ENVIRONMENTAL MONITORING REPORT, AUGUST 2021

PARRAMATTA LIGHT RAIL INFRASTRUCTURE WORKS

30 August 2021

Parramatta Connect

Contents

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0	30 August 2021	A. Nair	H. Chemney	H. Chemney	Nil

1. Introduction

1.1. Background

Parramatta Light Rail Stage 1 ('Stage 1') will connect Westmead to Carlingford via Parramatta Central Business District (CBD) and Camellia. Stage 1 is expected to be operational in 2023.

Stage 1 will create new communities, connect great places and help both local residents and visitors move around and explore what the region has to offer. The route will link Parramatta's CBD and train station to a number of key locations, including the Westmead Precinct, the Parramatta North Growth Centre, the new Western Sydney Stadium, the Camellia Town Centre, the new Powerhouse Museum and Riverside Theatre arts and cultural precinct, the private and social housing redevelopment at Telopea, the Rosehill Gardens Racecourse and the three Western Sydney University campuses.

Key features of Stage 1 include:

- A new dual track light rail network of approximately twelve (12) kilometres in length, including approximately seven (7) kilometres within the existing road corridor and approximately five (5) kilometres within the existing Carlingford Line and Sandown Line, replacing current heavy rail services
- Sixteen (16) stops that are fully accessible and integrated into the urban environment including a terminus stop at each end of Westmead and Carlingford
- High frequency 'turn-up-and-go' services operating seven days a week from 5am to 1am. Weekday services will operate approximately every 7.5 minutes in the peak period between 7am and 7pm
- Modern and comfortable air-conditioned light rail vehicles, nominally 45 metres long and driver-operated, each carrying up to 300 passengers.
- Intermodal interchanges with existing public transport services at Westmead terminus, Parramatta CBD and the Carlingford terminus
- Creation of two light rail and pedestrian zones (no general vehicle access) within the Parramatta CBD along Church Street (generally between Market Street and Macquarie Street) and along Macquarie Street (generally between Horwood Place and Smith Street)
- A Stabling and Maintenance (SaM) Facility located in Camellia for light rail vehicles to be stabled, cleaned and maintained
- New bridge structures along the alignment including over James Ruse Drive and Clay Cliff Creek, Parramatta River (near the Cumberland Hospital), Kissing Point Road and Vineyard Creek, Rydalmere
- Alterations to the existing road network including line marking, additional traffic lanes and turning lanes, new traffic signals, and changes to traffic flows
- Relocation and protection of existing utilities
- Public domain and urban design works along the corridor and at Stop precincts
- Closure of the heavy rail line between Carlingford and Clyde
- Active transport corridors and additional urban design features along sections of the alignment and within Stop precincts
- Integration with the Opal Electronic Ticketing System (ETS)
- Real time information in light rail vehicles and at Stops via visual displays and audio.

1.1.1. Statutory Context

The Parramatta Light Rail is classified as Critical State Significant Infrastructure (CSSI) and was subject to environmental impact assessment under the *Environmental Planning and Assessment Act 1979* (EP&A Act). The EIS assessed impacts for Parramatta Light Rail Stage 1 (Westmead to Carlingford) including the light rail and associated road enabling works.

Stage 1 received Infrastructure Approval from the Minister for Planning under Section 5.19 of the EP&A Act on 29 May 2018 (Critical State Significant Infrastructure Application SSI-8285), subject to the conditions provided in the Instrument of Approval, specifically Schedule B – Ministerial Conditions of Approval.

The Infrastructure Approval was subsequently modified under Section 5.25 of the EP&A Act on 21 December 2018 and 25 January 2019.

The planning approval, modifications and related environmental assessment documents are located at: http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=8285.

A Construction Environmental Management Plan (CEMP) has been prepared for the Parramatta Light Rail Package 4 – Infrastructure Works (Infrastructure Works). The purpose of the CEMP and associated Sub-plans is to address the requirements of the:

- Minister's Conditions of Approval (CoA) SSI-8285
- Revised Environmental Mitigation and Management Measures (REMMMs)
- Environmental Performance Outcomes (EPOs)
- Applicable legislation and contractual requirements, including the PLR Stage 1 Infrastructure Contract Project Deed (ISD-17-6721).

The REMMMs and EPOs are listed in Parramatta Light Rail Stage 1 Westmead to Carlingford via Parramatta CBD and Camellia Environmental Impact Statement (the EIS), as amended by the Parramatta Light Rail (Stage 1) Westmead to Carlingford via Parramatta CBD and Camellia Submissions Report (incorporating Preferred Infrastructure Report) (March 2018) (the SPIR). The CEMP and associated Sub-plans were approved the Secretary on the 21 November 2019.

1.2. Scope

The scope of this report is report is to present monthly results of the inspection and monitoring programs outlined in the Infrastructure Works CEMP and associated Sub-plans, including the results of the construction monitoring programs referred to in Condition C9 of the Planning Infrastructure Approval.

Environmental inspections and monitoring are undertaken to:

- Validate the predicted impacts of the Infrastructure Works
- Measure the effectiveness of environmental controls
- Track progress against targets and objectives of the CEMP.

The monitoring requirements for nominated aspects are included in the relevant Sub-plans and summarised in **Table 1-1**.

Where relevant, data will be presented on a progressive basis (i.e. monthly summary) to identify trends.

The data of the monitoring programs will also be reviewed annually in the Annual Environment Report.

Table 1-1 Monthly Environmental Monitoring Reporting Requirements

CEMP or Sub-plan	Monitoring program	Distribution
Noise and Vibration Management Sub-plan	– Locations and descriptions of monitoring undertaken – Noise monitoring results – Summary of any exceedance of the nominated criteria – Corrective actions	– City of Paramatta Council – Cumberland Council – EPA – NSW Health – TfNSW – IC – ER – AA – Made publicly available
Soil and Water Management Sub-plan	– Weather forecasts and observations – Water Quality (Turbidity) monitoring – Discharge and dewatering monitoring	– City of Paramatta Council – Cumberland Council – EPA – DOI Water – TfNSW – IC – Made publicly available
Air Quality and Dust Management Sub-plan	– Weather observations – Dust deposition monitoring – Real time aerosol dust monitors – Asbestos fibre air monitoring	– EPA – TfNSW – IC – Made publicly available
Grey-headed Flying-fox (GHFF) Construction Monitoring Program	– Weekly visual checks of GHFF camp during high risk periods (1 September to 31 January)	– TfNSW

2. Site Activities

Table 2-1 provides a summary of the site activities for this reporting period (26 July 2021 to 25 August 2021).

Table 2-1 Site Activities During Reporting Period

Precinct	Site Activities
Westmead and North Parramatta	**Westmead** – Ongoing property adjustment, drainage, Combined Service Route (CSR), track works – Urban design landscaping works commenced **Cumberland** – Ongoing property adjustment, drainage, CSR, track works – Urban design landscaping works commenced **North Parramatta** – Ongoing property adjustment, drainage, CSR, track works – Urban design landscaping works commenced
Parramatta CBD	**Area 2 West (CBD)** – Eat Street o Paving footpath o Tree/landscaping maintenance o Installation of Multi-Function Poles – Church / Phillip St Intersection o Paving footpath o Installation of Multi-Function Poles – Macquarie Street o Paving footpath o Construction of road and kerbing **Area 2 East (Smith Street to Arthur Street)** – Macquarie Street o Construction of road and kerbing o Track installation – Macquarie / Harris Intersection o resumption of extended shutdown o track and track slab installation o kerbing – Harris Street / Robin Thomas Reserve o Tree pits o Track installation o Kerbing – George Street / Purchase Intersection o resumption of extended shutdown o track and track slab installation o kerbing – Tramway Avenue o Piling o Platform works

Precinct	Site Activities
Camellia and Carlingford line	**Camellia** – James Ruse Drive Bridge deck and fit out works – Active Transport Link and track slab / ballast track works from Camellia Junction to Parramatta River – Road intersection and landscaping at Grand Avenue – Landscaping at 13a Grand Avenue **Carlingford Line** – James Hardie, Camellia Bridge, Vineyard Creek, Kissing Point Road & Leamington Road bridge fit out and track works – Stormwater drainage works at Reserve Street Rydalmere and Adderton Road Telopea – Ballast track from Rydalmere to Carlingford – Telopea and Carlingford Stop and platform works – Active Transport Link works from Camellia to Carlingford – Landscaping from Camellia to Carlingford

3. Monitoring Results

Section 3 presents a summary of the environmental inspection and monitoring programs completed during the reporting period (26 July 2021 to 25 August 2021). Detailed monitoring results for each activity are presented in the appendices to this report.

3.1. Inspections

Due to the government mandated site shutdown due to COVID between 16 July 2021 and 11 August 2021, there were no ER, AA or TfNSW inspections during the reporting period. A total of eight internal inspections were completed during the reporting period. It should be noted that prior to the site shutdown, environmental controls were implemented and maintained for its duration, including:

- Stockpiles covered with polymer/geofabric
- Erosion and Sediment controls
- Daily checks by site support crews

Table 3-1 provides a summary of the number of actions raised and closed within the agreed timeframe.

Table 3-1 Inspections for reporting period

Date	Number of Inspections	Type	Actions	Closed in Time
16/08/21	1	Internal Inspection	2	Yes
23/08/21	5	Internal Inspection	15	Yes
25/08/21	2	Internal Inspection	4	Yes
Total	**8**	**-**	**21**	**-**

3.2. Weather

The total rainfall recorded during the reporting period was 76.4 mm with three days exceeding one millimetre of rain. Two events exceeded the 85th percentile (33.1mm).

During the reporting period, there were 18 days where the maximum wind gust recorded was greater than 25km/hr and three days where the maximum wind gust recorded was greater than 50km/hr. There was a total of eight days where wind speeds greater than 25km/hr were forecast. On those days, a notification was issued to the construction team to alert them of the strong winds forecast, including direction for necessary controls to be implemented.

A summary of the weather observations and weather events during the reporting period of relevance to the Soil and Water Management Sub-plan and Air Quality Management Sub-Plan Trigger Action Response Plans (TARPs) are summarised in **Table 7-2**. A comparison between long term monthly means and recorded values can be found in **Figure 3-2**.

Detailed weather observation records for the reporting period are presented in **Appendix A-1**.

Table 3-2 Weather Summary and Trigger Weather Events for reporting period[1]

Weather Event	Forecast	Observation
Minimum temperature	3.0°C	2.3°C
Maximum temperature	26.0°C	26.7°C
Total rainfall	106.6 mm	76.4 mm
Number of days with rain (>1mm)	4 days	3 days
>80th percentile (25.8mm) rain events	1 day	2 days
>80th percentile (33.1mm) rain events	1 day	2 days
Flood warning / events	1 event	1 event
>25km/hr wind[2]	8 days	18 days
>50km/hr wind	No days	3 days
>60km/hr wind	No days	No days

[1]Weather summary based on data from the 26 July 2021 to 25 August 2021 (31 days).

[2]Wind data from Sydney Olympic Park AWS (Archery Centre) {station 066212}. Weather data from Parramatta North (Masons Drive) {station 066124}.

Note: Red text indicates observation greater than forecast.

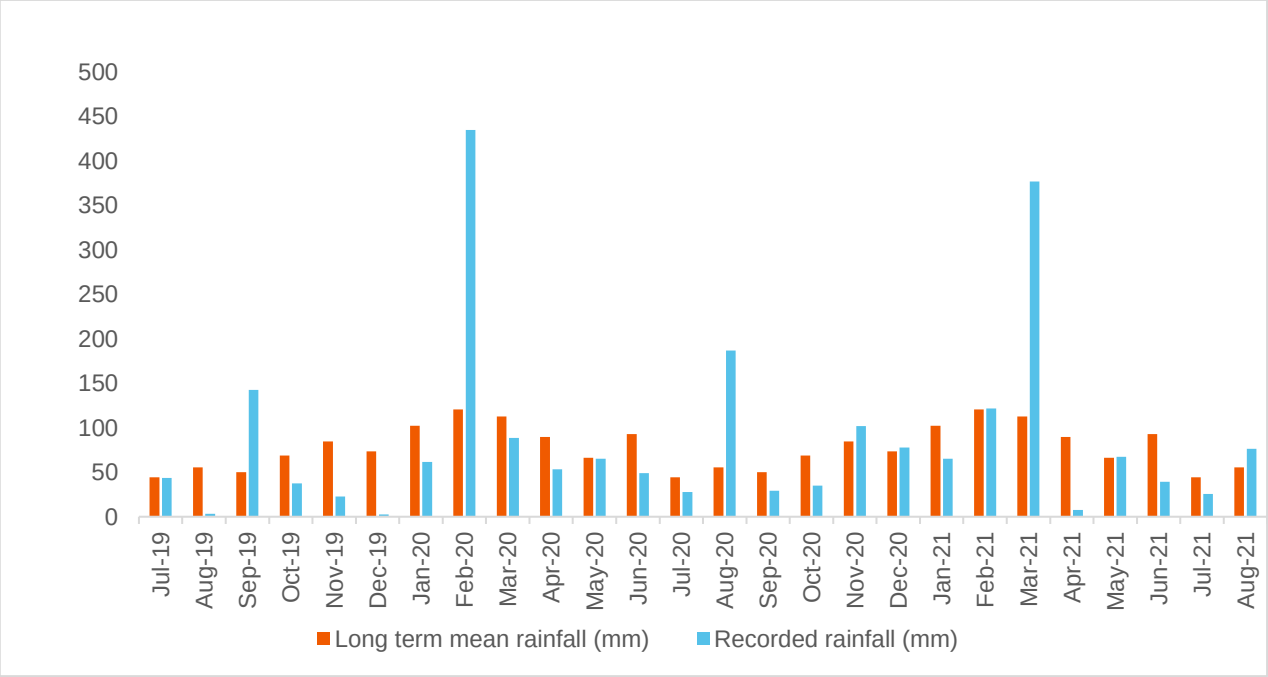

Figure 3-1 Monthly rainfall comparison

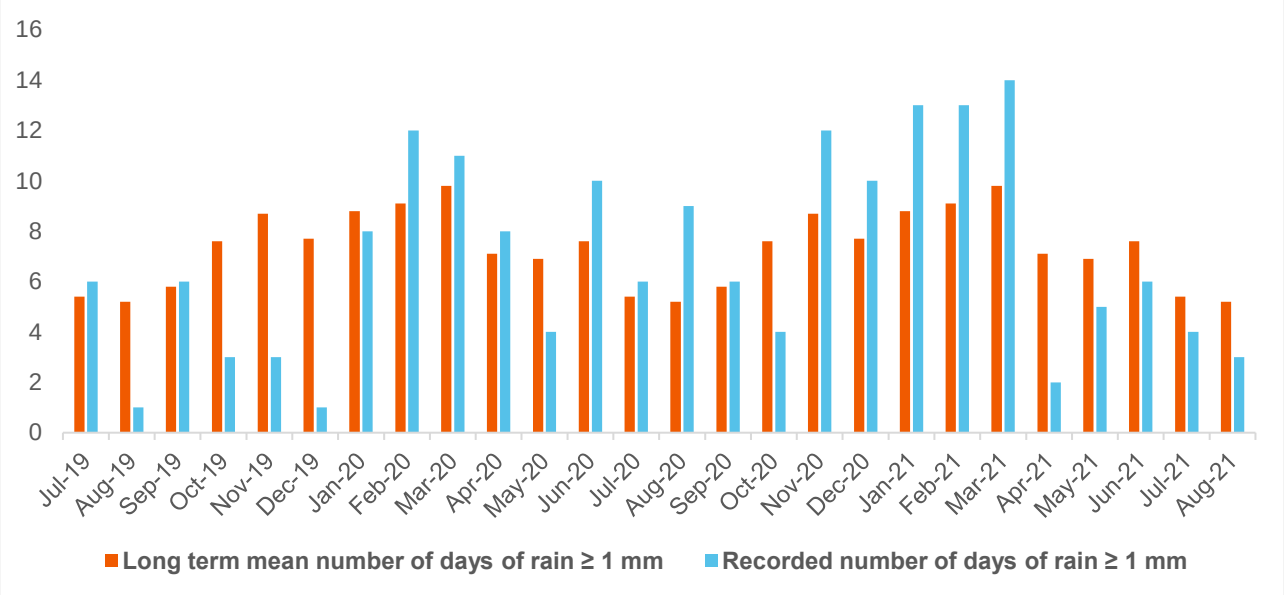

Figure 3-2 Monthly rain days comparison

3.3. Noise and Vibration

Table 3-3 provides a summary of noise monitoring events conducted during the reporting period. Detailed noise monitoring results and comments are presented in **Appendix A-2**. Results for the reporting period were affected by the unprecedented lockdown mandated by the government to combat the coronavirus pandemic. Construction was halted due to COVID-19 from 16 July 2021 till 11 August 2021 and as such, no attended noise and vibration monitoring was carried out during the reporting period.

Additional information on the hours of works, respite requirements and alternative accommodation is provided in the Noise and Vibration Management Sub-plan (Section 11.3).

All noise and vibration monitors available during the reporting period, together with current NATA calibration data, are provided in **Table 3-5**.

Continuous noise and vibration monitoring was undertaken during the reporting period at medical facilities in Westmead that have been identified as sensitive receivers. In consultation with the Health Administration Corporation, monitoring will be ongoing for 12 months. Locations of the noise and vibration monitors are provided in **Table 3-6.**

Table 3-3 Summary of Noise Monitoring for reporting period

Date	Monitoring Location	Attended/Continuous	Description
26/06/2020 -ongoing	Westmead Institute for Medical Research (Sleep Lab)	Continuous	General construction
26/06/2020 -ongoing	Westmead Institute for Medical Research (Brain Dynamics Centre)	Continuous	General construction
26/06/2020 -ongoing	Children's Medical Research Institute (Microscopy Labs)	Continuous	General construction
26/06/2020 -ongoing	Cumberland Hospital (Clinical psychology rooms)	Continuous	General construction

Table 3-4 Summary of Vibration Monitoring for reporting period

Date	Monitoring Location	Attended/Continuous	Description
26/06/2020	Westmead Institute for Medical Research (HAL incubators)	Continuous	General construction
26/06/2020	Westmead Institute for Medical Research (Microscopy Labs)	Continuous	General construction
26/06/2020	Children's Medical Research Institute (Microscopy Labs)	Continuous	General construction

Table 3-5 Noise and Vibration Monitors and NATA Calibration

Equipment	Serial Number	Calibration Date
Noise Level Meter	00973277	2/12/2021
Noise Level Meter	00661732	01/06/2022
Noise Level Meter	00973275	17/12/2021
Vibration Monitor	BE14639	10/02/2023
Vibration Monitor	BE17441	14/07/2022

Table 3-6 HAC Noise and Vibration Monitor Locations

Organisation	Monitor Type	Location
Westmead Institute for Medical Reach	Vibration Monitor	HAL incubators
		Microscopy Labs
	Noise Monitor	Sleep Lab
		Brain Dynamics Centre
Children's Medical Research Institute	Vibration Monitor	Microscopy Labs
	Noise Monitor	Labs (Level 1)
Cumberland Hospital	Noise Monitor	Clinical psychology rooms

Note: The calibration of the monitoring equipment is checked in the field before and after the noise measurement period per Standards Australia AS/IEC 60942:2004/IEC 60942:2003–Electroacoustic – Sound Calibrators.

3.4. Soil and Water

3.4.1. Water quality in receiving waters

A pre-construction investigation to establish water quality objectives for the project is included within the EIS Technical Paper 6 – Water Quality Assessment.

During the reporting period, wet weather monitoring was undertaken summarised in **Table 3-7** and detailed in **Table A-3-1.** This monitoring was undertaken during a 71.0 mm two-day rainfall event. Water levels were medium to high during the wet sampling. Overall, there was a moderate amount of debris or leaf litter present. All results were within the water quality objectives during the reporting period.

Table 3-7 Water Quality in Receiving Waters

Date	Type	Type of Results	Wet / Dry	Locations

26/07/21	Monitoring during construction	Field	Wet	Parramatta River: PR1, PR2, PR3, PR4, PR5 and PR6 Clay Cliff Creek: CC1, CC2 Vineyard Creek: VY1, VY2 A'becketts Creek: AC1, AC2 Domain Creek (DC1) and Subiaco Creek (SC1) were unable to be tested during the reporting period due to the limited site movements imposed by the coronavirus-related government lockdown.

Table 3-8 Water Monitor Calibration

Equipment[1]	Serial Number	Calibration Date
Water Quality Monitor	DV7F6E7J	23/07/2022

[1]All equipment is calibrated by NATA standards.

3.4.2. Discharge and dewatering

There were two discharge events during the reporting period as presented in **Table A-3-2**. All events were compliant with discharge criteria.

3.5. Air Quality

3.5.1. Dust Deposition Monitoring

A dust deposition gauge was installed at 13A Grand Avenue in Camellia in December 2019 in advance of works which commenced at the beginning of February 2020. Baseline data indicated that the value of Total Insoluble Matter (TIM) was 3.9 g/m^2 before the commencement of construction activities at 13A Grand Avenue.

Additional dust gauges were progressively installed at Rydalmere Station, Dundas Station, Carlingford and Telopea in advance of large-scale earthworks.

From December 2020 onwards, results have been presented as both TIM and Ash Content. The Ash Content method of analysis involves burning the TIM in a furnace to rid the sample of combustible materials such as vegetative matter, coal and insects. The remaining non-combustible material is then weighed to provide a more accurate dust monitoring result.

Dust deposition results are summarised in **Table A-4-1** in **Appendix A-4**, noting that data is received one month in arrears. Laboratory results were delayed due to the government mandated site shutdown and as such, these results will be detailed in the next reporting period.

3.5.2. Asbestos Fibre Monitoring

Asbestos air monitoring is completed in accordance with the Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres [NOHSC: 3003(2005)], with NATA certification applying to all sample collection, handling and analytical procedures.

Asbestos Fibre Monitoring results are summarised in **Table A-4-2** in **Appendix A-4**. All reported results were satisfactory and conform with the minimum action level of <0.01 fibres /mL for control monitoring as outlined in Work, Health and Safety (2017) Regulation; and SafeWork NSW (2019) Code of Practice – How to Safely Remove Asbestos.

3.6. Flora and Fauna

3.6.1. Grey-Headed Flying Fox Monitoring

A Grey-Headed Flying Fox (GHFF) camp is located in Parramatta Park which lies approximately 150m from the project boundary at the nearest point.

Under Condition of Approval C9, a GHFF Construction Monitoring Program has been developed by TfNSW. The requirements of this Program have been reflected in the Flora and Fauna Management Sub-plan and include visual inspections on a weekly basis during the 'high risk' months of September to January. If distress is observed within the camp, immediate notification must be provided to TfNSW.

In addition, as required by the Environmental Work Method Statement for Bridge Road Bridge, a trained ecologist from Narla Environmental is required to undertake additional inspections of the camp during bridge piling works (**Table 3-9**). As these works have concluded, it was determined that weekly visual inspections and Narla monitoring were not required for the reporting period.

Table 3-9 Observations from Visual Monitoring of Grey Headed Flying Fox Camp

Date	Time	Works	Notification Triggers[1]	Comments
-	-	-	-	-

[1]Notification triggers include: >50% of the roost takes flight for over 20 minutes, GHFF leaving the roost in daylight hours, unusual vocalisations, located on or 2m from the ground, panting, saliva spreading, adults moving away from young, GHFF injured or killed on site (including aborted foetuses).

3.7. Issues/incidents/non-compliance

Table 3-10 provides a summary of environmental compliance during the reporting period. There were no environmental incidents or non-compliances identified during the reporting period.

Table 3-10 Issues/incidents/non-compliances

Date	Location	Description
-	-	-

Appendices

A-1 Weather Observations

Table A-1-1 Weather Observations: Parramatta North (Masons Drive) {station 066124}.

Date	Temperatures		Rain	9:00 AM				
	Min	Max		Temp	RH	Cld	Dir	Spd
	°C	°C	mm	°C	%	8th	km/h	
26/07/2021	8.2	20.3	0	14.8	58	3	W	7
27/07/2021	10.8	20.2	0	15.2	64	2	NNW	6
28/07/2021	13	24.5	0	17	52	5	NW	19
29/07/2021	13.2	18.3	0	13.5	55	0	Calm	
30/07/2021	2.3	19.8	0	9.3	68	0	WNW	6
31/07/2021	5.3	22.7	0	11.5	73	6	NE	4
1/08/2021	11.7	25.3	0	20.5	65	2	NNW	6
2/08/2021	7.5	18.3	0	11	80	1	SW	4
3/08/2021	9.8	19.5	4	12.8	96	6	NW	6
4/08/2021	7.8	16.1	0	12.2	54	2	W	11
5/08/2021	7.8	19.3	0	14.2	63	0	NW	6
6/08/2021	7.2	20.6	0	13.8	64	0	NW	2
7/08/2021	4.6	19.2	0	10.8	72	0	W	4
8/08/2021	7.8	15.5	0.4	11.5	96	8	SW	4
9/08/2021	8.1	18.7	1	11.9	94	5	NW	2
10/08/2021	7.6	22.3	0	13	81	2	WSW	2
11/08/2021	13.2	24	0	18	58	0	NNW	19
12/08/2021	13.8	20.7	0	16	59	2	W	11
13/08/2021	5	20.2	0	11	69	0	W	4
14/08/2021	5.2	20.3	0	11.4	71	0	WNW	4
15/08/2021	6.4	21	0	12.5	73	0	WSW	4
16/08/2021	9.2	22.7	0	15.3	51	0	NNW	6
17/08/2021	7.2	19.8	0	13.8	58	0	SW	4
18/08/2021	5.1	19.3	0	10.6	73	0	W	6
19/08/2021	5.6	22	0	11.6	81	6	N	2
20/08/2021	8.6	23.7	0	14.8	70	0	W	2
21/08/2021	12.3	23.4	0	16.7	58	7	NW	2
22/08/2021	10.5	26.7	0	17	66	3	NNW	6
23/08/2021	14.2	25.4	0	20.6	60	6	NNW	11
24/08/2021	8.7	12.1	34	8.8	99	8	W	11
25/08/2021	8.3	15.7	37	12	60	7	SW	19

Table A-1-2 Wind Observations: Sydney Olympic Park AWS (Archery Centre) {station 066212}.

Date	Maximum Wind Gusts			9:00 AM		3:00 PM	
	Direction	Speed	Time	Direction	Speed	Direction	Speed
	km/h		local	km/h		km/h	
26/07/2021	WNW	48	13:16	NW	15	WNW	28
27/07/2021	NNW	33	13:56	NNW	11	NNW	11
28/07/2021	WNW	56	15:42	NNW	13	WNW	22
29/07/2021	WNW	33	9:44	W	6	WSW	13
30/07/2021	WNW	15	8:34	NW	9	E	9
31/07/2021	N	24	12:55	SW	2	NNE	11
1/08/2021	WNW	41	17:12	NW	15	WNW	19
2/08/2021	NE	26	15:06	WNW	11	ENE	11
3/08/2021	NW	50	14:37	WNW	11	WNW	26
4/08/2021	WNW	50	11:37	WNW	22	W	19
5/08/2021	WSW	31	11:16	WNW	9	WSW	15
6/08/2021	WNW	24	11:27	NW	7	WNW	9
7/08/2021	SW	24	17:32	WNW	11	WSW	7
8/08/2021	ESE	26	14:20	WSW	6	E	15
9/08/2021	N	19	12:13	WNW	6	N	9
10/08/2021	WNW	31	14:41	Calm		NNW	11
11/08/2021	N	39	12:45	NNW	20	NNW	19
12/08/2021	SW	33	2:58	W	13	SW	11
13/08/2021	WNW	20	9:06	WNW	9	W	9
14/08/2021	E	20	15:25	WNW	7	ESE	13
15/08/2021	WNW	22	9:26	WNW	9	NW	6
16/08/2021	W	44	19:59	Calm		W	11
17/08/2021	SSE	24	11:53	W	9	ESE	11
18/08/2021	NE	20	14:29	WNW	11	E	13
19/08/2021	E	20	14:33	NW	7	E	11
20/08/2021	NNW	20	11:15	WNW	9	NW	4
21/08/2021	NW	24	14:20	Calm		NW	11
22/08/2021	NW	28	13:08	WNW	6	N	13
23/08/2021	NW	52	14:38	NNW	15	NW	30
24/08/2021	WNW	52	16:04	WNW	17	WNW	22
25/08/2021	W	48	1:34	WSW	19	W	19

Notes:

Blue text indicates a rain event greater than 1mm of rain.
The orange text indicates a rain event greater than the 80th percentile of 25.8mm, and a wind speed of greater than 25km/hr
Red text indicates a rain event greater than the 85th percentile of 33.1mm, and a wind speed greater than 50km/hr.
* Data was unavailable.

A-2 Noise and Vibration Monitoring Results

Table A-2-1 Noise Monitoring Results

Date	Time	Works Period	Construction Activity	Activity Location	Monitoring Location	NML (dBA)	Predicted (dBA)	Additional Mitigation Measures	LAmax	Recorded $L_{eq, 15min}$ (dBA)	Exceedance of Predicted (dBA)	Exceedance of Predicted	Comments
26/06/2020 - ongoing	Continuous monitoring		Construction works	Hawkesbury Road works	Westmead Institute for Medical Research (Sleep Lab)	65	*	*	*	*	*	No	Activities are reviewed in response to exceedance alerts. Where the exceedance is attributed to construction, a review is undertaken of works and plant/equipment or methodology is modified where necessary. No exceedances were attributed to Parramatta Connect construction activities. Continuous monitoring values are available on request.
26/06/2020 - ongoing	Continuous monitoring		Construction works	Hawkesbury Road works	Westmead Institute for Medical Research (Brain Dynamics Centre)	65	*	*	*	*	*	No	
26/06/2020 - ongoing	Continuous monitoring		Construction works	Hawkesbury Road works	Children's Medical Research Institute (Microscopy Labs)	65	*	*	*	*	*	No	
26/06/2020 - ongoing	Continuous monitoring		Construction works	Cumberland Hospital	Cumberland Hospital (Clinical psychology rooms)	55	*	*	*	*	*	No	

[1]Sound Pressure Level (SPL) used instead of NML

Notes:

Standard hours:

a) All areas excluding Eat Street and Camellia – Monday to Friday 7:00 am to 7:00 pm. Saturday 8:00 am to 6:00 pm

b) Eat Street (Church Street between Palmer Street and George Street) – Monday to Friday 7:00 am to 6:00 pm. Saturday 8:00 am to 12:00 pm)

c) Camellia, Rosehill and Rydalmere (east of James Ruse Drive to Victoria Road) – 24 hours a day and seven days a week provided that sensitive receivers are not affected by noise levels of greater than 5 dBA above the rating background level at any residence

OOHW Period 1 is defined as:

a) 6:00pm to 10:00pm (evenings) Monday to Saturday

b) 7:00am to 8:00am and 1:00pm to 10:00pm (day & evening) Saturday and

c) 8:00am to 6:00pm Sunday and public holidays (days).

OOHW Period 2 is defined as:

a) 10:00pm to 7:00am (nights) Monday to Saturday and
6:00pm to 8:00am (nights) Sundays and public holidays.

Additional Mitigation Measures
PN = Project Notification
V = Verification Monitoring
RP = Respite Period
AA = Alternate Accommodation
SN = Specific Notification / individual briefing or phone call
DR = Duration Reduction
RO = Project Specific Respite Offer

Table A-2-2 Vibration Monitoring Results

Date	Time	Works Period	Construction Activity	Activity Location	Monitoring Location	Trigger Value (mm/s)	95th Percentile PPV (mm/s)	Maximum PPV (mm/s)	Exceedance of Target	Construction Vibration Exceedance	Comments
26/06/2020	Continuous monitoring		Hawkesbury Road works	Hawkesbury Road	Westmead Institute for Medical Research (HAL incubators)	0.1 mm/s	*		No	No	Activities are reviewed in response to exceedance alerts. Where the exceedance is attributed to construction, a review is undertaken of works and plant/equipment or methodology is modified where necessary. No exceedances were attributed to PLR construction activities. Continuous monitoring values are available on request.
26/06/2020	Continuous monitoring		Hawkesbury Road works	Hawkesbury Road	Westmead Institute for Medical Research (Microscopy Labs)	0.1 mm/s	*		No	No	
26/06/2020	Continuous monitoring		Hawkesbury Road works	Hawkesbury Road	Children's Medical Research Institute (Microscopy Labs)	0.1 mm/s	*		No	No	

A-3 Water Sampling and Discharge Results

Table A-3-1 Water Quality Monitoring - Comments and observations

Location	Waterway	Upstream/ Downstream of Works	Type[3]	Date	Time	pH 5.5-8.5[2]	Elec. Conduct. (µS/cm) LR[1]: 125–2200[2] E: None	Turbidity (NTU) 6-50[2]	Comments and Observations
AC1	A'becketts Creek	Upstream	Wet	26/08/2021	12:03	15.06	2940	44.1	Overcast weather, moderate amount of rubbish, high turbidity, moderate leaf litter and vegetation. AC1 is noted to be an estuarine environment and as such there is not a trigger value for electrical conductivity.
AC2	A'becketts Creek	Downstream	Wet	26/08/2021	12:14	14.49	2470	45.9	Overcast weather, moderate amount of rubbish, high turbidity, large amount of leaf litter and vegetation. AC2 is noted to be an estuarine environment and as such there is not a trigger value for electrical conductivity.
CC1	Clay Cliff Creek	Upstream	Wet	26/08/2021	12:48	14.96	3980	21	Fair weather, moderate amount of rubbish, some turbidity, minimal leaf litter and vegetation. CC1 is noted to be an estuarine environment and as such there is not a trigger value for electrical conductivity.
CC2	Clay Cliff Creek	Downstream	Wet	26/08/2021	12:36	15.2	6580	25.2	Fair weather, large amount of rubbish, some turbidity, moderate leaf litter and vegetation. CC2 is noted to be an estuarine environment and as such there is not a trigger value for electrical conductivity.
PR1	Parramatta River	Upstream	Wet	25/08/2021	11:56	13.43	756	38.3	Overcast weather, no rubbish, moderate turbidity, minimal leaf litter and vegetation.
PR2	Parramatta River	Downstream	Wet	25/08/2021	12:29	13.18	288	43.6	Overcast weather, no rubbish, moderate turbidity, no leaf litter and vegetation.
PR3	Parramatta River	Upstream	Wet	26/08/2021	13:48	14.66	269	22.6	Sunny weather, no rubbish, moderate turbidity, no leaf litter and vegetation.
PR4	Parramatta River	Downstream	Wet	26/08/2021	14:01	15.16	265	30	Sunny weather, no rubbish, some turbidity, minimal leaf litter and vegetation.

PR5	Parramatta River	Upstream	Wet	26/08/2021	13:17	15.94	19600	34.9	Fair weather, minimal rubbish, some turbidity, minimal leaf litter and vegetation, high tide.
PR6	Parramatta River	Downstream	Wet	26/08/2021	11:12	13.44	18000	29.4	Sunny weather, no rubbish, minimal turbidity, minimal leaf litter and vegetation.
VY1	Vineyard Creek	Upstream	Wet	26/08/2021	10:17	13.15	509	25.6	Sunny weather, no rubbish, minimal turbidity, minimal leaf litter and vegetation, low water level.
VY2	Vineyard Creek	Downstream	Wet	26/08/2021	10:20	12.82	490	27.2	Sunny weather, no rubbish, minimal turbidity, minimal leaf litter and vegetation, low water level.

1. ANZECC Waterway types: Fresh water (PR1, PR2, PR3, PR4, VY1 and VY2); E: Estuarine (CC1, CC2, AC1, AC2, PR5, PR6 and SC1).
2. Trigger values were established by Parramatta Connect within the Pre-Construction Sampling (Baseline Review) Water Quality Monitoring Report (PLR1INF-CPBD-ALL-WA-RPT-000003). Red text indicates values outside of the baseline trigger values.
3. Charles Street Weir separates Parramatta River from up and downstream.

Table A-3-2 Discharge Water Quality

Discharge monitoring Point ID	Type of Monitoring Point	Type of Discharge Point	Date	Discharge Permit #	Oil and Grease (Not visible)	pH (6.5 - 8.5)	Turbidity (NTU)	Comments
A1.18	Basins and settling containers	Stormwater inlet	20/08/2021	DW-A1-057	Not visible	8.2	13.6	Discharge to stormwater 1.18
A1.45	Basins and settling containers	Stormwater inlet	25/08/2021	DW-A1-058	Not visible	8.4	23.5	Discharge to stormwater 1.45

A-4 Air Quality Monitoring Results

Table A-4-1 Summary of Dust Deposition Data (Ash Content)

Date	Monitoring Location	Ash Content g/m^2/month	Total Insoluble Matter (g/m^2/month)
July	13a Grand Avenue	-	-
July	Rydalmere Station	-	-
July	Dundas Station	-	-
July	Telopea	-	-
July	Carlingford	-	-

Red text indicates exceedance of the ash content trigger value 4.0 g/m^2/month.

Table A-4-2 Summary of Asbestos Fibre Monitoring

Report Number	Date	Location	Start time	End time	Result (Fibres/Fields)	Result (Fibres/mL)
AMR311	18-Aug	CAMELLIA JUNCTION, SOUTH BOUNDARY FENCING	7:10	15:01	0/100	<0.01
AMR311	18-Aug	CAMELLIA JUNCTION, WEST FENCING DRIVE WAY	7:11	15:02	0/100	<0.01
AMR311	18-Aug	CAMELLIA JUNCTION, NORTH WEST FENCING ADJACENT WATER PUMPING STATION	7:13	15:04	0/100	<0.01
AMR311	18-Aug	OVERPASS AREA, NORTH BOUNDARY FENCING	7:15	15:10	0/100	<0.01
AMR311	18-Aug	OVERPASS AREA, NORTH WEST BOUNDARY	7:17	15:13	0/100	<0.01
AMR311	18-Aug	OVERPASS AREA, SOUTH EAST BOUNDARY	7:19	15:17	0/100	<0.01
AMR311	18-Aug	OVERPASS AREA, SOUTH WEST BOUNDARY FENCING	7:22	15:19	0/100	<0.01
AMR312	19-Aug	OVERPASS AREA, ADJACENT NORTH EASTERN GATE BOUNDARY FENCING	7:10	15:01	0/100	<0.01
AMR312	19-Aug	OVERPASS AREA, SOUTH BOUNDARY FENCING	7:12	15:03	0/100	<0.01
AMR312	19-Aug	OVERPASS AREA, SOUTH WEST BOUNDARY FENCE	7:15	15:05	0/100	<0.01
AMR312	19-Aug	OVERPASS AREA, NORTH WESTERN CORNER BOUNDARY FENCING	7:17	15:07	0/100	<0.01
AMR312	19-Aug	CAMELLIA JUNCTION, ADJACENT WATER PUMPING STATION FENCELINE	7:20	15:09	0/100	<0.01
AMR312	19-Aug	CAMELLIA JUNCTION, EASTERN FENCELINE	7:22	15:11	0/100	<0.01
AMR312	19-Aug	JRD LEASE SITE, SUBJECT AREA, ADJACENT JAMES HARDIE BRIDGE, FENCELINE	7:31	14:32	0/100	<0.01

AMR312	19-Aug	JRD LEASE SITE, SUBJECT AREA, NORTH SECTION, ADJACENT PIPELINES, WEST FENCELINE	7:33	14:33	0/100	<0.01
AMR313	20-Aug	OVERPASS AREA, NORTH EASTERN BOUNDARY FENCING	7:04	15:08	0/100	<0.01
AMR313	20-Aug	OVERPASS AREA, SOUTH EASTERN SECTION, EAST WALL	7:06	15:11	0/100	<0.01
AMR313	20-Aug	OVERPASS AREA, SOUTH WESTERN SECTION, WEST FENCE	7:08	15:13	0/100	<0.01
AMR313	20-Aug	OVERPASS AREA, NORTH WESTERN SECTION, WEST FENCE	7:10	15:15	0/100	<0.01
AMR313	20-Aug	CAMELLIA JUNCTION, NORTH EASTERN SECTION, EAST BOUNDARY FENCING	7:15	15:01	0/100	<0.01
AMR313	20-Aug	CAMELLIA JUNCTION, NORTH WESTERN SECTION, WEST BOUNDARY FENCING ADJACENT WATER PUMP STATION	7:17	15:04	0/100	<0.01
AMR313	20-Aug	CAMELLIA JUNCTION, SOUTH WESTERN SECTION, SOUTH BOUNDARY FENCING	7:19	15:06	0/100	<0.01
AMR314	21-Aug	OVERPASS AREA, NORTH EAST SECTION, NORTH BOUNDARY FENCING	7:01	14:20	0/100	<0.01
AMR314	21-Aug	OVERPASS AREA, SOUTH EAST SECTION, EAST WALL	7:03	14:23	0/100	<0.01
AMR314	21-Aug	OVERPAS AREA, SOUTH WEST SECTION, WEST BOUNDARY FENCING	7:05	14:25	0/100	<0.01
AMR314	21-Aug	OVERPASS AREA, NORTH WEST SECTION, WEST BOUNDARY FENCING	7:07	14:27	0/100	<0.01
AMR314	21-Aug	CAMELLIA JUNCTION, WEST SECTION, BOUNDARY FENCING	7:11	14:30	0/100	<0.01
AMR314	21-Aug	CAMELLIA JUNCTION, NORTH WEST SECTION, BOUNDARY FENCING	7:13	14:32	0/100	<0.01
AMR314	21-Aug	CAMELLIA JUNCTION, EAST SECTION, BOUNDARY FENCING	7:15	14:35	0/100	<0.01

AMR315	23-Aug	OVERPASS AREA, NORTH EASTERN SECTION, NORTH BOUNDARY FENCING	7:01	15:03	0/100	<0.01
AMR315	23-Aug	OVERPASS AREA, SOUTH EASTERN SECTION, EAST BOUNDARY FENCING	7:03	15:05	0/100	<0.01
AMR315	23-Aug	OVERPASS AREA, SOUTH WESTERN SECTION, WEST BOUNDARY FENCING	7:05	15:08	0/100	<0.01
AMR315	23-Aug	OVERPASS AREA, NORTH WESTERN SECTION, WEST BOUNDARY FENCING	7:07	15:09	0/100	<0.01
AMR315	23-Aug	CAMELLIA JUNCTION, SOUTH WEST SECTION BOUNDARY FENCING	7:10	15:12	1/100	<0.01
AMR315	23-Aug	CAMELLIA JUNCTION, NORTH WEST SECTION BOUNDARY FENCE ADJACENT WATER	7:13	15:14	0/100	<0.01
AMR315	23-Aug	CAMELLIA JUNCTION, EAST SECTION EAST BOUNDARY FENCING	7:15	15:15	0/100	<0.01
AMR315	23-Aug	SANDOWN LINE 40M EAST OF WEST ENTRY GATE NORTH BOUNDARY FENCE	7:30	15:25	0/100	<0.01
AMR315	23-Aug	SANDOWN LINE, 40M EAST OF WEST ENTRY GATE SOUTH BOUNDARY FENCE	7:32	15:27	0/100	<0.01