7	Manual stacker loading and unloading of the trains has ceased and permanent electrified automatic night-time stacking of containers has commenced. This subsequently reduce noise impacts associated with container stacking and loading within the container yard.	During Automatic Operation	IMEX Terminal Manager Shift Supervisor	F5A(a) (SSD 6766)

4 MONITORING AND REVIEW

4.1 Monitoring Requirements

Noise monitoring will be conducted as per the requirement of this Plan and the CoC. Noise measurements shall be undertaken consistent with the procedures documented in NSW EPA-*Noise Policy for Industry* (2017), which supersedes the NSW EPA Industrial Noise Policy (2000).

Noise monitoring procedures, locations and reporting will be completed in accordance with the latest approved MPE Stage 1 ONVMP.

4.2 Exceedances of Monitoring Criteria

Monitoring criteria applicable to the Condition F5A Management Plan are provided in Section 3.4. In the event that noise from the IMEX Terminal during night-time operations exceeds the operational noise criteria for the night-time period at nearby residential receivers, the following activities will be undertaken to determine the potential causes and/or sources and whether consideration of additional mitigation measures are required to minimise potential impacts.

- Identification of the monitored exceedance is to be reported to the Site HSEQ Manager/Advisor.
- Works identified as causing the exceedance will cease or reduce, at the direction of the Shift Supervisor, and an investigation will be undertaken to determine the potential sources and/or causes.
- Determine if the exceedance is an atypical or single occurrence, or sustained occurrence.
- Plant and machinery will be checked and verified for noise levels and appropriate exhaust/fittings/noise attenuators.
- Weather conditions at the time of the exceedance will be recorded.

In the event that a review of activities did not identify any potential sources and/or causes for the noise, the following alternative mitigation measures will be implemented, where reasonable and feasible.

- revisiting management measures/practices/sequencing to reduce noise levels and minimise impacts on receivers
- If the noise surveys identify noise exceedances, Qube will engage a qualified acoustic consultant to provide recommendations to amend this Plan accordingly.
- Recommendations made by the acoustic consultant will be implemented as soon as practical, where feasible and reasonable.

4.3 Review and Improvement

Review and improvement of this plan will be undertaken in accordance with the CoC and Section 6.2 of the OEMP [PREC-QPMS-EN-APP-00001]. Continuous improvement opportunities will be captured through the ongoing evaluation of environmental management performance and effectiveness of this plan against environmental policies, objectives and targets.

A copy of any updated plan and changes will be distributed to all relevant stakeholders in accordance with the approved document control procedure, as outlined in Section 1.4.1 of the OEMP. Copies of the detailed reports and the Plan (as amended) will be made available on the Project Website.

4.4 Incidents

All night-time operational noise incidents will be reported and managed in accordance with LOGOS Incident Reporting & Management Procedure (WHSMS-LOGOS-007) and Qube's Incident Reporting and Management Procedure (SHEMS-QM-13-PR-0126). Incidents are classified based on the incident's severity as shown in Section 4.6 of the OEMP [PREC-QPMS-EN-APP-00001].

All incidents will be managed and reported according to Section 4.6 of the OEMP.

4.5 Complaints

Complaints handling will be undertaken in accordance with Section 4.5.1 of the OEMP and the Community Communication Strategy (as managed by the Precinct Operator).

4.6 Non-Compliance, Non-Conformances and Corrective Actions

Non-compliance, non-conformances and resulting corrective actions will be managed in accordance with Section 6.4 of the OEMP.

Moorebank Intermodal Precinct

APPENDIX E – WATER QUALITY MONITORING REPORTS

MOOREBANK PRECINCT EAST STAGE 2: BIODIVERSITY MONITORING IN ANZAC CREEK

SPRING 2023 SURVEY

Report Prepared for
ARCADIS

9 January 2024

BIO-ANALYSIS Pty Ltd
Marine & Freshwater Ecology
2/1 Botham Close, Charmhaven, NSW 2263
(Mobile) 0414 477 066; (Email) info@bioanalysis.com.au

Document Information

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Contact Information

Dr Sharon Cummins
Telephone: 043 811 2962
Email: cumminssharon@bigpond.com

Dr Dan Roberts
Telephone: 0414 477 066
Email: dan@bioanalysis.com.au

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EXECUTIVE SUMMARY

Introduction

The Sydney Intermodal Terminal Alliance (SIMTA) received approval for the construction and operation of Stage 2 (the Project) of the Moorebank Precinct East (MPE) Project, which comprises the second stage of development under the MPE Concept Approval (MP10_0193) and approved under Development Approval SSD 7628.

The MPE site, including the Project site, is located approximately 27 km south-west of the Sydney Central Business District (CBD) and approximately 26 km west of Port Botany and includes the former Defence National Storage and Distribution Centre (DNSDC) site. The MPE site is situated within the Liverpool Local Government Area (LGA), in Sydney's Southwest subregion, approximately 2.5 km from the Liverpool City Centre.

The MPE Project involves the development of an intermodal facility including warehouse and distribution facilities, freight village (ancillary site and operational services), stormwater infrastructure, landscaping, servicing and associated works on the eastern side of Moorebank Avenue. Stage 2 of the MPE Project (MPES2) involves the construction and operation of warehousing and distribution facilities on the MPE site and upgrades to approximately 2.1 kilometres of Moorebank Avenue.

Water during construction will be managed in accordance with the currently approved Construction Environmental Management Plan (CEMP) and will be discharged into the sediment (SED) Basins and into Anzac Creek (via DP5 and DP7). It was also considered likely that runoff from some areas of the MPES2 site would be collected by a vegetated dam situated within Commonwealth Department of Defence land. Flow from this dam enters Anzac Creek upstream of Site AQ14 via a culvert.

A Baseline Aquatic Ecological Monitoring Program (BAEMP) was developed by Biosis Pty Ltd for Arcadis in March 2018, to address CoC B106. The purpose of the BAEMP was to establish baseline stream health and water quality conditions within selected sites along Anzac Creek prior to commencement of Early Works. This was undertaken in autumn 2018. Construction activities commenced soon after.

The baseline monitoring forms the basis for the ongoing Biodiversity Monitoring Strategy (BMS) to assess stream health in accordance with CoC B106, to determine any change in stream health or water quality throughout the life of the Project and to ascertain whether these changes can be attributed to the Project works. The BMS outlines monitoring requirements and includes the Stormwater Monitoring Strategy required by CoC B43 and B44.

BIO-ANALYSIS Pty Ltd was commissioned by Arcadis on behalf of Tactical Group to assess stream health and water quality at six monitoring sites along Anzac Creek (the Study Area) in spring 2023, in accordance with the BMS.

Methods

The BMS focusses on four main indicators: i) aquatic habitat, including riparian habitat, aquatic macrophytes and fish habitat; ii) surface water quality and sediment characteristics; iii) aquatic macroinvertebrates sampled using the Australian River Assessment System (AUSRIVAS) protocol; and iv) fish sampled using a backpack electro-fisher.

The primary aim of monitoring is to determine whether any change in stream health or water quality occur throughout the life of the MPE Project in accordance with the BMS and to ascertain whether these changes can be attributed to the Project works. Should an indicator variable deteriorate below the range for its baseline value, a stream health investigation protocol is to be initiated under the BAEMPs Adaptive Management Plan.

The sampling design included six sites (approximately 100 m in length). Site AQ1 is situated upstream of the MPE Project. Sites AQ4, AQ8, AQ12, AQ13 and AQ14 are situated at increasing distances downstream of the MPE Project. Stream health monitoring is to be done on two occasions within each of autumn and spring.

The results of the spring 2023 monitoring event were compared with those obtained in autumn 2018 (baseline), spring 2018, autumn and spring 2019, autumn and spring 2020, autumn and spring 2021, autumn and spring 2022, and autumn 2023 (during construction).

Results

This report presents the results of i) spring 2023 surveys 1 and 2 and ii) comparisons of the findings of the current survey with the Baseline survey (autumn 2018) and subsequent surveys done each autumn and spring.

Within the current reporting period (after June 2023), two construction discharges occurred via DP 7. There was no exceedance (as per communication with Tactical) and no sediment was evident along the discharge pathway. Extensive cover by vegetation within the riparian zone and stream channel contribute stability to the refuge pool and the majority of Anzac Creek.

Throughout the survey period, concentrations of lead in sediments collected at Site AQ1 (range = 21 to 130 mg/kg) continue to exceed the guideline value (50 mg/kg), including at the time of the baseline (91 mg/kg) survey. Copper, nickel and zinc have occasionally exceeded guideline values, but total petroleum hydrocarbons and poly-fluoroalkyl substances (e.g. PFAS and PFOS), continue to comply. Site AQ1 is situated upstream of potential inputs from the Project, so no additional testing at this site is considered necessary.

Reduced dissolved oxygen levels, elevated nitrogen, aluminium, copper and zinc measured at the refuge pool (Site AQ12), including prior to commencement of the Project, have consistently suggested that aquatic habitat and biota within Anzac Creek are influenced by various types of anthropogenic disturbance. Recent dry conditions and the presence of accumulations of macro-algae within the pool are also likely to have contributed to poor water quality. Importantly, the data collected to date indicate that there has been no further degradation of water quality since the Project related construction work began.

Over the course of the monitoring program, the diversity of aquatic macroinvertebrates, Australian River Assessment System (AUSRIVAS) and Stream Invertebrate Grade Number Average Level (SIGNAL2) scores have been relatively low, indicating that the aquatic macroinvertebrate fauna have experienced one or more forms of human impact. Despite this, some pollution tolerant taxa have commonly been identified, including dragonfly, caddis fly and mayfly families. Importantly, comparison of the AUSRIVAS and SIGNAL2 scores

between the baseline and construction phase continue to indicate an overall stability in aquatic health.

Altogether, ten species of fish have been collected from within the refuge pool: three native species of gudgeon, two native species of eel, one native galaxiid species, one native cat-fish species and three introduced species (Gambusia, Goldfish and Oriental weatherloach), confirming that the creek does provide some habitat for native species of fish. All of the species caught are common within NSW. No threatened species of fish listed under the *NSW Fisheries Management Act, 1994* or the *Environment Protection and Biodiversity Conservation Act, 1999* have been recorded.

Conclusions

Examination of the results from the spring 2023 monitoring event found no evidence of changes in the indicator variables (bed and bank stability, surface water and sediment quality, assemblages of aquatic macroinvertebrates and fish) that could be attributed to the Project works. Thus, in accordance with the Biodiversity Monitoring Strategy, no adaptive management contingency measure was triggered.

Recommendations

It is recommended that the stream health monitoring programme is continued using the methods employed for baseline and operation phase surveys, to ensure continuity of the program.

In addition, it is recommended that Land Managers focus on containment and on-going suppression of the Alligator Weed infestation at Site AQ1 and downstream habitats, and the aquarium plant, Egeria, detected within the refuge pool at Site AQ12 in spring 2020 and 2023. Signage and public information at popular points of entry by the public to the creek and other local waterways may reduce the chance of unintentional human-assisted introductions (e.g. by using live bait, or by being released by aquaria) of aquatic plants and fish.

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1.0 INTRODUCTION

The Sydney Intermodal Terminal Alliance (SIMTA) received approval for the construction and operation of Stage 2 (the Project) of the Moorebank Precinct East (MPE) Project, which comprises the second stage of development under the MPE Concept Approval (MP10_0193) and approved under Development Approval SSD 7628.

The MPE site, including the Project site, is located approximately 27 km south-west of the Sydney Central Business District (CBD) and approximately 26 km west of Port Botany and includes the former Defence National Storage and Distribution Centre (DNSDC) site. The MPE site is situated within the Liverpool Local Government Area (LGA), in Sydney's Southwest subregion, approximately 2.5 km from the Liverpool City Centre.

The MPE Project involves the development of an intermodal facility including warehouse and distribution facilities, freight village (ancillary site and operational services), stormwater infrastructure, landscaping, servicing and associated works on the eastern side of Moorebank Avenue. Stage 2 of the MPE Project involves the construction and operation of warehousing and distribution facilities on the MPE site and upgrades to approximately 2.1 kilometres of Moorebank Avenue. Warehouses 1, 3, 4, 5 and 7a are now operational. The location of Warehouses 6-8[1] was left as compacted pads until earthworks for the construction of Warehouses 6 and 7 commenced on 9/06/22. Operation of Warehouses 6 and 7b are expected to commence in Quarter 4 of 2023 and Quarter 2 2024 (respectively). Water during construction will be managed in accordance with the currently approved CEMP and will be discharged into the sediment (SED) Basins and discharged into Anzac Creek (via DP5 and DP7).

BIO-ANALYSIS Pty Ltd has been commissioned by Arcadis on behalf of Tactical Group to assess stream health and water quality along Anzac Creek (the Study Area) in spring 2023. Monitoring is to be done in accordance with a Biodiversity Monitoring Strategy (BMS) developed by Biosis (2018) to satisfy the Minister's Conditions of Consent (CoC) B106. The BMS also includes the Stormwater Monitoring Strategy required by CoC B43 and B44.

[1] Following a redesign of MPE, only Warehouses 6 and 7 will be constructed within the area designated for Warehouses 6-8. Warehouse 8 will no longer be constructed.

The primary aim of monitoring is to determine whether any change in stream health or water quality occur throughout the life of the MPE Stage 2 (MPES2) Project in accordance with the BMS and to ascertain whether these changes can be attributed to the Project works. Sampling commenced in autumn 2018 (Biosis, 2018).

2.0 METHODS

2.1 Study Area

Anzac Creek is a small tributary of the Georges River and lies entirely within the Liverpool Local Government Area. The catchment covers an area of approximately 10.6 km^2 (Figure 1).

The headwaters of Anzac Creek lie within the Commonwealth Department of Defence Lands in Moorebank. The creek is approximately 4 km long and highly urbanised: it flows past the suburb of Wattle Grove, underneath the M5 and Heathcote Road intersection, through the Moorebank Industrial Area and underneath Newbridge Road.

While predominantly ephemeral, Anzac Creek has been noted to hold permanent water in isolated pools (Arcadis, 2016). An unnamed first order tributary of Anzac Creek flows from south to north along the eastern boundary of the MPE Project area (GHD, 2016).

Surface water from the MPES2 site was expected to enter Anzac Creek as a licensed discharge between Site AQ4 and AQ8 (Figure 1). It was also considered likely that runoff from some areas of the MPES2 site would be collected by a vegetated dam situated within Commonwealth Department of Defence land (Biosis, 2018). Flow from this dam enters Anzac Creek upstream of Site AQ14 via a culvert (Figure 1).

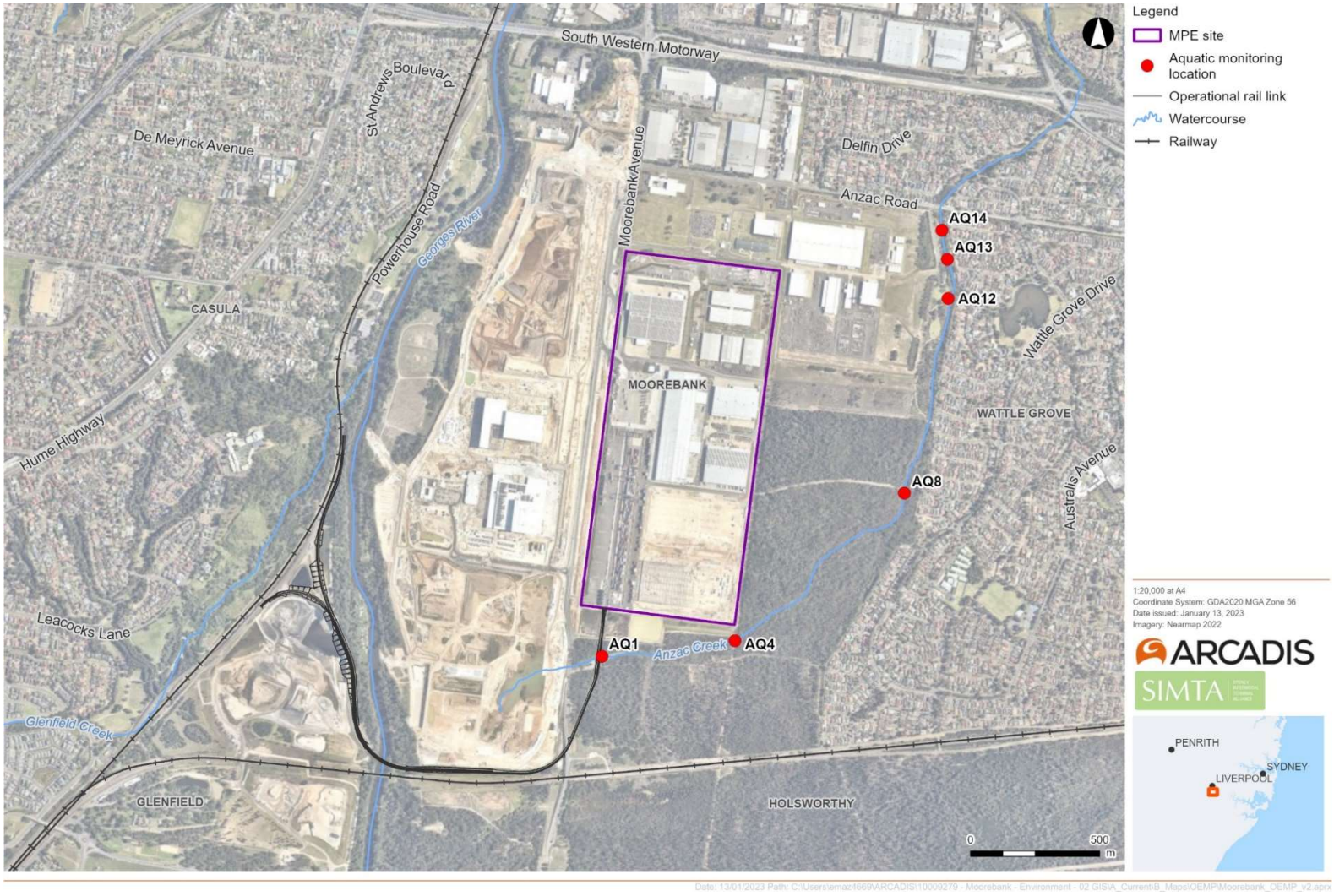

Figure 1. Project Location

2.2 Sampling Dates

The dates and phases of the stream health monitoring program for the MPES2 Project are outlined in Table 1.

Table 1. Date and information on aquatic ecology monitoring completed for the Project.

Project Phase	Event	Dates	Comments
Baseline	Autumn 2018	12&19 April 2018	Only one Baseline survey was able to be sampled in autumn 2018, due to the May 2018 bushfire.
Construction	Spring 2018	6&12 December 2018	
Construction	Autumn 2019	14&30 May 2019	Construction of culvert upstream of Site AQ1 largely completed on 30 May 2019. Site AQ12 was inaccessible to undertake Survey 2 due to restricted access.
Construction	Spring 2019	24 September 2019 21 November 2019	Warehouses 3 and 4 under construction. Moorebank Ave upgrade works ongoing.
Construction /Operation	Autumn 2020	25 May 2020 2 September 2020	Sampling required for the autumn 2020 survey season was unable to commence until late May 2020 due to COVID-19 related delays. The second survey was further delayed due to the time taken to receive parts required to repair the Electrofisher. Warehouses 3 and 4 were operational whilst Warehouse 5 was under construction. Moorebank Ave upgrade works ongoing.
Construction /Operation	Spring 2020	11&30 November 2020	Warehouses 3, 4 and 5 were operational. No further warehouses were being constructed at the time of monitoring
Construction /Operation	Autumn 2021	28 April 2021 11 June 2021	Warehouses 3, 4 and 5 are now operational and the location of Warehouses 6-8 have been left as compacted pads. Any water sheets off into the SED Basin and discharges into ANZAC Creek (via DP5 and DP7). No warehouses were being constructed at the time of monitoring.
Construction /Operation	Spring 2021	21 September 2021 8 November 2021	As above
Construction /Operation	Autumn 2022	5 & 31 May 2022	As above
Construction /Operation	Spring 2022	10 October 2022 30 November 2022	Warehouses 6&7 earthworks commenced on 9/06/22.
Construction /Operation	Autumn 2023	18 May & 3 July 2023	Warehouses 6&7 earthworks completed. It is expected that these warehouses will become operational in Q3 of 2023.

Project Phase	Event	Dates	Comments
Construction /Operation	Spring 2023	20 September & 15 November 2023	Warehouse 7a is now operational. Warehouses 6&7 earthworks completed. Operation of Warehouse 6 and 7b are expected to commence in Quarter 4 of 2023 and Quarter 2 2024.

2.3 Performance Measures and Indicators

No instream or riparian works are being undertaken as part of the Project. Alteration to hydrology (increased stormwater inputs from both the stormwater network and surface flows from increases in non-permeable surfaces) and earthworks that have the potential to mobilise sediments into Anzac Creek were identified as potential impacts associated with the construction phase of the project (Biosis, 2018).

Biosis (2018) indicated that increased stormwater inputs to Anzac Creek could result in:

- Bed and bank scour as a result of increased volume and velocity of water during rainfall events;
- Alterations in vegetation structure as a result of altered hydrological regime;
- Introduction of sediments and pollutants via stormwater, with common pollutants including nitrogen, phosphorous, copper, aluminium and zinc.

Water Sensitive Urban Design (WSUD) measures such as onsite detention basins and rainwater gardens were incorporated into designs for the Project to mitigate impacts. A key outcome of this monitoring program was to determine whether these measures functioned as intended. Six monitoring sites (Sites AQ1, AQ4, AQ8, AQ12, AQ13 and AQ14 (Figure 1) are to be assessed in accordance with the BMS to satisfy the CoC B43, B44 and B106 (Table 2). The assessment types to be applied at each site are outlined in Table 2.

Should an indicator variable deteriorate below the range for its baseline value, a stream health investigation protocol is to be initiated under the BAEMPs Adaptive Management (Table 3).

Baseline values are presented in Table 4, Table 5 and Table 6 (Results).

Table 2. Assessment types recommended for each monitoring site (Biosis, 2018).

Assessment Type	Assessment Protocol/ Indicator Variable	AQ1	AQ4	AQ8	AQ12	AQ13	AQ14
Visual	DPI Classification	√	√	√	√	√	√
	NSW AUSRIVAS	√	√	√	√	√	√
	HABSCORE	√	√	√	√	√	√
	Ephemeral Stream Assessment	√	√	√	√	√	√
Surface Water & Sediment Quality Monitoring	*In situ* water quality				√		
	Nutrient, dissolved metal & PFAS				√		
	Sediment & PFAS	√	√				√
Aquatic Macroinvertebrates	NSW AUSRIVAS & Signal2				√		
Fish	Assemblage structure				√		

Table 3. Indicator variables and adaptive management contingency measures.

Result	Potential Problem	Contingency measure
Increases in results of water quality parameters	Introduction or exacerbation of pollutants entering Anzac Creek.	Identify source and undertake corrective measures.
Reduction in results of biological monitoring	Subtle effects of construction and operation are influencing stream health within Anzac Creek.	Identify components causing decline. Assess feasibility of suitable corrective actions. If corrective measures can be implemented, these aspects are to be the focus of future monitoring. If corrective measures cannot be implemented, regulatory authority to be notified of change.
Increase scour of bed and banks of waterways	Reduction in bed and bank stability or loss of instream vegetation.	Identify point source/s of increased flow velocities or changes in stream hydraulics and discuss with project engineers to determine best methods for flow reduction or rectification of stream hydraulics

2.4 Field Methods

To fulfil the requirements of the BMS, monitoring is to be undertaken at 6 sites along Anzac Creek (Figure 1) four times annually during the pre-construction and construction phases of the Project, with the frequency reduced to twice annually during the operational phase of the Project. Surveys should take place during autumn and spring (Biosis, 2018). Sites are to be assessed using the methods outlined below, in accordance with Table 2.

2.4.1 Visual Stream Assessments

A visual assessment was undertaken at each site regardless of the availability of aquatic habitat (i.e. wet or dry). The condition of aquatic habitat at each site was assessed according to the *NSW Department of Primary Industries Policy and Guidelines for Fish Habitat Conservation and Management* (DPI NSW, 2013). The two key indices were habitat *type* and *class*.

Information on stream characteristics was recorded at each site in accordance with the New South Wales (NSW) Australian River Assessment System (AUSRIVAS) protocol (Turak et al., 2004). Characteristics recorded included a visual assessment of surrounding landforms, instream features, presence, extent and type of aquatic vegetation, stream substratum, potential areas of refuge during low flow periods, presence of fish habitat, presence of barriers to fish movement, indicators of point source and diffuse pollution.

HABSCORE assessments were also completed at each site, based on the presence and condition of pool substratum characteristics, pool variability, channel flow status, bank vegetation and stability, width of riparian zone, and epifaunal substrate/cover. The *CSIRO Ephemeral Stream Assessment* guideline was also used to provide an assessment of the geomorphic integrity of each site and to identify the processes operating within each site.

Each site was photographed and the locations recorded with a hand-held GPS (satellite-based Global Positioning System).

2.4.2 Surface Water Quality & Sediment Monitoring

Where sufficient amounts of water were present, *in situ* water quality was measured using a Yeo-Kal 618 probe. Physico-chemical properties measured included electrical conductivity (µS/cm), dissolved oxygen (% saturation and mg/L), pH (pH units), temperature (°C) and turbidity (NTU). Three replicate measures of each variable were collected from just below the water surface at each site.

Alkalinity was also determined in the field at Site AQ12, using a CHEMetrics' total alkalinity field kit.

As required by the BMS, water chemical and sediment sampling were undertaken for a range of nutrients, metals and hydrocarbons:

- Total Phosphorus (surface water only);
- Total Kjeldahl Nitrogen (TKN) (Total Organic Nitrogen + Total Ammonia) (surface water only);
- Total Nitrogen (TKN + (Nitrate + Nitrite) (surface water only);
- Dissolved metals (standard 19 relevant to aquatic assessment) (surface water);
- Total metals (standard 19 relevant to aquatic assessment) (sediment only);
- Total petroleum hydrocarbons, BTEX (benzene, toluene, ethylbenzene, trimethylbenzenes and three xylene isomers) hydrocarbons;
- PFAS: Poly-fluoroalkyl substances (including Perfluorohexane sulfonate PFHxS).

Samples were sent to the National Measurement Institute (NMI) laboratory (a NATA accredited laboratory) for analysis.

Construction Discharges

All earthworks have been completed. Construction of the warehouses was above ground and included fit-out. Two construction discharges occurred via DP 7 within the reporting period (after June 2023). There was no exceedance (as per communication with Tactical) and no sediment was evident along the discharge pathway.

2.4.3 Aquatic Macroinvertebrates

Aquatic macroinvertebrates were required to be collected by the BMS at Site AQ12 (Biosis, 2018) using the NSW AUSRIVAS protocol (Turak et al., 2004). Biosis (2018) considered this large pool to provide reliable and valuable aquatic habitat. Stream edge habitats were sampled using a 250 µm dip net.

The contents of each net sample were placed into a white sorting tray and animals collected for a minimum period of 30 minutes. Thereafter, removals were done in 10-minute periods, up to a total of one hour (Turak et al., 2004). If no new taxa were found within a 10-minute period, removals ceased (Turak et al., 2004). The animals were collected and placed inside a labelled container and preserved with 70 % alcohol.

In the laboratory, taxa were identified to family level with the exception of Acarina (to order), Chironomidae (to sub-family), Nematoda (to phylum), Nemertea (to phylum), Oligochaeta (to class), Ostracoda (to subclass) and Polychaeta (to class). Some families of Anisoptera (dragonfly larvae) were identified to species, because they could potentially include threatened aquatic species.

2.4.4 Fish Community Survey

Fish sampling is done at Site AQ12 using a Smith Root LR-24 backpack electrofisher. The Electrofisher is used to stun fish in open water, around the edge of the pool, around snags and aquatic vegetation and any overhanging banks. All fish caught were identified and the length of up to 30 individuals of each species measured. Incidental observations such as evidence of disease were also noted before native fish species were returned to the water.

2.4.5 Data Analysis

Water quality measurements were used to assess health of the aquatic ecosystem by comparison with guideline values recommended by ANZECC[2] and ARMCANZ[3] (2000) for the protection of lowland streams (i.e. systems at < 150 m altitude) in south-east Australia.

For aquatic macroinvertebrates, data were analysed using the appropriate AUSRIVAS predictive models developed for NSW. The ecological health of a waterway was assessed by comparing the macroinvertebrates collected at a site (i.e. Observed) to those predicted to occur (Expected) as if the site was in an undisturbed or 'reference' condition.

The principal outputs of the AUSRIVAS model include:

- Observed to Expected ratio (OE50): the ratio of the number of macroinvertebrate families collected at a site which had a predicted probability of occurrence of greater than 50 % (i.e. Observed) to the sum of the probabilities of all of the families predicted with greater than a 50 % chance of occurrence (i.e. Expected) (Ransom et al., 2004);
- BAND: for each model, the OE50 taxa ratios were divided into bands representing different levels of impairment. Band X represents a more diverse assemblage of macroinvertebrates than control sites; Band A was considered equivalent to reference condition; Band B represents sites below reference condition (i.e. significantly impaired); Band C represents sites well below reference condition (i.e. severely impaired); and Band D represents impoverished sites (i.e. extremely impaired) (Ransom et al., 2004).

The SIGNAL2 biotic index (Stream Invertebrate Grade Number Average level) developed by Chessman (2003) was also used to give an indication of water quality at the sites sampled. The SIGNAL score for a macroinvertebrate sample was calculated by averaging the pollution sensitivity grade numbers of the families present, which may range from 10 (most sensitive) to 1 (most tolerant). The SIGNAL2 scores from samples collected between autumn 2018 and autumn 2023 were presented graphically to provide an indication of changes over time.

[2] ANZECC – Australian and New Zealand Environment and Conservation Council
[3] ARMCANZ – Agriculture and Resource Management Council of Australia and New Zealand

2.4.6 Quality Assurance/Quality Control (QA/QC)

Data collected in the field were checked for accuracy and completeness before leaving each site. In the office, field data and other records were incorporated into appropriate excel data sheets and checked. Spreadsheets were locked prior to analysis to prevent accidental over-writes or corruption.

In the laboratory, macroinvertebrate samples were identified by an appropriately qualified staff member. Data for each sample were entered into an excel spreadsheet and then checked.

3.0 RESULTS

For the spring 2023 monitoring event, sites were sampled on 20 September 2023 (Survey 1) and 15 November 2023 (Survey 2). Each site was approximately 100 m in length with their GPS co-ordinates listed in Appendix A. Collections of fish and macroinvertebrates were completed in accordance with Section 37 of the *NSW Fisheries Management Act 1994* using Scientific Collection Permit Number P03/0032(B) and NSW Agriculture, Animal Research Authority Care and Ethics Certificate of Approval Number 03/2445.

3.1 Aquatic Habitat Characteristics

The section of Anzac Creek within the study area was not mapped as Key Fish Habitat (KFH) under the NSW DPI Key Fish Habitat mapping for the Sydney LGA (DPI 2007; Appendix A). Nevertheless, this section of Anzac Creek is ranked as TYPE 1 KFH according to the DPI (2013) classification scheme due to the presence of native aquatic plants and snags. According to the waterway CLASS scheme, a permanent pool with freshwater aquatic vegetation situated at Site AQ12 is considered CLASS 2 KFH. The remaining reaches of Anzac Creek within the Study Area were considered to be CLASS 3 KFH despite the presence of aquatic vegetation, due to the ephemeral nature of any pools that were present (DPI, 2013).

Vegetation within the channel and banks of Anzac Creek has been classified as Parramatta Red Gum woodland in high condition (GHD, 2016).

Within the two months prior to the 2023 spring Survey 1 (20 September 2023) and 2023 spring Survey 2 (15 November 2023), a total of 66 mm and 112 mm rainfall was recorded respectively by the meteorological station situated near Bankstown Airport (Station ID: 66137) (Figure 2).

All earthworks have been completed. Construction of the warehouses was above ground and includes fit-out. Two construction discharges occurred within the reporting period (after June 2023) via DP 7. There was no exceedance (as per communication with Tactical) and no sediment was evident along the discharge pathway.

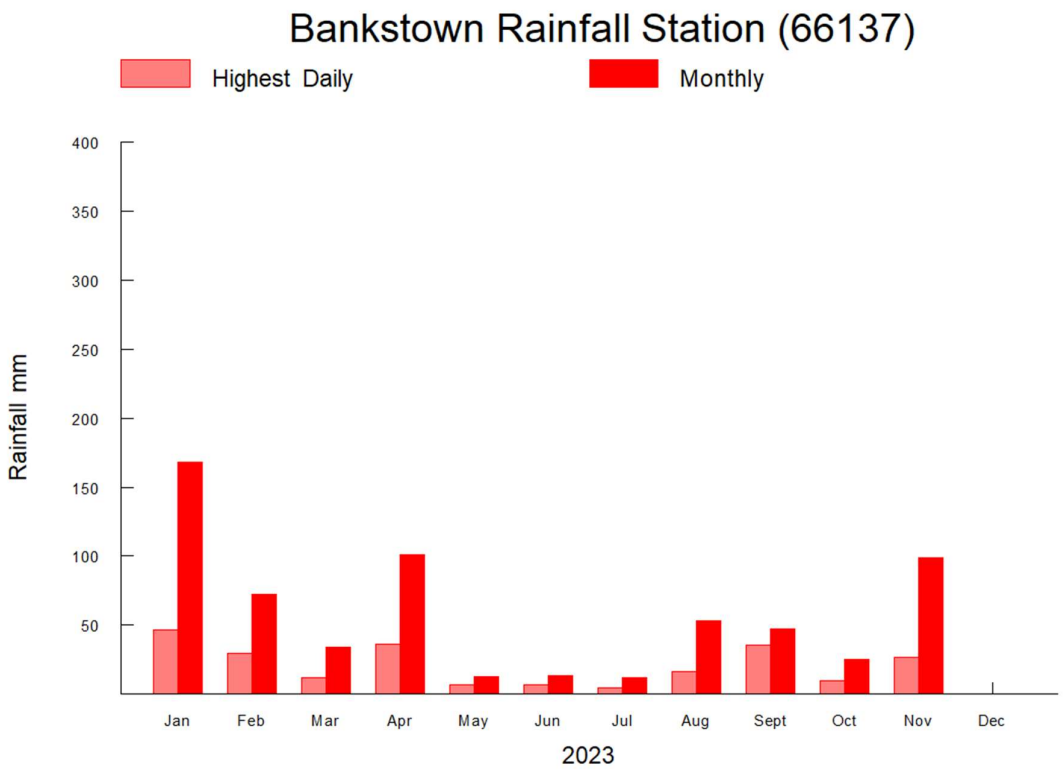

Figure 2. Rainfall (mm) measured at Bankstown Rainfall Station (66137) between 1 January and 30 November 2023.

Site AQ1

Site AQ1 was situated approximately 750 m downstream of the source of Anzac Creek (Figure 1), and approximately 100 m downstream of a culvert built across Anzac Creek as part of the MPE Stage 1 project. The culvert was composed of box culverts to a length of 15 m and supports one rail track and a maintenance access footway. Construction of the culvert was completed by CPB and handed over to the proponent, Qube Holdings Limited, in July 2019.

The active channel zone at this site (up to approximately 5 m wide) remains stable (i.e., no signs of active erosion), due to the absence of flow, cover of remaining aquatic plants and the relatively intact woody riparian vegetation (Appendix 2). The channel bed consisted of fine sediment, the upper layers of which were anoxic (Plate 1).

Alligator Weed (*Alternanthera philoxeroides*) had recolonised much of the channel since autumn 2023 surveys and the first spring 2023 survey in September 2023 (Plates 1&2), most likely due to rainfall during November 2023. Native plant species included Marsh Club-rush (*Bolboschoenus fluviatilis*), Typha (*Typha* sp.), Slender knotweed (*Persicaria decipiens*) and *Myriophyllum variifolium*. The tree canopy was mostly comprised of *Melaleuca* spp. and *Eucalyptus* spp. (Plates 1&2).

Plate 1: AQ1 – View upstream (20/09/23)

Plate 2: AQ1 – View upstream (15/11/23)

Site AQ4

Site AQ4 was situated approximately 400 m downstream of Site AQ1 (Figure 1).

The stream channel at Site AQ4 has occasionally been dry, including at the time of the Baseline survey (i.e. autumn 2018). Since the autumn 2020 surveys, surface water has been observed along the study reach (up to approximately 0.4 m deep), including at the time of spring 2023 Survey 2 (up to approximately 0.15 m deep) but not Survey 1 (Plates 3&4).

Since the baseline survey, stands of the emergent macrophyte, Jointed Twig Rush (*Baumea articulata*) and Twig Rush (*Baumea rubiginosa*) have colonised a large proportion of the stream channel (Plates 3&4). Jointed Twig Rush and Twig Rush continues to be common (Plates 3&4). Typha, Slender Knotweed and Frog's Mouth (*Philydrum lanuginosum*) were also present.

The active channel zone, composed of fine sediments, was up to approximately 4 m wide (Plates 3&4). No indicators of significant erosion were observed suggesting that Anzac Creek continues to be relatively stable at this site, particularly since colonisation of the stream channel by emergent macrophytes and reduced flow within the creek since spring 2022 (Plate 3&4, Appendix 2).

Plate 3: AQ4 – View upstream (15/11/23)

Plate 4: AQ4 – View downstream (15/11/23)

Site AQ8

Site AQ8 was situated approximately 1 km downstream of Site AQ4 (Figure 1). At the time of Surveys 1 and 2, surface water was mostly absent.

Most notably, taller species of emergent macrophyte, including Jointed Twig Rush and Tall Spikerush (*Eleocharis sphacelata*) have encroached upon habitat previously dominated by Heron Bristle Sedge (*Chorizandra cymbaria*) (Plates 5&6). Other shorter plants, including Frogsmouth (*Philydrum lanuginosum*), Slender Knotweed and the introduced species, Umbrella Sedge (*Cyperus eragrostis*) have also declined in abundance. Riparian vegetation continues to be dominated by *Casuarina* trees. Common Reed/Phragmites (*Phragmites australis*) was present at the downstream end of the site. Blackberry (*Rubus fruticosus*), which is listed as a weed of national significance, was also present.

The stream channel at Site AQ8 (up to approximately 20 m wide) continues to be classified as stable, mostly due to the dense cover by emergent macrophytes in addition to a relatively intact, woody riparian zone (Appendix 2).

Plate 5: Site AQ8 – view upstream (20/09/23)

Plate 6: Site AQ8 – view downstream (15/11/23)

Site AQ12

Site AQ12 was situated approximately 750 km downstream of Site AQ8 (Figure 1). Similar to the findings of biodiversity surveys done since autumn 2018, a large pool (approximately 20 m wide) and a relatively diverse assemblage of aquatic plants, including submerged species, were present (Plates 7&8). The pool substratum was composed primarily of fine sediment with a considerable cover of detritus and green macro-algae.

Water level in the pool was up to approximately 0.7 m deep. Flow was apparent at the downstream end of the pool at the time of Survey 2 but not Survey 1. Water clarity was considered fair. Extensive cover of vegetation within the riparian zone contributes stability to the edges of the pool at Site AQ12. An area of active erosion was apparent at the downstream end of the pool since the autumn 2020 surveys, associated with heavy rainfall and bank overflows. Much of the scouring observed in spring 2022 has been re-colonised by exotic grasses.

The submerged macrophyte species, Ribbonweed (*Vallisneria* sp.) and *Potamogeton ochreatus* were common, in addition to Slender Knotweed and dense stands of Typha, Phragmites and Tall Spike Rush (Plate 7). *Nymphoides geminata* (Entire Marshwort), with mostly floating leaves, and accumulations of green filamentous algae continue to be abundant in areas close to the shore (Plates 7&8). Also noted during spring 2022, autumn and spring 2023 was the native perennial, *Utricularia* sp., which occurs on wet soil and in freshwater as terrestrial or aquatic species. Egeria (*Egeria densa*), which was collected close to the left-bank (facing downstream) of the pool in spring 2020, was present. Riparian vegetation included

Casuarina, Eucalyptus and Melaleuca trees and Spiny-head Mat-rush/Basket Grass (*Lomdandra longifolia*) (Plates 7&8).

Plate 7: Site AQ12 – view upstream (15/11/23)

Plate 8: Site AQ12 – view downstream (15/11/23)

Site AQ13

Site AQ13 was situated approximately 200 m downstream of Site (Figure 1). This site was located approximately 150 m downstream from an overflow channel that enters the creek from Wattle Grove. Water to a depth of approximately 0.6 m was present at Site AQ13 at the time of the second survey. Flow was apparent at the time of Survey 2 (Plates 9&10). There was an apparent anoxic layer covering the stream substratum.

A large proportion of the stream channel and edges were colonised by Typha and Slender Knotweed. The aquatic weed, *Sagittaria platyphylla* (Sagittaria) continued to expand its distribution within the channel of the creek. River Clubrush (*Schoenoplectus validus*) was also common. The stream channel appeared stable (Appendix 2).

Plate 9: Site AQ13 – view downstream (15/11/23)

Plate 10: Site AQ13 – view downstream (15/11/23)

Site AQ14

Site AQ14 was situated approximately 150 m downstream of Site AQ13 and immediately downstream of the culvert that links the dam within Commonwealth Department of Defence land to Anzac Creek (Figure 1). Flow was not apparent at the time of both spring 2023 surveys (Plates 11&12).

Typha, Slender Knotweed, River Clubrush and Whorled Pennywort/Shield Pennywort continue to be common (Plates 11&12). Sagittaria continued to expand its distribution within the channel of the creek (Plates 11&12). This section of Anzac Creek remains mostly stable due to dense instream vegetation and vegetated banks (Appendix 2). Water visibility was 'good' at the time of both surveys (Plates 11&12).

Plate 11: Site AQ14 – view downstream (20/09/23)

Plate 12: Site AQ14 – view upstream (15/11/23)

3.2 Water & Sediment Characteristics

3.2.1 Water Quality

Physico-chemical measurements were collected at Site AQ12 in accordance with the requirements of the BMS (cf Biosis, 2018) and at sampling sites where sufficient water was present to submerge a water quality instrument probe. The data were compared to the default trigger values (DTVs) recommended by ANZECC/ARMCANZ (2000) for the protection of slightly disturbed lowland river ecosystems in southeast Australia (Table 4).

Results from the 2023 spring surveys 1 and 2 indicated that:

- Water temperature was 12.9 to 19.0 °C at the time of survey 1. Temperature was unable to be measured during survey 2 due to instrument malfunction;
- pH (range = 6.5 to 8.3) was above the recommended DTV at site AQ12 at the time of Survey 2 but within range during Survey 1;
- Conductivity (range = 189 to 367 µS/cm) was within the recommended DTVs at all the sites sampled;
- Dissolved oxygen (DO) measurements (range = 29 to 80 % saturation) were below the lower DTV at all sites during Survey 1 and Survey 2;
- Turbidity levels were within the recommended DTV at all sites during spring 2023 (range = 4.7 to 35.8 NTU);
- Concentrations of total phosphorous (range = <0.05 mg/L) were within the recommended DTV (0.05 mg/L) at Site AQ12;
- Total nitrogen (range = 0.61 – 5.6 mg/L) exceeded the upper DTV (0.5 mg/L) at Site AQ12 during Survey 1 and Survey 2. Nitrogen levels commonly exceeded the upper limit, including at the time of the baseline survey (see Table 4);
- Total Kjeldahl Nitrogen (TKN) (Total Organic Nitrogen + Ammonia) measured at AQ12 during Survey 1 was considerably lower than the Total Nitrogen (TKN + (Nitrate + Nitrite) value, indicating that the source of nitrogen within the refuge pool at that time was most likely inorganic (e.g. fertiliser) rather than organic (e.g. algae or decomposing plant material) (Table 4). Similar TKN and TN values were recorded at the time of the second survey (Table 4).

A range of toxicants were also measured in the water between autumn 2018 (baseline) and spring 2023 (during construction) within the vicinity of Site AQ12 (Table 5&6) in accordance with the BMS (cf Biosis, 2018).

Results indicated that:

- Aluminium commonly exceeded the DTV (80 µg/L) (i.e. 13 of 20 surveys), including at the time of the baseline survey (260 µg/L), but not during autumn 2023 (Survey 1: 30 Survey 2: 42 µg/L);
- Cadmium exceeded the DTV (0.4 µg/L) at Site AQ12 in autumn 2019 (Survey 1: 0.49 µg/L; Survey 2: 0.41 µg/L) and autumn 2021 Survey 1 (3.8 µg/L), but not subsequently;
- Copper commonly exceeded the DTV (1.8 µg/L) (i.e. 14 of 20 surveys, including the baseline survey (2 µg/L) and during spring 2023 (Survey 1: 2.7 µg/L; Survey 2: 2.5 µg/L);
- Zinc exceeded the DTV during autumn 2021 (Survey 2: 20 µg/L) and autumn 2023 (Survey 2: 53 µg/L) (Table 5);
- BTEX compounds and total recoverable hydrocarbons were not detected (Table 6)
- PFOA (perfluoro-octanoic acid) was occasionally detected but has always been well within the recommended DTV (Table 6): PFOA was not detected during spring 2023(Table 6);
- PFOS was commonly detected, including during the spring 2023 (Survey 1: 0.031 µg/L; Survey 2: 0.032 µg/L) but continues to be within the recommended DTV (Table 6).

Table 4. Mean (± SE) physico-chemical water quality and nutrient values recorded at the time of the Baseline (autumn 2018, *n* = 1) and the spring 2023 (*n* = 3) surveys and the appropriate Default Trigger Values (DTV). Values highlighted in bold type indicate where results were outside the recommended DTV.

Indicator Variable	DTV*	Baseline[A]	Survey 1 (20/09/23)					
			AQ1	AQ4	AQ8	AQ12	AQ13	AQ14
Temperature °C (*n* =3)	-	-	I/A	I/A	I/A	19.0 (0.0)	15.5 (0.0)	12.9 (0.0)
pH (*n* =3)	**6.5-8.0**	7.01	I/A	I/A	I/A	6.8 (0.0)	6.9 (0.0)	7.0 (0.0)
Conductivity (µS/cm) (*n* = 3)	**125-2200**	354	I/A	I/A	I/A	319.7 (4.4)	367.3 (4.4)	234.0 (0.0)
Dissolved Oxygen (%) (*n* = 3)	**85-110**	**62**	I/A	I/A	I/A	**29.3** (0.7)	**57.4** (0.4)	**79.0** (0.1)
Turbidity (NTU) (*n* = 3)	**<50**	**91**	I/A	I/A	I/A	35.8 (0.7)	25.6 (0.4)	4.7 (0.0)
Alkalinity (mg/L) *(n* = 1)	-	-	N/R	N/R	N/R	16	N/R	N/R
Total Phosphorous (mg/L) *(n* = 1)	**0.05**	**0.58**	N/R	N/R	N/R	<0.05	N/R	N/R
Total Nitrogen (mg/L) *(n* = 1)	**0.5**	**8.2**	N/R	N/R	N/R	5.6	N/R	N/R
Total Kjeldahl (mg/L) *(n* = 1)	-	-	N/R	N/R	N/R	1.0	N/R	N/R
Indicator Variable	**DTV***	**Baseline**	**Survey 2 (15/11/23)**					
			AQ1	**AQ4**	**AQ8**	**AQ12**	**AQ13**	**AQ14**
Temperature °C (*n* =3)	-	-	I/A	9.0 (0.0)	I/A	I/M	I/M	I/M
pH (*n* =3)	**6.5-8.0**	7.01	I/A	6.9 (0.0)	I/A	**8.3** (0.0)	6.5 (0.0)	6.5 (0.0)
Conductivity (µS/cm) (*n* = 3)	**125-2200**	354	I/A	345.7 (2.3)	I/A	200.7 (0.7)	202.7 (0.9)	188.7 (0.3)
Dissolved Oxygen (%) (*n* = 3)	**85-110**	**62**	I/A	**82.4** (0.5)	I/A	**80.3** (0.3)	**70.3** (0.5)	**67.7** (0.3)
Turbidity (NTU) (*n* = 3)	**<50**	**91**	I/A	9.1 (0.2)	I/A	13.0 (0.3)	13.1 (0.5)	8.5 (0.3)
Alkalinity (mg/L) *(n* = 1)	-	-	N/R	N/R	N/R	30	N/R	N/R
Total Phosphorous (mg/L) *(n* = 1)	**0.05**	**0.58**	N/R	N/R	N/R	<0.05	N/R	N/R
Total Nitrogen (mg/L) *(n* = 1)	**0.5**	**8.2**	N/R	N/R	N/R	0.61	N/R	N/R
Total Kjeldahl (mg/L) *(n* = 1)	-	-	N/R	N/R	N/R	0.61	N/R	N/R

*ANZECC/ARMCANZ (2000) – slightly disturbed systems

[A] Baseline values for pH, conductivity, dissolved oxygen and turbidity were obtained from Site AQ12, whilst baseline data for phosphorous and total nitrogen were obtained from Site AQ11 (Biosis, 2018)

I/A: Insufficient Aquatic Habitat; N/R: Not Required; I/M: Instrument Malfunction. Samples were collected in the field and measured at the laboratory.

Table 5. Summary of dissolved metal compound results for Site AQ12 in autumn 2018 (Baseline), autumn and spring 2019, autumn and spring 2020 and autumn and spring 2023 (*n* = 1).

Indicator Variable	DTV* (µg/L)	Baseline Site AQ11	Autumn 2019 Site AQ12		Spring 2019 Site AQ12	
		April 2018	14/05/19	30/05/19	24/09/19	21/11/19
Aluminium pH >6.5	**80**	**260**	**150**	68	**2730**	**280**
Aluminium pH <6.5	**-**	**-**	**-**	-	**-**	-
Arsenic Total (µg/L)	**42**	<1	<1	<1	1.1	<1
Barium	**-**	2	55	34	21	32
Beryllium	**-**	<1	<1	<1	<1	<1
Boron	**680**	<50	20	17	14	14
Cadmium (µg/L)	**0.4**	<0.1	**0.49**	**0.41**	<0.1	<0.1
Chromium	**6**	<1	<1	<1	2.3	<1
Cobalt	**-**	<1	<1	<1	<1	<1
Copper (µg/L)	**1.8**	**2**	**2**	1.1	**3**	**2.3**
Iron	**-**	450	300	100	1650	900
Lead (µg/L)	**5.6**	<1	<1	<1	2.6	<1
Manganese	**2500**	3	33	6.2	60	47
Mercury (µg/L)	**1.9** [A]	<0.1	<0.1	<0.1	0.12	<0.1
Molybdenum	**-**	<1	<1	<1	<1	<1
Nickel (µg/L)	**13**	<1	<1	N/R	1.7	1.1
Selenium Total	**18**	<10	<2	<1	<1	<1
Strontium	**-**	52	120	120	73	53
Vanadium	**-**	<10	<1	<1	3.8	1.4
Zinc (µg/L)	**15**	<5	6.8	N/R	13	14

*ANZECC/ARMCANZ (2000) – slightly disturbed systems (90% species protection)
[A] = inorganic mercury; N/R: not recorded

Table 5 (Cont'd). Summary of dissolved metal compound results for Site AQ12 (*n* = 1).

Indicator Variable	DTV* (µg/L)	Baseline Site AQ11	Autumn 2020 Site AQ12		Spring 2020 Site AQ12	
		April 2018	25/05/20	2/09/20	11/11/20	30/11/20
Aluminium pH >6.5	**80**	**260**	**230**	70	**230**	**100**
Aluminium pH <6.5	**-**	**-**	-	**-**	**-**	-
Arsenic Total (µg/L)	**42**	<1	<1	<1	<1	<1
Barium	**-**	2	31	19	36	39
Beryllium	**-**	<1	<1	<1	<1	<1
Boron	**680**	<50	21	<5	32	31
Cadmium (µg/L)	**0.4**	<0.1	<0.1	<0.1	<0.1	<0.1
Chromium	**6**	<1	<1	<1	<1	<1
Cobalt	**-**	<1	<1	<1	<1	<1
Copper (µg/L)	**1.8**	**2**	**1.9**	<1	**2**	1.3
Iron	**-**	450	620	270	460	280
Lead (µg/L)	**5.6**	<1	1.5	<1	<1	<1
Manganese	**2500**	3	19	8.8	6.9	12
Mercury (µg/L)	**1.9** [A]	<0.1	<0.1	<0.1	<0.1	<0.1
Molybdenum	**-**	<1	1.3	<1	<1	1.1
Nickel (µg/L)	**13**	<1	1.1	<1	1.1	<1
Selenium Total	**18**	<10	<1	<1	<1	<1
Strontium	**-**	52	120	140	120	130
Vanadium	**-**	<10	<1	<1	<1	<1
Zinc (µg/L)	**15**	<5	8.5	3.6	5.7	2.9

*ANZECC/ARMCANZ (2000) – slightly disturbed systems (90% species protection)
[A] = inorganic mercury; N/R: not recorded

Table 5 (Cont'd). Summary of dissolved metal compound results for Site AQ12 (*n* = 1).

Indicator Variable	DTV* (µg/L)	Baseline Site AQ11	Autumn 2021 Site AQ12		Spring 2021 Site AQ12	
		April 2018	28/04/21[4]	11/06/21	21/9/21	8/11/21
Aluminium pH >6.5	**80**	**260**	**150**	**1260**	62	**200**
Aluminium pH <6.5	**-**	**-**				
Arsenic Total (µg/L)	**42**	<1	<1	<1	<1	<1
Barium	**-**	2	29	<1	31	13
Beryllium	**-**	<1	<1	<1	<1	<1
Boron	**680**	<50	20	10	20	15
Cadmium (µg/L)	**0.4**	<0.1	**3.8**	<0.1	<0.1	<0.1
Chromium	**6**	<1	<1	1.5	<1	<1
Cobalt	**-**	<1	<1	<1	<1	<1
Copper (µg/L)	**1.8**	**2**	**2.1**	**3.3**	1.7	**3.2**
Iron	**-**	450	160	420	150	180
Lead (µg/L)	**5.6**	<1	<1	<1	<1	<1
Manganese	**2500**	3	6.9	4.7	10	2
Mercury (µg/L)	**1.9** [A]	<0.1	<0.1	<0.1	<0.1	0.15
Molybdenum	**-**	<1	<1	<1	<1	<1
Nickel (µg/L)	**13**	<1	1.1	<1	<1	<1
Selenium Total	**18**	<10	<1	<1	<1	<1
Strontium	**-**	52	130	46	110	40
Vanadium	**-**	<10	<1	2.7	<1	1.9
Zinc (µg/L)	**15**	<5	9	**20**	8.3	12

*ANZECC/ARMCANZ (2000) – slightly disturbed systems (90% species protection)
[A] = inorganic mercury; N/R: not recorded

[4] NB Data reported here for autumn 2021 Survey 1 and Survey 2 differ from those reported in the autumn 2021 report. Data had been entered incorrectly in the autumn 2021 report but have since been corrected.

Table 5 (Cont'd). Summary of dissolved metal compound results for Site AQ12 (*n* = 1).

Indicator Variable	DTV* (µg/L)	Baseline Site AQ11	Autumn 2022 Site AQ12		Spring 2022 Site AQ12	
		April 2018	5/05/22	31/05/22	10/10/2022	30/11/2022
Aluminium pH >6.5	**80**	**260**		**200**	**1400**	**93**
Aluminium pH <6.5	**-**	**-**	70			
Arsenic Total (µg/L)	**42**	<1	<1	<1	<1	<1
Barium	**-**	2	18	19	15	28
Beryllium	**-**	<1	<1	<1	<1	<1
Boron	**680**	<50	21	18	26	29
Cadmium (µg/L)	**0.4**	<0.1	<0.1	0.13	<0.1	<0.1
Chromium	**6**	<1	<1	<1	1.1	<1
Cobalt	**-**	<1	<1	<1	<1	<1
Copper (µg/L)	**1.8**	**2**	1.4	1.5	**2.6**	<1
Iron	**-**	450	560	320	1500	350
Lead (µg/L)	**5.6**	<1	<1	<1	2.3	<1
Manganese	**2500**	3	99	5.9	9.1	16
Mercury (µg/L)	**1.9** [A]	<0.1	<0.1	<0.1	<0.1	<0.1
Molybdenum	**-**	<1	<1	<1	<1	<1
Nickel (µg/L)	**13**	<1	<1	<1	<1	<1
Selenium Total	**18**	<10	<1	<1	<1	<1
Strontium	**-**	52	93	56	35	99
Vanadium	**-**	<10	<1	<1	2.2	<1
Zinc (µg/L)	**15**	<5	8	6.7	12	5.2

*ANZECC/ARMCANZ (2000) – slightly disturbed systems (90% species protection)
[A] = inorganic mercury; N/R: not recorded

Table 5 (Cont'd). Summary of dissolved metal compound results for Site AQ12 (*n* = 1).

Indicator Variable (µg/L)	DTV*(µg/L)	Baseline Site AQ11	Autumn 2023 Site AQ12		Spring 2023 Site AQ12	
		April 2018	18/05/23	3/07/23	20/09/23	15/11/23
Aluminium pH >6.5	**80**	**260**	37	**160**	30	42
Aluminium pH <6.5	**-**	**-**				
Arsenic Total (µg/L)	**42**	<1	<1	<1	<1	<1
Barium	**-**	2	19	21	20	12
Beryllium	**-**	<1	<1	<1	<1	<1
Boron	**680**	<50	19	22	19	24
Cadmium (µg/L)	**0.4**	<0.1	0.25	0.27	<0.1	<0.1
Chromium	**6**	<1	<1	<1	<1	<1
Cobalt	**-**	<1	<1	<1	<1	<1
Copper (µg/L)	**1.8**	**2**	1.7	**2.5**	**2.7**	**2.5**
Iron	**-**	450	220	400	170	120
Lead (µg/L)	**5.6**	<1	<1	<1	<1	<1
Manganese	**2500**	3	20	40	120	11
Mercury (µg/L)	**1.9** [A]	<0.1	<0.1	<0.1	<0.1	<0.1
Molybdenum	**-**	<1	<1	<1	<1	<1
Nickel (µg/L)	**13**	<1	<1	<1	<1	<1
Selenium Total	**18**	<10	<1	<1	<1	<1
Strontium	**-**	52	67	88	74	66
Vanadium	**-**	<10	<1	<1	<1	<1
Zinc (µg/L)	**15**	<5	13	**53**	11	2

*ANZECC/ARMCANZ (2000) – slightly disturbed systems (90% species protection)
[A] = inorganic mercury; N/R: not recorded

Table 6. Summary of BTEX and perfluoronated compound results (*n* = 1).

Indicator Variable	DTV* (µg/L)	Baseline Site AQ11	Spring 2018 Site AQ12		Autumn 2019 Site AQ12	
		April 2018	6/12/18	12/12/18	14/05/19	30/05/19
BTEXN (µg/L)						
Benzene (µg/L)	**1300**	<1	<1	<1	<1	<1
Toluene (µg/L)	**-**	<2	<1	<1	<1	<1
Ethylbenzene (µg/L)	**-**	<2	<1	<1	<1	<1
Ortho-Xylene (µg/L)	**470**	<2	<1	<1	<1	<1
Perfluoronated Compounds (µg/L)						
PFHxS (µg/L)	**-**	0.02	0.02	0.12	0.039	0.039
PFOS (µg/L)	**0.13**	0.03	0.043	0.070	0.068	0.069
PFOA (µg/L)	**220**	<0.01	<0.01	0.011	0.011	0.010
Sum of PFHxS and PFOS	**-**	0.05	0.063	0.19	0.107	0.108
Sum of PFAS (WA DER List)[B]	**-**	0.05	0.128[C]	0.185[C]	0.188[C]	0.19[C]
Indicator Variable	**DTV* (µg/L)**	**Baseline Site AQ11**	**Spring 2019 Site AQ12**		**Autumn 2020 Site AQ12**	
		April 2018	**24/9/19**	**21/11/19**	**25/5/20**	**2/9/20**
BTEXN (µg/L)						
Benzene (µg/L)	**1300**	<1	<1	<1	<1	<1
Toluene (µg/L)	**-**	<2	<1	<1	<1	<1
Ethylbenzene (µg/L)	**-**	<2	<1	<1	<1	<1
Ortho-Xylene (µg/L)	**470**	<2	<1	<1	<1	<1
PFHxS (µg/L)	**-**	0.02	0.091	0.025	0.044	0.068
PFOS (µg/L)	**0.13**	0.03	0.084	0.057	0.055	0.076
PFOA (µg/L)	**220**	<0.01	<0.01	0.013	<0.01	<0.01
Sum of PFHxS and PFOS	**-**	0.05	0.175	0.082	0.099	0.144
Sum of PFAS (WA DER List)[B]	**-**	0.05	0.252[C]	0.164[C]	0.178[C]	0.219[C]

*BTEXN: ANZECC/ARMCANZ (2000) – slightly disturbed systems (90% species protection); PFAS suite: DEE (2016) – Freshwater (95 % species protection – slightly to moderately disturbed ecosystems).

[B] = PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTS and 8:2 FTS.

[C] For any site, where a value has been recorded as less than the detection limit, it was assigned a value of half the detection limit in order to calculate the mean (e.g. <0.02 taken as 0.01).

Table 6 (Cont'd).

Indicator Variable	DTV* (µg/L)	Baseline Site AQ11	Spring 2020 Site AQ12		Autumn 2021 Site AQ12	
		April 2018	11/11/20	30/11/20	28/04/21	11/06/21
Benzene (µg/L)	**1300**	<1	<1	<1	<1	<1
Toluene (µg/L)	**-**	<2	<1	<1	<1	<1
Ethylbenzene (µg/L)	**-**	<2	<1	<1	<1	<1
Ortho-Xylene (µg/L)	**470**	<2	<1	<1	<1	<1
PFHxS (µg/L)	**-**	0.02	0.026	0.041	0.065	0.011
PFOS (µg/L)	**0.13**	0.03	0.054	0.062	0.065	<0.02
PFOA (µg/L)	**220**	<0.01	0.005[C]	0.014	<0.01	<0.01
Sum of PFHxS and PFOS	**-**	0.05	0.080	0.103	0.13	0.021[C]
Sum of PFAS (WA DER List)[B]	**-**	0.05	0.151[C]	0.196[C]	0.222[C]	0.086[C]
Indicator Variable	**DTV* (µg/L)**	**Baseline Site AQ11**	**Spring 2021 Site AQ12**		**Autumn 2022 Site AQ12**	
		April 2018	**21/9/21**	**8/11/21**	**5/05/22**	**31/05/22**
BTEXN (µg/L)						
Benzene (µg/L)	**1300**	<1	<1	<1	<1	<1
Toluene (µg/L)	**-**	<2	<1	<1	<1	<1
Ethylbenzene (µg/L)	**-**	<2	<1	<1	<1	<1
Ortho-Xylene (µg/L)	**470**	<2	<1	<1	<1	<1
PFHxS (µg/L)	**-**	0.02	0.037	<0.01	0.044	0.039
PFOS (µg/L)	**0.13**	0.03	0.032	0.021	0.047	0.054
PFOA (µg/L)	**220**	<0.01	0.013	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	**-**	0.05	0.069	0.026[C]	0.091	0.093
Sum of PFAS (WA DER List)[B]	**-**	0.05	0.169[C]	0.091[C]	0.166	0.176

*BTEXN: ANZECC/ARMCANZ (2000) – slightly disturbed systems (90% species protection); PFAS suite: DEE (2016) – Freshwater (95 % species protection – slightly to moderately disturbed ecosystems).

[B] = PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTS and 8:2 FTS.

[C] For any site, where a value has been recorded as less than the detection limit, it was assigned a value of half the detection limit in order to calculate the mean (e.g. <0.02 taken as 0.01).

Table 6 (Cont'd).

Indicator Variable	DTV* (µg/L)	Baseline Site AQ11	Spring 2022 Site AQ12		Autumn 2023 Site AQ12	
		April 2018	30/10/22	30/11/22	18/05/2023	3/07/2023
Benzene (µg/L)	**1300**	<1	<1	<1	<1	<1
Toluene (µg/L)	**-**	<2	<1	<1	<1	<1
Ethylbenzene (µg/L)	**-**	<2	<1	<1	<1	<1
Ortho-Xylene (µg/L)	**470**	<2	<1	<1	<1	<1
PFHxS (µg/L)	**-**	0.02	0.031	0.026	0.028	0.020
PFOS (µg/L)	**0.13**	0.03	0.030	0.044	0.040	0.024
PFOA (µg/L)	**220**	<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	**-**	0.05	0.061	0.070	0.068	0.044
Sum of PFAS (WA DER List)[B]	**-**	0.05	0.126[C]	0.135[C]	0.145	0.122
Indicator Variable	**DTV* (µg/L)**	**Baseline Site AQ11**	**Spring 2023 Site AQ12**			
		April 2018	**20/09/23**	**15/11/23**		
Benzene (µg/L)	**1300**	<1	<1	<1		
Toluene (µg/L)	**-**	<2	<1	<1		
Ethylbenzene (µg/L)	**-**	<2	<1	<1		
Ortho-Xylene (µg/L)	**470**	<2	<1	<1		
PFHxS (µg/L)	**-**	0.02	0.029	0.028		
PFOS (µg/L)	**0.13**	0.03	0.031	0.032		
PFOA (µg/L)	**220**	<0.01	<0.01	<0.01		
Sum of PFHxS and PFOS	**-**	0.05	0.060	0.060		
Sum of PFAS (WA DER List)[B]	**-**	0.05	0.154[C]	0.136[C]		

*BTEXN: ANZECC/ARMCANZ (2000) – slightly disturbed systems (90% species protection); PFAS suite: DEE (2016) – Freshwater (95 % species protection – slightly to moderately disturbed ecosystems).

[B] = PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTS and 8:2 FTS.

[C] For any site, where a value has been recorded as less than the detection limit, it was assigned a value of half the detection limit in order to calculate the mean (e.g. <0.02 taken as 0.01).

3.2.2 Sediment Characteristics

Sediment samples were collected at Site AQ1, AQ4, AQ14 between autumn 2018 (baseline) and spring 2023 (during construction) (Table 7&8).

Results indicated that:

- At the time of Survey 1 during spring 2023, concentrations of lead, copper, nickel and zinc measured at Site AQ1 exceeded the Interim Sediment Quality Guidelines (ISQG) threshold limit's (ANZECC/ARMCANZ 2000);
- Concentrations of lead measured at Site AQ1 (Survey 1: 94 mg/kg; Survey 2: 87 mg/kg) exceeded the guideline value (50 mg/L) on both sampling occasions within spring 2023. The majority (i.e. 13 of 15 times) of measurements of lead at AQ1 (range = 21 to 130 mg/kg) exceeded the threshold limit (50 mg/kg) detailed in the Interim Sediment Quality Guidelines (ISQG) (ANZECC/ARMCANZ 2000), including at the time of the baseline (91 mg/kg) survey (discussed further in Section 5.1);
- Nickel measured in sediments at Site AQ1 marginally exceeded the upper ANZECC/ARMCANZ (2000) guideline level on one other occasion, during spring 2022 (25 mg/kg);
- Concentrations of lead (56 mg/kg), nickel (23 mg/kg) and zinc (220 mg/kg) measured at AQ4 marginally exceeded the ANZECC/ARMCANZ (2000) guideline levels during Survey 1 in autumn 2022 (Table 7);
- Concentrations of lead measured at Sites AQ4 and AQ14, situated downstream of any inputs from the Project, were consistently within the Baseline value;
- Concentrations of mercury measured at AQ1 exceeded the recommended trigger level during the autumn 2022 (Survey 1: <0.2 mg/kg; Survey 2: 0.29 mg/kg) but not subsequently, including during autumn and spring 2023 (Table 7);
- A spike in barium was detected at Site AQ14 in autumn 2019 (Survey 1: 902 mg/kg) but not subsequently. There are no guideline criteria for barium in sediments or water (ANZECC/ARMCANZ 2000);
- PFOS was consistently detected at the sites sampled (range = <0.002 to 0.044 mg/kg) but concentrations continued to be below the recommended guideline value for Urban Residential/Public Open Spaces (32 mg/kg) as well as National Parks/Areas with High Ecological Values (6.6 mg/L);

- PFAS (range = <0.001 to 0.0483 mg/kg) measured at each site continued to be similar to baseline values and below the recommended guideline value for Urban Residential/Public Open Spaces (29 mg/kg) and National Parks/Areas with High Ecological Values (1.0 mg/L) (Tables 7&8).

Table 7. Mean (± SE) sediment metal results (mg/L) for surveys done between autumn 2018 (*n* = 1) and autumn 2023 (*n* = 2).

Indicator Variable	Trigger Value*	Baseline (Autumn 2018)			Autumn 2019			Spring 2019		
		AQ1	AQ4	AQ14	AQ1	AQ4	AQ14	AQ1	AQ4	AQ14
Aluminium	-	-	-	-	26,800	24,300 (700)	2,295 (365)	-	-	-
Antimony	-	-	-	-	<0.5	<0.5 (0)	<0.5 (0)	-	-	-
Arsenic	**20**	<5	<5	<5	4	6 (0.9)	1 (0.2)	3.90 (0.6)	2.75 (0.5)	2.65 (0.3)
Barium	-	110	60	<10	100	66 (4.5)	455 (447)	135 (15)	76.5 (7.5)	29.5 (1.5)
Beryllium	-	<1	1	<1	0.96	1.2 (0.0)	<0.5 (0)	1.20 (0.1)	1.01 (0.1)	<0.5 (0.00)
Boron	-	<50	<50	<50	2.9	0.8 (0.3)	<1 (0)	<1.0 (0.0)	<1.0 (0.0)	<1.0 (0.0)
Cadmium	**1.5**	<1	<1	<1	<0.5	<0.5 (0)	<0.5 (0)	0.43[A] (0.2)	<0.5 (0.0)	<0.5 (0.0)
Chromium	**80**	23	21	3	21	23 (2.0)	3 (0.4)	21.0 (2.0)	13.5 (0.5)	6.3 (0.7)
Cobalt	-	8	6	<2	9	8 (1.9)	1 (0.1)	-	-	-
Copper	**65**	31	12	<5	28	11 (2.1)	2 (0.3)	30.0 (5.0)	6.1 (1.7)	9.0 (1.0)
Lead	**50**	**91**	44	<5	**72**	35 (0.0)	4 (0.2)	**78.0** (32.0)	21.5 (0.5)	12.0 (1.0)
Manganese	-	45	69	16	32	80 (2.0)	7 (0.8)	85.0 (55.0)	50.0 (15.0)	32.5 (12.5)
Mercury	**0.15**	<0.1	<0.1	<0.1	<0.2	<0.2 (0)	<0.2 (0)	<0.2 (0.0)	<0.2 (0.0)	<0.2 (0.0)
Molybdenum		-	-	-	2.2	1.0 (0.4)	<0.5 (0)	-	-	-
Nickel	**21**	14	9	<2	16	9 (0.0)	1 (0.0)	20.5 (0.5)	10.6 (1.4)	3.85 (0.2)
Selenium Total	-	<5	<5	<5	1	1 (0.0)	<0.5 (0)	2.65 (1.4)	1.59 (0.9)	0.63[A] (0.4)
Strontium	-	-	-	-	23	17 (4.5)	1 (0.1)	-	-	-
Vanadium	-	48	54	10	36	60 (9.5)	9 (0.9)	-	-	-
Zinc	**200**	93	96	17	100	64 (4.0)	14 (1.5)	119 (61.5)	29 (17.5)	74 (17.0)

***Interim Sediment Quality Guideline – Low (Trigger value) (ANZECC/ARMCANZ 2000)**

[A] For any site, where a value has been recorded as less than the detection limit, it was assigned a value of half the detection limit in order to calculate the mean (e.g. <0.02 taken as 0.01)

NB Aluminium, Antimony, Molybdenum, Strontium and Vanadium were not tested for by the Spring 2019 surveys because they were not required by the BMS (cf Biosis, 2018)

Table 7 (Cont'd).

Indicator Variable	Trigger Value*	Baseline (Autumn 2018)			Autumn 2020			Spring 2020		
		AQ1	AQ4	AQ1	AQ1	AQ4	AQ14	AQ1	AQ4	AQ14
Aluminium	-	-	-	-	-	-	-	-	-	-
Antimony	-	-	-	-	-	-	-	-	-	-
Arsenic	**20**	<5	<5	<5	1.90 (0.2)	3.4 (0.4)	5.1 (3.1)	1.90 (0.4)	3.4 (1.2)	2.4 (0.3)
Barium	-	110	60	<10	83 (15)	63.5 (3.5)	41.3 (31.7)	87.0 (33.0)	69.5 (9.5)	37.5 (9.5)
Beryllium	-	<1	1	<1	0.72 (0.1)	0.98 (0.0)	0.5 (0.3)	0.71 (0.2)	0.79 (0.1)	<0.5 (0.0)
Boron	-	<50	<50	<50	0.85 (0.4)	0.5 (0.0)	0.5 (0.0)	1.95 (0.4)	1.25 (0.2)	0.75
Cadmium	**1.5**	<1	<1	<1	0.25 (0.0)	0.25 (0.0)	0.3 (0.0)	<0.05 (0.0)	<0.5 (0.0)	1.0[B] (0.5)
Chromium	**80**	23	21	3	14.5 (0.5)	18.5 (0.5)	12.9 (8.2)	13.5 (3.5)	13.0 (0.0)	6.2 (0.3)
Cobalt	-	8	6	<2	-	-	-	-	-	-
Copper	**65**	31	12	<5	16.5 (0.5)	11.0 (2.0)	16.7 (12.3)	16.5 (6.5)	7.9 (0.2)	7.2 (1.2)
Lead	**50**	**91**	44	<5	**71** (5.0)	33.5 (3.5)	23.5 (15.6)	**53.5** (10.5)	26.0 (1.0)	11.5 (0.5)
Manganese	-	45	69	16	38.5 (0.5)	66.5 (10.5)	49.5 (38.5)	56.5 (16.5)	52.5 (4.5)	31.0 (3.0)
Mercury	**0.15**	<0.1	<0.1	<0.1	0.10 (0.0)	0.10 (0.0)	0.1 (0.0)	<0.2 (0.0)	<0.2 (0.0)	<0.2 (0.0)
Molybdenum		-	-	-	-	-	-	-	-	-
Nickel	**21**	14	9	<2	10.7 (1.3)	8.65 (0.5)	5.4 (3.3)	11.5 (2.6)	6.5 (0.5)	2.8 (0.6)
Selenium Total	-	<5	<5	<5	0.70 (0.0)	0.44 (0.2)	0.6 (0.4)	0.63[B] (0.4)	0.40[B] (0.2)	<0.5 (0.0)
Strontium	-	-	-	-	-	-	-	-	-	-
Vanadium	-	48	54	10	25 (1.0)	41 (2.0)	36.0 (21)	23 (5.0)	32 (5.5)	19.0 (1.0)
Zinc	**200**	93	96	17	78 (6.0)	144 (46.5)	111.0 (79)	86 (24)	58 (6.0)	45.5 (19.5)

***Interim Sediment Quality Guideline – Low (Trigger value) (ANZECC/ARMCANZ 2000**

[A] For any site, where a value has been recorded as less than the detection limit, it was assigned a value of half the detection limit in order to calculate the mean (eg. <0.02 taken as 0.01)

NB Aluminium, Antimony, Molybdenum, Strontium and Vanadium were not tested for by the Spring 2019 surveys because they were not required by the BMS (cf Biosis, 2018)

Table 7 (Cont'd).

Indicator Variable	Trigger Value*	Baseline (Autumn 2018)			Autumn 2021			Spring 2021		
		AQ1	AQ4	AQ1	AQ1	AQ4	AQ14	AQ1	AQ4	AQ14
Aluminium	-	-	-	-	-	-	-	-	-	-
Antimony	-	-	-	-	-	-	-	-	-	-
Arsenic	**20**	<5	<5	<5	3.65 (1.3)	6.10 (0.0)	4.30 (0.8)	14.55 (9.5)	3.5 (2.6)	2.85 (0.7)
Barium	-	110	60	<10	116.5(23.5)	99.5 (10.5)	68.0 (5.0)	74.5 (18.5)	48.0 (41.0)	84.5 (11.5)
Beryllium	-	<1	1	<1	1.20 (0.2)	0.87 (0.1)	0.50[A] (0.2)	0.81 (0.2)	0.38 (0.4)	0.44[A] (0.4)
Boron	-	<50	<50	<50	2.00 (0.9)	1.75[A] (1.3)	1.40[A] (0.9)	0.80[A] (0.3)	<1 (0.0)	0.95[A] (0.5)
Cadmium	**1.5**	<1	<1	<1	0.41[A] (0.2)	<0.5 (0.0)	<0.5 (0.0)	<0.5 (0.0)	<0.5 (0.0)	<0.5 (0.0)
Chromium	**80**	23	21	3	24 (7.0)	24.5 (1.5)	13.0 (2.0)	17.5 (0.5)	12.7 (10.3)	12.0 (1.0)
Cobalt	-	8	6	<2	-	-	-	-	-	-
Copper	**65**	31	12	<5	23 (8.0)	13.5 (1.5)	12.8 (3.3)	13.0 (2.0)	6.55 (5.5)	12.3 (2.8)
Lead	**50**	**91**	44	<5	**80** (50)	31.5 (2.5)	27.5 (7.5)	25.5 (4.5)	16.2 (12.9)	27.0 (7.0)
Manganese	-	45	69	16	28 (8)	150 (40)	46 (5)	95 (75)	57.1 (53)	27.5 (13.5)
Mercury	**0.15**	<0.1	<0.1	<0.1	<0.2 (0.0)	<0.2 (0.0)	<0.2 (0.0)	<0.2 (0.0)	<0.2 (0.0)	<0.2 (0.0)
Molybdenum		-	-	-	-	-	-	-	-	-
Nickel	**21**	14	9	<2	17.5 (3.5)	9.75 (2.3)	5.85 (1.4)	10.5 (3.6)	4.1 (3.4)	7.3 (2.8)
Selenium Total	-	<5	<5	<5	1.20 (0.00)	0.88 (0.00)	0.41 (0.2)	0.88 (0.3)	0.44 [A] (0.4)	1.18 [A] (0.9)
Strontium	-	-	-	-	-	-	-	-	-	-
Vanadium	-	48	54	10	10 (13)	56 (2.0)	31 (3.0)	34 (7.0)	32 (22.4)	26 (2.0)
Zinc	**200**	93	96	17	92 (68)	77 (14.0)	94.5 (35.5)	46 (22.0)	35 (28.2)	43 (16.0)

***Interim Sediment Quality Guideline – Low (Trigger value) (ANZECC/ARMCANZ 2000**

[A] For any site, where a value has been recorded as less than the detection limit, it was assigned a value of half the detection limit in order to calculate the mean (eg. <0.02 taken as 0.01)

NB Aluminium, Antimony, Molybdenum, Strontium and Vanadium were not tested for by the Spring 2019 surveys because they were not required by the BMS (cf Biosis, 2018)

Table 7 (Cont'd).

Indicator Variable	Trigger Value*	Baseline (Autumn 2018)			Autumn 2022 (5/5/22)			Autumn 2022 (31/5/22)		
		AQ1	AQ4	AQ1	AQ1	AQ4	AQ14	AQ1	AQ4	AQ14
Aluminium	-	-	-	-	-	-	-	-	-	-
Antimony	-	-	-	-	-	-	-	-	-	-
Arsenic	**20**	<5	<5	<5	4.3	10	6	2.9	3.6	4.6
Barium	-	110	60	<10	140	150	61	87	71	52
Beryllium	-	<1	1	<1	1.2	1.7	0.61	0.84	0.83	<0.5
Boron	-	<50	<50	<50	3.7	5	1.8	2	1.8	1
Cadmium	**1.5**	<1	<1	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chromium	**80**	23	21	3	23	49	11	17	20	9.9
Cobalt	-	8	6	<2	-	-	-	-	-	-
Copper	**65**	31	12	<5	24	32	14	19	14	13
Lead	**50**	**91**	44	<5	**54**	**56**	30	**55**	29	17
Manganese	-	45	69	16	28	320	66	25	110	41
Mercury	**0.15**	<0.1	<0.1	<0.1	<0.2	<0.2	<0.2	**0.29**	<0.2	<0.2
Molybdenum		-	-	-	-	-	-	-	-	-
Nickel	**21**	14	9	<2	17	**23**	5.1	13	8.8	4.2
Selenium Total	-	<5	<5	<5	3.4	3	1.3	1.1	0.68	0.57
Strontium	-	-	-	-	-	-	-	-	-	-
Vanadium	-	48	54	10	37	99	31	35	46	33
Zinc	**200**	93	96	17	48	**220**	73	76	96	56

***Interim Sediment Quality Guideline – Low (Trigger value) (ANZECC/ARMCANZ 2000**

[A] For any site, where a value has been recorded as less than the detection limit, it was assigned a value of half the detection limit in order to calculate the mean (eg. <0.02 taken as 0.01)

NB Aluminium, Antimony, Molybdenum, Strontium and Vanadium were not tested for by the Spring 2019 surveys because they were not required by the BMS (cf Biosis, 2018)

Table 7 (Cont'd).

Indicator Variable	Trigger Value*	Baseline (Autumn 2018)			Spring 2022 (10/10/22)			Spring 2022 (30/11/22)		
		AQ1	AQ4	AQ1	AQ1	AQ4	AQ14	AQ1	AQ4	AQ14
Aluminium	-	-	-	-	-	-	-	-	-	-
Antimony	-	-	-	-	-	-	-	-	-	-
Arsenic	**20**	<5	<5	<5	1.9	3.6	9.8	6.1	4.1	2.1
Barium	-	110	60	<10	100	80	61	110	61	71
Beryllium	-	<1	1	<1	0.86	1	1.2	1.1	1.2	0.65
Boron	-	<50	<50	<50	4.4	2.6	4.2	1.7	<1	<1
Cadmium	**1.5**	<1	<1	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chromium	**80**	23	21	3	19	24	22	56	14	7.3
Cobalt	-	8	6	<2	-	-	-	-	-	-
Copper	**65**	31	12	<5	20	15	25	36	6.7	5.4
Lead	**50**	**91**	44	<5	**79**	32	44	**62**	23	12
Manganese	-	45	69	16	57	130	62	53	78	74
Mercury	**0.15**	<0.1	<0.1	<0.1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Molybdenum		-	-	-	-	-	-	-	-	-
Nickel	**21**	14	9	<2	14	11	9.9	**25**	6.3	3.4
Selenium Total	-	<5	<5	<5	0.62	0.61	1.1	1	0.54	<0.5
Strontium	-	-	-	-	-	-	-	-	-	-
Vanadium	-	48	54	10	24	48	67	35	40	21
Zinc	**200**	93	96	17	93	110	160	84	45	23

***Interim Sediment Quality Guideline – Low (Trigger value) (ANZECC/ARMCANZ 2000**

[A] For any site, where a value has been recorded as less than the detection limit, it was assigned a value of half the detection limit in order to calculate the mean (eg. <0.02 taken as 0.01)

NB Aluminium, Antimony, Molybdenum, Strontium and Vanadium were not tested for by the Spring 2019 surveys because they were not required by the BMS (cf Biosis, 2018)

Table 7 (Cont'd).

Indicator Variable	Trigger Value*	Baseline (Autumn 2018)			Autumn 2023 (18/05/23)			Autumn 2023 (3/07/23)		
		AQ1	AQ4	AQ1	AQ1	AQ4	AQ14	AQ1	AQ4	AQ14
Aluminium	-	-	-	-	26700	24500	20600	-	-	-
Antimony	-	-	-	-	<0.5	<0.5	<0.5	-	-	-
Arsenic	**20**	<5	<5	<5	2.8	3.1	4.6	2.9	5.1	4.2
Barium	-	110	60	<10	88	70	92	100	42	54
Beryllium	-	<1	1	<1	0.91	0.81	0.99	0.9	0.59	0.63
Boron	-	<50	<50	<50	4.5	2.2	3	2.6	<1	<1
Cadmium	**1.5**	<1	<1	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chromium	**80**	23	21	3	19	20	19	15	18	15
Cobalt	-	8	6	<2	7.4	7.7	6.5	-	-	-
Copper	**65**	31	12	<5	22	12	18	17	9.6	16
Lead	**50**	**91**	44	<5	**120**	25	36	37	19	32
Manganese	-	45	69	16	38	91	130	23	90	44
Mercury	**0.15**	<0.1	<0.1	<0.1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Molybdenum		-	-	-	1.8	0.86	0.66	-	-	-
Nickel	**21**	14	9	<2	14	9.9	8.3	12	5.5	6.7
Selenium Total	-	<5	<5	<5	1.3	0.79	1.1	1.6	0.53	0.68
Strontium	-	-	-	-	28	19	9.5	-	-	-
Vanadium	-	48	54	10	33	39	43	26	43	34
Zinc	**200**	93	96	17	100	97	77	48	54	72

***Interim Sediment Quality Guideline – Low (Trigger value) (ANZECC/ARMCANZ 2000**

[A] For any site, where a value has been recorded as less than the detection limit, it was assigned a value of half the detection limit in order to calculate the mean (eg. <0.02 taken as 0.01)
NB Aluminium, Antimony, Molybdenum, Strontium and Vanadium were not tested for by the Spring 2019 surveys because they were not required by the BMS (cf Biosis, 2018)

Table 7 (Cont'd).

Indicator Variable	Trigger Value*	Baseline (Autumn 2018)			Spring 2023 (20/09/23)			Spring 2023 (15/11/23)		
		AQ1	AQ4	AQ1	AQ1	AQ4	AQ14	AQ1	AQ4	AQ14
Aluminium	-	-	-	-	-	-	-	-	-	-
Antimony	-	-	-	-	-	-	-	-	-	-
Arsenic	**20**	<5	<5	<5	8	3.8	2.3	3.7	3.7	4.3
Barium	-	110	60	<10	140	48	42	150	79	78
Beryllium	-	<1	1	<1	1.5	0.63	<0.5	1.3	1.2	1.3
Boron	-	<50	<50	<50	6.4	<1	<1	3.7	4.2	1.2
Cadmium	**1.5**	<1	<1	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chromium	**80**	23	21	3	30	14	6.8	31	22	12
Cobalt	-	8	6	<2	-	-	-	-	-	-
Copper	**65**	31	12	<5	**78**	8.7	4.5	24	19	10
Lead	**50**	**91**	44	<5	**94**	20	13	**87**	28	17
Manganese	-	45	69	16	95	54	42	31	130	55
Mercury	**0.15**	<0.1	<0.1	<0.1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Molybdenum		-	-	-	-	-	-	-	-	-
Nickel	**21**	14	9	<2	**26**	5.4	2.6	20	11	8.2
Selenium Total	-	<5	<5	<5	2.1	0.89	0.61	0.91	0.65	<0.5
Strontium	-	-	-	-	-	-	-	-	-	-
Vanadium	-	48	54	10	51	33	20	46	40	31
Zinc	**200**	93	96	17	**230**	52	24	150	120	60

***Interim Sediment Quality Guideline – Low (Trigger value) (ANZECC/ARMCANZ 2000**

[A] For any site, where a value has been recorded as less than the detection limit, it was assigned a value of half the detection limit in order to calculate the mean (eg. <0.02 taken as 0.01)
NB Aluminium, Antimony, Molybdenum, Strontium and Vanadium were not tested for by the Spring 2019 surveys because they were not required by the BMS (cf Biosis, 2018)

Table 8. Mean (± SE) sediment results for perfluoronated compounds between autumn 2018 (*n* = 1) and autumn 2023 (*n* = 2).

Indicator Variable	Trigger Value*	Baseline (Autumn 2018)			Spring 2018			Autumn 2019		
		AQ1	AQ4	AQ14	AQ1	AQ4	AQ14	AQ1[C]	AQ4	AQ14
Perfluoronated compound (mg/kg)										
PFHxS	-	0.0036	0.0007	<0.0002	0.0023 (0.00)	<0.001 (0.00)	<0.001 (0.00)	0.0037	<0.001 (0.00)	<0.001 (0.00)
PFOS	32	0.0444	0.0061	0.0005	0.0310 (0.01)	0.0049 (0.00)	<0.002 (0.00)	0.0220	0.0085 (0.01)	<0.002 (0.00)
PFOA	29	-	-	-	<0.001 (0.00)	<0.001 (0.00)	<0.001 (0.00)	<0.001	<0.001 (0.00)	<0.001 (0.00)
Sum of PFHxS and PFOS	-	0.0480	0.0068	0.0005	0.0333 (0.01)	0.0055 [B] (0.00)	0.002 [B] (0.00)	0.0257	0.0090 [B] (0.01)	0.0015 [B] (0.00)
Sum of PFAS (WA DER List) [A,B]	-	0.0483	0.0068	0.0005	0.0369 [B] (0.01)	0.0096 [B] (0.00)	0.0058 [B] (0.00)	0.0329	0.0150 [B] (0.01)	0.0075 [B] (0.00)
Indicator Variable	**Trigger Value***	**Baseline (Autumn 2018)**			**Spring 2019**			**Autumn 2020**		
		AQ1	**AQ4**	**AQ14**	**AQ1**	**AQ4**	**AQ14**	**AQ1**	**AQ4**	**AQ14**
Perfluoronated compound (mg/kg)										
PFHxS	-	0.0036	0.0007	<0.0002	0.0016 (0.00)	<0.001 (0.00)	<0.001 (0.00)	0.0005 (0.00)	0.0005 (0.00)	0.0005 (0.00)
PFOS	32	0.0444	0.0061	0.0005	0.0075 (0.01)	0.0062 (0.00)	0.0028 (0.00)	0.0115 (0.00)	0.0015 (0.00)	0.0052 (0.00)
PFOA	29	-	-	-	<0.001 (0.00)	<0.001 (0.00)	<0.001 (0.00)	<0.001 (0.00)	<0.001 (0.00)	<0.001 (0.00)
Sum of PFHxS and PFOS	-	0.0480	0.0068	0.0005	0.0231 (0.08)	0.0067 [B] (0.00)	0.0033[B] (0.00)	0.0120 (0.00)	0.0020 (0.00)	0.0057 (0.00)
Sum of PFAS (WA DER List) [A,B]	-	0.0483	0.0068	0.0005	0.0281 [B] (0.08)	0.0117 [B] (0.00	0.0083 [B] (0.00)	0.0170 (0.00)	0.0070 (0.00)	0.0107 (0.00)

*DEE (2016) - Urban residential/public open spaces

[A] = PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTS and 8:2 FTS

[B] For any site, where a value has been recorded as less than the detection limit, it was assigned a value of half the detection limit in order to calculate the mean (e.g. <0.02 taken as 0.01), the Sum of PFHxS and PFOS and the Sum of PFAS.

[C] Only one survey was undertaken at Site AQ1 in autumn 2019.

Table 8 (Cont'd).

Indicator Variable	Trigger Value*	Baseline (Autumn 2018)			Spring 2020			Autumn 2021		
		AQ1	AQ4	AQ14	AQ1	AQ4	AQ14	AQ1[C]	AQ4	AQ14
Perfluoronated compound (mg/kg)										
PFHxS	-	0.0036	0.0007	<0.0002	<0.001 (0.00)	<0.001 (0.00)	<0.001 (0.00)	<0.001[B] (0.00)	<0.001 (0.00)	<0.001 (0.00)
PFOS	32	0.0444	0.0061	0.0005	0.0070 (0.00)	0.0022[B] (0.00)	<0.002 (0.00)	0.016 (0.004)	0.006 (0.002)	0.004 (0.003)
PFOA	29	-	-	-	<0.001 (0.00)	<0.001 (0.00)	<0.001 (0.00)	<0.001 (0.00)	<0.001 (0.00)	<0.001 (0.00)
Sum of PFHxS and PFOS	-	0.0480	0.0068	0.0005	0.0075[B] (0.00)	0.0032[B] (0.00)	0.0015[B] (0.00)	0.0164[B] (0.003)	0.0069[B] (0.002)	0.0042[B] (0.003)
Sum of PFAS (WA DER List) [A,B]	-	0.0483	0.0068	0.0005	0.0125[B] (0.00)	0.0082[B] (0.00)	0.0065[B] (0.00)	0.021[B] (0.003)	0.0119[B] (0.002)	0.0090[B] (0.003)
Indicator Variable	**Trigger Value***	**Baseline (Autumn 2018)**			**Spring 2021**			**Autumn 2022**		
		AQ1	**AQ4**	**AQ14**	**AQ1**	**AQ4**	**AQ14**	**AQ1**	**AQ4**	**AQ14**
PFHxS	-	0.0036	0.0007	<0.0002	<0.001 (0.00)	<0.001 (0.00)	<0.001 (0.00)	0.0015 (0.0010)	<0.001 (0.00)	<0.001 (0.00)
PFOS	32	0.0444	0.0061	0.0005	0.0090 (0.00)	0.0030[B] (0.00)	0.009[B] (0.01)	0.0265 (0.0075)	0.0056 (0.0014)	0.0038 (0.0033)
PFOA	29	-	-	-	<0.001 (0.00)	<0.001 (0.00)	<0.001 (0.00)	<0.001 (0.00)	<0.001 (0.00)	<0.001 (0.00)
Sum of PFHxS and PFOS	-	0.0480	0.0068	0.0005	0.0075[B] (0.00)	0.0032[B] (0.00)	0.0015[B] (0.00)	0.0280 (0.01)	0.0056 (0.00)	0.0036 (0.0036)
Sum of PFAS (WA DER List) [A,B]	-	0.0483	0.0068	0.0005	0.0168[B] (0.01)	0.0089[B] (0.00)	0.0148[B] (0.01)	0.034[B] (0.0075)	0.0111[B] (0.0014)	0.0096[B] (0.0031)

*DEE (2016) - Urban residential/public open spaces

[A] = PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTS and 8:2 FTS

[B] For any site, where a value has been recorded as less than the detection limit, it was assigned a value of half the detection limit in order to calculate the mean (e.g. <0.02 taken as 0.01), the Sum of PFHxS and PFOS and the Sum of PFAS.

[C] Only one survey was undertaken at Site AQ1 in autumn 2019.

Table 8 (Cont'd).

Indicator Variable	Trigger Value*	Baseline (Autumn 2018)			Spring 2022			Autumn 2023		
		AQ1	AQ4	AQ14	AQ1	AQ4	AQ14	AQ1	AQ4	AQ14
PFHxS	-	0.0036	0.0007	<0.0002	<0.001 (0.00)	<0.001 (0.00)	<0.001 (0.00)	<0.001 (0.00)	<0.001 (0.00)	<0.001 (0.00)
PFOS	32	0.0444	0.0061	0.0005	0.0134 (0.01)	0.0008[B] (0.00)	<0.003 (0.00)	0.017[B] (0.00)	0.002[B] (0.00)	0.007[B] (0.00)
PFOA	29	-	-	-	<0.001 (0.00)	<0.001 (0.00)	<0.001 (0.00)	<0.001 (0.00)	<0.001 (0.00)	<0.001 (0.00)
Sum of PFHxS and PFOS	-	0.0480	0.0068	0.0005	0.0139[B] (0.01)	0.0013[B] (0.00)	0.0038[B] (0.00)	0.018[B] (0.01)	0.001[B] (0.00)	0.004[B] (0.00)
Sum of PFAS (WA DER List) [A,B]	-	0.0483	0.0068	0.0005	0.0035[B] (0.00)	0.0046[B] (0.00)	0.0091[B] (0.00)	0.023[B] (0.00)	0.0075[B] (0.001)	0.013[B] (0.004)
Indicator Variable	**Trigger Value***	**Baseline (Autumn 2018)**			**Spring 2023**					
		AQ1	**AQ4**	**AQ14**	**AQ1**	**AQ4**	**AQ14**			
PFHxS	-	0.0036	0.0007	<0.0002	<0.005 (0.00)	<0.001 (0.00)	<0.001 (0.00)			
PFOS	32	0.0444	0.0061	0.0005	0.009[B] (0.01)	0.0021[B] (0.01)	0.0085[B] (0.01)			
PFOA	29	-	-	-	<0.005 (0.00)	<0.001 (0.00)	<0.001 (0.00)			
Sum of PFHxS and PFOS	-	0.0480	0.0068	0.0005	0.0198[B] (0.00)	0.0034[B] (0.00)	0.0098[B] (0.00)			
Sum of PFAS (WA DER List) [A,B]	-	0.0483	0.0068	0.0005	0.0242 (0.01)	0.0076[B] (0.00)	0.014[B] (0.01)			

*DEE (2016) - Urban residential/public open spaces

[A] = PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTS and 8:2 FTS

[B] For any site, where a value has been recorded as less than the detection limit, it was assigned a value of half the detection limit in order to calculate the mean (e.g. <0.02 taken as 0.01), the Sum of PFHxS and PFOS and the Sum of PFAS.

[C] Only one survey was undertaken at Site AQ1 in autumn 2019.

3.3 Aquatic Macroinvertebrates

A total of 14 taxon were identified from edge habitat samples collected at Site AQ12 in spring 2023 (Survey 1: 12 taxon; Survey 2: 9 taxon) (Table 11, Appendix 3). Seven taxa, Acarifomes (Water mites), Chironominae (True flies), Tanypodinae (True flies), Oxygastridae and Libellulidae (Dragonflies), Leptoceridae (Caddis flies) and Lymnaeidae (Freshwater snails) were collected on both sampling occasions (Appendix 3). The alien species of fish, Gambusia, was also collected in net samples (Survey 1: 8 individuals; Survey 2: 4 individuals).

Site AQ12 obtained an OE50 score of 0.40 for Survey 1 and 0.50 for Survey 2 during spring 2023 (Table 11, Figure 3), indicating that the macroinvertebrate assemblage at Site AQ12 was severely impaired (Band C) relative to reference sites selected by the AUSRIVAS model. The most recent OE50 scores were within the range of scores obtained since the baseline survey (Figure 3).

Similar to the findings of the previous surveys, taxon with > 0.80 probability of occurrence but not collected at the Anzac Creek site were the mayfly family, Leptophlebiidae, the aquatic bug family, Veliidae, and the beetle family, Hydrophilidae.

SIGNAL2 scores of 3.82 and 4.00 were obtained for both surveys (Table 4). The absence of Leptophlebiidae was likely to have contributed to the lower score (Table 4, Figure 4). In summary, SIGNAL 2 scores obtained for Site AQ12 have changed little over time and indicate that the macroinvertebrate assemblage at AQ12 has commonly been dominated by pollution-tolerant taxa since the commencement of sampling in autumn 2018 (Table 11, Figure 4).

Table 9. Total number of taxa, AUSRIVAS & SIGNAL 2 outputs for Site AQ12 (*n* = 1).

Survey	No Taxa	SIGNAL-2	OE50	Band
Autumn 2018	13	4.00	0.49	B
Spring 2018 – Survey 1	9	3.25	0.39	C
Spring 2018 – Survey 2	5	3.07	0.10	D
Autumn 2019 – Survey 1	10	2.69	0.41	C
Autumn 2019 – Survey 2	8	3.41	0.20	C
Spring 2019 – Survey 1	11	2.09	0.38	C
Spring 2019 – Survey 2	11	2.18	0.19	D
Autumn 2020 – Survey 1	19	3.00	0.68	B
Autumn 2020 – Survey 2	13	3.33	0.49	B
Spring 2020 – Survey 1	10	3.10	0.40	C
Spring 2020 – Survey 2	13	3.33	0.40	C
Autumn 2021 – Survey 1	13	3.38	0.49	B
Autumn 2021 – Survey 2	12	3.64	0.41	C
Spring 2021 – Survey 1	10	2.41	0.30	C
Spring 2021 – Survey 2	6	3.00	0.30	C
Autumn 2022 – Survey 1	13	3.86	0.49	B
Autumn 2022 – Survey 2	7	4.58	0.31	C
Spring 2022 – Survey 1	12	3.25	0.30	C
Spring 2022 – Survey 2	9	4.74	0.40	C
Autumn 2023 – Survey 1	7	0.30	0.29	C
Autumn 2023 – Survey 2	8	0.30	0.29	C
Spring 2023 – Survey 1	12	3.82	0.40	C
Spring 2023 – Survey 2	9	4.00	0.50	C

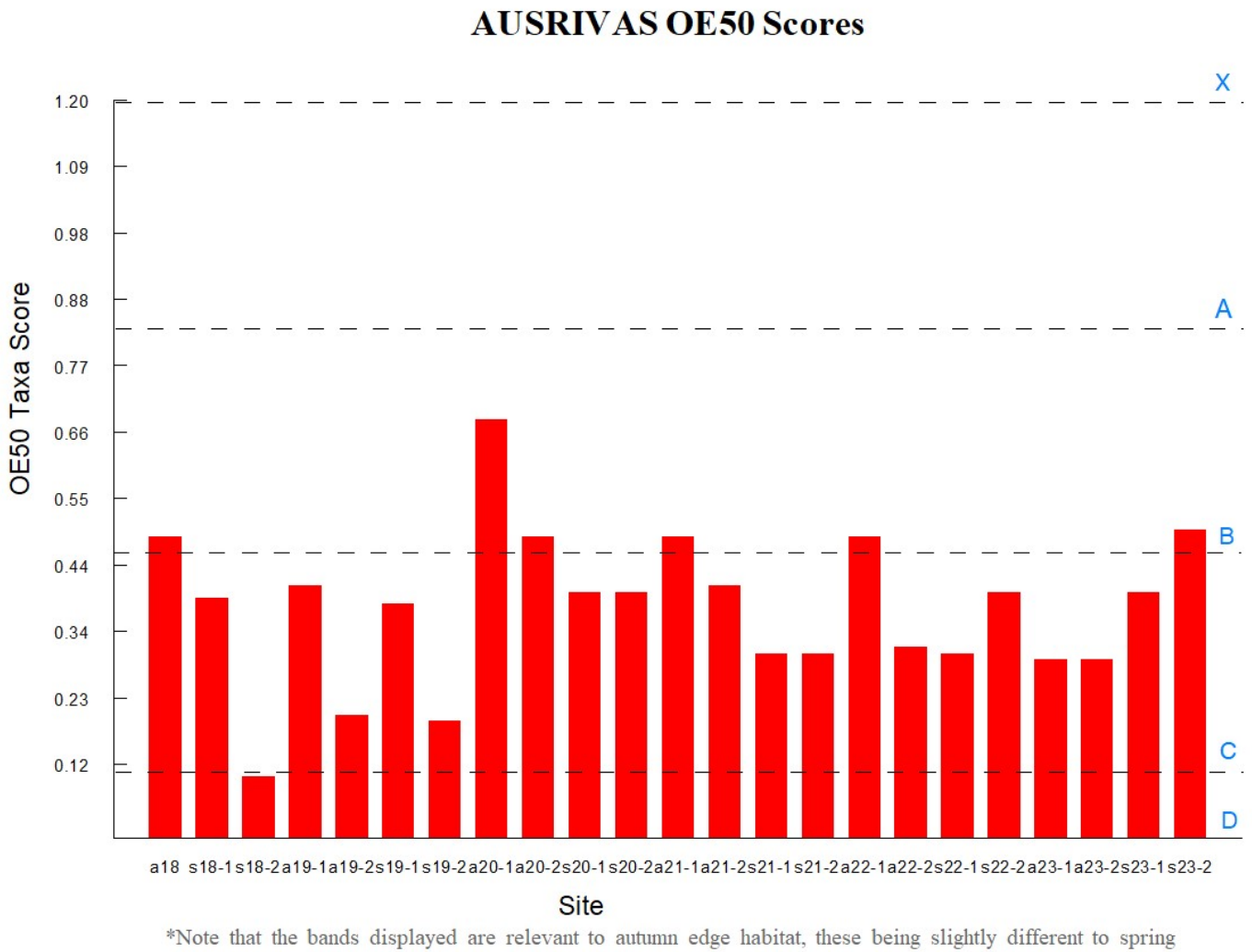

Figure 3. OE50 Taxa Scores and their respective Band Scores (B-D) for AUSRIVAS samples collected at Site AQ12 since autumn 2018.

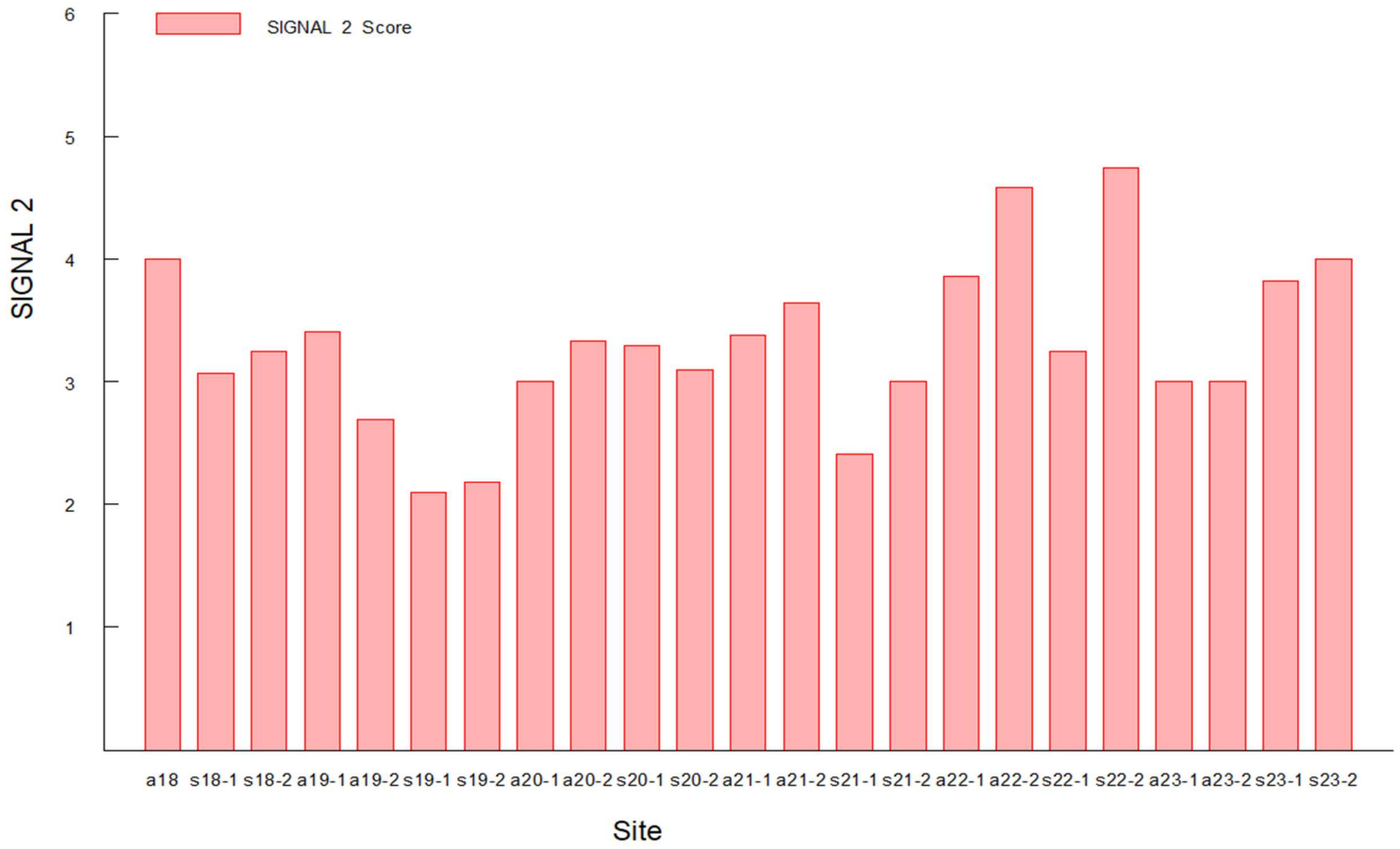

Figure 4. Quadrant diagram showing SIGNAL 2 results for Site AQ12 sampled in Anzac Creek since autumn 2018.

3.4 Fish

Due to extensive cover of green macroalgae at Site AQ12, fish were unable to be sampled using the electro-fisher at the time of the spring 2023 surveys (Table 10). Gambusia (*Gambusia holbrooki*) were observed and also caught in dip nets used to sample aquatic macroinvertebrates in spring 2023 (Table 6).

In total, ten species of fish, including three introduced species, were collected since sampling commenced in autumn 2018 (Table 10). All the species caught were common within NSW (McDowall, 1996; DPI 2006; Howell and Creese, 2010). No threatened species of fish listed under the *NSW Fisheries Management Act, 1994* or the *Environment Protection and Biodiversity Conservation Act, 1999* were recorded.

Plate 13: Eel-tailed catfish collected at Site AQ12 (18/05/2023).

Table 10. Fish collected at Site AQ12 between autumn 2018 and autumn 2023[#].

Species	Common Name	Aut-18 (Biosis, 2018)	Sp-18	Au-19	Sp-19	Sp-20	Au-21	Sp-21	Au-22	Sp-22	Au-23
Anguilla reinhardtii	Long-finned eel	2	3	2	-	4	1	2	1	1	-
Anguilla australis	Short-finned eel	-	13	-	9	13	2	4	2	4	1
Galaxias maculatus	Common galaxias								8		-
Gobiomorphus australis	Striped gudgeon	28	8	3	2	-	-	-	2	2	3
Hypseleotris compressa	Empire gudgeon	13	-	-	-	-	-	-	-	-	1
Hypseleotris cf *galii*	Firetail gudgeon	-	-	-	1	1	-	-	-	-	-
Tandanus tandanus	Eel tailed catfish										1
*Carassius auratus**	Goldfish	-	2	-	-	-	1	-	-	1	-
*Gambusia holbrooki**	Gambusia	328	100's	10's	10's	100's	100's	100's	10's	100's	100's
*Misgurnus anguillicaudatus**	Oriental weatherloach	-	-	-	1	-	-	-	2	1	1
Unidentified sp.								1	-	-	-

*Introduced species;

[#]Fish were unable to be sampled at Site AQ12 within the autumn 2020 survey period (due to instrument malfunction) or during autumn 2023 (due to the presence of extensive mats of green macro-algae).

3.5 Limitations

- Only one Baseline survey was able to be sampled in autumn 2018, due to the May 2018 bushfire (Biosis, 2018);
- Due to restricted access through the construction worksite, it was not possible to access Site AQ1 on 30 May 2019 to undertake the 2019 autumn survey 2. Whilst the collection of replicate samples at each site provides important measures of variability in habitat characteristics and concentrations of toxicants, the results from Survey 1 and subsequent surveys were within the range of results collected in the Baseline survey. Therefore, it is considered that the missing sample did not detract from being able to interpret the findings of the 2019 autumn sampling event, and that the intent and outcomes of the MPES2 monitoring survey were achieved;
- Water quality measurements collected during the biological sampling only provide a snapshot of quality at the time of sampling under the prevailing flow conditions;
- In the absence of external reference sites (i.e. similar sites but in systems not subject to the Project activities), it is not possible to account for changes in the variable examined that may occur naturally at a broader regional scale.

5.0 DISCUSSION

After construction of Warehouses 1, 3, 4 and 5, the location of Warehouses 6-8 was left as compacted pads in December 2020. Warehouses 6 and 7 earthworks commenced on 9/06/22 and have since been completed, Warehouse 7a is now operational. Operation of Warehouses 6 and 7b are expected to commence in Quarter 4 of 2023 and Quarter 2 2024 (respectively). During construction, water is managed is accordance with the approved CEMP and water is discharged via the sediment (SED) Basins and into Anzac Creek (via DP5 and DP7).

5.1 Aquatic Habitat & Environmental Conditions

Reduced pool water levels and flow were noted in the spring 2023 survey 1, compared to the autumn 2023 and spring 2022 surveys. At the most upstream site sampled (Site AQ1), aquatic habitat was limited to a shallow, anoxic pool. Subsequent rainfall refilled the channel prior to the second survey and Alligator Weed, Marsh Club-rush, Typha and Slender knotweed had recolonised a large proportion of Site AQ1.

Levels of lead, copper, nickel and zinc collected from the isolated pool at Site AQ1 by Survey 1 exceeded the Interim Sediment Quality Guidelines (ISQG) (ANZECC/ARMCANZ 2000) and baseline values measured by the BAEMP survey. In sediments collected in the second survey, only lead exceeded the recommended guideline values. Most measurements of lead at AQ1 (range = 21 to 130 mg/kg) have exceeded the threshold limit (50 mg/kg), including at the time of the baseline (91 mg/kg) survey. ALS (2011), JBS&G (2016) and Biosis (2018) attributed these impacts to historical contributions from Commonwealth Department of Defence lands, industrial and urban run-off, among others. A number of factors contribute to the variability in sedimentary concentrations of metals within a site. For instance, when aquatic habitats are dried during extended periods without rain and then re-flooded, metals (including lead, copper, nickel and lead) can be released from the sediments, particularly in areas with a legacy of heavy metal pollution (Hansen and Horne, 2022). Sediment grain size is also a factor, with coarser grains often present at the outer edges of channels, while finer sediment is commonly distributed along the inside of the channel

In any case, all other toxicants monitored within sediments within spring 2023, including total petroleum hydrocarbons and poly-fluoroalkyl substances (e.g. PFAS and PFOS), continued to be within the ANZECC/ARMCANZ (2000) guideline levels. Heavy metals (including lead) bound in sediments were not identified as specific contaminants of concern for the MPES2 Project (Biosis, 2018). Further, Site AQ1 was situated upstream of potential inputs from the Project and therefore no additional testing of heavy metals at Site AQ1 should be considered necessary at this stage.

Reduced dissolved oxygen levels, elevated nitrogen, aluminium, and copper measured in surface water in the large refuge pool (Site AQ12), including prior to commencement of the Project, also reflect historic and current activities (ALS, 2011; Biosis, 2018). Concentrations of total petroleum hydrocarbons and poly-fluoroalkyl substances measured during spring 2023 remain similar to baseline values and within the recommended Australian-derived guidelines for water.

While the Project may also be influencing water quality within the creek, measures of water quality continue to be comparable to those measured previously (including prior to the commencement of the Project). Additional degradation of water quality does not appear to have occurred since the Project related construction work began.

5.2 Biological Monitoring

The macroinvertebrate assemblage supported by the refuge pool appears to experience some degree of environmental stress. This is evident in the OE50 Taxa Scores and Bands, which have generally been indicative of an assemblage that is less diverse compared to reference sites selected by the AUSRIVAS model. Low values of the SIGNAL 2 score and the number of macroinvertebrate types (only 14 taxa) were also indicative of a site suffering from one or more forms of human impact (see Chessman, 2003a&b).

Lower than expected macroinvertebrate indices were not unexpected given exposure to multiple stressors (e.g., floating mats of macro-algae, very little flow, elevated levels of nitrogen, and excessive aquatic plant growth) that can adversely affect the condition of aquatic habitat. The presence of extensive mats of green macroalgae and other aquatic vegetation within the refuge pool are a symptom of nutrient enrichment and reduced inflows.

While the plants provide substrata for attachment of filter-feeders, predators and other macroinvertebrate taxa, they alter microhabitats by slowing or modifying currents, trapping detritus, blocking light and altering oxygen regimes (Gregg and Rose, 1985; Cummins et al., 2004). Dissolved oxygen levels within the refuge pool have consistently been below the ANZECC/ARMCANZ (2000) guideline.

The introduced fish, Gambusia (*Gambusia holbrooki*), has also consistently been observed within the refuge pool. Predation by Gambusia is listed as a Key Threatening Process by the NSW *Biodiversity Conservation Act 2016*, because of known effects on frogs, freshwater fishes and aquatic macroinvertebrates.

Nevertheless, some pollution sensitive taxa were identified (including caddis fly and dragonfly larvae) and ten species of fish, including seven native species, were collected, indicating that the creek continues to provide important habitat for aquatic species. Of the species collected, all are common within NSW (McDowall, 1996; DPI 2006; Howell and Creese, 2010).

6.0 CONCLUSION & RECOMMENDATIONS

Examination of the results from the spring 2023 monitoring event found no evidence of changes in the indicator variables (bed and bank stability, surface water and sediment quality, assemblages of aquatic macroinvertebrates and fish) that could be attributed to the Project works. Thus, in accordance with the Biodiversity Monitoring Strategy, no adaptive management contingency measures were triggered.

Recommendations include:

- Sampling of the stream health monitoring program to be repeated in autumn 2024;
- Land managers focus on containment and on-going suppression of Alligator Weed within Anzac Creek, particularly at Site AQ1, and the popular aquarium plant, *Egeria densa* (Egeria), observed within the refuge pool (Site AQ12) in spring 2020 and spring 2023.

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APPENDICES

Appendix 1 - GPS positions (UTMs) for stream monitoring sites (spring 2023).

Site Code	Easting	Northing
AQ1	308116	6240233
AQ4	308557	6240282
AQ8	309220	6240814
AQ12	309385	6241601
AQ13	309383	6241735
AQ14	309365	6241881

Datum: WGS 84, Zone 56H

Appendix 2 – Visual Assessment Scores

Appendix 2a – Ephemeral stream assessment results

	Autumn 2018		Spring 2018		Autumn 2019	
Site	**Score (%)**	**Category**	**Score (%)**	**Category**	**Score (%)**	**Category**
AQ1	88	Very Stable	75	Stable	80	Stable
AQ4	88	Very Stable	75	Stable	78	Stable
AQ8	91	Very Stable	93	Very Stable	93	Very Stable
	Spring 2019		**Autumn 2020**		**Spring 2020**	
Site	**Score (%)**	**Category**	**Score (%)**	**Category**	**Score (%)**	**Category**
AQ1	88	Very Stable	90	Very Stable	90	Very Stable
AQ4	80	Stable	88	Very Stable	89	Very Stable
AQ8	92	Very Stable	93	Very Stable	93	Very Stable
	Autumn 2021		**Spring 2021**		**Autumn 2022**	
Site	**Score (%)**	**Category**	**Score (%)**	**Category**	**Score (%)**	**Category**
AQ1	80	Very Stable	90	Very Stable	92	Very Stable
AQ4	89	Very Stable	89	Very Stable	90	Very Stable
AQ8	93	Very Stable	93	Very Stable	93	Very Stable
	Spring 2022		**Autumn 2023**		**Spring 2023**	
Site	**Score (%)**	**Category**	**Score (%)**	**Category**	**Score (%)**	**Category**
AQ1	92	Very Stable	88	Very Stable	88	Very Stable
AQ4	92	Very Stable	93	Very Stable	93	Very Stable
AQ8	94	Very Stable	94	Very Stable	94	Very Stable

Appendix 2b – HABSCORE assessment results

	Autumn 2018		Spring 2018		Autumn 2019	
Site	**Score (%)**	**Category**	**Score (%)**	**Category**	**Score (%)**	**Category**
AQ1	27	Marginal	29	Marginal	32	Marginal
AQ4	28	Marginal	25	Marginal	25	Marginal
AQ8	41	Marginal	38	Marginal	38	Marginal
AQ12	55	Suboptimal	51	Suboptimal	53	Suboptimal
AQ13	21	Poor	23	Poor	21	Poor
AQ14	22	Poor	23	Poor	22	Poor
	Spring 2019		**Autumn 2020**		**Spring 2020**	
Site	**Score (%)**	**Category**	**Score (%)**	**Category**	**Score (%)**	**Category**
AQ1	30	Marginal	32	Marginal	27	Marginal
AQ4	26	Marginal	29	Marginal	28	Marginal
AQ8	41	Marginal	41	Marginal	41	Marginal
AQ12	51	Suboptimal	50	Suboptimal	53	Suboptimal
AQ13	19	Poor	21	Poor	22	Poor
AQ14	21	Poor	22	Poor	23	Poor
	Autumn 2021		**Spring 2021**		**Autumn 2022**	
Site	**Score (%)**	**Category**	**Score (%)**	**Category**	**Score (%)**	**Category**
AQ1	29	Marginal	31	Marginal	31	Marginal
AQ4	36	Marginal	38	Marginal	40	Marginal
AQ8	41	Marginal	41	Marginal	41	Marginal
AQ12	55	Suboptimal	55	Suboptimal	50	Suboptimal
AQ13	23	Poor	23	Poor	25	Poor
AQ14	24	Poor	24	Poor	25	Poor
	Spring 2022		**Autumn 2023**		**Spring 2023**	
Site	**Score (%)**	**Category**	**Score (%)**	**Category**	**Score (%)**	**Category**
AQ1	31	Marginal	32	Marginal	27	Marginal
AQ4	39	Marginal	40	Marginal	29	Marginal
AQ8	41	Marginal	41	Marginal	38	Marginal
AQ12	53	Suboptimal	53	Suboptimal	50	Suboptimal
AQ13	21	Poor	25	Poor	25	Poor
AQ14	25	Poor	25	Poor	25	Poor

Appendix 3 - Macroinvertebrate taxa collected at Site AQ12 in spring 2023 using the NSW AUSRIVAS protocol.

Taxa	Survey 1 (20 September 2023)	Survey 2 (15 November 2023)
Acariformes	12	3
Ceratopogonidae	0	10
Chironomidae - Chironominae	14	8
Chironomidae - Tanypodinae	2	2
Coenagrionidae	3	0
Dytiscidae	0	1
Oligochaeta	1	0
Oxygastridae	1	3
Physidae	2	0
Hemicorduliidae	2	0
Hydrobiidae	16	0
Leptoceridae	1	2
Libellulidae	1	1
Lymnaeidae	2	2
Number of Taxa	**12**	**9**

Moorebank Intermodal Precinct

APPENDIX F COMPLAINTS REGISTER

Moorebank Intermodal Precinct Complaints Register - as of 30 April 2024			
Date received	**Complainant**	**Nature of complaint**	**Status**
30/04/2024	Community member	Noise: Community member lodged complaint about loud noise occurring from intermodal precinct – not sure if construction noise or operational noise. Sounds like operator dropping items. Heard in Wattle Grove @8:30pm 30/04 and keeping 3yr old up. - Currently investigating work location/operational practices possibly resulting in noise generation.	**Open**
30/04/2024	Community member	Noise: Community member lodged complaint about loud noise occurring from intermodal precinct during night of 29/04. Noise from containers being loaded and unloaded. Concerned about level of noise when terminal is fully uploaded. - Currently investigating work location/operational practices possibly resulting in noise generation.	**Open**
27/04/2024	Community member	Light pollution: Multiple lights in intermodal precinct resulting in high noise pollution to residents in Casula. 4 lights currently turned on with 7 yet to be activated. Stakeholder worried about final lighting pollution. Concerned about direction of lights and colour scheme of warehouses getting lit up with current lighting. - Currently investigating lighting requirements and possible modifications to assist stakeholder.	**Open**
26/04/2024	Community member	Personal Injury and property damage: Motorcycle rider fell off bike on Moorebank Avenue at intersection with Anzac Road. Sustained injury and damage to property (bike, watch, phone). Original complaint submitted to Liverpool City Council and LCC contacted Logos. - Currently investigating CCTV footage of the incident.	**Open**
23/04/2024	Community member	Traffic impacts: Community member lodged complaint about current road layout of Moorebank Avenue – single lane from Anzac Road to M5 is heavily congested, and stakeholder is worried final layout is unequipped for traffic volume of operational precinct. - Informed stakeholder of Moorebank Avenue realignment works. - Currently seeking additional information to provide stakeholder to close out complaint.	**Open**
05/04/2024	Community member	Noise: Community member lodged complaint about loud noise occurring morning of 5/04 from the intermodal terminal, which sounds like someone dropping something large every 30 seconds. Located in Casula and could be heard in Wattle Grove by family member. Stakeholder contacted and provided update: All noise monitors recorded identified noise; however no work activities were occurring on site. Noise not generated from MIP. Stakeholder appreciative of update and glad to see the effort that went into resolving complaint. The complaint has been closed.	Closed
01/02/2024	Community member	Noise: The complaint involved a loud echoing noise from a truck's hatch dropping dirt, disturbing a caller working from home across the river about 800 meters away from the construction site. The noise occurred within the scheduled hours, however, disrupted the caller's work online meeting. The caller acknowledged the normalcy of construction noise but emphasized the exceptional loudness on that morning. The caller's feedback was relayed to the construction team	Closed

		for consideration in the future. The complaint has been closed.	
25/01/2024	Community member	Noise: A community member complained about helicopter lifting works that occurred on January 25th, 2024. The complaint suggested that the works extended beyond the scheduled and published hours, causing noise disturbances during nighttime. The investigation revealed that the works have been undertaken in accordance with the communicated schedule and there were no scheduled or unscheduled night works at the Precinct during the specified period. The complaint has been closed.	Closed
25/01/2024	Community member	Noise: CCC member (Casula resident) complained about noise and the days of operation related to helicopter lift works on January 25th, 2024. The complainant was informed that the helicopter lift works occurred in accordance with the communicated schedule and were sanctioned activities approved under the MPW Construction Noise and Vibration Management Plan. The complainant provided with a copy of the document for their reference. Additionally, the complainant was also advised that their specific observations regarding noise-related issues and preferences for certain days for this type of works would be subject to further investigation by the Project team and discussed during the upcoming Community Consultative Committee meeting. The complaint has been closed.	Closed
24/12/2023	Road User	Development impacts: A road user made a complaint regarding a visibility issue caused by an unidentified substance on the caller's vehicle surface while driving in the Precinct area. The investigation determined the substance in question originated from construction operations within the area. The complainant provided with a suitable cleaning product. Additionally, professional cleaning services have been arranged for their car to ensure the complete removal of the substance. The complaint has been closed.	Closed
22/09/2023	Road User	Traffic lights: A road user made a complaint about traffic congestion at the intersection of Moorebank Avenue and Anzac Road during peak morning and evening hours. According to the complainant, the congestion is attributed to an auto-sensor system on Anzac Road that causes delays for road users traveling on Moorebank Avenue. The project team advised the complainant that these traffic signals are controlled by TfNSW and not by the Precinct, therefore the concern is to be raised with TfNSW. The complaint has been closed.	Closed
04/09/2023	Community member	Noise: A complainant reported noise in the late-night hours near the Fire and Rescue Station on Anzac Road. The area is outside of MIP development boundary, hence there are no construction works or operations being undertaken within the vicinity of the Fire and Rescue station on Anzac Road. The noise appears not related to the MIP development. The complaint has been closed.	Closed
21/08/2023	Community	Noise:	Closed

	member	A Wattle Grove resident complained about a metallic clunking noise most often at night-time from a west facing wall (towards the precinct). The project team investigated and found no works that could initiate noises described by the complainant were being undertaken within the precinct during night-time hours at the time of complaint. The complainant was advised that the precinct could not identify any specific events that would have caused any excessive night-time noise. However, operational teams were reminded to stay vigilant when operating at night.	
27/06/2023	Community member	Dust: A Wattle Grove resident provided feedback about dust generation on Moorebank Avenue. The project team investigated and found no exceedances of the criteria for deposited dust in the last three months. A letter response explaining specific methods for the management and monitoring of dust generation at the Precinct was provided to the complainant. The complaint has been closed.	Closed
30/05/2023	Community member	Noise: A Wattle Grove resident complained about noise in the early hours of the morning which they believed originated from the precinct. The project team investigated and found no works were being undertaken within the precinct on the night in question. The complaint has been closed.	Closed
10/05/2023	Road user	Traffic congestion: The complainant reported traffic congestion along Moorebank Avenue resulting in increased commute time. The project team investigated and found traffic signals controlled by TfNSW TMC had malfunctioned on the morning in question. A response was provided to the complainant advising of the signal outage and how to report future signal faults. Information about the closure of Chatham Road intersection was also provided.	Closed
27/04/2023	Road user	Road conditions: The complainant reported damage to their vehicle while driving on Moorebank Avenue. Further information required to investigate the complaint was not provided. The complaint has been closed.	Closed
07/02/2023	Road user	Road conditions: The complainant reported damage to their vehicle while driving on Moorebank Avenue. The project team liaised with the vehicle owner to resolve the complaint.	Closed
02/02/2023	Community member	Noise monitoring: Resident raised concern about specific locations of attended noise monitoring undertaken in 2022. The resident was provided with further clarification regarding the location of the noise monitoring as well as details of the noise monitoring requirements under the project's conditions of consent.	Closed
19/01/2023	Road user	Construction dust and mud: Road user complained about construction dust and mud on Moorebank Avenue. Road user was advised of mitigation measures in place including dust suppression, the use of water caters, wheel washing and sweeper trucks.	Closed
2022 Complaints			
Date Received	**Complainant**	**Nature of Complaint**	**Status**
31/12/2022	Community	Development impacts:	Closed

	member	Resident raised concern about the height of MPW warehousing and its impact on views. Resident was advised of initiatives to reduce impacts for community and was advised of the previous community consultation related to the development, including height of warehousing.	
14/11/2022	CCC member	Construction schedule and upcoming works: CCC member (Casula resident) complained about helicopter lifting work continuing past standard construction hours. The project team investigated the incident with the relevant contractor, who has been instructed to implement measures to ensure that any future helicopter lifts do not exceed construction hours. Further, the team notified the complainant of upcoming helicopter lifting work in December.	Closed
10/10/2022	Local business	Water / Flooding: Water entered the premises of a site neighbour during a heavy rainfall event. Site contractors have undertaken remediation works to repair, regrade and lift the bund to drain the area, pump out remaining water and revegetate the area to stabilise the bund. Contractors will continue to monitor the area to pump excess water as required.	Closed
20/09/2022	Community member	General project and noise: A Wattle Grove resident complained about noise and hours of operation at the site, and about the project more broadly. The complainant was advised further additional attended noise monitoring will be undertaken.	Closed
21/08/2022	Community member	Noise: A Wattle Grove resident complained about noise and hours of operation at the site, including out of hours works helicopter activity undertaken on site. The complainant was advised the works were an approved activity under the approved MPE Stage 2 Construction Noise and Vibration Management Plan (CNVMP) and noise monitoring undertaken as required by out of hours work consent identified noise levels were under the predicted levels outlined in the CNVMP. The complainant was also advised their observations of noise at other days/times are being investigated further through additional noise monitoring. The complainant was advised further additional attended noise monitoring will be undertaken.	Closed
18/8/2022	Community member	Noise: A Wattle Grove resident complained about noise and hours of operation at the site. The complainant was advised their observations are being investigated further through additional noise monitoring. The complainant was advised further additional attended noise monitoring will be undertaken.	Closed
17/8/2022	Community member	Noise: A Wattle Grove resident complained about noise and hours of operation at the site. The complainant was advised their observations are being investigated further through additional noise monitoring. The complainant was advised further additional attended noise monitoring will be undertaken.	Closed
16/8/2022	Community	Noise:	Closed

	member	A Wattle Grove resident complained about noise and hours of operation at the site. The complainant was advised their observations are being investigated further through additional noise monitoring. The complainant was advised further additional attended noise monitoring will be undertaken.	
13/8/2022	Community member	Noise: A Wattle Grove resident complained about noise and hours of operation at the site. The complainant was advised their observations are being investigated further through additional noise monitoring. The complainant was advised further additional attended noise monitoring will be undertaken.	Closed
13/8/2022	Community member	Noise: A Wattle Grove resident complained about noise and hours of operation at the site. The complainant was advised their observations are being investigated further through additional noise monitoring. The complainant was advised further additional attended noise monitoring will be undertaken.	Closed
12/8/2022	Community member	Noise: A Wattle Grove resident complained about noise and hours of operation at the site. The complainant was advised their observations are being investigated further through additional noise monitoring. The complainant was advised further additional attended noise monitoring will be undertaken.	Closed
12/8/2022	Community member	Noise: A Wattle Grove resident complained about noise and hours of operation at the site. The complainant was advised their observations are being investigated further through additional noise monitoring. The complainant was advised further additional attended noise monitoring will be undertaken.	Closed
11/8/2022	Community member	Noise: A Wattle Grove resident complained about noise and hours of operation at the site. The complainant was advised their observations are being investigated further through additional noise monitoring. The complainant was advised further additional attended noise monitoring will be undertaken.	Closed
10/8/2022	Community member	Noise: A Wattle Grove resident complained about noise and hours of operation at the site. The complainant was advised their observations are being investigated further through additional noise monitoring. The complainant was advised further additional attended noise monitoring will be undertaken.	Closed
31/7/2022	Community member	Noise: A Wattle Grove resident complained about noise and hours of operation at the site. The complainant was advised their observations are being investigated further through additional noise monitoring. The complainant was advised further additional attended noise	Closed

		monitoring will be undertaken.	
30/7/2022	Community member	Noise: A Wattle Grove resident complained about noise and hours of operation at the site. The complainant was advised their observations are being investigated further through additional noise monitoring. The complainant was advised further additional attended noise monitoring will be undertaken.	Closed
29/7/2022	Community member	Noise: A Wattle Grove resident complained about noise and hours of operation at the site. The complainant was advised their observations are being investigated further through additional noise monitoring. The complainant was advised further additional attended noise monitoring will be undertaken.	Closed
28/7/2022	Community member	Noise: A Wattle Grove resident made a complaint about truck and container movement noise at the site. The complainant was advised the project has approval to operate 24/7 within limits of the Operational Noise and Vibration Management Plan and the project undertakes ongoing noise management and monitoring, including permanent noise monitors. Further, the team notified the complainant that staged commencement of automated electric crane operations later this year which are expected to result in more environmentally friendly operations on site. The complainant was advised further additional attended noise monitoring will be undertaken.	Closed
19/7/2022	Community member	Noise: A Wattle Grove resident complained about noise emanating from the site, particular trucks and container movement noise. The complainant was advised the project has approval to operate 24/7 within limits of the Operational Noise and Vibration Management Plan and the project undertakes ongoing noise management and monitoring, including permanent noise monitors. Further, the team notified the complainant that staged commencement of automated electric crane operations later this year which are expected to result in more environmentally friendly operations on site. The complainant was advised further additional attended noise monitoring will be undertaken	Closed
4/7/2022	Local business	Flooding: Water entered the premises of a site neighbour during a heavy rainfall weather event (300mm +). Following an investigation, SIMTA contractors undertook cleaning of the site and repair to verges. Further work will be undertaken to repair swale damage.	Closed
18/06/2022	Community member	Noise: A resident in Wattle Grove made a complaint relating to container movement noise. The project team investigated and noise monitoring at the time described included some container noise which was within approved noise parameters for the site. As a result of the community member's observations, attended noise monitoring will be undertaken in the area to further explore (in addition to permanent noise monitoring already in place at	Closed

		locations determined by DPE). The complainant was advised further additional attended noise monitoring will be undertaken.	
10/06/2022	Community member	Noise: A resident in Wattle Grove made a complaint about container movement noise. The project team investigated and noise monitoring at the time described included some container noise which was within approved noise parameters for the site. As a result of the community member's observations, attended noise monitoring will be undertaken in the area to further explore (in addition to permanent noise monitoring already in place at locations determined by DPE).	Closed
26/04/2022	CCC member	Noise: Complainant noted sound from a water pump has been operating 24/7 near the Georges River at the north of the site for about a week. The project team investigated the complaint and discovered the water level within the excavation works area had recently receded, causing the pump to function incorrectly. The complainant was informed acoustic blankets would be installed for additional noise attenuation and the pump would only be running during standard construction hours until they are in place. Further noise modelling will be undertaken before overnight pumping resumes.	Closed
19/02/2022	CCC member	Noise: Complainant noted weekend work was being carried out after 1pm Saturday. The complainant was advised a new extended weekend construction hours order had been issued by the NSW Minister for Planning and was supplied a copy of the order.	Closed
11/01/2022	CCC member	Noise: Complainant noted heavy vehicle noise late at night. No work was being undertaken on our project at that time, which complainant was advised.	Closed
2021 Complaints			
Date received	**Complainant**	**Nature of complaint**	**Status**
25/11/2021	Road user	Condition of road: A motorist complained about potholes on Moorebank Avenue between East Hills railway line and Cambridge Avenue. The project team advised the motorist that the potholes are within the section of the road owned and managed by the Department of Defence and was not related to the project. The complainant was directed to contact Department of Defence. (Issue not related to project).	Closed
05/11/2021	Road user	Condition of road: A road user complained about the condition of Anzac Road. The project team investigated the specific location of Anzac Road and discovered this is an area of Anzac Road currently being upgraded by Liverpool City Council. This upgrade is unrelated to the project.	Closed
04/11/2021	CCC member	Dust: A CCC member reported dust coming from the southern end of Moorebank Precinct West. The project team reminded all contractors to ensure mitigation strategies continue to be	Closed

		implemented appropriately. Further discussions about dust management from active stockpiles were conducted with the overall project team. The complaint occurred on a day where the wind was 80-90km/hr - while water carts were suppressing dust on the day, it was impossible to eliminate the dust due to these high wind speeds.	
01/11/2021	Community member	Noise: A resident in Wattle Grove complained about night works noise coming from Anzac Road. The project team discovered that these works are undertaken by Liverpool City Council and advised the resident to contact council. (Issue not related to project).	Closed
28/10/2021	Road user via Liverpool City Council	Condition of road: Liverpool City Council on behalf of road users complained about the condition of Bapaume Road, Moorebank. The project team is investigating ways to temporary remedy potholes and conditions of the road where possible. Please note this is a local controlled council road.	Closed
25/10/2021	Community member	Noise: A resident complained about noise coming from the Moorebank Intermodal Terminal direction. The project team acknowledged the complainant's concerns and requested more information about the noise so the team could carry out further investigation to identify the source. No further information was provided by the complainant, and project teams confirmed that no out of hours works were undertaken at the time by Moorebank Intermodal Terminal.	Closed
16/10/2021	Community member	Noise: A resident in Wattle Grove complained about night works noise. The project team investigated the complaint and discovered that night works (asphalting) were undertaken by nearby Holsworthy Army Barrack. Stakeholder was advised and encouraged to provide additional detail for future noise issues. (Issue not related to project.)	Closed
09/09/2021	CCC member	Noise: A CCC member complained about trucks beeping noise from a heavy vehicle in the early hours. The project team investigated the noise and discovered that it came from a Fire & Rescue NSW truck inspecting a local business premises. (Issue not related to project.)	Closed
07/09/2021	Community member	General project: A resident in Glenfield complained about the height of warehousing on MPW hindering his cityscape view. The project team provided information to assist complainant understanding of works currently underway and those planned and approved for the near future.	Closed
17/07/2021	Road user	Vehicle Damage: A motorist reported a pothole on Anzac Road, east of Anzac Creek. The project team advised that the pothole was within the section of the road owned and managed by the Department of Defence and was not related to the project. The complainant was directed to DoD. (Issue not related to project.)	Closed
14/07/2021	Road user	Vehicle Damage:	Closed

		A motorist reported windscreen damaged by a rock from a truck on Moorebank Avenue. The project team investigated the claim and discovered the truck was not working on the project on the day of the incident. The motorist was directed to contact the truck company directly. (Issue not related to project.)	
14/05/2021	Road user	Driver behaviour: Site neighbour advised that vehicle leaving site failed to completely stop moving at a stop sign. SIMTA contractors issued road safety to relevant team members.	Closed
13/05/2021	Community member	Noise: A resident from East Moorebank complained of OOH excavator noise during a one-month period. Further information was requested from the complainant, but no response was provided. Investigations indicated the noise was not related to the project.	Closed
06/05/2021	Local Business	Water/Flooding: Site neighbour advised that water was flowing from SIMTA property into culvert situated along fence line on private property. SIMTA introduced measures to help prevent runoff during heavy rainfall.	Closed
13/04/2021	Road user	Traffic lights: A road user complained about traffic congestion on Moorebank Avenue causing major delays. Roads and Maritime Services advised the light sequencing system was faulty. The project team had also directly reported the issue to TfNSW. (Issue not related to project.)	Closed
08/04/2021	Local Business	Water/Flooding: Advised by site neighbour that a water hose situated on SIMTA property was leaking. The project team inspected the hose and repaired it.	Closed
29/03/2021	Road user	Traffic lights: A road user complained about traffic congestion on Moorebank Avenue causing major delays. Roads and Maritime Services advised the light sequencing system was faulty. (Issue not related to project.)	Closed
29/03/2021	Road user	Traffic lights: A road user complained about traffic congestion on Moorebank Avenue causing major delays. Roads and Maritime Services advised the light sequencing system was faulty. (Issue not related to project.)	Closed
22/03/2021	Local Business	Water/Flooding: Water entered the premises of a site neighbour during heavy rainfall. As a gesture of goodwill, SIMTA offered to pay for the clean-up.	Closed
09/01/2021	CCC member	Noise: A CCC member complained about trucks tailgates making noise during the delivery of material to the site. The project team investigated the complaint and noted that the complaint related to trucks operating during standard construction hours and within approval conditions.	Closed
2020 Complaints			
Date received	**Complainant**	**Nature of complaint**	**Status**
12/12/2020	CCC member	Noise: A CCC member complained about noise from night work. The	Closed

		project team acknowledge the CCC member's concerns and informed that they have amended the work methodology in response to previous complaints. The team advised they have moved the out-of-hours work to a section of the site located further away from homes in Casula, endeavouring to ensure all plant and machinery on MPW uses non-tonal reversing sounders. Furthermore, the project team also introduced several initiatives to reduce the impact of night works. Noise monitoring indicates that these initiatives appear to be working in helping reduced noise impacts from night works.	
10/12/2020	Community member	Dust: A community member complained about dust impacts on her home. The project team outlined the measures used to mitigate the impact of dust; including frequent use of dust suppression vehicles, continually monitoring dust levels and work practices being altered during strong winds. The project team apologised the community member for any impacts.	Closed
09/11/2020	CCC member	Noise: A CCC member visited BMD gate on MPW and complained about noisy night work. The site supervisor discussed new noise mitigation measures had been put in place for the night work and the CCC member agreed the noise level had dropped. The supervisor also explained to the CCC member that ongoing toolbox talks with contractors/drivers on the need to keep noise levels down, especially with the use of horns and closing tailgates. The CCC member agreed that everyone was doing their best to keep noise levels down.	Closed
04/11/2020	Road user	Truck driver behaviour: A road user complained about an interaction with a truck driver on Moorebank Avenue. The project team investigated the complaint and dashcam footage was inconclusive in terms of the account of the incident. The project team also discussed with the truck driver the importance of always ensuring road safety and road rules are adhered to when entering and leaving site. The project team apologised the road user for any concerns caused by the incident.	Closed
22/10/2020	CCC member	Noise: A CCC member complained about noisy night work. The project team acknowledge the CCC member's concerns and advised that they have amended the work methodology in response to his expressing dissatisfaction with the level of out-of-hours work noise. The team advised they have moved the out-of-hours work to a section of the site located further away from homes in Casula. In addition, the project team also introduced additional noise monitoring to help confirm noise sources. Feedback from the CCC member indicated that this eliminated the noise issues he had been experiencing.	Closed
20/10/2020	CCC member	Dust: A CCC member complained about dust coming up from the northern end of MPW. The project team investigated the complaint and informed the CCC member they could not conclusively identify any work that caused the dust complaint reported. The project team organised additional street sweeping	Closed

		and dust suppression vehicles to mitigate any possible dust issues.	
15/10/2020	Community member	A resident in Casula complained about construction noise. The project team acknowledge the resident's concerns and advised that they have amended the work methodology in response to residents expressing dissatisfaction with the level of out-of-hours work noise. The team did this by relocating the out-of-hours work to a section of the site located further away from homes in Casula. In addition, the project team also introduced additional noise monitoring to help confirm noise sources.	Closed
14/10/2020	Community member	Noise: Two residents in Casula complained that they could hear loud metallic bangs at night. The project team acknowledged the residents' concerns and advised that the "banging" noises were determined to be caused by tipper trucks' tailgates delivering crushed sandstone to the site during extended hours. The team reiterated to drivers that they should take care to ensure their tailgates closed as quietly as possible after they deposited their load on-site. In addition, the project team relocated the out-of-hours work to a section of the site further away from homes in Casula and introduced additional noise monitoring. Feedback from the community indicated that this eliminated the noise issues they had been experiencing.	Closed
09/10/2020	Community member	Noise: A resident in Wattle Grove complained that he could hear hydraulic excavator or similar making loud noises at night. The project team investigated the complaint and informed the resident that there had not been any night-time activity on the site other than out-of-hours deliveries of crushed sandstone to Moorebank Precinct.	Closed
24/09/2020	Neighbour	Traffic lights: A representative of the Department of Defence complained about the traffic light timing at the intersection of Moorebank Ave and Frank Partridge Drive. Roads and Maritime Services advised that the signals operate on an auto-sensor system. Complainant was provided RMS details to advise of traffic delays that may require adjustment to the signaling.	Closed
24/09/2020	Community member	Noise: A resident in Casula complained about the noise generated by nightworks. The project team investigated and informed the resident that the noise was caused by trucks delivering crushed sandstone to the site during extended hours. The project team apologised for the inconvenience caused and reminded the contractor of the importance of minimising the noise created by this work.	Closed
21/09/2020	CCC member	Noise: A CCC member complained about noisy night work, including jackhammering. The project team investigated and confirmed that no work of high-impact nature caused the excessive noise claimed. The only work which used plant machinery and a bulldozer was the ongoing importation of materials to site.	Closed
15/09/2020	Community member	Dust: A community member complained via DPIE about rubbish and sand	Closed

	via DPIE	on Moorebank Avenue. The project team organised additional street sweeping and dust suppression.	
02/09/2020	Community member	Noise: A resident in Casula complained that he could hear loud metallic bangs at night. The project team investigated the complaint and informed the resident that the noise was likely caused by a truck's tailgate closing after it delivered crushed sandstone to the site during extended hours. The project team apologised for the inconvenience caused and reminded the contractor of the importance of minimising the noise created by this work.	Closed
02/09/2020	Community member	Vehicle Damage: A motorist reported that a pothole on Moorebank Avenue caused damaged to her car. The project team investigated the complaint and discovered that the pothole was within the section of the road owned and managed by the Department of Defence. The complainant was directed to DoD to discuss further.	Closed
26/08/2020	CCC member	Noise: A CCC member complained about loud metallic bangs from trucks' tailgate while unloading crushed sandstone to site. The project team investigated the complaint and believed that the noise might have been caused by a truck's tailgate closing after it had tipped its load. The project team reminded the contractor of the importance of this work being carried out more quietly in future and has also been carrying out noise monitoring of this work.	Closed
25/08/2020	Community member	Environmental impacts: A resident in Casula complained about the height of the proposed Woolworths warehousing on MPW affecting the view from his backyard. The project team advised the resident the proposal was open for public consultation and directed him to the online information link to provide a submission detailing his concerns.	Closed
24/08/2020	Community member	Condition of road: A member of the community complained about her vehicle being damaged by the pothole in Moorebank Avenue south of the East Hills rail line. The project team investigated the complaint and discovered that the pothole is in the area owned and managed by Department of Defence and advised her to raise her concerns with DoD.	Closed
18/08/2020	CCC member via DPIE	Environmental impacts: CCC member complained via DPIE that the colour scheme of the IMEX crane located on the Moorebank Precinct East site is considered visually intrusive. The project team confirmed to the complainant that this is the final colour scheme of the equipment.	Closed
17/08/2020	Community member	Condition of road: A community member complained about a pothole in Moorebank Avenue. The project team investigated the location of the pothole and found that it is in the area owned and managed by Department of Defence and advised the resident to contact the DoD.	Closed
27/05/2020	CCC member	Noise:	Closed

		CCC member noted that noise was audible until 8.30 pm on 26/5 as trucks delivered materials to the worksite. Project team confirmed that this is permitted by project approvals.	
20/04/2020	CCC member	Lighting: CCC member asked that on-site lighting be trimmed down as one unit is directing light towards his home. Project team adjusted the relevant lighting, including light shields and further engaged with complainant to ensure temporary lighting units were not placed in locations that directed light towards his home.	Closed
13/03/2020	Community member via DPIE	Vegetation: Resident claimed that Aboriginal Scar trees were being removed from site. Project team confirmed and provided evidence that this had not occurred.	Closed
10/03/2020	Community member via Liverpool City Council	Condition of road: Local resident observed potholes on Moorebank Ave near Anzac Avenue and wanted the potholes repaired. Project team worked with LCC to identify and repair potholes.	Closed
24/02/2020	Community member	Environmental impacts: Request that traffic controllers stop feeding bread to the cockatoos. Personnel ceased doing so immediately.	Closed
18/02/2020	Local business	General construction: Noting runoff of water from site detention basins following 450mm rainfall storm event. Project team confirmed that this is in line with project approvals.	Closed
22/01/2020	Community member	General construction: Stacked containers wall fell during supercell storm. Project team reduced height of stack and altered stacking method to further reinforce the noise wall.	Closed
22/01/2020	Community member	General construction: Stacked containers wall fell during supercell storm. Project team reduced height of stack and altered stacking method to further reinforce the noise wall.	Closed
2019 Complaints			
Date received	**Complainant**	**Nature of complaint**	**Status**
27/11/2019	RAID via DPIE	Dust: RAID member claimed dust that had settled on outdoor furniture was produced by project construction. No further evidence was able to be supplied.	Closed
25/11/2019	Local business	Condition of road: Roadside bollards damaged by turning truck. Project team repaired bollards.	Closed
25/10/2019	Community member via DPIE	Dust: Resident noted dust issues affecting his home and pool, as well as Moorebank Avenue. Project team noted dust mitigation and management protocols that are in place.	Closed
11/10/2019	Road user	Condition of road: Three pot holes on the road approaching the bridge on Cambridge Ave, Moorebank. Project team reported potholes to road owner.	Closed

7/09/2019	Road user	Vehicle damage: Road user reported that her vehicle was damaged by site fencing during heavy wind. Investigation by relevant insurance agency determined that the damage had been existing on the vehicle.	Closed
2/09/2019	Community member	Dust: Resident noted dust issues affecting his home. Project team noted dust mitigation and management protocols that are in place.	Closed
21/08/2019	Community member	Noise: Complainant reported excessive night-time noise over three nights, which they believed to have been caused by project construction. Project team confirmed that construction took place on only two of the three dates, and that the activities reported as occurring around 2am had concluded by midnight. Project team was able to ascertain that MS Motorway roadworks were also carried out on the dates in question.	Closed
21/08/2019	Community member	Noise: Complainant reported excessive night-time noise, which they believed to have been caused by project construction. Project team confirmed that construction took place on the reported date, with MS Motorway roadworks also carried out on the date in question.	Closed
20/08/2019	Community member	Noise: Complainant reported excessive night-time noise, which they believed to have been caused by project construction. Project team confirmed that construction took place on the reported date, with MS Motorway roadworks also carried out on the date in question.	Closed
17/08/2019	Community member	Noise: Complainant reported excessive night-time noise, which they believed to have been caused by project construction. Project team confirmed that construction took place on the reported date, with MS Motorway roadworks also carried out on the date in question.	Closed
16/08/2019	Community member	Noise: Complainant reported excessive night-time noise, which they believed to have been caused by project construction. Project team confirmed that construction took place on the reported date, with MS Motorway roadworks also carried out on the date in question.	Closed
18/07/2019	Community member	Water use: Repeat of 9/7/19 complaint, project team reiterated that water use was legal, approved, paid for and only took place when captured rainwater was unavailable.	Closed
16/07/2019	Community member	Truck movements: Resident noted heavy vehicle use of Anzac Road in exceedance of weight limit. Was unable to provide any registration number or other identifying features of the vehicles he witnessed.	Closed
9/07/2019	Community member	Water use: Complainant witnessed project water suppression tankers filling up from Sydney Water pumping station and alleged water was being stolen. Project team confirmed that this was approved under licence by Sydney Water, that the water was paid for and that mains refilling only took place when project water basins were empty.	Closed

2/07/2019	Local business	Condition of road: Complainant noted dirt "tracking" from worksite onto Bapaume Road and dirt in drains from site runoff. Project team cleaned Bapaume Road with street sweeper, improved site features to reduce tracking, cleaned gutters and pumped out roadside drains.	Closed
28/06/2019	Community member	Water use: Complainant witnessed project water suppression tankers filling up from Sydney Water pumping station. Project team confirmed that this was approved under licence by Sydney Water and that mains refilling only took place when project water basins were empty.	Closed
20/05/2019	Community member via DPIE	Noise: Complainant reported hearing an 'evacuation warning siren'. Project team was unable to identify a source of the noise within the worksite.	Closed
9/04/2019	Road user via Transport for NSW	Condition of road: Road user reported a "lip" in the road surface above the new rail underpass. Project team confirmed this was not the final road surface and that a weekend road closure to apply the final surface was upcoming.	Closed
3/04/2019	RAID via Liverpool City Council	Condition of road: Complainant reported localised flooding on the road along Moorebank Ave and its effect on road users. Project team worked with Liverpool City Council to clear drains, and confirmed that a new drainage system delivered with the Moorebank Ave upgrade would resolve this issue.	Closed
15/03/2019	Community member	Consultation: Complaint about lack of notification for upcoming helicopter movements. Project team confirmed that a letterbox notification was delivered across an area twice the size of that required by approval condition and the complainant resided outside that area. Also advised that all project notifications are made available on the project website.	Closed
15/02/2019	Community member	Noise: Complainant reported noise being produced on-site before 7am start of works. Project team reminded contractors about noise requirements and ensuring staff arrival noise was minimised.	Closed
2018 Complaints			
Date received	**Complainant**	**Nature of complaint**	**Status**
23/11/2018	Road user	Condition of road: Road user reported a near-miss on Moorebank Avenue attributed to vehicle swerving to avoid a pothole. Project team arranged repair of pothole.	Closed
6/11/2018	Community member	Worker behaviour: Complainant reported contractor parking on property. Project team reminded work crews of respectful interface with neighbours and community.	Closed
5/11/2018	Community member	Truck movements: Resident noted heavy vehicle use of Anzac Road in exceedance of weight limit. Provided vehicle details and sub- contractor was reminded of approved truck travel routes.	Closed

25/10/2018	Road user	Vehicle damage and condition of road: Road user reported that two tyres on his vehicle were burst by Moorebank Ave pothole. Project team arranged reimbursement of the cost of two new tyres.	Closed
22/10/2018	Road user via Liverpool City Council	Vehicle damage: Liverpool City Council received advice of damage to two vehicles caused by Moorebank Ave road surface. Project team referred complainants to relevant insurance agency.	Closed
19/10/2018	Community member via Sydney Trains	Truck movements: Trucks producing dust and blocking entry to Sydney Trains maintenance facility. Project team met with Sydney Trains, erected signage advising trucks not to stop in designated areas and increased dust suppression on entry road.	Closed
3/10/2018	Road user	Condition of road: Cyclist advised of dissatisfaction with arrangements for cyclists on Moorebank Avenue during construction and identified safety hazard of damaged signposts. Project team confirmed that footpath that had closed was not a cycle path and use by cyclists was not legally permitted. Project team advised of the approved method for cyclists to navigate during construction, including using road traffic lanes as permitted by the road rules, and ensured dangerous signposts were removed.	Closed
21/9/2018	Local business	Condition of road: Roadside bollards damaged by turning truck. Project team repaired bollards.	Closed
10/9/2018	Community member	General project: Complainant expressing disgust in the SIMTA project and asking to see proof of approvals from the Land and Environment Court. Project team provided relevant approvals.	Closed
27/8/2018	Community member	Dust: Reiteration of earlier complaint.	Closed
24/8/2018	Community member via DPIE	Environmental impacts: Resident raised concerns about vegetation clearing beside Moorebank Avenue and asked whether approval had been sought. Project team confirmed this work had been approved and provided relevant approval documents.	Closed
23/8/2018	Road user	Condition of road: Complaint about dust and debris on Moorebank Ave. Project team advised of systems in place to manage dust/dirt and regular sweeping of the road surface. Project team reviewed dust suppression measures as a result of this and two other complaints and introduced an additional mitigation measure - spraying a polymer binder to seal dirt that would remain exposed long-term.	Closed
23/8/2018	Community member	Condition of road: Complaint about dust and debris on Moorebank Ave. Project team advised of systems to manage dust/dirt and regular sweeping. Project team reviewed suppression measures as a result of this and two other complaints and introduced an additional mitigation measure - spraying a polymer binder to seal dirt that would remain exposed long-term.	Closed
21/8/2018	Community	Dust:	Closed

	member	Complainant reported his house and car were being regularly made dirty by dust caused by construction and sought compensation for cleaning that he had been carrying out. Project team reviewed dust suppression measures as a result of this and two other complaints and introduced an additional mitigation measure - spraying a polymer binder to seal dirt that would remain exposed long-term.	
8/8/2018	Road user	Traffic: Complainant reporting delays on Moorebank Ave caused by the management of project's traffic control. Traffic controllers were advised to ensure priority was given to vehicles travelling on Moorebank Ave during peak periods.	Closed
6/8/2018	Community member	Damage to property: Concrete slurry was left. Construction team cleaned this.	Closed
12/7/2018	Community member	Noise: Casula resident complaint about beeping noises before 7am. Project team confirmed no site vehicles have reversing "beepers" fitted, and reminded crews to arrive quietly.	Closed
2/7/2018	Community member	Condition of road: Resident advised on Moorebank Ave potholes. Project team organised for road to be repaired.	Closed
26/6/2018	Community member via Liverpool City Council	General construction: Temporary reinstatement of footpath with asphalt viewed by pedestrian as insufficient. Requested better permanent surface. This was provided after construction was completed in the area.	Closed
17/6/2018	Community member	Truck movements: Resident had observed trucks parking alongside Anzac Road so drivers could frequent take-away food store. Also noted exceedance of Anzac Rd weight limit and claimed vehicles were parking in a No Stopping zone. Project team investigated and confirmed that roadside parking in the relevant section of Anzac Rd was legal, but ensured truck drivers were reminded not to block footpath when parking and that Anzac Rd past fire station carried a weight limit.	Closed
28/5/2018	Community member	General project: General Concerns around the amount of trucks that will be on local roads in the coming years. Complainant commented that the trucks are too noisy, and she believes they are speeding, especially on her street. Project team advised of project benefits around reduction of heavy vehicle movements and investigated claim re truck speeding on complainant's street. Complainant lives on the northern side of Moorebank in an area not used by project vehicles.	Closed
28/5/2018	Community member	General project: Caller advised that she received a letter re Moorebank Intermodal Terminal Facility and she would like more information. Resident lives on Junction Rd, Moorebank, and has many concerns around traffic and project works impacting on Junction Rd. Project team provided additional information on project.	Closed
24/5/2018	Local business	Truck movements: Complaint about trucks parking on nature strip outside business's premises.	Closed

		Nature strip was fenced off to ensure trucks were unable to park at that location.	
16/5/2018	Road user	Vehicle damage: Complainant's vehicle was sprayed with a substance from a project vehicle. Project team arranged repair of the vehicle.	Closed
4/4/2018	Community member	General project: Complainant generally opposes the project. Project team noted the complaint.	Closed
2/3/2018	Community member	Dust: Caller advised of large plume of dust going high into the air, viewed from Casula. Project team spoke with demolition crews and was unable to identify cause or confirm this was related to the project.	Closed
1/3/2018	Community member	Environmental impacts: A resident advised they had provided EPA with photos of what they say is a sediment control incident. Project team liaised with EPA to resolve matter.	Closed
21/2/2018	Community member	Lighting: Report that temporary traffic lights are left on all night. Project team resolved.	Closed
16/2/2018	Community member via OPIE	Noise: Resident alleged that loud banging noise was audible at Sam. Project team confirmed no work was underway on site at that time.	Closed
8/2/2018	Community member	General project: Complaint made about ignoring community feedback. Project team noted this complaint.	Closed
5/2/2018	Community member	Traffic: Complainant reporting delays on Moorebank Ave caused by the management of project's traffic control. Traffic controllers were advised to ensure priority was given to vehicles travelling on Moorebank Ave during peak periods.	Closed
19/1/2018	Community member via OPIE	Noise: Resident alleged that loud banging noise was audible at 4.25am. Project team confirmed no work was underway on site at that time.	Closed

APPENDIX G – BIODIVERSITY (FLORA AND FAUNA MONITORING REPORTS)

Ongoing internal reporting. No submission required under SSD 6766 and 7628.

Moorebank Intermodal Precinct

APPENDIX H BTODR REPORTING

Biannual Trip Origin Destination Report

01 November 2023 – 30 April 2024

Moorebank Precinct East
29/07/2024
P1065r09

Info@asongroup.com.au
+61 2 9083 6601
Suite 17.02, Level 17,
1 Castlereagh Street,
Sydney, NSW 2000

Document Control

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Revision History

Revision No.	Date	Details	Author	Approved by
I	31/05/2024	Issue I	J. Lam	J. Laidler
II	31/05/2024	Issue II	J. Lam	J. Laidler
III	03/06/2024	Issue III	J. Lam	J. Laidler
IV	29/07/2024	Issue IV	J. Lam	J. Lam

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APPENDICES

Glossary

Acronym	Description
BTODR	Biannual Trip Origin Destination Report
GFA	Gross Floor Area
IMEX	IMEX (Import-Export) Intermodal Terminal
MIP	Moorebank Intermodal Precinct
MPE	Moorebank Precinct East
OD	Origin - Destination
QUBE	Qube Property Management Services Pty Limited
RMS	Roads & Maritime Services
SSD	State Significant Development
TA	Transport Assessment
TEU	Twenty Foot Equivalent Units
TfNSW	Transport for New South Wales
SIMTA	Sydney Intermodal Terminal Alliance

Reference Documents

Abbreviation	Document
BTODR Framework Report	Moorebank Precinct East -Biannual Trip Origin Destination Report Framework for Data Collection and Reporting, (Arcadis, August 2019)
BTODR Report May 2023	Biannual Trip Origin Destination Report, Moorebank Precinct East, Ref:1065r07 (Ason Group, August 2023)
MPE Stage 1 - TAIA	SIMTA Intermodal Terminal Facility Stage 1 Traffic & Accessibility Impact Assessment (Hyder Consulting, March 2015)
MPE Stage 2 - OTTIA	Moorebank Precinct East Stage 2 Proposal - Operational Traffic and Transport Impact Assessment (Arcadis, December 2016)
MPE Stage 2 – RtS	Moorebank Precinct East Stage 2 Proposal – Response to Submission - Appendix C3: Consolidated Traffic Table (Arcadis, July 2017)

1 Introduction

1.1 Introduction

Ason Group has been commissioned by Qube Property Management Services Pty Limited to prepare an initial BTODR for MPE (including IMEX), as outlined within the development consents SSD 7628 and SSD 6766. This report has been prepared following Condition B28 of SSD 7628, which has been provided below;

Condition B28. The Applicant is to prepare a Biannual Trip Origin and Destination Report each six months following commencement of any operation (in a format agreed with TfNSW and RMS) that advises:

a) the number of actual and standard twenty-foot equivalent shipping containers despatched and received during the period;

b) the number of days in the period that the truck gate was open for despatching trucks 24 hours a day, 7 days a week and detail any exceptions to this and advise actual hours of operation;

c) records of vehicle numbers accessing the site; and

d) representative vehicle origins and destinations, based on a cordon in the surrounding network.

A framework for recording and reporting on the data required for the report, prepared to the satisfaction of TfNSW and RMS, is to be submitted to the Secretary three months prior to the commencement of operation.

The report is to be submitted within one month of its preparation throughout operation of the project, starting six months from the commencement of operation, unless otherwise agreed by the Secretary, TfNSW and RMS.

The cordon count at (d) above will:

- apply to all classes of vehicles; and
- cover the intermodal terminal, the warehousing facility, and any other uses such as the freight village.

As such, this report has been prepared on the basis of a review of the documentation provided and relevant publicly available documentation associated with the staged redevelopment of the MPE. Additionally, the reference BTODR Framework report (at **Appendix A**) forms the basis and format of this report and has been prepared to the satisfaction of Transport for NSW.

The BTODR is a document ultimately intended for when MPE is fully operational. Currently MPE has a mixture of lots where warehouses are operational or under construction; therefore, there are challenges to collect the full extent of data envisaged at this stage. Accordingly, this BTODR has been compiled on the basis of the data available at this time, with a view to achieving as best as possible the objectives of the BTODR.

1.2 Purpose

This BTODR addresses the relevant requirements of the Project Approvals and other guidelines and standards applicable during operations of MPE. The BTODR is proposed to keep an accurate record of the shipping containers and vehicle arrivals / departures against approved volumes.

1.3 Scope

For the purpose of the BTODR, the scope of this report shall include:

- Review of the number of twenty-foot equivalent shipping containers dispatched and received.
- Review the number of days in the period that the truck gate was open for despatching trucks and detail any exceptions to the actual hours of operation.
- Record the number of vehicles accessing MPE.
- Outline the vehicle origin and destinations based on a cordon in the surrounding round network.
- Comment on the employee numbers at MPE.

This report has assumed selected OD cordons (as outlined within **Figure 1**) which will apply to all classes of vehicles (while also covering the IMEX, warehousing facilities and any other uses such as the freight village).

1.4 Period of Reporting

As mentioned above, the main objective of the BTODR is to report on traffic once MPE is completed and fully operational. At this stage, MPE is only partially operational and has a number of areas within the Site that are under construction.

TABLE 1: BREAKDOWN OF OPERATIONAL STATUS WITHIN MPE

Tenanted Area	Operational	
	1 May 2023 – 31 Oct 2023	1 Nov 2023 – 30 Apr 2024
IMEX	Yes	Yes
WH 1	Yes	Yes
WH 3A	Yes	Yes
WH 3B	Yes	Yes
WH 4A	Yes	Yes
WH 4B	Yes	Yes
WH 5	Yes	Yes
WH 6	No	No
WH 7A	No	**Yes**
WH 7B	No	No
WH 8	No	No

*Note: Those in **bold** are the changes from the precious reporting period.*

The reporting periods assessed by this BTODR – based on available data – are outlined below:

- Shipping Container Transport: 1 November 2023 – 30 April 2024
- Truck Gate opening period: 1 November 2023 – 30 April 2024
- Traffic Volumes: 18 March 2024 – 22 March 2024
- Origin / Destination Numbers: 18 March 2024 – 22 March 2024

2 Container Transport

This section provides the total number of actual TEUs dispatched and received during the reporting period. The analysis is based on the operational data from logistical schedules.

The information outlined below has been sourced by Tactical, BMD, Qube Logistics, Knight Frank who are currently operating in some form within MPE. **Table 2** presents the total TEUs received and dispatched from the IMEX terminal.

TABLE 2: SHIPPING CONTAINER TRANSPORT

Reporting Period	Month	Total Containers Received / Dispatched	Cumulative Total for Period
Period 7	May-2023	900	900
	Jun-2023	921	1,821
	Jul-2023	1,295	3,116
	Aug-2023	1,609	4,725
	Sep-2023	1,585	6,310
	Oct-2023	1,789	8,099
Period 8	Nov-2023	4,044	4,044
	Dec-2023	4,774	8,818
	Jan-2024	4,995	13,813
	Feb-2024	7,339	21,152
	Mar-2024	9,396	30,548
	Apr-2024	10,741	41,289

3 Truck Gate Opening Periods

3.1 Period of Opening

The BTODR Framework requires reporting on the number of days in a specific period that the truck gate was operational. In response, the period of time where the gate was operational has been in **Table 3**.

TABLE 3: BREAKDOWN OF OPERATIONAL STATUS WITHIN MPE

Reporting Period	Period of Opening
Period 7	1 May 2023 – 31 October 2023
Period 8	1 November 2023 – 30 April 2024

3.2 Exceptions to Full Time Opening

Further to the above, the BTODR Framework requires reporting on any periods when the gates were not open. In response, **Table 4** outlines the timeframes and reasons for when no containers left IMEX by truck.

TABLE 4: TRUCK GATE OPENING PERIOD EXCEPTIONS

Reporting Period	Period of Closure	Reason for Closure
Period 6	No Closures during this period	-
Period 7	No Closures during this period	-

3.3 Actual Hours of Opening

At present, the general truck gate daily opening times are outlined below.

- Monday – Friday: 4:00am – 3:00am
- Saturday: 4:00am – 4:00pm
- Sunday: Closed

These times changed from the previous period of reporting.

4 Traffic Volumes

4.1 MPE Main Access

Traffic data has been collected to identify the volumes of light and heavy vehicles accessing MPE from the current main access on Moorebank Avenue. **Table 5** summarises the average daily volumes from the data collected.

TABLE 5: AVERAGE DAILY TRAFFIC VOLUMES

Reporting Period	Reporting Dates	Vehicles In		Vehicles Out	
		Light Vehicles	Heavy Vehicles	Light Vehicles	Heavy Vehicles
Period 7	27 Nov 2023 – 1 Dec 2023	897	354	894	352
Period 8	18 Mar 2024 – 22 Mar 2024	863	361	856	348

5 Origin-Destination Results

5.1 Survey Locations

OD surveys have been undertaken to understand the distribution of MPE traffic on the surrounding road network. To meet the requirements of the BTODR, the OD surveys have recorded traffic volumes across a 24-hour period, with the locations of the survey and corresponding gate numbers presented on **Figure 1** and outlined below.

TABLE 6: OD SURVEY GATES

Gate Number	Gate Location
OD1	Moorebank Avenue, about 350 metres north of the M5 South Western Motorway
OD2	Eastbound off-ramp of M5 Interchange
OD3	Eastbound on-ramp of M5 Interchange
OD4	Westbound on-ramp of M5 Interchange
OD5	Westbound off-ramp of M5 Interchange
OD6	Moorebank Avenue, about 300 metres south of the M5 South Western Motorway
OD7	Anzac Road
~~**OD8**~~	~~**Defence Joint Logistics Access**~~
OD9	IMEX/MPE Main Access
OD10	Cambridge Avenue
~~**OD11**~~	~~**Moorebank Avenue, south of Cambridge Avenue**~~

5.2 Amendments to Survey Locations

During a previous reporting period of the BTODR (Period 4: 1 May 2022 – 31 October 2022), concerns were raised by the Department of Defence (DoD). DoD owns and manages sensitive properties within proximity of the Moorebank Intermodal (IMT) and were concerned about the potential for security issues for their property and/or personnel arising from traffic survey data that is routinely collected for the IMT using video camera technology. The main concern of DoD relates to the security of personnel arriving/departing from their lands and the potential for the driver and/or their vehicles being identified from the video footage.

The DoD outlined the 2 intersections that are of significance, being:

- OD8: Access intersection of the Defence Joint Logistics Unit (DJLU) with Moorebank Avenue
- OD11: Moorebank Avenue intersection with Cambridge Avenue – The southern approach of Moorebank Avenue effectively provides the rear access to the Holsworthy Military Barracks

Ason Group were instructed to remove OD and CIC survey from both intersections, therefore for this reporting period of the BTODR, OD8 and OD 11 have been removed, as noted in **Table 6** and **Figure 1**.

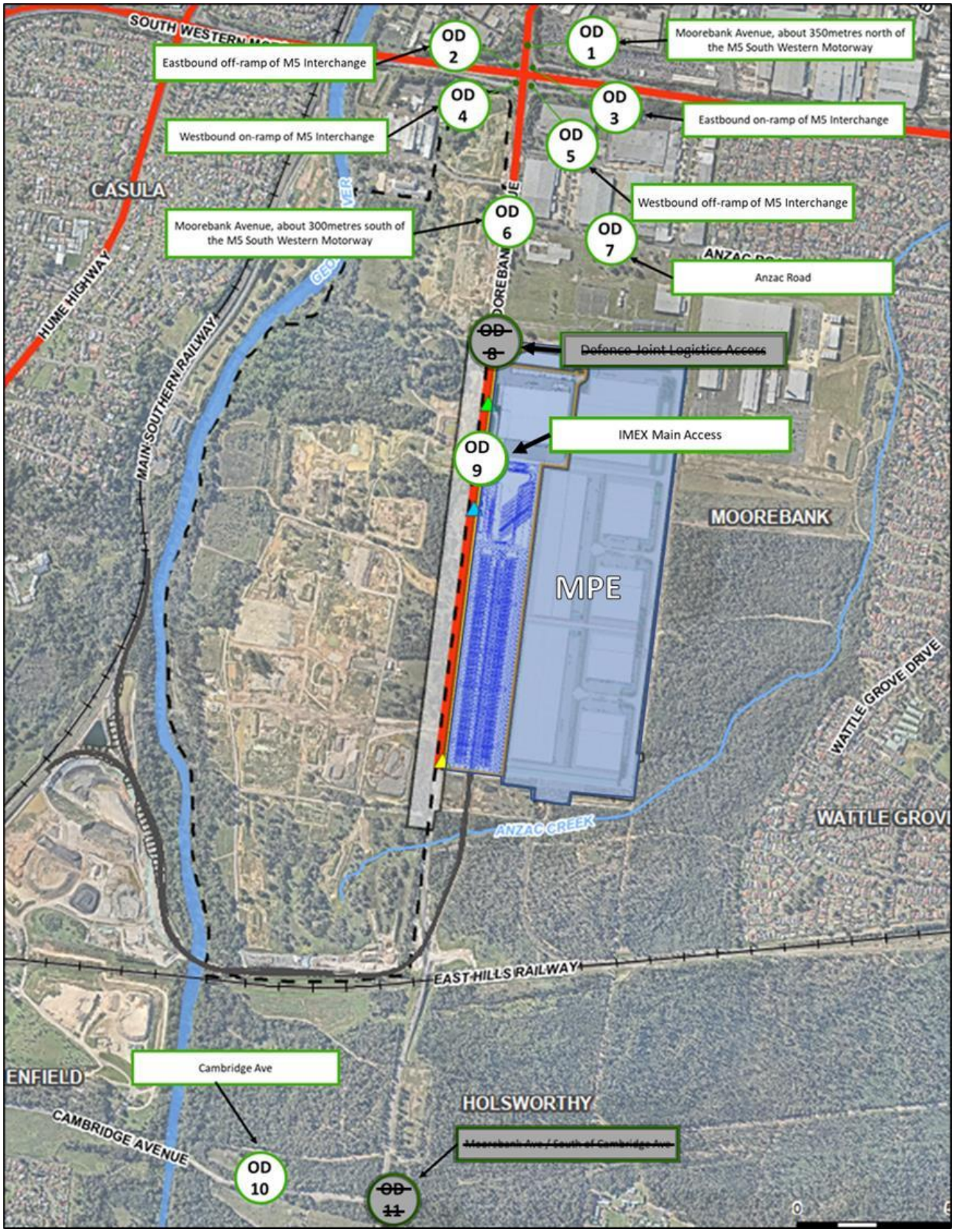


Figure 1: Origin-Destination Gates

The data of the OD surveys have been collated and is presented on the following tables for the relevant vehicle classes, as well as graphically on the following figures.

TABLE 7: AVERAGE OD MOVEMENTS – ALL VEHICLES

	To Station									
From Station	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**9**	**10**	**Total**
1		0	490	9,444	0	3,228	1,055	199	1,606	**16,022**
2	14,869		0	158	0	4,910	1,619	446	2,209	**24,212**
3	0	0		0	0	0	0	0	0	**0**
4	0	0	0		0	0	0	0	0	**0**
5	1,819	0	1,819	0		3,079	894	201	1,492	**9,304**
6	3,489	0	3,210	4,294	0		3,858	1,034	5,483	**21,367**
7	899	0	781	1,195	0	2,839		88	2,064	**7,866**
9	192	0	428	533	0	1,108	0		96	**2,357**
10	965	0	2,739	1,606	0	5,296	2,078	107		**12,792**
Total	**22,233**	**0**	**9,466**	**17,231**	**0**	**20,460**	**9,503**	**2,074**	**12,950**	**93,918**

Below is a visual representation of the OD Movements within **Figure 2**.

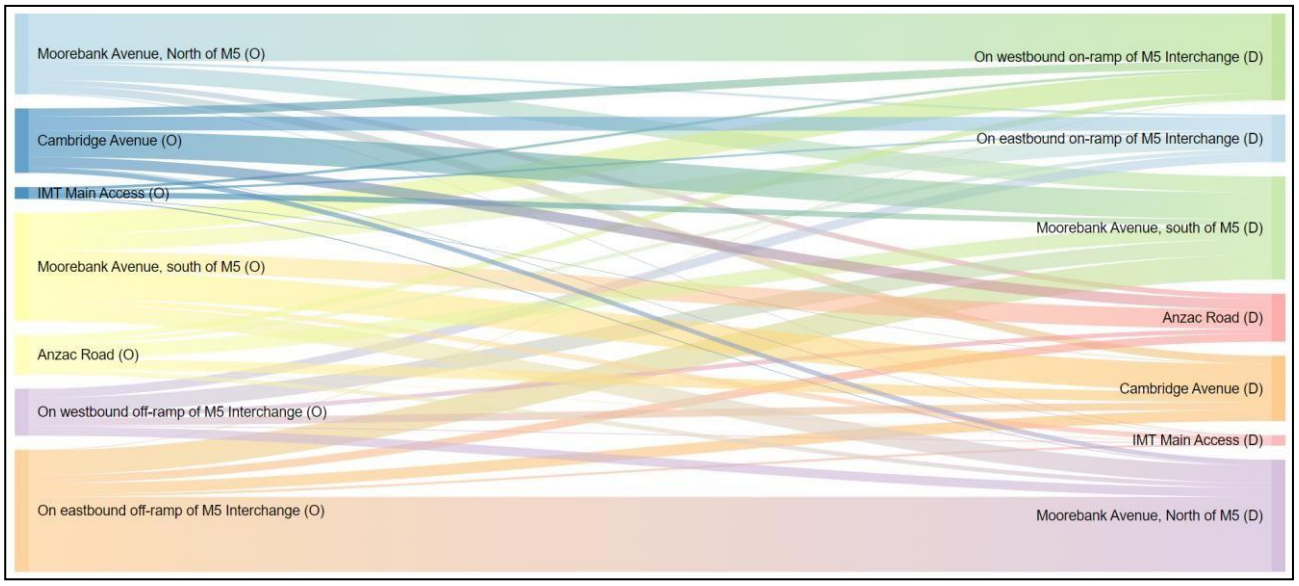


Figure 2: Visual of Average OD Movements - All Vehicles

TABLE 8: AVERAGE OD MOVEMENTS – LIGHT VEHICLES

	To Station									
From Station	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**9**	**10**	**Total**
1		0	376	8,056	0	2,915	985	142	1,541	**14,016**
2	13,403		0	142	0	4,326	1,507	322	2,116	**21,815**
3	0	0		0	0	0	0	0	0	**0**
4	0	0	0		0	0	0	0	0	**0**
5	1,694	0	1,694	0		2,777	851	154	1,439	**8,608**
6	3,220	0	2,880	3,705	0		3,526	700	5,203	**19,233**
7	801	0	713	1,031	0	2,542		88	2,008	**7,184**
9	122	0	327	334	0	772	0		83	**1,638**
10	920	0	2,680	1,528	0	5,128	2,021	86		**12,363**
Total	**20,160**	**0**	**8,670**	**14,796**	**0**	**18,460**	**8,889**	**1,492**	**12,390**	**84,857**

Below is a visual representation of the OD Movements within **Table 8**.

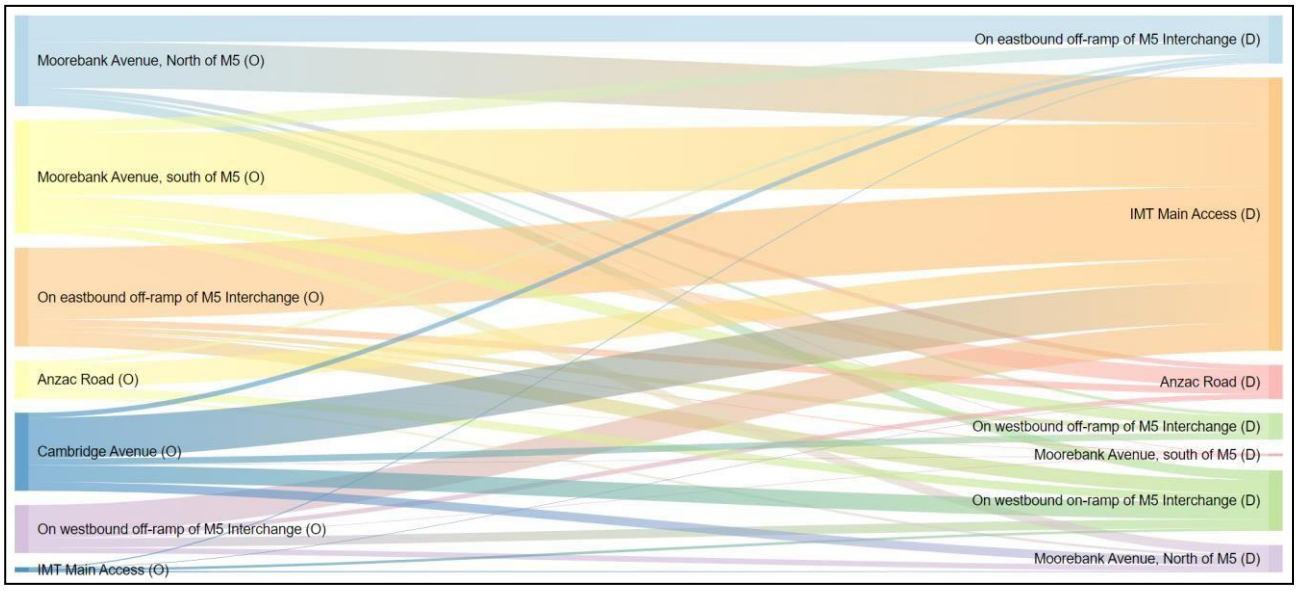


Figure 3: Visual of Average OD Movements - Light Vehicles

TABLE 9: AVERAGE OD MOVEMENTS –HEAVY VEHICLES

	To Station									
From Station	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**9**	**10**	**Total**
1		0	82	870	0	270	70	52	62	**1,406**
2	1,078		0	13	0	337	91	71	78	**1,668**
3	0	0		0	0	0	0	0	0	**0**
4	0	0	0		0	0	0	0	0	**0**
5	93	0	93	0		192	40	31	42	**491**
6	233	0	240	324	0		274	212	242	**1,526**
7	84	0	56	117	0	245		0	47	**549**
9	49	0	77	98	0	209	0		8	**441**
10	40	0	50	61	0	138	51	15		**356**
Total	**1,578**	**0**	**599**	**1,484**	**0**	**1,390**	**527**	**381**	**479**	**6,437**

Below is a visual representation of the OD Movements within **Table 9**.

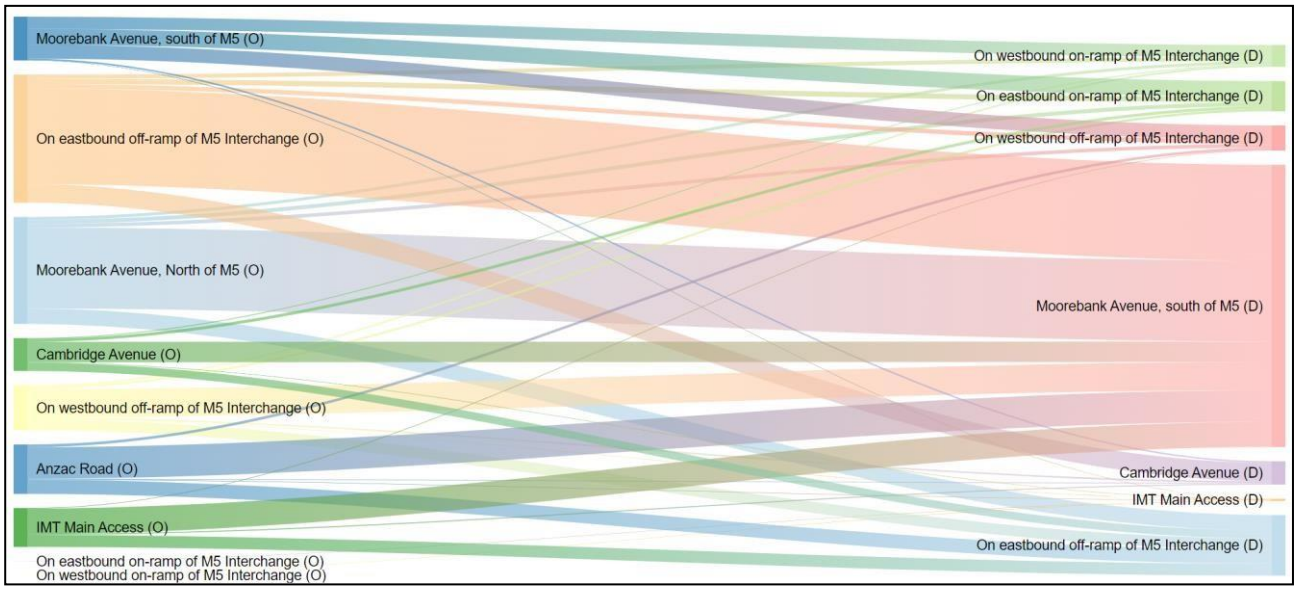


Figure 4: Visual of Average OD Movements - Heavy Vehicles

TABLE 10: AVERAGE OD MOVEMENTS – ARTICULATED HEAVY VEHICLES

	To Station									
From Station	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**9**	**10**	**Total**
1		0	32	518	0	44	0	5	2	**600**
2	388		0	4	0	248	21	52	16	**728**
3	0	0		0	0	0	0	0	0	**0**
4	0	0	0		0	0	0	0	0	**0**
5	31	0	31	0		110	3	16	12	**204**
6	36	0	90	265	0		57	122	38	**608**
7	14	0	12	46	0	52		0	9	**133**
9	21	0	24	102	0	127	0		4	**278**
10	5	0	8	17	0	30	6	6		**73**
Total	**496**	**0**	**197**	**952**	**0**	**610**	**87**	**201**	**81**	**2,624**

Below is a visual representation of the OD Movements within **Table 10**.

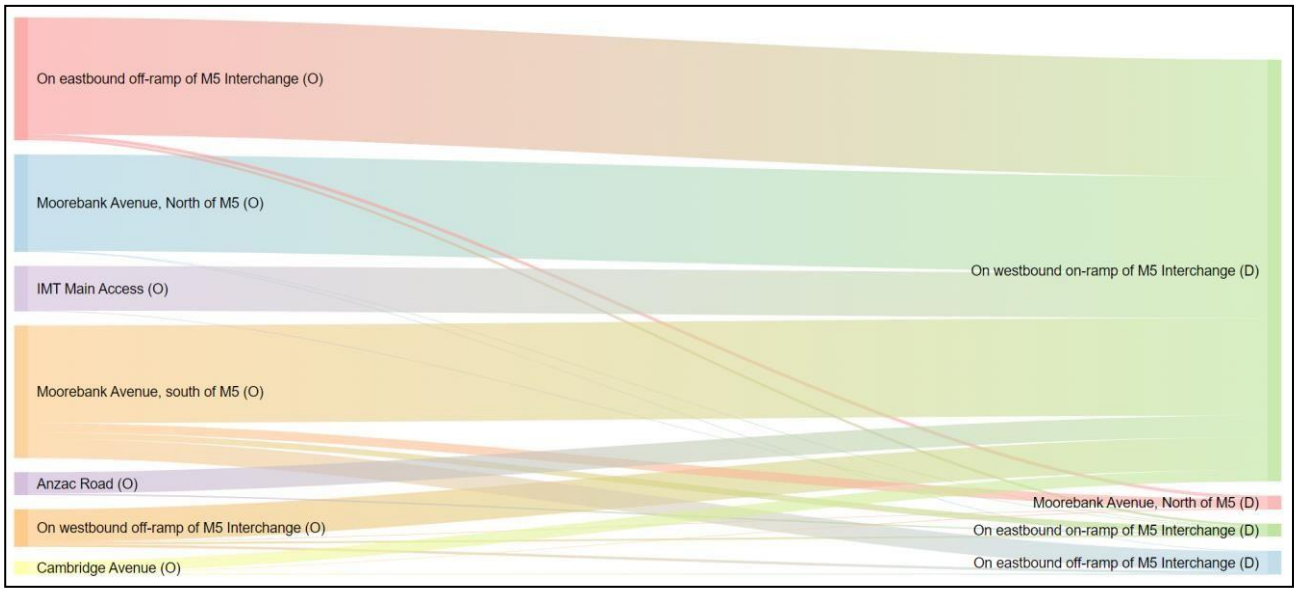


Figure 5: Visual of Average OD Movements – Articulated Heavy Vehicles

6 Employee Numbers

To corroborate data provided within the Workplace Travel Plan and minimise the need for additional reporting, **Table 11** presents relevant information on employee numbers for each of the sub-area's within MPE.

TABLE 11: OD SURVEY GATES

Reporting Periods	Month	IMEX	Rail Link	Tenanted Area	
Period 7	01 May 2023 – 31 Oct 2023	61	9	WH 1	100
				WH 3A	15
				WH 3B	36
				WH 4A	12
				WH 4B	36
				WH 5	78
				WH 7A	-
Period 8	01 Nov 2023 – 30 Apr 2024	61	9	WH 1	100
				WH 3A	15
				WH 3B	45
				WH 4A	12
				WH 4B	36*
				WH 5	110
				WH 7A	20

*Note: Any information not received from individual tenants have been marked with an *. This report will be updated if/when the information is provided.*

7 Summary

The data provided within this report has been collected in accordance with the BTODR Framework report and enables a comparative assessment of traffic accessing the Site and future growth in operational activities.

All data is a fair and accurate representation of the operational traffic for MPE and its surrounding road network. This data has been collected for the reporting period between 1 May 2023 and 31 October 2023.

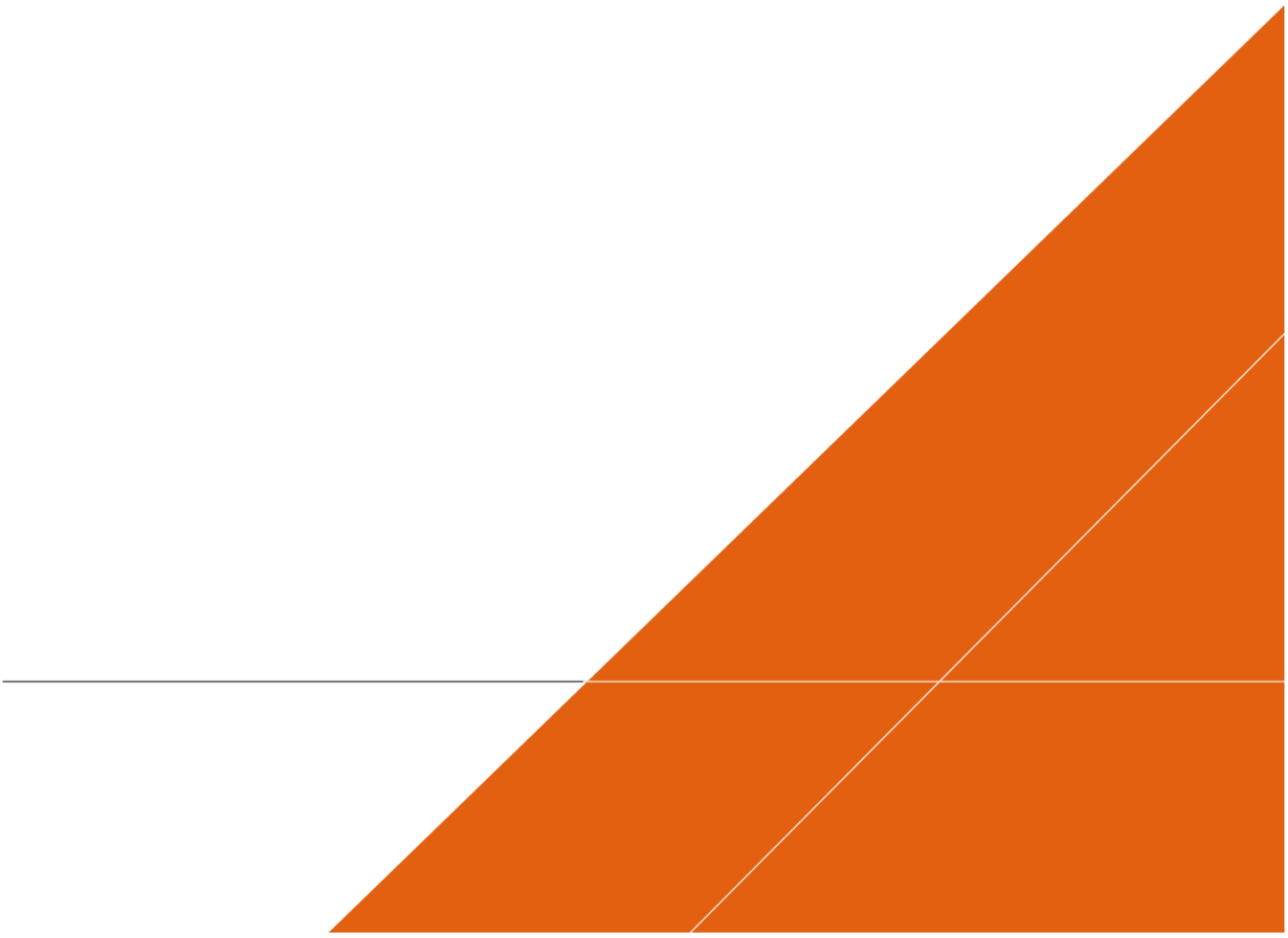
Appendix A. BTODR Framework Report

ARCADIS Design & Consultancy for natural and built assets

MOOREBANK PRECINCT EAST - BIANNUAL TRIP ORIGIN DESTINATION REPORT

Framework for Data Collection and Reporting

27 AUGUST 2019



CONTACT

NICOLE VUKIC
Manager Transport Planning and Traffic Engineering

T +61 2 8907 3932
M +61 417 233 935
E Nicole.Vukic@arcadis.com

Arcadis
Level 16, 580 George Street
Sydney NSW 2000

QUBE

MOOREBANK PRECINCT EAST - BIANNUAL TRIP ORIGIN DESTINATION REPORT

Framework for Data Collection and Reporting

Author Jerry Xiang

Checker Nicole Vukic

Approver Ketan Patel

Report No PREC-ARC-TR-RPT-0001

Date 27/08/2019

Revision Text 008

REVISIONS

Revision	Date	Description	Prepared by	Approved by
001	28/11/18	Issued for client review	JX	NV
002	13/03/19	Revised and issued for client review	NV	KP
003	5/06/19	Revised to address agency comment	NV	NV
004	14/06/19	Revised to address further agency comment	MWR	KP
005	28/06/19	Revised to address further agency comments	KP	NV
006	29/07/19	Revised to address further agency comments	NV	KP
007	15/08/19	Consultation table updated to close out agency comments	MWR	JC

Revision	Date	Description	Prepared by	Approved by
008	27/08/19	Updated to close out RMS consultation	NV	AL

CONTENTS

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ACRONYMS AND DEFINITIONS

Acronym	Meaning
CoC	Conditions of Consent
DJLU	Defence Joint Logistics Unit
DP&E	Department of Planning and Environment
EP&A Act	*Environmental Planning and Assessment Act 1979*
IMEX	Import-Export
MIP	Moorebank Intermodal Precinct
MPE	Moorebank Precinct East
MPW	Moorebank Precinct West
RFID	Radio-Frequency Identification
RMS	Roads and Maritime Services
Secretary	Secretary under the EP&A Act, or nominee
SIMTA	Sydney Intermodal Terminal Alliance
SSD	State Significant Development
TfNSW	Transport for New South Wales
the Moorebank Precinct	Moorebank Intermodal Precinct

1 INTRODUCTION

1.1 Background.

The Sydney Intermodal Terminal Alliance (SIMTA) received approval for the construction and operation of Stage 2 of the MPE Project (SSD 7628), which together comprises the second stage of development under the MPE Concept Consent (MP10_0193). Operations are due to commence in April 2018.

This Biannual Trip Origin and Destination Report addresses the relevant requirements of the Project Approvals, including the Environmental Impact Statement (EIS), Revised Statement of Commitments (RSoC), Response to Submissions (RtS) and Minister's Conditions of Consent (CoC), and guidelines and standards applicable during operations of the MIP East Precinct.

1.1 Scope and Purpose

Condition of Consent (CoC) B28 of SSD 7628 requires that a *Biannual Trip Origin and Destination Report* is prepared. Table 1-1 and Table 1-2 details the applicable CoC.

Table 1-1: CoCs of SSD 7628 (MPE Stage 2)

CoC	Requirement	Document Reference
Primary Conditions		
B28	The Applicant is to prepare a Biannual Trip Origin and Destination Report each six months following the commencement of any operation (in a format agreed with TfNSW and RMS) that advises:	
	a. the number of actual and standard twenty-foot equivalent shipping containers despatched and received during the period;	Section 3 Section 5
	b. the number of days in the period that the truck gate was open for despatching trucks 24 hours a day, 7 days a week and detail and exceptions to this and advise actual hours of operation;	Section 3 Section 5 Note that there is no truck gate at the warehouse entrance however a truck gate is in operation at the IMEX entrance where truck numbers will be monitored.
	c. records of vehicle numbers accessing the site; and	Section 5
	d. representative vehicle origin and destinations, based on a cordon in the surrounding network.	Section 5
	A framework for recording and reporting on the data required for the report, prepared to the satisfaction of TfNSW and RMS, is to be submitted to the Secretary three months prior to the commencement of operation.	This document provides a framework for recording and reporting on the data required for the *Biannual Trip Origin and Destination Report*

CoC	Requirement	Document Reference
	The report is to be submitted within one month of its preparation throughout operation of the project, starting six months from the commencement of operation, unless otherwise agreed by the Secretary, TfNSW and RMS. The cordon count at (d) above will: • apply to all classes of vehicles; and • cover the intermodal terminal, the warehousing facility and any other uses such as the freight village.	Section 3.1
Secondary Conditions		
B89	Heavy road freight vehicles are not permitted to use Moorebank Avenue south of the East Hills Railway corridor. A main gate monitoring system (eg CCTV) shall be installed to identify heavy vehicles turning left from the terminal site onto Moorebank Avenue, or turning right from Moorebank Avenue to the terminal site. The Secretary may at any time request the Applicant to provide a heavy vehicle monitoring report for the prior 12 month period.	Section 2.3

Table 1-2: CoCs of SSD 6766 (MPE Stage 1)

CoC	Requirement	Document Reference
Secondary Conditions		
G11	The Applicant shall prepare a six-monthly report to the Secretary with the results of container and vehicle monitoring for a period of 3 years, or as otherwise agreed with the Secretary, from the commencement of operation of the IMEX terminal. The Secretary shall consider the need for further reporting following a review of the results for year 3. The report shall include:	Section 3.1
	a) The number of twenty foot equivalent units dispatched and received during the period	Section 3 Section 5
	b) A record of heavy vehicle entry by date and approximate time; and	Section 5
	c) The number of light vehicles turning right into the terminal site from Moorebank Avenue and turning left from the terminal site onto Moorebank Avenue for a representative day	Section 5
G14	Heavy road freight vehicles are not permitted to use Moorebank Avenue south of the East Hills Railway corridor. A main gate monitoring system (eg CCTV) shall be installed to identify heavy vehicles turning left from the terminal site onto Moorebank Avenue, or turning right from Moorebank Avenue to the terminal site. The Secretary may at any time request the Applicant to provide a heavy vehicle monitoring report for the prior 12 month period.	Section 2.3

This report has been prepared to provide a framework for recording and reporting on the data required for the *Biannual Trip Origin and Destination Report*, which will be used to agree a format for the six-month reports with TfNSW and RMS. This report assumes that the condition is related to the impact of 20-foot equivalent shipping containers and does not address other heavy vehicles associated with operations, such as garbage trucks and maintenance vehicles.

1.2 Consultation

The Framework for Biannual Trip Origin Destination Report has been prepared to the satisfaction of Transport for NSW (TfNSW) and Roads and Maritime Services (RMS). Following the development of this draft framework, the document will be issued to the Secretary for review and comment.

Table 1-3: Consultation Summary

Agency	Date	Person Contacted	Comment	Status
Transport for NSW (TfNSW)	26/3/19	TfNSW Representative	Draft report emailed for review and comment	Open
	11/4/19	TfNSW Representative	Email to follow up on progress of review	Open
	18/4/19	TfNSW Representative	Email to follow up on progress of review	Open
	29/4/19	TfNSW Representative	Email to follow up on progress of review	Open
	3/5/19	TfNSW Representative	Email to follow up on progress of review	Open
	4/5/19	TfNSW Representative	Email to follow up on progress of review	Open
	9/5/19	TfNSW Representative	Email to follow up on progress of review	Open
	10/5/19	MIP Representative	Email noting that TfNSW is to provide comments early next week	Open
	15/5/19	MIP Representative	Email noting that TfNSW is drafting a letter including comments on the report	Open
	16/5/19	MIP Representative	Letter from TfNSW including comments on the report	Open
	26/5/19	TfNSW Representative	Email with attachment provided in response to TfNSW's comments	Open
	30/5/19	TfNSW Representative	Email to follow up on progress of review	Open
	6/6/19	TfNSW Representative	Email to follow up on progress of review	Open
	6/6/19	MIP Representative	Email noting that TfNSW is to provide further comments early next week	Open

	7/6/19	TfNSW Representative	Email to confirm satisfaction of timeframe for comment review	Open
	7/6/19	MIP Representative	Email with attachment provided in response to TfNSW's comments	Open
	13/06/19	TfNSW Representative	Meeting to discuss final comments	Open
	17/06/19	TfNSW Representative	Minutes of meeting submitted for review	Open
	28/06/19	TfNSW Representative	Updated document submitted demonstrating comments incorporated	Open
	12/07/19	MIP Representative	Email with further comments	Open
	7/08/19	TfNSW Representative	Updated document submitted demonstrating comments incorporated	Open
	13/08/19	MIP Representative	Email with further comments	Open
	15/08/19	TfNSW Representative	Updated document submitted demonstrating comments incorporated	Open
	16/08/19	TfNSW Representative	Email with final RMS comments	Closed
Roads and Maritime Service (RMS)	26/3/19	RMS representative	Draft plan emailed for review and comment	Open
	4/4/19	RMS representative	Email to follow up on progress of review	Open
	11/4/19	RMS representative	Email to follow up on progress of review	Open
	18/4/19	RMS representative	Email to follow up on progress of review	Open
	26/4/19	RMS representative	Email to follow up on progress of review	Open
	2/5/19	RMS representative	Email to follow up on progress of review	Open
	3/5/19	MIP representative	Email advising that a new contact point for RMS	Open
	9/5/19	RMS representative	Email to follow up on progress of review	Open
	14/5/19	RMS representative	Email to follow up on progress of review	Open
	15/5/19	MIP representative	Email from RMS providing comments on the report	Open
	26/5/19	RMS representative	Email noting that response to RMS review would be provided in the coming days	Open

3/6/19	RMS representative	Email noting that response to RMS review would be provided in the coming days	Open
3/6/19	MIP representative	Email to confirm satisfaction of timeframe for response	Open
4/6/19	RMS representative	Email with attachment provided in response to RMS's comments	Open
12/6/19	MIP representative	Email providing comments to previous responses	Open
13/06/19	MIP representative	Email providing additional comments to previous responses	Open
29/06/19	RMS representative	Response to comments and updated document submitted demonstrating comments incorporated	Open
22/07/19	MIP representative	Email providing comments on updated document	Open
07/08/19	RMS representative	Email providing updated document to confirm close out of comments	Open
09/08/19	RMS representative	Email and phone call to follow up on progress of close out.	Open
16/08/19	TfNSW Representative	Email with final RMS comments	Closed

2 PROJECT DESCRIPTION

2.1 Site Location

The MPE Project site, is located approximately 27 kilometres south-west of the Sydney Central Business District (CBD) and approximately 26 kilometres west of Port Botany and includes the former Defence National Storage and Distribution Centre (DNSDC) site. The MPE site is situated within the Liverpool Local Government Area, in Sydney's south west subregion, approximately 2.5 kilometres from the Liverpool city centre.

Figure 2-1 illustrates the MPE site location and local context.

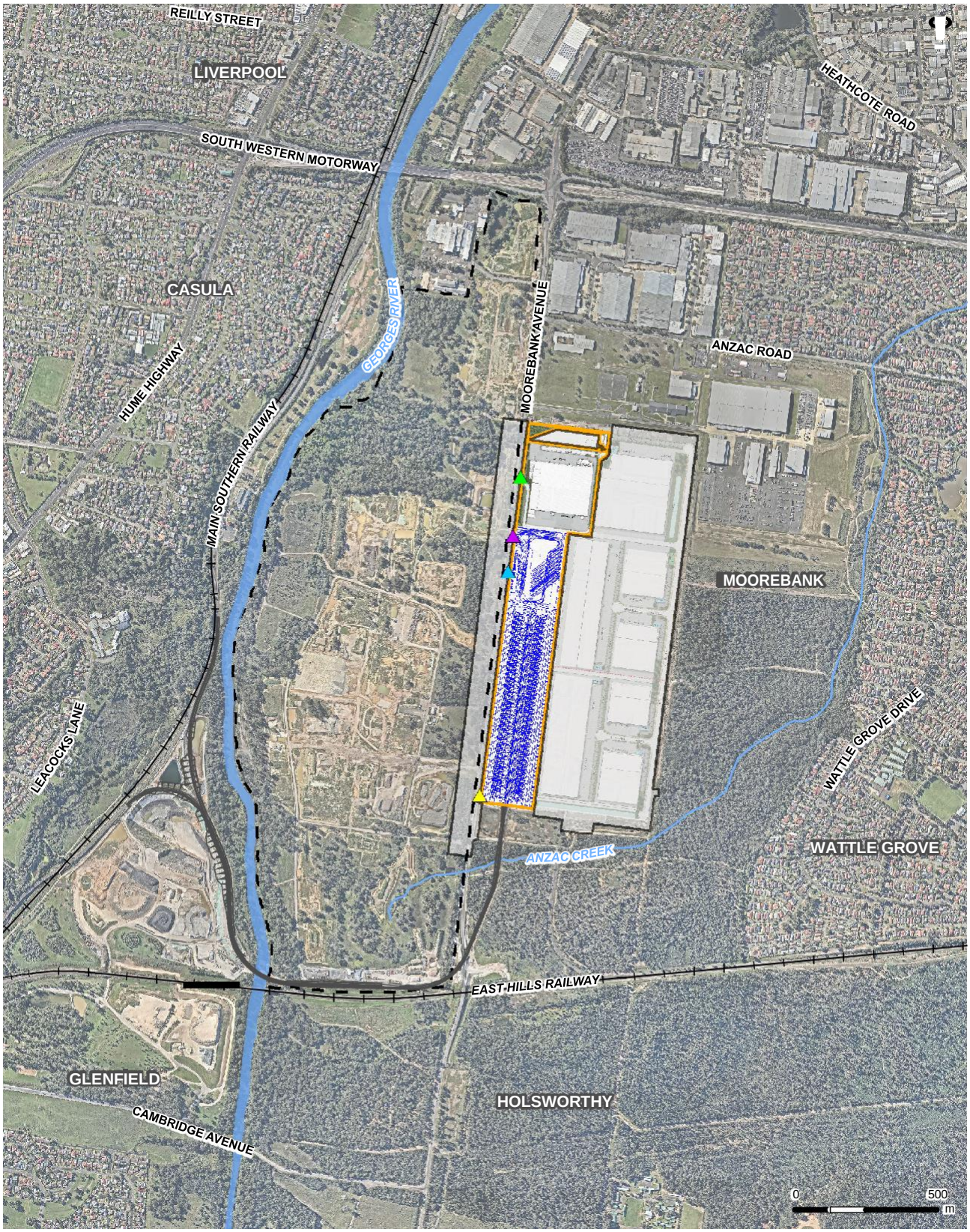
2.2 Site Operations

The operational activities associated with the MIP East Precinct site, which are likely to result in vehicle movements into and out of the site are detailed as follows:

- Import Expert (IMEX) Terminal, operating 24 hours, seven days per week:
  - Rail loading/ unloading and container processing
  - Truck processing and holding
  - Maintenance activities, such as vegetation management, electrical infrastructure, civil and drainage work, signalling and track maintenance
- Rail link, operating 24 hours, seven days per week to support the IMEX terminal activities:
  - Maintenance activities, such as vegetation management, electrical infrastructure, civil and drainage work, signalling and track maintenance
- Common or non-tenanted areas:
  - An internal road network to enable efficient movement of vehicles, dispatch of freight from the warehouses and transport of containers between the IMEX Terminal and warehouse and distribution facilities
  - Maintenance activities, such as internal roads, utilities services, fire protection systems, drainage, fencing and signage, bush fire hazard reduction and pest and vegetation control
  - Waste management
- Warehousing operational activities (24 hours, seven days per week), which will be dependent on the individual tenant and will be detailed in the respective Warehouse Operational Environmental Management Plans.

2.3 Heavy Vehicle Access Routes

Figure 2-2 illustrates the heavy vehicle access routes to/ from the MPE site during the operation of the proposed facilities.



LEGEND

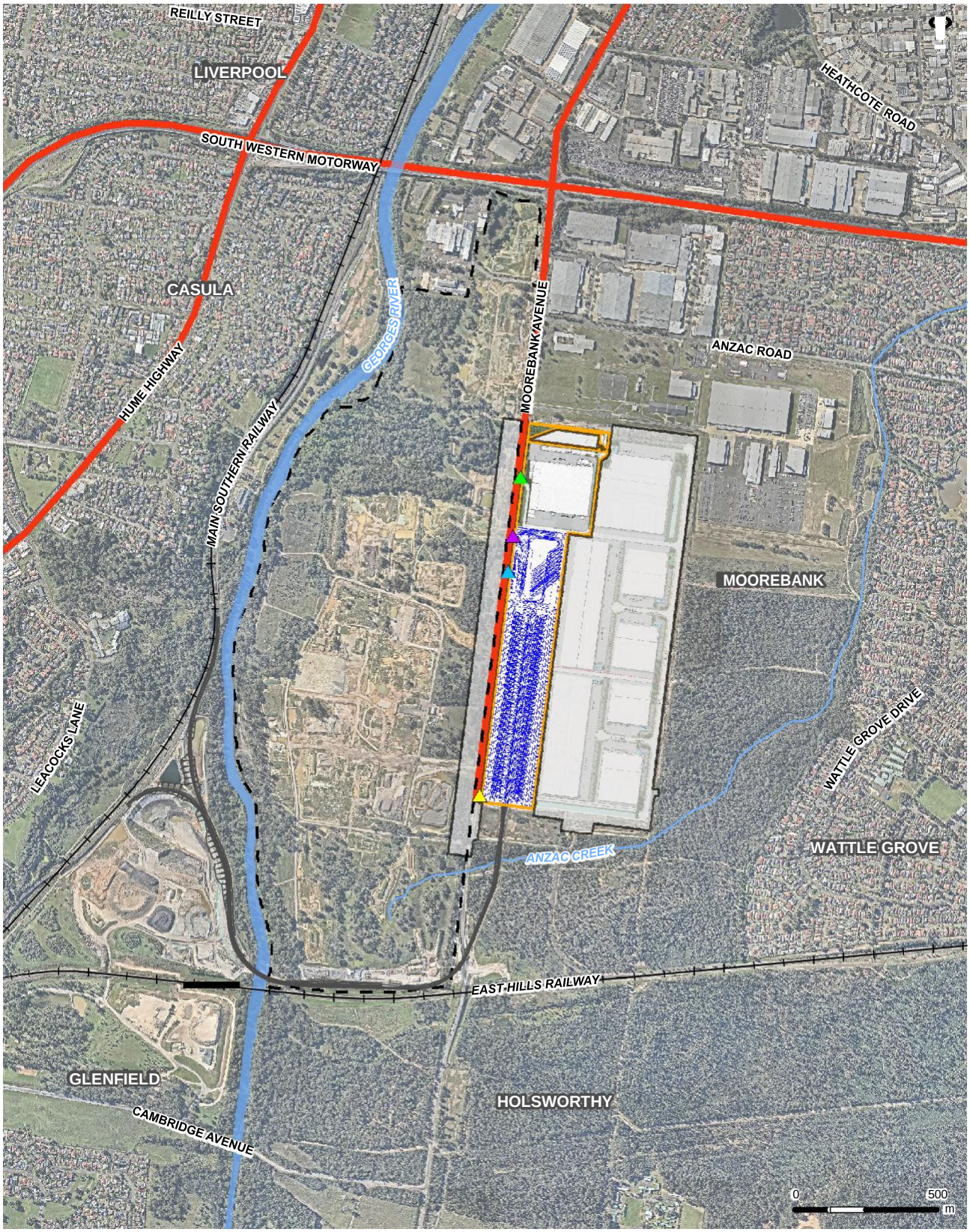
- MIP East Precinct construction area
- MIP East Precinct operational area
- Warehouse access
- IMEX truck access
- IMEX office access
- Emergency access
- MPW site
- Existing railway
- Watercourse
- Operational rail link

ARCADIS AUSTRALIA PACIFIC PTY LTD
ABN 76 104 485 289
Level 16, 580 George St | Sydney NSW 2000
P: +61 (0) 2 8907 9000 | F: +61 (0) 2 8907 9001

Coordinate System: GDA 1994 MGA Zone 56
Date issued: June 26, 2019
Aerial imagery supplied by Nearmap (Mar, 2019)

1:20,000 at A4

Figure 2-1: Site Location and Local Context



LEGEND

- MIP East Precinct construction area
- MIP East Precinct operational area
- Warehouse access
- IMEX truck access
- IMEX office access
- Emergency access
- MPW site
- Heavy vehicle access route
- Existing railway
- Watercourse
- Operational rail link

ARCADIS AUSTRALIA PACIFIC PTY LTD
ABN 76 104 485 289
Level 16, 580 George St | Sydney NSW 2000
P: +61 (0) 2 8907 9000 | F: +61 (0) 2 8907 9001

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Date issued: June 26, 2019
Aerial imagery supplied by Nearmap (Mar, 2019)

1:20,000 at A4

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SIMTA

Figure 2-2: Heavy Vehicle Access Routes to MPE site

3 REPORTING FRAMEWORK

3.1 Frequency of Reporting

The Biannual Trip Origin and Destination Report is to be prepared every six months, starting six months from the commencement of operation. The report will be submitted within one month of its preparation throughout the operation of the MIP East Precinct, unless otherwise agreed by the Secretary, TfNSW and RMS.

3.2 Report Structure

The outline and structure of the *Biannual Trip Origin Destination Report* is provided in Table 3-1.

Appendix A provides templates for presenting the data analysis required for each section within the report.

Table 3-1: Report Outline and Structure

Section	Description
Introduction	This section will include the following subsections: • Introduction • Purpose • Scope • Period of Reporting.
Shipping container transport	This section provides the total number of actual and standard 20-foot equivalent shipping containers dispatched and received during the period. This analysis will be primarily based on the operational data from logistical schedules. This section will include the following subsections: • Shipping containers received • Shipping containers dispatched. This data will be presented using a combination of tables (refer to template in Appendix A) and graphs.
Truck gate opening periods	This section will detail the number of days in the period that the truck gate was open for dispatching trucks 24 hours a day, seven days a week and detail and exceptions to this and advise actual hours of operation. This analysis will be based on the operational data from logistical schedules and on-site monitoring (refer to Section 5.1.1). This section will include the following subsections: • Period of opening • Exceptions to full time opening • Actual hours of opening. This data will be presented in a table (refer to template in Appendix A) with commentary of the results under each subsection.

Section	Description
Traffic volumes	This section will record the number of vehicles (split by Austroads light and heavy vehicle classification) accessing the site. This analysis will be based on logistical schedules, on-site monitoring and gate data (for the IMEX). Vehicles accessing the warehouse will be required to be recorded. This section will include the following subsections: • Total vehicles accessing the site for reporting period. The total vehicles accessing the site will be presented in tables (refer to template in Appendix A) and graphs. The mid-block traffic volume profiles will be presented in graphs.
Origin-destination results	This section will provide representative vehicle origins and destinations (split by Austroads light and heavy vehicle classification), based on the cordon identified for the site. This section will include the following subsections: • Approach distribution (origin) • Departure distribution (destination). The data will be presented on plans indicating approach/ departure routes with the proportion of the total vehicles arriving/ leaving the MPE site.
Employee numbers	The Workplace Travel Plan requires Annual reporting of employee numbers to DP&E, TfNSW and RMS. To minimise the requirement for an additional report, employee numbers will be also included in *Biannual Trip Origin Destination Report*
Summary	Provides an overview of the findings reported above

3.3 Process

The process for preparing the *Biannual Trip Origin Destination Report* is illustrated in Figure 3-1.

Figure 3-1: Biannual trip origin destination reporting process

4 ROLES AND RESPONSIBILITIES

An overview of the key roles for the MIP East Precinct are provided in Figure 4-1. The responsibilities for the preparation and submission of the *Biannual Trip Origin Destination Report* and implementation of this framework for each of the key roles are outlined in Table 4-1.

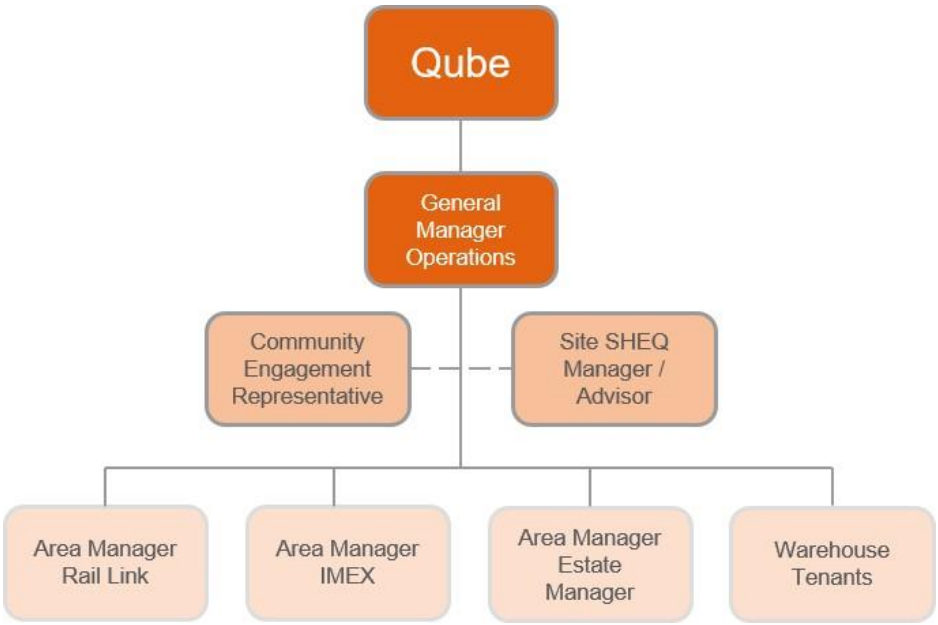


Figure 4-1: Key roles for MIP East Precinct

Table 4-1: Key roles and responsibilities

Role	Responsibility
General Manager Operations	• Accountable for the operational activities and performance of the MIP East Precinct • Provide sufficient resources to implement, develop and maintain the *Biannual Trip Origin Destination Report* and framework throughout the operating life of the MIP East Precinct • Define, document and communicate roles, responsibilities and authorities of all personnel to facilitate data collection, analysis and reporting • Review and approve changes to the framework and *Biannual Trip Origin Destination Report* • Based on the outcome of the review and validation of the data collected to support the development of the *Biannual Trip Origin Destination Report*, endorse the data as fit for purpose.
Area Managers: • IMEX • Rail Link • Estate Manager	• Responsible for the implementation of the *Biannual Trip Origin Destination Report* and framework within the areas of responsibility • Provide operational data to support the *Biannual Trip Origin Destination Report*, including logistical schedules and on-site monitoring data

Role	Responsibility
	• Communicate the requirements of the *Biannual Trip Origin Destination Report* and framework and obligations to the operational team • Monitor operations against the requirements of the CoC, collect data and maintain records required to inform the *Biannual Trip Origin Destination Report* • Where required, implement changes to activities to manage ongoing operation to the satisfaction of TfNSW and RMS • Report issues pertaining to the preparation of the *Biannual Trip Origin Destination Report* to the General Manager Operations.
Site Safety, Health, Environment and Quality Manager / Advisor **(Site HSEQ Manager / Advisor)**	• Act as the primary contact point for TfNSW and RMS in relation to the *Biannual Trip Origin Destination Report* • Provide advice on matters specified in the CoC relating to the IMEX, Rail Link and Estate operations • Review and implement *Biannual Trip Origin Destination Report* and framework and monitoring programs required under the CoC • Monitor operations against the *Biannual Trip Origin Destination Report* and framework to evaluate compliance with the CoC • Commission surveys and collate data required to carry out analysis and produce the *Biannual Trip Origin Destination Report* • Commission (if required), coordinate and manage resources to carry out the data collection, analysis and preparation of the *Biannual Trip Origin Destination Report* • Maintain the register of data collection and reports issued.
Community Engagement Representative	• Act as the 'control tower' for all public communications and be the central contact to keep nearby residential receivers informed of monitoring/ surveys • Communicate community concerns to the Qube Environmental Representative in relation to vehicle movements within the surrounding road network.
Individual Tenants	• Support the compliance with the CoC and provide data and information to Qube to inform the development of the *Biannual Trip Origin Destination Report* as required.

5 DATA COLLECTION FRAMEWORK

5.1 Data Collection Scope and Methodology

The following intersection, mid-block and origin-destination (OD) surveys should be carried out concurrently.

5.1.1 Operational Data Collection

Other Operational Data

The following operational data will be obtained from the logistical schedules or via on-site monitoring:

- Total vehicles accessing the site (B28 [c])
- Number of shipping containers (20-foot equivalent) dispatched and received by the site (B28 [a])
- Truck gate opening periods (B28 [b]).

IMEX Gate Data Collection

The IMEX accesses will be gated and data will be recorded to determine the number of vehicles entering and exiting the site (classified in accordance with Austroads vehicle classifications). In accordance with MPE Stage 1 (SSD 6766) CoC F6, a vehicle booking system will be implemented with all trucks fitted with Radio-Frequency Identification (RFID) readers. Road Operators will pre-book the Truck Visit with IMEX using 1-Stop, and data on road operator, container, truck details, and arrival and departure time(s). This data will be rechecked again on exit from the terminal to confirm load manifests.

Further detail on this process will be included within the Operational Traffic Management Plan developed in consultation with the Cargo Movement Coordination Centre.

The gate data will also be used to determine the periods during which the gates were open for the reporting period. The Area Managers will be responsible for recording the reasons for any potential periods of gate closure.

Warehouse Access Data Collection

The warehouse access will not be gated. Therefore, data will need to be collected to record the number of vehicles entering and exiting the site (classified in accordance with Austroads vehicle classifications) through the installation of permanent tube counters or detector loops.

Logistical Schedules

Logistical schedules maintained by the Area Managers will need to record the total number of 20-foot equivalent shipping containers that are received and dispatched by the MPE site for the reporting period.

5.1.2 Traffic Surveys

Traffic surveys will be commissioned to provide representative vehicle origins and destinations for the MPE site for a cordon area (see Figure 5-1) of the surrounding road network (B28 [d]). This requires collection of:

- Origin-destination (OD) surveys
- Intersection surveys at access points and key intersections.

OD Surveys

OD surveys will be undertaken to understand the traffic distribution of the MPE site on Moorebank Avenue, the M5 South Western Motorway, Anzac Road, Cambridge Avenue as well as all the access points of the MPE site. This data will be collected on the same day as the intersection surveys and will be analysed to provide representative vehicle origins and destinations for the site for a cordon area of the surrounding road network. This will be combined with classification counts in accordance with Austroads vehicle classifications and an hourly and daily summary.

OD surveys will be required as follows:

- During the following network peak periods on a typical weekday (not within two weeks before or after school holidays):
  - Peak morning period (7am to 9am)
  - Evening period (4pm to 6pm)
- During the following expected traffic peak periods for facility operations based on shift patterns and peak heavy vehicle movements Monday to Sunday:
  - 4:30am to 6:30am
  - 8am to 10am
  - 1pm to 3pm
  - 8pm to 11pm

Therefore, the OD surveys will be undertaken during the following times on weekdays:

  - 4:30am to 6:30am
  - 7am to 10am
  - 1pm to 3pm
  - 4pm to 6pm
  - 8pm to 11pm.

The survey company commissioned to carry out the OD surveys is required to capture all vehicles passing the OD stations. A detailed report will be prepared by the survey company to summarise:

- The data collection process
- Data processing and analysis approach
- Outputs
- Data errors and expansion factors adopted to address incomplete data sets.

Intersection Surveys

Intersection turn counts are to be surveyed at the key MPE accesses along Moorebank Avenue. This data will be used to analyse the general network peak period volumes captured by the OD surveys, which will be undertaken concurrently to provide representative vehicle origins and destinations for the site. This data will also be used to confirm the data recorded at the gates and accesses of the facility during the peak periods.

Intersection surveys will be required for:

- Network peak morning period (7am to 9am) and evening period (4pm to 6pm) on a typical weekday (not within two weeks before or after school holidays)
- Expected facility peak periods of 4:30am to 6:30am, 8am to 10am, 1pm to 3pm, and 8pm to 10pm Monday to Sunday

- Classification counts in accordance with Austroads vehicle classifications
- 15-minute intervals
- Peak hour identified and reported.

The survey at the Moorebank Avenue/ M5 South Western Motorway is a full interchange survey with the through lanes on the M5 South Western Motorway recorded as well as the movements at the traffic signals.

5.1.3 Survey Locations

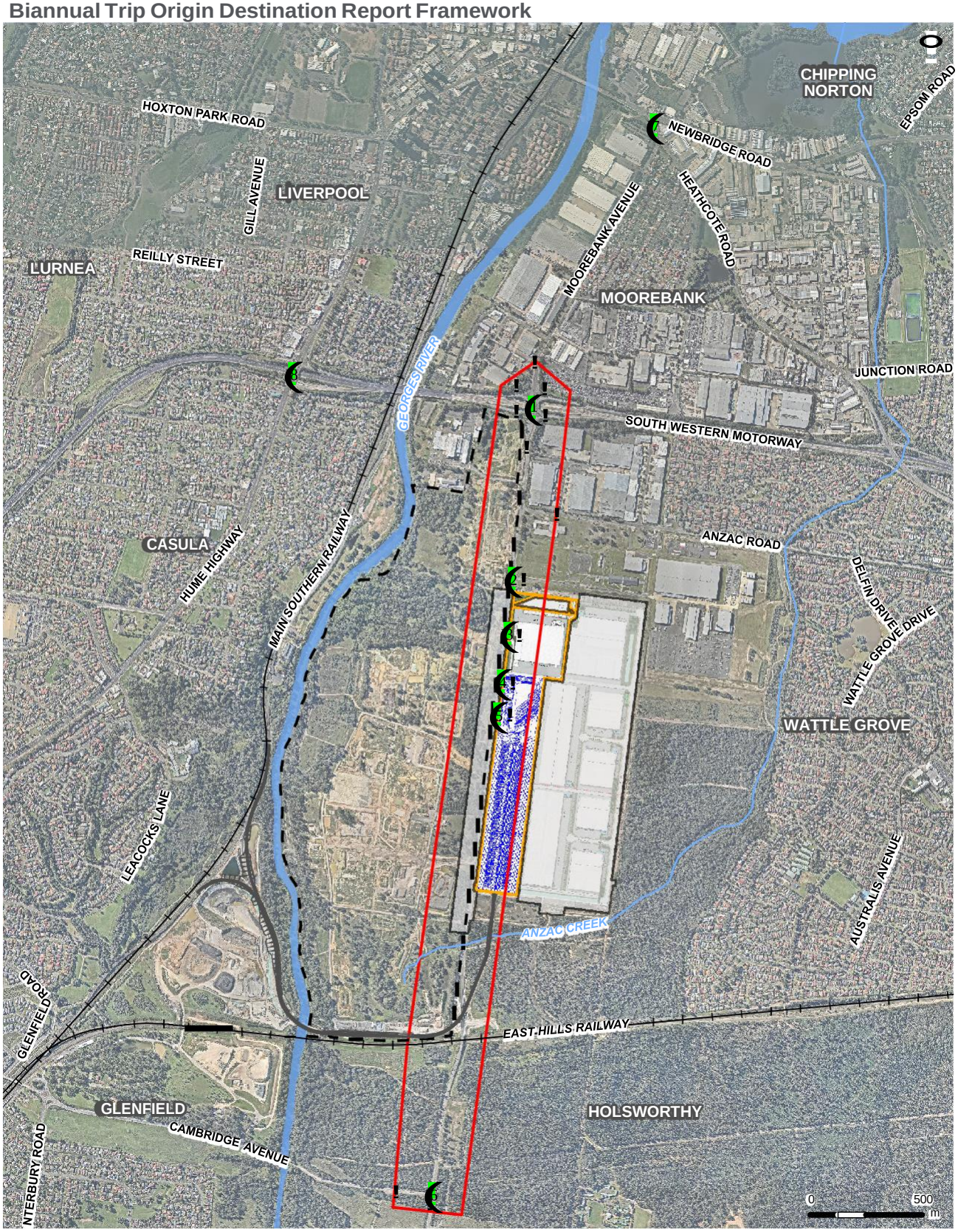
The suggested locations of the survey are provided in Figure 5-1, including:

- OD surveys at the following stations:
  - Moorebank Avenue, about 350 metres north of the M5 South Western Motorway
  - Moorebank Avenue, about 300 metres south of the M5 South Western Motorway
  - Moorebank Avenue, south of Cambridge Avenue
  - M5 South Western Motorway on and off ramps to and from Moorebank Avenue
  - Cambridge Avenue
  - Anzac Road
  - Site accesses at MPE warehouse access, MPE IMT truck access and MPE IMT staff access.
- Intersection surveys:
  - I1 - Moorebank Avenue/ M5 South Western Motorway interchange (full interchange survey to include M5 South Western Motorway through lanes)
  - I2 - Moorebank Avenue/ Defence Joint Logistics Unit (DJLU) access
  - I3 - Moorebank Avenue/ MPE warehouse access
  - I4 - Moorebank Avenue/ MPE IMT truck access
  - I5 - Moorebank Avenue/ MPE IMT staff access
  - I6 - Moorebank Avenue/ Cambridge Avenue
  - I7 – Moorebank Avenue/ Newbridge Road
  - I8 – M5 South Western Motorway/ Hume Highway.

The OD survey locations were determined in consultation with a survey company to adequately capture the vehicle movements generated by the site for a recommended survey cordon, which includes the M5 South Western Motorway as well as RMS and TfNSW. The recommended cordon is considered appropriate to provide a representative OD pattern for the site.

Given that the Hume Highway is designed to accommodate substantial heavy vehicle movements, it is considered too far for the recommended cordon and heavy vehicles generated by the site would be absorbed in the existing traffic volumes on this part of the network.

OD stations have been included on Cambridge Avenue and Anzac Road to capture the travel patterns of all vehicles generated by the site. These stations would also identify any heavy vehicles using these routes, which are not designated heavy vehicle routes.



LEGEND

- MIP East Precinct construction area
- MIP East Precinct operational area
- MPW site
- Cordon area
- Intersection ID and location
- OD station
- Existing railway
- Watercourse
- Operational rail link

ARCADIS AUSTRALIA PACIFIC PTY LTD
ABN 76 104 485 289
Level 16, 580 George St | Sydney NSW 2000
P: +61 (0) 2 8907 9000 | F: +61 (0) 2 8907 9001

Coordinate System: GDA 1994 MGA Zone 56
Date issued: July 29, 2019
Aerial imagery supplied by Nearmap (Mar, 2019)

1:25,000 at A4

ARCADIS

SIMTA

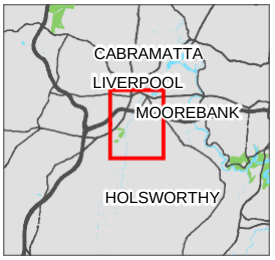


Figure 5-1: Survey Locations

5.2 Using the Data in the Report

Providing Comparable Data

Data collection in accordance with this framework and carrying out surveys using methodology specified in Section 5.1 enables a comparative assessment of traffic accessing the site and growth in operational activities for the MPE facility.

Within the report, the data should be presented to provide a comparison between the current six-month period and preceding period. Table templates are provided in Appendix A, which will be used to present the data collected for each reporting period to satisfy CoC B28.

Data Completeness

Where data is incomplete, or data collection is flawed, the report will provide qualifying commentary, including:

- Reason for missing/ erroneous data
- Impact on the analysis of the data
- Mitigation implemented for addressing the shortfall in data collection (if any).

Data Validation

All data collected will be reviewed and validated to confirm it is fit for purpose in addressing the requirements of the CoC.

Data Provision

All traffic survey data files will be provided to Transport for NSW and RMS, in addition to the summaries documented in the reporting tables.

APPENDIX A REPORTING TABLE TEMPLATES

Shipping Container Transport

Total number of shipping containers received/ dispatched by month

Reporting period	Month	Total containers received/ dispatched	Cumulative total for period
Period 1 2019	January		
	February		
	March		
	April		
	May		
	June		

Truck Gate Opening Period

Truck gate closure record

Date	Period of closure	Reason for closure

Traffic Volumes

Traffic volumes accessing site by month

Reporting period	Month	Vehicles in		Vehicles out	
		Light vehicles	Heavy vehicles	Light vehicles	Heavy vehicles
Period 1 2019	January				
	February				
	March				
	April				

Reporting period	Month	Vehicles in		Vehicles out	
		Light vehicles	Heavy vehicles	Light vehicles	Heavy vehicles
	May				
	June				

Traffic volumes accessing site by week

Reporting period	Week	Vehicles in		Vehicles out	
		Light vehicles	Heavy vehicles	Light vehicles	Heavy vehicles
Period 1 2019	1				
	2				
	3				
	4				
	5				
	6				
	7				
	8				
	9				
	10				
	11				
	12				
	13				
	14				
	15				
	16				
	17				
	18				
	19				
	20				
	21				

Reporting period	Week	Vehicles in		Vehicles out	
		Light vehicles	Heavy vehicles	Light vehicles	Heavy vehicles
	22				
	23				
	24				
	25				
	26				

OD Surveys All Vehicles (count of matched plates)

	To station						
From station							Total
OD1							
OD2							
OD3							
OD4							
OD5							
OD6							
Total							

OD Surveys Light Vehicles (count of matched plates)

	To station						
From station	OD1	OD2	OD3	OD4	OD5	OD6	Total
OD1							
OD2							
OD3							
OD4							
OD5							

	To station						
OD6							
Total							

OD Surveys Rigid Heavy Vehicles (count of matched plates)

From station	To station						
	OD1	OD2	OD3	OD4	OD5	OD6	Total
OD1							
OD2							
OD3							
OD4							
OD5							
OD6							
Total							

OD Surveys Articulated Heavy Vehicles (count of matched plates)

From station	To station						
	OD1	OD2	OD3	OD4	OD5	OD6	Total
OD1							
OD2							
OD3							
OD4							
OD5							
OD6							
Total							

Employee Numbers

Employee numbers per area of the site

Reporting period	Month	IMEX	Rail Link	Tenanted area
Period 1 2019	January			
	February			
	March			
	April			
	May			
	June			

APPENDIX B EVIDENCE OF CONSULTATION

Mr Ibrahim Awad
Environmental Manager
Tactical Group
Level 15
124 Walker Street
North Sydney NSW 2060

Dear Mr Awad

Moorebank Logistics Park MPE Stage 1 (SSD-6766) and Stage 2 (SSD_7628) - B2 (CTAMP-B), B28 (Biannual Report Framework), B26 OTAMP & B29 WTP

Thank you for your correspondence dated 11 April 2019, requesting Transport for NSW (TfNSW) comments on the following reports:

- Construction Traffic & Access Management Plan B (CTAMP B)
- Operations Traffic & Access Management Plan (OTAMP)
- Bi-annual Trip Report
- Workplace Travel Plan (WTP)

It is advised that:

- Roads and Maritime Services will provide a separate response on the Construction Traffic & Access Management Plan B (CTAMP B) and Operations Traffic & Access Management Plan (OTAMP); and
- Details comments on the Bi-annual trip report and the Workplace Travel Plan (WTP) are included in **TAB A**.

If you require clarification on the above, please don't hesitate to contact Para Sangar, Senior Transport Planner on 0466 024 892.

Yours sincerely

16/5/2019

Mark Ozinga
Principal Manager, Land Use Planning and Development
Freight, Strategy and Planning

Objective Number CD19/03084

TAB A – Detailed Comments

Bi-Annual Trip Report

Section 5.1.2 – Traffic Surveys

- This section needs to clearly state the purpose of these traffic surveys and whether light and heavy vehicles will be surveyed;
- Peak periods of the development is not included for the survey period (5am-6am and 1pm-2pm);
- No information in relation to the sample size for light and heavy vehicles that would be captured for Origin-Destination surveys is provided; and
- The proposed Origin-Destination Surveys do not capture vehicle movements along the interchange ramps of M5 Motorway/Moorebank Avenue.

Workplace Travel Plan (WTP)

Section 1.5 - Objectives and Targets

The overall objective of the precinct-wide Workplace Travel Plan (WTP) should incorporate visitors as well as employees and the target mode share highlighted - 30% for public and active transport - should be set for an initial period of time not the lifetime of operations and targets should be reviewed and revised as appropriate during the monitoring and evaluation process.

Section 2.2.1 – EPBC Act Approval

The summary of mitigation measures includes the following:

- Consideration of the establishment of Glenfield Station to Liverpool Station express bus;
- Installation of a bus interchange and waiting area; and
- Consideration of the extension of Bus Route 901.

It is advised that

- Providing an attractive public bus route is not possible until Cambridge Avenue has been upgraded to eliminate flooding;
- Any bus route diversion needs to be logical and does not require the bus to double back on itself. Bus facilities for east and west Moorebank sites needs to ensure that in servicing both sites buses are not doubling back on themselves as well;
- If Cambridge Avenue upgrade is implemented, any on site diversions and bus facilities need also to be built to be compatible with a bus route linking Glenfield to Liverpool via Cambridge Avenue and Moorebank Avenue which services both sites rather than the 901 which would only ever be attractive for workers coming from Liverpool; and
- Future bus facilities need to consider the realignment of Moorebank Avenue.

Section 2.3 - Roles and Responsibilities

An important component of the overall WTP for the Moorebank Logistics Park – East precinct going forward will be the preparation of individual / organisational WTPs by each tenant/occupant. It should be a requirement of all tenants/occupants to develop and manage an individual WTP and contribute to the on-going development and management of the precinct-wide WTP.

It is recommended that:

- A Steering Group (comprising representatives from each organisation across the precinct) is formed to oversee the development and management of the precinct-wide WTP and individual WTPs; and

- A succinct one page summary of key components of the precinct-wide WTP/individual organisational WTPs is provided to include:

    - Statement demonstrating ongoing commitment of senior executive management across all workplaces across the Precinct to the:

        - Promotion of sustainable transport and operating practices; and

        - Ongoing development, implementation, monitoring, evaluation, reporting and management of a precinct-wide / individual organisational WTP.

    - Governance structure:

        - Details of precinct-wide Steering Group (interim arrangements until full occupation of precinct) and intent to form a Working Group comprising nominated Travel Plan coordinator/champion for the precinct / representative for each workplace/organisation.

- Agreed Action Plan:

        - As agreed by precinct-wide Steering Group, overview of WTP outcomes, goals and objectives, mode share targets and action plan including proposed measures, initiatives, monitoring, evaluation, reporting and stakeholder engagement strategies with indicative timeline and individual / group / agency responsible for actioning; and

        - Each tenant/organisation should prepare a summary, as detailed above, of its WTP, developed in close consultation with its occupants and visitors.

Section 6.3 – Management Measures

It is recommended that the following management measures are added:

- The Interim Steering Group needs to establish a stakeholder engagement strategy as early as possible, identifying and consulting with key partners at the earliest opportunity to assist with the progression of identified actions prior to occupation e.g. State government, local council, local community, transport operators.

- Travel Information Pack needs to be prepared to include an introductory statement from the Precinct management/ Steering Group promoting sustainable transport and operating practices and encouraging use of active and public transport. The document provides an opportunity to raise awareness of the WTP and individual organisation WTPs and the intent of the precinct management to include the whole precinct community in the on-going development, implementation and management of the wider and individual WTPs.

- The Travel Information Pack including the Transport Access Guide (TAG) and Travel Survey is prepared to inform and gain information from prospective tenants, employees and visitors prior to occupation. There is an opportunity to provide information to future users of the precinct during staff recruitment, procurement of servicing, maintenance, cleaning and caretaking, regular deliveries etc. It is recommended that the promotion of carpooling (and request to register interest in its establishment) is included in the TAG.
- On-going monitoring, education and awareness activities should be planned to promote sustainable travel from the outset. There is potential to establish a forum for interested employees who wish to participate in workplace / precinct-wide Travel Plan activities. The establishment of focus groups across precinct workplaces is another useful engagement method to gain a better understanding of transport challenges and opportunities facing occupants of the precinct
- Preferential parking provision is considered for staff / visitors who carpool with designated spaces allocated and signage displayed. Administration and management will need to be established.
- If not yet installed the car park should be future proofed to incorporate sufficient power and conduits to enable the installation of charging stations for Electric and Hybrid Vehicles and Connected and Autonomous vehicles.
- Consideration is to be given in collaboration with occupants of the precinct to the future repurposing of the car parking spaces to be removed as active and public transport use increases e.g. communal sports / recreation facilities.
- Quality end of trip facilities (including locker and secure storage facilities) should be installed to encourage greater take up of active transport as the precinct becomes more established. Such facilities will also encourage active transport during staff comfort breaks contributing to employee wellbeing. It is important that maintenance and replacement of such facilities is explicit in the Cycling and Pedestrian Access Sub Plan (not appended to WTP).
- There is an opportunity to establish a walking and cycling buddy scheme to encourage increased participation in active transport.

Appendix D - Staff Travel Surveys

- The travel survey questions workplace occupants and visitors about existing and preferred modes and seeks to gain a better understanding of any challenges and opportunities to the use of active and public transport to/from home to the precinct and during the working shift; and
- While the travel survey should not be too onerous to complete it should seek to gain as much information on existing/preferred transport mode and working practices and any challenges/opportunities e.g. shift times, scope for remote working, virtual meetings etc as this will help inform and develop targeted initiatives.

Technical Note

It is recommended that the proposals outlined in the Technical Note be considered in consultation with relevant agencies, operators and known occupants (tenants and employees) of the precinct as a matter of priority.

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Before printing this document, please consider the environment.

From: Para Sangar <Para.Sangar@transport.nsw.gov.au>
Sent: Friday, 16 August 2019 11:10 AM
To: Ibrahim Awad <iawad@tacticalgroup.com.au>
Cc: Mark Ozinga <Mark.Ozinga@transport.nsw.gov.au>; Laura Van putten <Laura.VAN.PUTTEN@rms.nsw.gov.au>
Subject: RE: TfNSW Consultations - B28 (Biannual Trip Report Framework) - Moorebank Logistics Park MPE Stage 2 (SSD_7628)

Hi Ibrahim

Further to my email message below, TfNSW has consulted with RMS to finalise our comments on the above report. RMS has advised the following:

> *"Roads and Maritime has no further comments for consideration subject to the following minor changes:*
>
> - *The intersection count at M5 / Hume Hwy also needs to count the movements down on the **M5 through lanes**, not just the movements up top, at the signals. This is really a full "interchange" count, not just an "intersection" count. Please ensure the wording is updated to guarantee that a full interchange count is undertaken.*
>
> - *Roads and Maritime requests that the actual traffic survey **data files** are provided, not simply tabulated summaries in reports."*

It would be appreciated if you could amend the report to reflect the above and send it back to us for TfNSW and RMS sign off.

Should you have any further queries, please contact me.

Regards
Para

Para Sangar
Senior Transport Planner
Customer Strategy and Technology
Transport for NSW

T 0466 024 892
Level 26, 477 Pitt Street, Haymarket, NSW 2008

NSW GOVERNMENT | Transport for NSW

From: Para Sangar
Sent: Tuesday, 13 August 2019 11:33 AM
To: Ibrahim Awad
Cc: Mark Ozinga
Subject: RE: TfNSW Consultations - B28 (Biannual Trip Report Framework) - Moorebank Logistics Park MPE Stage 2 (SSD_7628)

Hi Ibrahim

Thank you for providing the amended report for comment.

Further to our telephone conversation today, please amend the row highlighted in yellow in the attached table to reflect the changes made in the report in relation to OD surveys proposed on the M5/Moorebank Avenue interchange ramps.

Should you have any further queries, please contact me.

Regards
Para

Para Sangar
Senior Transport Planner
Customer Strategy and Technology
Transport for NSW

T 0466 024 892
Level 26, 477 Pitt Street, Haymarket, NSW 2008

From: Ibrahim Awad [mailto:iawad@tacticalgroup.com.au]
Sent: Wednesday, 7 August 2019 6:41 PM
To: Para Sangar
Cc: Mark Ozinga; Nathan Cairney; Fei Chen
Subject: RE: TfNSW Consultations - B28 (Biannual Trip Report Framework) - Moorebank Logistics Park MPE Stage 2 (SSD_7628)

Hi Para

Please find attached the updated consultation response table and BTODR addressing your additional comment in the below email.

Can you please confirm that you are satisfied we have addressed your comment so that we can move to close out our consultation on this Report and submit to DPIE for approval?

Please let me know if you need any further information and/ or would like to discuss.

Thanks,
Ibrahim

Regards,
IBRAHIM AWAD
ENVIRONMENTAL MANAGER
TACTICAL GROUP

LEVEL 15 | 124 WALKER STREET | NORTH SYDNEY | NSW | 2060

T +61 2 8907 0700
M +61 426 832 993
E iawad@tacticalgroup.com.au
W www.tacticalgroup.com.au

From: Para sangar Sangarapillai <Para.Sangar@transport.nsw.gov.au>
Sent: Friday, 12 July 2019 10:49 AM
To: Ibrahim Awad <iawad@tacticalgroup.com.au>
Cc: Mark Ozinga <Mark.Ozinga@transport.nsw.gov.au>
Subject: RE: TfNSW Consultations - B28 (Biannual Trip Report Framework) - Moorebank Logistics Park MPE Stage 2 (SSD_7628)

Hi Ibrahim

Thank you for sending the revised report for comments.

It is noted that Section 5.1.2 (page 15) of the attached report includes the following without further details:

> *"Therefore, the OD surveys will be undertaken during the following times;"*

It is also noted that the survey period 8pm-10pm does not cover the movements of workers leaving the site. A copy of spreadsheet that includes further details is attached for your information.

If you have any further details, please contact me.

Regards
Para

Para Sangar
Senior Transport Planner
Customer Strategy and Technology
Transport for NSW

T 0466 024 892
Level 26, 477 Pitt Street, Haymarket, NSW 2008

SENSITIVE: NSW GOVERNMENT

From: Ibrahim Awad [mailto:iawad@tacticalgroup.com.au]
Sent: Saturday, 29 June 2019 8:52 AM
To: Para Sangar
Cc: Mark Ozinga; Nathan Cairney; Fei Chen
Subject: RE: TfNSW Consultations - B28 (Biannual Trip Report Framework) - Moorebank Logistics Park MPE Stage 2 (SSD_7628)

Hi Para

We have received approval from Qube to expand the OD survey as requested in your consultation comments and our recent meeting. In summary, the changes include expanding the OD survey to include the surrounding network, directional split, 'on and off ramps' for the M5, and development peak hours/traffic.

Please find attached the following:

- Revised MoM with the changes requested in your email below
- Updated BTODR with details of the expanded OD survey (marked in track changes)
- Final pdf copy of the BTODR

Could you please confirm that you are satisfied with these changes so that we can present this agreed framework to DPE?

We will also forward a copy of these changes to RMS as they have also requested an expansion of the OD survey for very similar reasons.

Thanks and regards,

Ibrahim

Regards,
IBRAHIM AWAD
ENVIRONMENTAL MANAGER
TACTICAL GROUP

LEVEL 15 | 124 WALKER STREET | NORTH SYDNEY | NSW | 2060

T +61 2 8907 0700
M +61 426 832 993
E iawad@tacticalgroup.com.au
W www.tacticalgroup.com.au

From: Para Sangar <Para.Sangar@transport.nsw.gov.au>
Sent: Tuesday, 25 June 2019 12:19 PM
To: Ibrahim Awad <iawad@tacticalgroup.com.au>
Cc: Mark Ozinga <Mark.Ozinga@transport.nsw.gov.au>
Subject: FW: TfNSW Consultations - B28 (Biannual Trip Report Framework) - Moorebank Logistics Park MPE Stage 2 (SSD_7628)

Hi Ibrahim

Thank you for sending the draft minutes of meeting.

Please remove the last point as shown in the attached document.

Should you have any further queries, please contact me.

Regards
Para

Para Sangar
Senior Transport Planner
Customer Strategy and Technology
Transport for NSW

T 0466 024 892
Level 26, 477 Pitt Street, Haymarket, NSW 2008

From: Ibrahim Awad [mailto:iawad@tacticalgroup.com.au]
Sent: Monday, 17 June 2019 2:03 PM
To: Para Sangar
Cc: Mark Ozinga; Nathan Cairney; Patel, Ketan; Vukic, Nicole; Fei Chen
Subject: TfNSW Consultations - B28 (Biannual Trip Report Framework) - Moorebank Logistics Park MPE Stage 2 (SSD_7628)

Hi Para

Once again, thank-you for making time last Thursday to meet with us to discuss your outstanding comments on the BTODR.

Please find attached the draft Minutes of Meeting. Could you please let me know if we've missed anything and/ or otherwise if you have any corrections?

Thanks,
Ibrahim

Regards,
IBRAHIM AWAD
ENVIRONMENTAL MANAGER

LEVEL 15 | 124 WALKER STREET | NORTH SYDNEY | NSW | 2060

T +61 2 8907 0700
M +61 426 832 993
E iawad@tacticalgroup.com.au
W www.tacticalgroup.com.au

From: Para Sangar <Para.Sangar@transport.nsw.gov.au>
Sent: Wednesday, 12 June 2019 10:00 AM
To: Ibrahim Awad <iawad@tacticalgroup.com.au>
Cc: Mark Ozinga <Mark.Ozinga@transport.nsw.gov.au>
Subject: FW: TfNSW Consultations - Moorebank Logistics Park MPE Stage 1 (SSD-6766) and Stage 2 (SSD_7628) - B2 (CTAMP-B), B28 (Biannual Report Framework), B26 OTAMP & B29 WTP

Hi Ibrahim

Thank you for your email message.

I have already sent an invitation for the meeting that has been scheduled to occur tomorrow (Thursday 13 June 2019).

Please accept the meeting invitation.

Regards
Para

Para Sangar
Senior Transport Planner
Customer Strategy and Technology
Transport for NSW

T 0466 024 892
Level 26, 477 Pitt Street, Haymarket, NSW 2008

From: Ibrahim Awad [mailto:iawad@tacticalgroup.com.au]
Sent: Saturday, 8 June 2019 8:15 AM
To: Para Sangar
Cc: Mark Ozinga; Nathan Cairney; Fei Chen
Subject: RE: TfNSW Consultations - Moorebank Logistics Park MPE Stage 1 (SSD-6766) and Stage 2 (SSD_7628) - B2 (CTAMP-B), B28 (Biannual Report Framework), B26 OTAMP & B29 WTP

Hi Para

Thanks for your additional comments on the WTP and BTODR.

We have noted your comments and recommendations for our consideration in the future application and further development of the WTP and consider our consultation on this document for this pre-operational phase closed. A log of your comments and these consultations will be provided in the updated WTP for submission and approval by DPE.

With regards your further comments on the BTODR, I would suggest that a face-to-face meeting to discuss the technical details / surveys with our Consultant might be the best way to address and resolve these outstanding comments and I'd like to request a meeting with your team for 13-15 June to discuss. Could you please confirm the availability of your relevant staff to attend such a meeting and your preferred date/time/location for this meeting?

We look forward to the opportunity to meet and discuss this with you soon.

Thanks,
Ibrahim

Regards,
IBRAHIM AWAD
ENVIRONMENTAL MANAGER
TACTICAL GROUP

LEVEL 15 | 124 WALKER STREET | NORTH SYDNEY | NSW | 2060

T +61 2 8907 0700
M +61 426 832 993
E iawad@tacticalgroup.com.au
W www.tacticalgroup.com.au

From: Para Sangar <Para.Sangar@transport.nsw.gov.au>
Sent: Friday, 7 June 2019 12:13 PM
To: Ibrahim Awad <iawad@tacticalgroup.com.au>
Cc: Mark Ozinga <Mark.Ozinga@transport.nsw.gov.au>
Subject: RE: TfNSW Consultations - Moorebank Logistics Park MPE Stage 1 (SSD-6766) and Stage 2 (SSD_7628) - B2 (CTAMP-B), B28 (Biannual Report Framework), B26 OTAMP & B29 WTP

Hi Ibrahim

Please find attached comments on the Tactical Group Response to TfNSW comments on the WTP and Biannual Report Framework.

Should you have any further queries, please contact me.

Regards
Para

Para Sangar
Senior Transport Planner
Customer Strategy and Technology
Transport for NSW

T 0466 024 892
Level 26, 477 Pitt Street, Haymarket, NSW 2008

SENSITIVE: NSW GOVERNMENT

From: Ibrahim Awad [mailto:iawad@tacticalgroup.com.au]
Sent: Friday, 7 June 2019 8:11 AM
To: Para Sangar
Cc: Mark Ozinga; Nathan Cairney; Fei Chen
Subject: RE: TfNSW Consultations - Moorebank Logistics Park MPE Stage 1 (SSD-6766) and Stage 2 (SSD_7628) - B2 (CTAMP-B), B28 (Biannual Report Framework), B26 OTAMP & B29 WTP

Hi Para

Thanks for the update on this and we look forward to hearing from you today /early next week.

Regards,
Ibrahim

Regards,
IBRAHIM AWAD
ENVIRONMENTAL MANAGER
TACTICAL GROUP

LEVEL 15 | 124 WALKER STREET | NORTH SYDNEY | NSW | 2060

T +61 2 8907 0700
M +61 426 832 993
E iawad@tacticalgroup.com.au
W www.tacticalgroup.com.au

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From: Para Sangar <Para.Sangar@transport.nsw.gov.au>
Sent: Thursday, 6 June 2019 3:57 PM
To: Ibrahim Awad <iawad@tacticalgroup.com.au>
Cc: Mark Ozinga <Mark.Ozinga@transport.nsw.gov.au>; Nathan Cairney <ncairney@tacticalgroup.com.au>; Fei Chen <fchen@tacticalgroup.com.au>
Subject: RE: TfNSW Consultations - Moorebank Logistics Park MPE Stage 1 (SSD-6766) and Stage 2 (SSD_7628) - B2 (CTAMP-B), B28 (Biannual Report Framework), B26 OTAMP & B29 WTP

Hi Ibrahim

Please note that I responded to you in relation to the status of TfNSW response via email dated on 31 May 2019 (A copy of the email message is attached).

Current status of TfNSW response is provided below:

- I have received internal comments for WTP and Biannual Report Framework. TfNSW executives are currently reviewing the TfNSW comments on the Tactical Group's response. I am aiming send our comments tomorrow/early next week.

- I am still waiting for comments from internal stakeholders for the OEMP.

Should you have any further queries, please contact me.

Regards
Para

Para Sangar
Senior Transport Planner
Customer Strategy and Technology
Transport for NSW

T 0466 024 892
Level 26, 477 Pitt Street, Haymarket, NSW 2008

NSW GOVERNMENT | Transport for NSW

SENSITIVE: NSW GOVERNMENT

From: Ibrahim Awad [mailto:iawad@tacticalgroup.com.au]
Sent: Thursday, 6 June 2019 11:20 AM
To: Para Sangar
Cc: Mark Ozinga; Nathan Cairney; Fei Chen
Subject: FW: TfNSW Consultations - Moorebank Logistics Park MPE Stage 1 (SSD-6766) and Stage 2 (SSD_7628) - B2 (CTAMP-B), B28 (Biannual Report Framework), B26 OTAMP & B29 WTP

Hi Para

We have still not received confirmation on your satisfaction with our response in which we have sought to address your comments on the WTP and BTODR (sent to you on 26 May 19 as per the below email) nor any further comments on the OEMP.

I've tried to follow up by email / phone on 26 May, 30 May, 3 June and 5 June but haven't been able to speak to you. We've planned to close out our consultation with TfNSW on these traffic management plans by tomorrow (Friday 7 June 19) and would be grateful to receive a confirmation from you that you are satisfied that we have addressed your comments and/ or otherwise a request to meeting to discuss / address any outstanding comments.

Please let me know if there's anything that we can do to assist in the close out of this consultation.

Thanks,
Ibrahim

Regards,
IBRAHIM AWAD
ENVIRONMENTAL MANAGER
TACTICAL GROUP

LEVEL 15 | 124 WALKER STREET | NORTH SYDNEY | NSW | 2060

T +61 2 8907 0700
M +61 426 832 993
E iawad@tacticalgroup.com.au
W www.tacticalgroup.com.au

From: Ibrahim Awad
Sent: Sunday, 26 May 2019 12:10 PM
To: 'Para Sangar Sangarapillai' <Para.Sangar@transport.nsw.gov.au>
Cc: Mark Ozinga <Mark.Ozinga@transport.nsw.gov.au>; Nathan Cairney <ncairney@tacticalgroup.com.au>; Fei Chen <fchen@tacticalgroup.com.au>
Subject: TfNSW Consultations - Moorebank Logistics Park MPE Stage 1 (SSD-6766) and Stage 2 (SSD_7628) - B2 (CTAMP-B), B28 (Biannual Report Framework), B26 OTAMP & B29 WTP

Hi Para

Please find attached our response to your comments on the BTODR and WTP.

We have already provided RMS with our response to the OTAMP and will be providing them with a response to the CTAMP-B and BTODR early this week.

Please let me know if you have any further comments on these plans and/ or would like to

discuss over the phone or in person.

Thanks and regards,

Ibrahim

Regards,
IBRAHIM AWAD
ENVIRONMENTAL MANAGER
TACTICAL GROUP

LEVEL 15 | 124 WALKER STREET | NORTH SYDNEY | NSW | 2060

T +61 2 8907 0700
M +61 426 832 993
E iawad@tacticalgroup.com.au
W www.tacticalgroup.com.au

From: Para Sangar Sangarapillai <Para.Sangar@transport.nsw.gov.au>
Sent: Thursday, 16 May 2019 2:50 PM
To: Ibrahim Awad <iawad@tacticalgroup.com.au>
Cc: Mark Ozinga <Mark.Ozinga@transport.nsw.gov.au>
Subject: RE: TfNSW Consultations - Moorebank Logistics Park MPE Stage 1 (SSD-6766) and Stage 2 (SSD_7628) - B2 (CTAMP-B), B28 (Biannual Report Framework), B26 OTAMP & B29 WTP

Hi Ibrahim

Please find attached a copy of the response letter for the above.

Should you have any further queries, please contact me.

Regards
Para

Para Sangar
Senior Transport Planner
Customer Strategy and Technology
Transport for NSW

T 0466 024 892
Level 26, 477 Pitt Street, Haymarket, NSW 2008

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From: Ibrahim Awad [mailto:iawad@tacticalgroup.com.au]
Sent: Wednesday, 15 May 2019 3:47 PM
To: Para Sangar Sangarapillai
Cc: Mark Ozinga; Nathan Cairney; Dan Blyde; Fei Chen
Subject: RE: TfNSW Consultations - Moorebank Logistics Park MPE Stage 1 (SSD-6766) and Stage 2 (SSD_7628) - B2 (CTAMP-B), B28 (Biannual Report Framework), B26 OTAMP & B29 WTP

Hi Para

Thanks very much for the update and we look forward to receiving your comments soon.

Regards,
Ibrahim

Regards,
IBRAHIM AWAD
ENVIRONMENTAL MANAGER
TACTICAL GROUP

LEVEL 15 | 124 WALKER STREET | NORTH SYDNEY | NSW | 2060

T +61 2 8907 0700
M +61 426 832 993
E iawad@tacticalgroup.com.au
W www.tacticalgroup.com.au

From: Para Sangar Sangarapillai <Para.Sangar@transport.nsw.gov.au>
Sent: Wednesday, 15 May 2019 1:57 PM
To: Ibrahim Awad <iawad@tacticalgroup.com.au>
Cc: Mark Ozinga <Mark.Ozinga@transport.nsw.gov.au>
Subject: RE: TfNSW Consultations - Moorebank Logistics Park MPE Stage 1 (SSD-6766) and Stage 2 (SSD_7628) - B2 (CTAMP-B), B28 (Biannual Report Framework), B26 OTAMP & B29 WTP

Hi Ibrahim

This is to inform that the draft letter is currently reviewed by TfNSW executives. I will forward the signed letter once it is signed off.

If you have any further queries, please contact me.

Regards
Para

Para Sangar
Senior Transport Planner
Freight, Strategy and Planning

Transport for NSW

T 0466 024 892
Level 26, 477 Pitt Street, Haymarket, NSW 2008

SENSITIVE: NSW GOVERNMENT

From: Ibrahim Awad [mailto:iawad@tacticalgroup.com.au]
Sent: Friday, 10 May 2019 2:45 PM
To: Para Sangar Sangarapillai
Cc: Mark Ozinga; Nathan Cairney; Dan Blyde; Fei Chen
Subject: RE: TfNSW Consultations - Moorebank Logistics Park MPE Stage 1 (SSD-6766) and Stage 2 (SSD_7628) - B2 (CTAMP-B), B28 (Biannual Report Framework), B26 OTAMP & B29 WTP

Hi Para

Thanks for the update. That's great news and we look forward to receiving your comments then.

Thanks and regards,

Ibrahim

Regards,
IBRAHIM AWAD
ENVIRONMENTAL MANAGER

LEVEL 15 | 124 WALKER STREET | NORTH SYDNEY | NSW | 2060

T +61 2 8907 0700
M +61 426 832 993
E iawad@tacticalgroup.com.au
W www.tacticalgroup.com.au

From: Para Sangar Sangarapillai <Para.Sangar@transport.nsw.gov.au>
Sent: Friday, 10 May 2019 12:53 PM
To: Ibrahim Awad <iawad@tacticalgroup.com.au>
Cc: Mark Ozinga <Mark.Ozinga@transport.nsw.gov.au>
Subject: RE: TfNSW Consultations - Moorebank Logistics Park MPE Stage 1 (SSD-6766) and Stage 2 (SSD_7628) - B2 (CTAMP-B), B28 (Biannual Report Framework), B26 OTAMP & B29 WTP

Hi Ibrahim

Thank you for your email message.

I have received comments from most of the TfNSW internal stakeholders.

We are aiming to provide TfNSW response by middle of next week at this stage.

Should you have any further queries, please contact me.

Regards
Para

Para Sangar
Senior Transport Planner
Freight, Strategy and Planning
Transport for NSW

T 0466 024 892
Level 26, 477 Pitt Street, Haymarket, NSW 2008

SENSITIVE: NSW GOVERNMENT

From: Ibrahim Awad [mailto:iawad@tacticalgroup.com.au]
Sent: Thursday, 9 May 2019 4:15 PM
To: Para Sangar Sangarapillai
Cc: Mark Ozinga; Nathan Cairney; Steve Ryan; Dan Blyde; Fei Chen
Subject: TfNSW Consultations - Moorebank Logistics Park MPE Stage 1 (SSD-6766) and Stage 2 (SSD_7628) - B2 (CTAMP-B), B28 (Biannual Report Framework), B26 OTAMP & B29 WTP

Hi Para

I just called and left a message with regards the review of the above plans.

You mentioned last we spoke that you were expecting to receive internal comments this week. Could you please help us with an update on the status of these comments and let me know if it would help for us to meet your team in person to discuss / resolve any comments?

Please also let me know if there is anything else we can do to assist you / TfNSW in this consultation process.

Thanks and regards,

Ibrahim

Regards,
IBRAHIM AWAD
ENVIRONMENTAL MANAGER

LEVEL 15 | 124 WALKER STREET | NORTH SYDNEY | NSW | 2060

T +61 2 8907 0700
M +61 426 832 993
E iawad@tacticalgroup.com.au
W www.tacticalgroup.com.au

From: Ibrahim Awad
Sent: Saturday, 4 May 2019 10:20 AM
To: para.sangar@transport.nsw.gov.au
Cc: 'mark.ozinga@transport.nsw.gov.au' <mark.ozinga@transport.nsw.gov.au>; Steve Ryan <sryan@tacticalgroup.com.au>; Nathan Cairney <ncairney@tacticalgroup.com.au>; 'Dan Blyde' <Dan.Blyde@qube.com.au>; 'VAN PUTTEN Laura E' <Laura.VAN.PUTTEN@rms.nsw.gov.au>
Subject: TfNSW Consultations - Moorebank Logistics Park MPE Stage 1 (SSD-6766) and Stage 2 (SSD_7628) - B2 (CTAMP-B), B28 (Biannual Report Framework), B26 OTAMP & B29 WTP

Hi Para

Further to Dan's email, Laura Van Putten (copied in) has emailed me to say that she will be looking after the review of these plans at RMS and that they are also looking to get us comments this coming week. You might be able to contact Laura on this if you have not heard back from Rachel Cummings.

Please note that we are awaiting comment on the below plans, with the OTAMP and WTP being of critical importance to DPE to enable the commencement of operations of the Target Warehouse next month (June 19):

1. Construction Traffic & Access Management Plan B (CTAMP B)
2. Operations Traffic & Access Management Plan (OTAMP)
3. Bi-annual trip report
4. Workplace Travel Plan (WTP)

Please let me know if there is anything else that we can assist with.

Thanks and regards,

Ibrahim

Regards,
IBRAHIM AWAD
ENVIRONMENTAL MANAGER

LEVEL 15 | 124 WALKER STREET | NORTH SYDNEY | NSW | 2060

T +61 2 8907 0700
M +61 426 832 993
E iawad@tacticalgroup.com.au
W www.tacticalgroup.com.au

From: Dan Blyde <Dan.Blyde@qube.com.au>
Sent: Friday, 3 May 2019 1:42 PM
To: para.sangar@transport.nsw.gov.au
Cc: Ibrahim Awad <iawad@tacticalgroup.com.au>; Fei Chen <fchen@tacticalgroup.com.au>; Steve Ryan <sryan@tacticalgroup.com.au>; Nathan Cairney <ncairney@tacticalgroup.com.au>; Ozinga Mark <Mark.Ozinga@transport.nsw.gov.au>
Subject: Re: MPE Stage 1 (SSD-6766) and Stage 2 (SSD_7628) TfNSW Consultation - B2 (CTAMP-B) and B28 (Biannual Report Framework)

Dear Para,

As discussed, RMS have told us they have received advice on the above plans from their internal stakeholders and are now dealing directly with DPE regarding the review and approval process. It would be greatly appreciated if you could liaise with Rachel Cumming ASAP so the TfNSW comments can either be incorporated or sent separately to us and DPE as soon as they are ready so we can finalise the consultation process.

As mentioned on our call, closing out the consultation on these plans is becoming critical given that it is a planning requirement before the first train can run into the Moorebank site and is also needed for Target to occupy and operate its major distribution warehouse on our site.
Appreciate your help on getting this completed.

Regards,

Dan

Dan Blyde | Senior Advisor - Corporate Affairs
Qube Holdings Limited

Fax: +61 2 9080 1999

> On 29 Apr 2019, at 5:27 pm, Nathan Cairney <ncairney@tacticalgroup.com.au> wrote:

Dan,

This one is at least a little more positive, after many weeks of trying we have today confirmed that TfNSW are targeting responses to our request for consultation by 10 May. If there is anything you can do to help this along, obtaining some certainty on this date would be relieving.

Regards,
NATHAN CAIRNEY
DIRECTOR
<image012.jpg>

LEVEL 15 | 124 WALKER STREET | NORTH SYDNEY | NSW | 2060
M +61 499 555 817
E ncairney@tacticalgroup.com.au
W www.tacticalgroup.com.au

<image013.jpg>
<image005.jpg> Before printing this document, please consider the environment.

From: Ibrahim Awad
Sent: Monday, 29 April 2019 10:28 AM
To: para.sangar@transport.nsw.gov.au
Cc: mark.ozinga@transport.nsw.gov.au; Nathan Cairney <ncairney@tacticalgroup.com.au>; Fei Chen <fchen@tacticalgroup.com.au>
Subject: FW: MPE Stage 1 (SSD-6766) and Stage 2 (SSD_7628) TfNSW Consultation - B2 (CTAMP-B) and B28 (Biannual Report Framework)

Hi Para

Thanks for your call earlier and for confirming that you have now issued the plans for internal review / comment.

I note that you are coordinating the internal reviews and that you are expecting internal comments to be received by the end of this week, at which point you will then consult externally with RMS to seek their comments.

I also note that you will aim to get comments to us by the 10th May '19, subject to the receipt / resolution of RMS comments.

Thanks again for your help on this and we look forward to hearing from you in due course.

Regards,

Ibrahim

Regards,
IBRAHIM AWAD

ENVIRONMENTAL MANAGER
<image001.gif>

LEVEL 15 | 124 WALKER STREET | NORTH SYDNEY | NSW | 2060

T +61 2 8907 0700
M +61 426 832 993
E iawad@tacticalgroup.com.au
W www.tacticalgroup.com.au

<image003.jpg>

<image004.jpg> Before printing this document, please consider the environment.

From: Ibrahim Awad
Sent: Monday, 29 April 2019 10:07 AM
To: 'para.sangar@transport.nsw.gov.au' <para.sangar@transport.nsw.gov.au>; 'mark.ozinga@transport.nsw.gov.au' <mark.ozinga@transport.nsw.gov.au>
Cc: Nathan Cairney <ncairney@tacticalgroup.com.au>; Fei Chen <fchen@tacticalgroup.com.au>
Subject: FW: MPE Stage 1 (SSD-6766) and Stage 2 (SSD_7628) TfNSW Consultation - B2 (CTAMP-B) and B28 (Biannual Report Framework)

Hi Para

I just called and left a message. I'm doing the weekly follow up on our consultations with TfNSW on the above plans.

Could you please let me know if this plan has now been assigned to one of your officers for review / comment and the contact details of that officer so that I can follow up?

Please also let me know if you have already reviewed and would like to discuss your comments over the phone or in person, or if there is anything else that we can do to help you in this process.

We look forward to hearing from you soon.

Thanks and regards,

Ibrahim

Regards,
IBRAHIM AWAD
ENVIRONMENTAL MANAGER
<image001.gif>

LEVEL 15 | 124 WALKER STREET | NORTH SYDNEY | NSW | 2060

T +61 2 8907 0700
M +61 426 832 993
E iawad@tacticalgroup.com.au
W www.tacticalgroup.com.au

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From: Ibrahim Awad
Sent: Thursday, 18 April 2019 5:05 PM
To: 'para.sangar@transport.nsw.gov.au' <para.sangar@transport.nsw.gov.au>
Cc: 'mark.ozinga@transport.nsw.gov.au' <mark.ozinga@transport.nsw.gov.au>; Nathan Cairney <ncairney@tacticalgroup.com.au>; Fei Chen <fchen@tacticalgroup.com.au>
Subject: FW: MPE Stage 1 (SSD-6766) and Stage 2 (SSD_7628) TfNSW Consultation - B2 (CTAMP-B) and B28 (Biannual Report Framework)

Hi Para

I tried to call earlier on your mobile phone and have left a message.

I'm doing the weekly follow up on our consultations with TfNSW on the OEMP/sub-plans submitted to you for review and comment.

I wanted to ask if you'd had a chance to review the documents and/ or if you've identified an alternative contact person for us to follow-up with.

Could you please let me know if there is anything we can continue to help with and/ or if you'd like to discuss any further comments over the phone or in person?

Thanks and regards,

Ibrahim

Regards,
IBRAHIM AWAD
ENVIRONMENTAL MANAGER


LEVEL 15 | 124 WALKER STREET | NORTH SYDNEY | NSW | 2060

T +61 2 8907 0700
M +61 426 832 993
E iawad@tacticalgroup.com.au
W www.tacticalgroup.com.au

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From: Ibrahim Awad
Sent: Thursday, 11 April 2019 10:45 AM
To: 'para.sangar@transport.nsw.gov.au' <para.sangar@transport.nsw.gov.au>
Cc: 'mark.ozinga@transport.nsw.gov.au' <mark.ozinga@transport.nsw.gov.au>; Nathan Cairney <ncairney@tacticalgroup.com.au>; Fei Chen <fchen@tacticalgroup.com.au>
Subject: FW: MPE Stage 1 (SSD-6766) and Stage 2 (SSD_7628) TfNSW Consultation

- B2 (CTAMP-B) and B28 (Biannual Report Framework)

Hi Para

Good to talk to you just then and thanks for the update on your review. We've made a note that you are still considering this and will be speaking to and / or coordinating with RMS on this.

As mentioned, if it would help, our contact at RMS for the same consultations on these plans is:

Rachel Cumming – rachel.cumming@rms.nsw.gov.au ph. 8849 2077

We look forward to hearing from you soon.

Thanks and regards,

Ibrahim

Regards,
IBRAHIM AWAD
ENVIRONMENTAL MANAGER
<image001.gif>

LEVEL 15 | 124 WALKER STREET | NORTH SYDNEY | NSW | 2060

T +61 2 8907 0700
M +61 426 832 993
E iawad@tacticalgroup.com.au
W www.tacticalgroup.com.au

<image003.jpg>

<image004.jpg> Before printing this document, please consider the environment.

From: Nathan Cairney
Sent: Tuesday, 26 March 2019 5:37 PM
To: 'Mark.Ozinga@transport.nsw.gov.au' <Mark.Ozinga@transport.nsw.gov.au>; development@trasport.nsw.gov.au
Cc: bob.rutledge@transport.nsw.gov.au; Steve Ryan <sryan@tacticalgroup.com.au>; Fei Chen <fchen@tacticalgroup.com.au>; Ian Irwin <iirwin@tacticalgroup.com.au>; Ibrahim Awad <iawad@tacticalgroup.com.au>
Subject: MPE Stage 1 (SSD-6766) and Stage 2 (SSD_7628) TfNSW Consultation - B2 (CTAMP-B) and B28 (Biannual Report Framework)

Hi Mark,

I spoke to Tim Dewey on the phone today to discuss consultation for a number of documents for the Moorebank Logistics Park and Tim informed me that he no longer works in your team and you would be the best contact to start with. I'm hoping to organise a session for us to discuss the upcoming consultation

requirements for the project and would like to confirm who the most appropriate contact would be for this.

In the meantime below is an extract of the conditions that relate to the documents that we expect to provide for consultation in the coming weeks, and attached is the first two of those documents for TfNSW's review and comment.

Please can you confirm who the appropriate contact would be for this consultation and suggest a suitable time that we may be able to meet with you to clarify any comments you or your team may have and assist in your understanding of the documents before making formal comments.

We would hope to be able to conclude consultation for the attached 2 documents by no later than 18 April 2019 to allow these documents to be submitted to DPE for their review and approval shortly thereafter. If there is anything that we can do in addition to the above to support meeting that timeframe please don't hesitate to let us know so that we can action appropriately.

Documents to be provided and timing:

- MPE 2 CoC B2: CTAMP B for the upgrade of Moorebank Avenue – provided in the attached
- MPE 2 CoC B28: Biannual Trip Origin Destination Reporting Framework - provided in the attached
- MPE 2 CoC B26 (including MPE 1 OTAMP): Operational TAMP – to be provided in the coming week
- MPE 2 CoC B29: Workplace travel plan – to be provided in 3 weeks
- MPE 1 and 2 overall: OEMP can be provided for reference if TfNSW would like to receive a copy.

Extract of the relevant conditions:

<image002.png>
<image006.png>
<image007.png>

<image008.png>
<image009.png>

Regards,
NATHAN CAIRNEY
DIRECTOR
<image014.jpg>

LEVEL 15 | 124 WALKER STREET | NORTH SYDNEY | NSW | 2060
M +61 499 555 817
E ncairney@tacticalgroup.com.au
W www.tacticalgroup.com.au
CPQQRT

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<image005.jpg> Before printing this document, please consider the environment.

<SSS2-QPMS-EN-PLN-0040_vB_clean.pdf><190313_Biannual Trip Origin Destination Report Framework_Final Draft_clean.pdf>

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Biannual Trip Origin Destination Report (Revision 002 (Final Draft) dated 13 March 2019)

Status of comments from TfNSW

Stakeholder	Initial Comment Date	Comment	Arcadis Response	Initial Response Date
TfNSW	16-May-19	Section 5.1.2 – Traffic Surveys		21-May-2019
TfNSW	16-May-19	This section needs to clearly state the purpose of these traffic surveys and whether light and heavy vehicles will be surveyed;	Section 5.1.2 has been updated to state what the surveys are intended to capture based on our understanding of the intent of the condition. It also specifies which surveys will capture light and/ or heavy vehicle movements. *TfNSW comments: Condition 28 (d) states that representative vehicle origin and destinations based on a cordon in the surrounding road network. This section needs to demonstrate that the development peak periods for light and heavy vehicles have been considered to identify representative vehicle origin and destinations.* The survey scope has been extended to include the development peak periods (capturing shift changes and forecast heavy vehicle peaks) as well as the general network peak periods.	21-May-2019 13 June 2019
TfNSW	16-May-19	Peak periods of the development is not included for the survey period (5am-6am and 1pm-2pm);	It is understood that surveys are intended to provide a representative OD for the site. It is recommended that to capture the overall network peak, the surveys are carried out in standard peak periods. *TfNSW comments: Condition 28 (d) states that representative vehicle origin and destinations based on a cordon in the surrounding road network. Missing development peak periods during the survey would not provide representative vehicle origin and destinations and therefore, the proposed survey period does not satisfy condition 28(d).* The survey scope has been extended to include the development peak periods (capturing shift changes and forecast heavy vehicle peaks) as well as the general network peak periods.	21-May-2019 13 June 2019

Stakeholder	Initial Comment Date	Comment	Arcadis Response	Initial Response Date
TfNSW	16-May-19	No information in relation to the sample size for light and heavy vehicles that would be captured for Origin-Destination surveys is provided; and	Section 5.1.2 has been updated to state that it is intended to capture all vehicles in the OD surveys. The OD survey result tables provided by the survey company commissioned will specify exactly how many vehicles were captured and based on the intersection surveys it will be determined what portion of total vehicles were accounted for in the OD. *TfNSW comments: Prior to the OD surveys, please confirm that it is intended to capture 100% (or close as close as possible) of the light and heavy vehicles.* It is the intention to capture as close as possible to 100% of vehicles passing through the OD stations. Any expansion factors required to correct missed vehicles will be recorded in the report prepared by the survey company. This has been specified in the *Biannual Trip Origin Destination Report*. Arcadis notes that TfNSW would not mandate that 100% of vehicles were captured in the OD survey.	21-May-2019 13-June-2019
TfNSW	16-May-19	The proposed Origin-Destination Surveys do not capture vehicle movements along the interchange ramps of M5 Motorway/Moorebank Avenue.	Advice from the survey company indicated that locating cameras on the ramps is highly undesirable. Therefore, the locations of the OD stations were determined to capture each of the movements required to inform the monitoring of the traffic generated by the site. **No further updates to the document are proposed.** *TfNSW: Please reflect the changes made in the report in relation to OD surveys proposed on the M5/Moorebank Avenue interchange ramps.* Following further consultation with TfNSW, the survey scope was modified to include the entry and exit ramps of the M5 Motorway. Therefore, the response above has been superseded and it has been confirmed with the survey company that placing cameras on the ramps has been allowed for.	21-May-2019 14-Aug-2019

Stakeholder	Initial Comment Date	Comment	Arcadis Response	Initial Response Date
TfNSW	12-July-19	It is noted that Section 5.1.2 (page 15) of the attached report includes the following without further details: "Therefore, the OD surveys will be undertaken during the following times;"	The report has been amended to correct the text and summarise the OD survey periods, capturing both the general network peak and development peak periods.	22-July-19
TfNSW	12-July-19	It is also noted that the survey period 8pm-10pm does not cover the movements of workers leaving the site. A copy of spreadsheet that includes further details is attached for your information.	The night-time survey period has been extended to 8pm to 11pm, which captures the shift change over and workers leaving the site, in accordance with the spreadsheet attached to TfNSW's email dated 12 July 2019.	22-July-19

MEETING MINUTES – NO 001

Moorebank Logistics Park – East Precinct Pre-Ops

PROJECT	Moorebank Logistics Park – East Precinct MPE Stage 2
MEETING TYPE	Traffic Management Plan Consultation Meeting with TfNSW
TIME & DATE	10am, Thurs 13 June 2019
LOCATION	TfNSW offices, Zenith Tower, Chatswood
ISSUED	17 June 2019

PRESENT		ORGANISATION	INITIAL	EMAIL ADDRESS
YES	APOLOGIES			
☒	☐	TfNSW	MO	mark.ozinga@transport.nsw.gov.au
☒	☐	TfNSW	PS	para.sangar@transport.nsw.gov.au
☒	☐	Arcadis	NV	nicole.vukic@arcadis.com
☒	☐	Arcadis	KP	ketan.patel@arcadis.com
☒	☐	Tactical	IA	iawad@tacticalgroup.com.au
☒	☐	Tactical	FC	fchen@tacticalgroup.com.au

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Nathan Cairney
Heather Tilley

ITEM	DESCRIPTION	ACTION	DATE
1.	**GENERAL**		
1.1.	Introductions	N/A	N/A
1.1.1.	IA noted the plans that had been submitted to TfNSW for review and comment and their current status, including close out of consultation with TfNSW on WTP and comments on BTODR. IA noted that RMS had also raised very similar comments with respect the BTODR.	N/A	N/A
1.1.2.	PS confirmed that the OEMP was still under review and that he'd emailed IA to request a copy of the ONVMP	IA TO PROVIDE COPY OF ONVMP TO PS PS to get back to IA on OEMP	N/A
1.1.3.	IA introduced NV to discuss details of comments on BTODR	N/A	N/A

ITEM	DESCRIPTION	ACTION	DATE
2.	**TRAFFIC – BTODR**		
2.1.	NV confirmed TfNSW request (comment) with respect the intent to capture 100% traffic movement in OD survey. MO stated that was the preferred approach but that it would be understandable if did not capture 100% but a little less. NV noted that the survey company would detail the proportion captured and document any adjustments required.	N/A	
2.1.1.	MO/PS stated that they would like to capture development peak periods, and different patterns of development peak periods in addition to network peaks and that TfNSW was interested in heavy vehicle peak periods including capturing: - Shift changes - Heavy vehicle peaks - General network peaks These would confirm uncertainty about the assumptions in the initial assessments. NV confirmed that the Consultant understood the intent of the comments and above recommendations and that the Consultant would look to capture these in an expanded OD survey. IA stated that we would first need to discuss the above further actions with Qube first and seek their input / feedback / approval on any further work in this regard.	IA to raise the request to cover development peak periods in an expanded OD survey with Qube and get back to TfNSW on the outcome.	Week end - 21 June 2019
2.1.1.1	MO and PS stated they were interested in understanding the directional split on the M5, which has high existing heavy vehicle volumes.	IA to raise with TfNSW request for expanding scope of OD survey to cover	Week end – 21 June 2019

ITEM	DESCRIPTION	ACTION	DATE
	NV stated that the Consultant understood the intent of this request but noted that there were previous difficulties with survey companies placing cameras on the ramps and safety issues and restrictions by various motorway operators. MO noted that Qube may need to sign a commercial / confidentiality agreement with Interlink before placing the cameras in order to get approval to place the cameras on the ramps. MO stated and agreed with NV that we do not need to count vehicles on the M5 just on the ramps. NV noted that the Consultant could look to include this in an expanded OD survey. IA noted that Tactical will raise this request for additional OD survey work with Qube and will come back to TfNSW with feedback.	directional split with Qube and come back to TfNSW with feedback.	

ISSUED BY
TACTICAL GROUP

IBRAHIM AWAD
ENVIRONMENTAL MANAGER

From:	Ibrahim Awad
To:	Laura Van putten
Cc:	Nathan Cairney; Fei Chen
Subject:	FW: Tactical & RMS Consultation - B, Biannual Trip Report - Moorebank Intermodal - MPE Stage 1 (SSD-6766) and Stage 2 (SSD_7628)
Date:	Friday, 9 August 2019 10:20:06 AM
Attachments:	BTODR - response to RMS comments - 25 Jul 19_tracked.docx 190724_Biannual Trip Origin Destination Report Framework_Final Draft_006_clean_FINAL (002).pdf

Hi Laura

I just called to follow up on the above. Can you please give me a call when you get a chance?

Thanks,
Ibrahim

Regards,
IBRAHIM AWAD
ENVIRONMENTAL MANAGER

LEVEL 15 | 124 WALKER STREET | NORTH SYDNEY | NSW | 2060

T +61 2 8907 0700
M +61 426 832 993
E iawad@tacticalgroup.com.au
W www.tacticalgroup.com.au

From: Ibrahim Awad
Sent: Wednesday, 7 August 2019 6:37 PM
To: 'Laura Van putten' <Laura.VAN.PUTTEN@rms.nsw.gov.au>
Cc: Rachel Cumming <rachel.cumming@rms.nsw.gov.au>; Nathan Cairney <ncairney@tacticalgroup.com.au>; Fei Chen <fchen@tacticalgroup.com.au>
Subject: RE: Tactical & RMS Consultation - B, Biannual Trip Report - Moorebank Intermodal - MPE Stage 1 (SSD-6766) and Stage 2 (SSD_7628)

Hi Laura

Please find attached the updated consultation response table and BTODR addressing your comments below.

Can you please confirm you are satisfied we have addressed your comments so that we can move to close out our consultation on this Report and submit to DPIE for approval?

Please let me know if you need any further information on this and/ or would like to discuss.

Thanks,
Ibrahim

Regards,
IBRAHIM AWAD
ENVIRONMENTAL MANAGER

LEVEL 15 | 124 WALKER STREET | NORTH SYDNEY | NSW | 2060

T +61 2 8907 0700
M +61 426 832 993
E iawad@tacticalgroup.com.au
W www.tacticalgroup.com.au

From: Laura Van putten <Laura.VAN.PUTTEN@rms.nsw.gov.au>
Sent: Monday, 22 July 2019 2:37 PM
To: Ibrahim Awad <iawad@tacticalgroup.com.au>
Cc: Rachel Cumming <rachel.cumming@rms.nsw.gov.au>
Subject: Tactical & RMS Consultation - B, Biannual Trip Report - Moorebank Intermodal - MPE Stage 1 (SSD-6766) and Stage 2 (SSD_7628)

Hi Ibrahim

Thank you for providing the updated Biannual Trip Origin Destination Report (BTODR). Whilst we appreciate the updates and note that the changes address some of our concerns, however the following issues remain to be addressed:

1. The OD survey will now include the movements onto and off the M5, in each direction. While the new survey points on the 4 ramps are described as "OD station" in Fig 4-1, they are described this way on page 16:

'The sites located on Moorebank Avenue, north and south of the South Western Motorway will be used to determine the vehicles travelling to and from the site through interpolation and combined with survey equipment on the on and off ramps of the M5 South Western Motorway will provide an adequate over of the origin and destination of light and heavy vehicles from the facility.'

It is unclear if the term "survey equipment" which is used to explain the equipment located on the 4 ramps will be collecting exactly the same type of information as the other OD stations. Further detail is required to inform that the OD Stations will be collecting the same data (for example number plates) and not simply counting vehicles. this data needs to be able to identify actual trips moving onto and off the M5, not just derive estimates based on some pro-rata split of count volumes on the ramps.

2. RMS preference is to extend the OD survey to cover the orientation of trips at Moorebank Ave / Newbridge Rd and at M5 / Hume Hwy, to provide further information on HV movements onto and from these key arterials. However, we accept that this would add significantly to the OD survey expense & complexity, and would suggest as an alternative that these two locations could

be added to the list of intersection surveys (ie simple counts, not OD) shown on page 16. For example, if the OD survey showed a high level of left turn movement onto M5 from the new intermodal facility, we would like to know if those HVs stayed on M5 (where their impact is less) or exited at Casula onto the Hume Hwy (where their impact is greater).

Should you have any questions happy to discuss my contact details are below.

Kind regards,

Laura van Putten

A/Senior Land Use Planner
Stategic Land Use | Sydney Planning
Greater Sydney Division
T 02 8849 2480 **M** 0429 505 961
www.rms.nsw.gov.au

Roads and Maritime Services
Level 5/27 Argyle Street Parramatta NSW 2150

From: Ibrahim Awad [mailto:iawad@tacticalgroup.com.au]
Sent: Saturday, 29 June 2019 9:12 AM
To: Laura Van putten; Pahee Rathan
Cc: Nathan Cairney; Fei Chen
Subject: RE: RMS Consultation - OTAMP, CTAMP-B, Biannual Trip Report - Moorebank Intermodal - MPE Stage 1 (SSD-6766) and Stage 2 (SSD_7628)

Hi Laura, Pahee

We have updated the BTODR to address very similar requests from both RMS (as per your email below) as well as TfNSW with respect to expanding the OD survey to cover traffic in the broader surrounding network, directional split, 'on and off' ramps for M5, and development traffic peaks.

These updates are marked in track changes in the OD Survey section (of the attached BTODR) and the changes have now been communicated back to TfNSW.

Could you please confirm that you are satisfied with these changes so that we can present the agreed framework to DPE?

Thanks and we look forward to meeting you next Thursday.

Regards,
Ibrahim

Regards,
IBRAHIM AWAD
ENVIRONMENTAL MANAGER

LEVEL 15 | 124 WALKER STREET | NORTH SYDNEY | NSW | 2060

From:	Ibrahim Awad
To:	Patel, Ketan; Vukic, Nicole
Cc:	Tilley, Heather; Nathan Cairney; Fei Chen
Subject:	FW: RMS Consultation - OTAMP, CTAMP-B, Biannual Trip Report - Moorebank Intermodal - MPE Stage 1 (SSD-6766) and Stage 2 (SSD_7628)
Date:	Thursday, June 13, 2019 8:40:43 AM
Attachments:	image001.gif image002.jpg image003.jpg image006.jpg image004.jpg BTODR - response to RMS comments - 3 Jun 19.docx

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Hi Ketan, Nicole

Please see further comments from RMS on the BTODR. I'll organise a time to discuss these before or after our meeting with TfNSW today and decide further actions.

Thanks,
Ibrahim

Regards,
IBRAHIM AWAD
ENVIRONMENTAL MANAGER

LEVEL 15 | 124 WALKER STREET | NORTH SYDNEY | NSW | 2060

T +61 2 8907 0700
M +61 426 832 993
E iawad@tacticalgroup.com.au
W www.tacticalgroup.com.au

From: Pahee Rathan <Pahee.RATHAN@rms.nsw.gov.au>
Sent: Wednesday, 12 June 2019 5:06 PM
To: Ibrahim Awad <iawad@tacticalgroup.com.au>
Cc: Laura Van putten <Laura.VAN.PUTTEN@rms.nsw.gov.au>
Subject: FW: RMS Consultation - OTAMP, CTAMP-B, Biannual Trip Report - Moorebank Intermodal - MPE Stage 1 (SSD-6766) and Stage 2 (SSD_7628)

Hi Ibrahim

Roads and Maritime has reviewed Tactical's response to the Roads and Maritime comments in regards to the Biannual Trip Report and has the following comments:

Roads and Maritime does not agree with the following statement, that the OD survey will "*adequately capture the vehicle movements generated by the site for a recommended survey cordon, which includes the M5 South Western Motorway.* "

The "recommended survey cordon" is very limited, and does not include all of the defined HV access routes (Fig 2-2). Roads and Maritime has an interest in knowing (as a minimum) the **directional split of the HVs on M5 and Newbridge Rd**. This will assist with answering questions such as will the intermodal's HVs predominantly be adding to the peak demand flow, or travelling mainly in the contra-peak direction? Etc.

The OD survey should be designed so that it provides insights into how the intermodal's HVs use M5 and Newbridge Rd over a typical day. This also extends to the Hume Highway, which is the other key HV access route. This is expected to add to the quality and usefulness of the data.

Should you have any questions my contact details are below.

Please note that RMS will provide a response to the OTAMP and CTAMP comments provided by Tactical next week.

Kind regards,

Laura van Putten

Land Use Assessment Officer
North West Precinct | Sydney Division

T 02 8849 2480
www.rms.nsw.gov.au

Roads and Maritime Services

From: Ibrahim Awad [mailto:iawad@tacticalgroup.com.au]
Sent: Tuesday, 4 June 2019 2:48 PM
To: Laura Van putten
Cc: Nathan Cairney; Fei Chen
Subject: RE: RMS Consultation - OTAMP, CTAMP-B, Biannual Trip Report - Moorebank Intermodal - MPE Stage 1 (SSD-6766) and Stage 2 (SSD_7628)

Hi Laura

Please find attached our response to your comments on the BTODR. Could you please confirm if you are satisfied that we have addressed your comments so that we can close out our consultation on this report?

I was also hoping to get the CATMP-B response to you yesterday but we are still working to address some of the comments and will have this to you soon..

Please also note that I will also shortly forward to you an updated version of the BTODR detailing changes to address comments from TfNSW for your information / reference.

Regards,
Ibrahim

Regards,
IBRAHIM AWAD
ENVIRONMENTAL MANAGER

LEVEL 15 | 124 WALKER STREET | NORTH SYDNEY | NSW | 2060

T +61 2 8907 0700
M +61 426 832 993
E iawad@tacticalgroup.com.au
W www.tacticalgroup.com.au

From: Laura Van putten <Laura.VAN.PUTTEN@rms.nsw.gov.au>
Sent: Monday, 3 June 2019 3:19 PM
To: Ibrahim Awad <iawad@tacticalgroup.com.au>
Subject: RE: RMS Consultation - OTAMP, CTAMP-B, Biannual Trip Report - Moorebank Intermodal - MPE Stage 1 (SSD-6766) and Stage 2 (SSD_7628)

Hi Ibrahim

Thank you for your email. Please note that I have sent your response to the relevant RMS sections to review and provide comments, once I have received these comments I will collate and provide to you.

Please note I am expecting to have a response by mid next week. Please let me know if there is any concerns with this timeframe.

Kind regards,

Laura van Putten

Land Use Assessment Officer
North West Precinct | Sydney Division
T 02 8849 2480
www.rms.nsw.gov.au

Roads and Maritime Services

From: Ibrahim Awad [mailto:iawad@tacticalgroup.com.au]
Sent: Monday, 3 June 2019 2:13 PM
To: Laura Van putten
Cc: Nathan Cairney; Fei Chen
Subject: RMS Consultation - OTAMP, CTAMP-B, Biannual Trip Report - Moorebank Intermodal - MPE Stage 1 (SSD-6766) and Stage 2 (SSD_7628)

Hi Laura

We provided our response to RMS's comments on the OTAMP on the 26 May 19 – please see below. Could you please let me know if you have any further comments that you'd like to discuss over the phone or in person and/or otherwise provide us an indication that you are satisfied we have addressed your comments?

We proposed to close out our consultation with RMS on this plan and submit to DPE for approval on Thursday 6th June 2019.

I'll also be forwarding to you our response to your comments on the CTAMP-B and BTODR by this afternoon.

Thanks and regards,

Ibrahim

Regards,
IBRAHIM AWAD
ENVIRONMENTAL MANAGER

LEVEL 15 | 124 WALKER STREET | NORTH SYDNEY | NSW | 2060

T +61 2 8907 0700
M +61 426 832 993
E iawad@tacticalgroup.com.au
W www.tacticalgroup.com.au


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From: Ibrahim Awad
Sent: Sunday, 26 May 2019 12:04 PM
To: 'VAN PUTTEN Laura E' <Laura.VAN.PUTTEN@rms.nsw.gov.au>
Cc: RATHAN Pahee <Pahee.RATHAN@rms.nsw.gov.au>; CUMMING Rachel <rachel.cumming@rms.nsw.gov.au>; Nathan Cairney <ncairney@tacticalgroup.com.au>; Fei Chen <fchen@tacticalgroup.com.au>
Subject: RE: Moorebank Intermodal - MPE Stage 1 (SSD-6766) and Stage 2 (SSD_7628) RMS Consultation - B2 (CTAMP-B) and B28 (Biannual Report Framework)

Hi Laura

Please find attached our response to your comments on the OTAMP.

We are working to finalise our response on the CTAMP-B and BTODR and will have these to you early this week.

Please let me know if you have any further comments on this plan and/ or would like to discuss over the phone or in person.

Thanks and regards,

Ibrahim

Regards,
IBRAHIM AWAD
ENVIRONMENTAL MANAGER

LEVEL 15 | 124 WALKER STREET | NORTH SYDNEY | NSW | 2060

T +61 2 8907 0700
M +61 426 832 993
E iawad@tacticalgroup.com.au
W www.tacticalgroup.com.au


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From: VAN PUTTEN Laura E <Laura.VAN.PUTTEN@rms.nsw.gov.au>
Sent: Wednesday, 15 May 2019 9:35 AM
To: Ibrahim Awad <iawad@tacticalgroup.com.au>
Cc: RATHAN Pahee <Pahee.RATHAN@rms.nsw.gov.au>; CUMMING Rachel <rachel.cumming@rms.nsw.gov.au>
Subject: Moorebank Intermodal - MPE Stage 1 (SSD-6766) and Stage 2 (SSD_7628) RMS Consultation - B2 (CTAMP-B) and B28 (Biannual Report Framework)

Hi Ibrahim

Roads and Maritime has reviewed the following traffic and transport documents supplied by Tactical Group and submitted under SSD 7628 Moorebank Precinct East Stage 2 (MPE Stage 2) application to satisfy condition B2:

- Construction Traffic and Access Management Plan (CTAMP) – Phase B – SSS2-QPMS-EN-PLN-0040 - 12/03/2019
- Operational Traffic and Access Management Plan (OTAMP) – PREC-QPMS-EN-PLN-0009 - 9/4/2019
- Moorebank Precinct East Biannual Trip Origin Destination Report - PREC-ARC-TR-RPT-0001 – 13/03/2019

Roads and Maritime provides the following comments for consideration:

Construction Traffic and Access Management Plan (CTAMP)

- The CTMP needs to meet the requirements of RMS G10 specification see attached G10 specifications document. This includes but not limited to Staging Arrangement Plans, Traffic Control Plans (including temporary signal plans), Vehicle Movement Plans, Pedestrian Movement Plans, Design Drawings, Incident Management Plans etc. Traffic Control Plans and Swept Path Analysis appendices were not supplied. The missing appendices are to be provided in line with RMS requirements.

- The CTMP is to consider / address requirements within the SSD conditions.

- Safety In Design Workshop is to be arranged by the proponent prior to commencement of construction work. An independent WHS consultant is to facilitate the workshop and all effected stakeholders (not limited to) including RMS, TMC, Utilities Providers, Council etc are to attend.

- Trip Distribution figures with clear assumptions at each intersection within the study area should be provided (heavy vehicle breakdown to be included).

- SIDRA outputs are required. Table 19 & 20 Peak intersection performance results: The Level of Service(LoS) column does not corresponds to Delays as per the standard threshold values of LoS vs Average Delays. Please verify and revise accordingly.

- Section 3.1.6 what is the alternative route should the nominated route be unavailable?

- Section 3.2.1 states that the Baseline Peak hour traffic volumes are used from 2015 LMARI traffic model and updated to reflect 2017 data for revised traffic analysis. The traffic volumes should be based on current/recent surveys to simulate the current conditions.

- Section 3.2.4 how will diversions impact traffic impact reduction strategy (3.3.5)? What are the alternative routes proposed?

- Section 3.2.5: the proponent is to Identify the alternate route for pedestrian and bicycle paths during Moorebank Avenue road diversion works.

Section 3.3.3 vehicle movements are unclear, more information required on access and direction.

- Section 3.3.9 TfNSW are to be included as a key stakeholder.

-

Operational Traffic and Access Management Plan (OTAMP)

-

- Similar to the CTMP updated traffic counts should be provided to simulate current conditions.
- Intersection capacity calculations should be provided with Sidra output files.
- Section 3.1.4.1 Provide the safety implications and proposed mitigations due to high percentage of heavy vehicles (56%) which might require special considerations in road geometry, width, grades and intersection layouts within the study area.
- What are the assumed network upgrades?
- Workplace travel plan not provided
- Access plans unclear
- What are the public transport services?
- What is the pedestrian/cycle detour paths?
- What is the parking management (on and off street)
- Access swept paths are required for the largest vehicles.

-

Moorebank Precinct East Biannual Trip Origin Destination Report

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- Figure 2-2 on page 7 shows in red the HV access routes around the facility, in particular M5 (E and W of Moorebank Ave), and Hume Hwy. I would have thus expected that the OD survey would be designed in such a way as to identify which of these HV access routes are used by HVs to/from the facility. However, Fig 4-1 (I think it should be called Fig 5-1) on page 16 shows that the only OD survey points are along Moorebank Ave, Cambridge Ave and Anzac Ave. There are no OD survey sites on M5 or Hume Hwy so it will not be possible to determine which HV access routes have been used. This looks like a huge oversight and brings into question the rationale for the OD survey.

  Furthermore, Cambridge Ave and Anzac Ave are not shown in Fig 2-2 as HV access routes. Why are they being surveyed? Purely to detect breaches?

- On page 13 it is stated that the Operational Data Collection will involve trucks filled with RFID readers. Does this equipment also form the basis of the vehicle identification for the OD surveys? If not, what method will be used to uniquely identify the HVs for the OD survey? Manual observation of number plates? (If so, how will this be done since the surveys extend beyond daylight hours?) Video cameras with number plate recognition software? Bluetooth readers? What level of accuracy can be expected?

- How will the OD data be tabulated / displayed? Appendix A – Reporting Table Templates outlines only the format for tabulation of operational data on vehicle & container volumes entering and leaving, gate opening periods and employee numbers. There is no reference to the presentation of OD data.

Should you have any questions or further enquiries in relation to this matter, my contact details are below or e: development.sydney@rms.nsw.gov.au.

-

It is emphasised that the comments provided above are informal and of a Pre-advice nature. They are not to be interpreted as binding upon Roads and Maritime and may change following formal assessment of a submitted development application from the appropriate consent authority.

Kind regards,

Laura van Putten

Land Use Assessment Officer
North West Precinct | Sydney Division
T 02 8849 2480
www.rms.nsw.gov.au

Roads and Maritime Services

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Biannual Trip Origin Destination Report (Revision 002 (Final Draft) dated 13 March 2019)

Status of comments from RMS

Stakeholder	Initial Comment Date	Comment	Arcadis Response	Initial Response Date
RMS	15-May-2019	Figure 2-2 on page 7 shows in red the HV access routes around the facility, in particular M5 (E and W of Moorebank Ave), and Hume Hwy. I would have thus expected that the OD survey would be designed in such a way as to identify which of these HV access routes are used by HVs to/from the facility. However, Fig 4-1 (I think it should be called Fig 5-1) on page 16 shows that the only OD survey points are along Moorebank Ave, Cambridge Ave and Anzac Ave. There are no OD survey sites on M5 or Hume Hwy so it will not be possible to determine which HV access routes have been used. This looks like a huge oversight and brings into question the rationale for the OD survey.	The OD survey locations were determined in consultation with a survey company to adequately capture the vehicle movements generated by the site for a recommended survey cordon, which includes the M5 South Western Motorway. The recommended cordon is considered sufficient for providing a representative OD pattern for the site. The sites located on Moorebank Avenue, north and south of the South Western Motorway will be used to determine the vehicles travelling to and from the site through interpolation. Given that the Hume Highway is designed to accommodate substantial heavy vehicle movements, it is considered too far for the proposed cordon and heavy vehicles generated by the site would be absorbed in the existing traffic volumes on this part of the network.	21-May-2019
RMS	15-May-2019	Furthermore, Cambridge Ave and Anzac Ave are not shown in Fig 2-2 as HV access routes. Why are they being surveyed? Purely to detect breaches	The OD surveys are intended to capture all vehicles (light and heavy) generated by the site. Additionally, assessing the vehicles on Cambridge Avenue and Anzac Road will enable the identification of heavy vehicles accessing the site using routes that are not designated for heavy vehicles. This section of the report has been amended to clarify this intent.	21-May-2019
RMS	15-May-2019	On page 13 it is stated that the Operational Data Collection will involve trucks filled with RFID readers.	Noted.	21-May-2019
		(a) Does this equipment also form the basis of the vehicle identification for the OD surveys?	They won't be sufficient to give the full spectrum of vehicles and will only cover container trucks. Not rigids, semis and LVs and only covering part of the conditions.	21-May-2019

Stakeholder	Initial Comment Date	Comment	Arcadis Response	Initial Response Date
		(b) If not, what method will be used to uniquely identify the HVs for the OD survey? Manual observation or number plates? (If so, how will this be done since the surveys extend beyond daylight hours?) Video cameras with number plate recognition software? Bluetooth readers? What level of accuracy can be expected?	This will be determined in commissioning the preferred survey company. The predominant method is using CCTV cameras with number plate recognition. The level of accuracy will be reported by the survey company for each survey, dependent on the survey conditions. This section of the report has been updated to specify that this is carried out and documented by the survey company commissioned.	21-May-2019
RMS	15-May-2019	How will the OD data be tabulated / displayed? Appendix A – Reporting Table Templates outlines only the format for tabulation of operational data on vehicle & container volumes entering and leaving, gate opening periods and employee numbers. There is no reference to the presentation of OD data.	The OD survey data will be provided by the survey company. The report will be updated to provide a template for presenting the OD data.	21-May-2019
RMS	22 July 2019	The OD survey will now include the movements onto and off the M5, in each direction. While the new survey points on the 4 ramps are described as "OD station" in Fig 4-1, they are described this way on page 16: '*The sites located on Moorebank Avenue, north and south of the South Western Motorway will be used to determine the vehicles travelling to and from the site through interpolation and combined with survey equipment on the on and off ramps of the M5 South Western Motorway will provide an adequate over of the origin and destination of light and heavy vehicles from the facility.*' It is unclear if the term "survey equipment" which is used to explain the equipment located on the 4 ramps will be collecting exactly the same type of information as the other OD stations. Further detail is required to inform that	The modified OD survey scope includes data collection on the ramps that is consistent with the remaining stations. The text referred to in the comment has been deleted from the report, since there is no longer requirement to interpolate data.	25 July 2019

Stakeholder	Initial Comment Date	Comment	Arcadis Response	Initial Response Date
		the OD Stations will be collecting the same data (for example number plates) and not simply counting vehicles. this data needs to be able to identify actual trips moving onto and off the M5, not just derive estimates based on some pro-rata split of count volumes on the ramps.		
RMS		RMS preference is to extend the OD survey to cover the orientation of trips at Moorebank Ave / Newbridge Rd and at M5 / Hume Hwy, to provide further information on HV movements onto and from these key arterials. However, we accept that this would add significantly to the OD survey expense & complexity, and would suggest as an alternative that these two locations could be added to the list of intersection surveys (ie simple counts, not OD) shown on page 16. For example, if the OD survey showed a high level of left turn movement onto M5 from the new intermodal facility, we would like to know if those HVs stayed on M5 (where their impact is less) or exited at Casula onto the Hume Hwy (where their impact is greater).	The two intersections of Moorebank Avenue/ Newbridge Road and at M5 / Hume Highway have been added to the scope for intersection surveys.	25 July 2019

Moorebank Intermodal Precinct

APPENDIX I MPE OPERATIONS INCIDENT REGISTER

No incidents reported during the period.

Moorebank Intermodal Precinct

APPENDIX J - COMPLIANCE REPORT DECLARATION FORM

Moorebank Intermodal Precinct

COMPLIANCE REPORT DECLARATION

Project Name	Moorebank Intermodal Precinct (MIP) – East Precinct
Project Application Number	SSD 6766 & SSD 7628
Description of Project	Moorebank Logistics Park aims to streamline the freight logistics supply chain from port to store, deliver savings to businesses and consumers, and help service the rapidly growing demand for imported goods in south-west Sydney. It is located approximately 27 kilometres (km) south-west of the Sydney Central Business District and approximately 26 km west of Port Botany within the Liverpool Local Government Area. The MIP is divided into an East Precinct and a West Precinct, located east and west of Moorebank Avenue respectively. The East Precinct includes the 24/7 operation of an import-export terminal (IMEX), rail link connecting to the South Sydney Freight Line (SSFL), warehousing and distribution facilities and freight village.
Project Address	Moorebank Logistics Park, Moorebank, NSW, 2170
Proponent	The Trust Company Limited (ACN 004 027 749)
Title of Compliance Report	Moorebank Logistics Park East Precinct – Operation Compliance Report
Date	Friday, 19 July 2024

I declare that I have reviewed relevant evidence and prepared the contents of the attached Compliance Report and to the best of my knowledge:

- the Compliance Report has been prepared in accordance with all relevant conditions of consent;
- the Compliance Report has been prepared in accordance with the Compliance Reporting Post Approval Requirements;
- the findings of the Compliance Report are reported truthfully, accurately and completely.
- due diligence and professional judgement have been exercised in preparing the Compliance Report; and
- the Compliance Report is an accurate summary of the compliance status of the development.

Notes:

- Under section 10.6 of the Environmental Planning and Assessment Act 1979 a person must not include false or misleading information (or provide information for inclusion in) a report of monitoring data or an audit report produced to the Minister in connection with an audit if the person knows that the information is false or misleading in a material respect. The proponent of an approved project must not fail to include information in (or provide information for inclusion in) a report of monitoring data or an audit report produced to the Minister in connection with an audit if the person knows that

Moorebank Intermodal Precinct

COMPLIANCE REPORT DECLARATION

the information is materially relevant to the monitoring or audit. The maximum penalty is, in the case of a corporation, $1 million and for an individual, $250,000; and

- The Crimes Act 1900 contains other offences relating to false and misleading information: section 307B (giving false or misleading information – maximum penalty 2 years' imprisonment or 200 penalty units, or both).

Name of Authorised Reporting Officer	Richard Mason
Title	MD Possum Environmental Consulting
Signature	
Qualification	Bachelor of Science – Environmental Science
Company	Possum Environmental Consulting
Company Address	7 Delprat Terrace, Whyalla South Australia 5600