

ENVIRONMENTAL MONITORING REPORT, JULY 2020

PARRAMATTA LIGHT RAIL INFRASTRUCTURE WORKS

25 July 2020

Parramatta
Connect

Contents

1. Introduction	1
1.1. Background	1
1.1.1. Statutory Context	2
1.2. Scope	2
2. Site Activities	4
3. Monitoring Results	6
3.1. Inspections	6
3.2. Weather	7
3.3. Noise and Vibration	8
3.4. Soil and Water	Error! Bookmark not defined.
3.4.1. Water quality (turbidity) in receiving waters	Error! Bookmark not defined.
3.4.2. Discharge and dewatering	11
3.5. Air Quality	11
3.5.1. Dust Deposition Monitoring	11
Appendices	13
A-1 Weather Observations	13
A-2 Noise and Vibration Monitoring Results	15
A-3 Water Sampling and Discharge Results	18



Project number	N81080
Document number	PLR1INF-CPBD-ALL-EN-RPT-0000012
Revision date	15 August 2020
Revision	C

Rev.	Date	Prepared By	Reviewed By	Approved By	Remarks
0	27 July 2020	O. Cooper	D. Corish	D. Corish	Monthly Environmental Monitoring Report for July 2020
A	28 July 2020	O. Cooper	D. Corish	D. Corish	Addition of HAC monitoring information and results from dust and water sampling.
B	28 July 2020	O. Cooper	D. Corish	D. Corish	Amendments following ER comments
C	10 August 2020	O. Cooper	D. Corish	D. Corish	Amendments following ER and AA comments



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 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 environmental management 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 Reports.



Table 1-1 Monthly Environmental Monitoring Reporting Requirements

CEMP or Sub-plan	Monitoring program	Distribution
Noise and Vibration Management Sub-plan	<ul style="list-style-type: none"> - Locations and descriptions of monitoring undertaken - Noise monitoring results - Summary of any exceedance of the nominated criteria - Corrective actions 	<ul style="list-style-type: none"> - City of Paramatta Council - Cumberland Council - EPA - NSW Health - TfNSW - IC - ER - AA - Made publicly available
Soil and Water Management Sub-plan	<ul style="list-style-type: none"> - Weather forecasts and observations - Water Quality (Turbidity) monitoring - Discharge and dewatering monitoring 	<ul style="list-style-type: none"> - City of Paramatta Council - Cumberland Council - EPA - DOI Water - TfNSW - IC - Made publicly available
Air Quality and Dust Management Sub-plan	<ul style="list-style-type: none"> - Weather observations - Dust deposition monitoring - Real time aerosol dust monitors - Asbestos fibre air monitoring 	<ul style="list-style-type: none"> - EPA - TfNSW - IC - Made publicly available



2. Site Activities

Table 2-1 provides a summary of the site activities for July 2020.

Table 2-1 Monthly Environmental Monitoring Reporting Requirements

Precinct	Site Activities
Westmead and North Parramatta	<ul style="list-style-type: none"> - Demolition of the Royal Oak Hotel complete. Storage area established in Fennel Street compound for salvaged items. - Demolition of Factory Street units is complete. - Tree removal ongoing at Cumberland campus. - Traffic Control Plan implementation from Factory to Market street in North Parramatta is now complete. - UTC-016, UTC-017, UTC-018 and UTC-018a will continue for the next 2 months - Commence UTC-022, UTC-023, UTC-024, UTC-025 from Factory to Market Street along Church Street for the next 2 months.
Parramatta CBD	<p>Area 2 West (CBD)</p> <p>Ongoing Utility Works</p> <ul style="list-style-type: none"> - UTC-005 (Telstra works) on Church, George, Smith Street - UTC-008 (General utility relocations including Jemena, Water, Endeavour) on Church Street - UTC-011 (General utilities including Jemena, Water, Endeavour) on Macquarie Street - UTC-035 (Electrical and Lighting) in the CBD - UTC-041 (Multifunction Poles) in the CBD <p>Micro tunnel – TBM Drilling from Pit 2 to Pit 5 Church Street – continue installing chain wire fencing Church Street – continue minor civil works and drainage</p> <p>Area 2 East (Smith Street to Arthur Street)</p> <p>Ongoing Utility Works</p> <ul style="list-style-type: none"> - UTC-006 (General utilities including Jemena, Water, Endeavour) on Harris and Macquarie Street - UTC-009 (General utilities including Jemena, Water, Endeavour) on George St between Harris to Purchase Street - UTC-010 (General utilities including Jemena, Water, Endeavour) on Purchase to Arthur Street - UTC-0012 – (General Utilities including Jemena, Water, Endeavour) on Macquarie/Charles Street Intersection - UTC-041 (Multifunction Poles) <p>Heritage investigations on George Street continuing Heritage investigations in Robin Thomas Reserve Barrack Lane demolition</p> <ul style="list-style-type: none"> - UTC-005 (Telstra works) on Church and George Street



Precinct	Site Activities
Camellia and Carlingford line	<p data-bbox="662 293 774 322"><u>Camellia</u></p> <p data-bbox="662 340 1284 369"><u>Grand Avenue North & Tramway Avenue (UTC-003)</u></p> <ul data-bbox="678 392 1356 533" style="list-style-type: none">- Drainage works at Grand Avenue North and Tramway Avenue.- Connection of utilities.- Temporary road at Grand Avenue North. <p data-bbox="662 551 1021 580"><u>Camellia Junction (UTC-013a)</u></p> <ul data-bbox="678 600 1141 629" style="list-style-type: none">- Ongoing deep excavation for sewer. <p data-bbox="662 647 965 676"><u>Grand Avenue (UTC-004)</u></p> <ul data-bbox="678 696 973 725" style="list-style-type: none">- Ongoing Utility works. <p data-bbox="662 743 1037 772"><u>James Ruse Drive Underbridge</u></p> <ul data-bbox="678 792 1284 822" style="list-style-type: none">- Piling at Tramway Avenue for JRD underbridge. <p data-bbox="662 840 869 869"><u>Carlingford Line</u></p> <ul data-bbox="678 889 1404 1232" style="list-style-type: none">- Foundation treatment for Camellia retaining wall.- James Hardie Underpass.- Camellia Bridge heritage abutment salvage.- Construction of Vineyard Creek Causeway and demolition of existing the bridge.- Foundation treatment at Rydalmere.- Retaining wall works from Rydalmere to Carlingford.- Fill compaction from Telopea to Carlingford.- Piling for deflection wall at Pennant Hills Road Overbridge. <p data-bbox="662 1249 925 1279"><u>Rydalmere (UTC-014)</u></p> <ul data-bbox="678 1299 1220 1328" style="list-style-type: none">- Site establishment and utility investigation. <p data-bbox="662 1346 1037 1375"><u>Kissing Point Road (UTC-020a)</u></p> <ul data-bbox="678 1395 1396 1453" style="list-style-type: none">- Site establishment, utility investigation and ongoing utility works.



3. Monitoring Results

Section 3 presents a summary of the environmental inspection and monitoring programs completed during the reporting period (26 June 2020 to 25 July 2020). Detailed monitoring results for each program are presented in the appendices to this report.

3.1. Inspections

A total of four ER inspections and five AA inspections were completed during the reporting period in addition to forty-nine internal inspections. **Table 3-1** provides a summary of the number of actions raised and closed within the agreed timeframe.

Table 3-1 Inspections for July 2020

Date	Number of Inspections	Type	Actions	Closed in Time
01/07/2020	2	Internal Inspection	8	Yes
02/07/2020	1	Internal Inspection	2	Yes
02/07/2020	1	ER Inspection	6	Yes
06/07/2020	4	Internal Inspection	1	Yes
07/07/2020	3	Internal Inspection	4	Yes
07/07/2020	2	AA Inspection	0	N/A
05/07/2020	1	ER Inspection	5	Yes
09/07/2020	9	Internal Inspection	9	Yes
10/07/2020	9	Internal Inspection	10	Yes
11/07/2020	1	AA Inspection	0	N/A
13/07/2020	4	Internal Inspection	0	N/A
14/07/2020	1	Internal Inspection	0	N/A
16/07/2020	1	Internal Inspection	4	Yes
16/07/2020	1	ER Inspection	5	Yes
20/07/2020	8	Internal Inspection	5	Yes
21/07/2020	1	AA Inspection	0	N/A
21/07/2020	1	ER Inspection	4	Yes
22/07/2020	1	Internal Inspection	0	N/A
23/07/2020	1	AA Inspection	0	N/A
23/07/2020	3	Internal Inspection	0	N/A



24/07/2020	6	Internal Inspection	8	Yes
Total	61		71	

3.2. Weather

The total rainfall during the reporting period was 27.8 mm with 6 days with >1mm of rain and no days exceeding the 80th percentile (25.8mm) or the 85th percentile (33.1mm).

During the reporting period, there were 11 days where the maximum wind gust recorded was greater than 25km/hr and no days where the maximum wind gust recorded was greater than 50km/hr. There was a total of 4 days where wind speeds greater than 25km/hr were forecast and on each of those days, notifications were issued to the construction team to alert them of the strong winds forecast.

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 3-2**. A comparison between long term monthly means and recorded values can be found in **Figure 3-2**.

Detailed weather observation records for July 2020 are presented in **Appendix A-1**.

Table 3-2 Weather Summary and Trigger Weather Events for July¹ 2020

Weather event	Forecast	Observation
Minimum temperature	3°C	3.6°C
Maximum temperature	22°C	22.8°C
Total rainfall	46mm	27.8mm
Number of days with rain (>1mm)	3 days	6 days
>80 th percentile (25.8mm) rain events	0	0 events
>85 th percentile (33.1mm) rain events	0	0 events
Flood warning / events	0	0 events
>25km/hr wind ²	3 days	11 days
>50km/hr wind	1 day	0 days

1. Weather summary based on data from the 26 June to 25 July (30 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 in Observation column indicates observation greater than forecast.

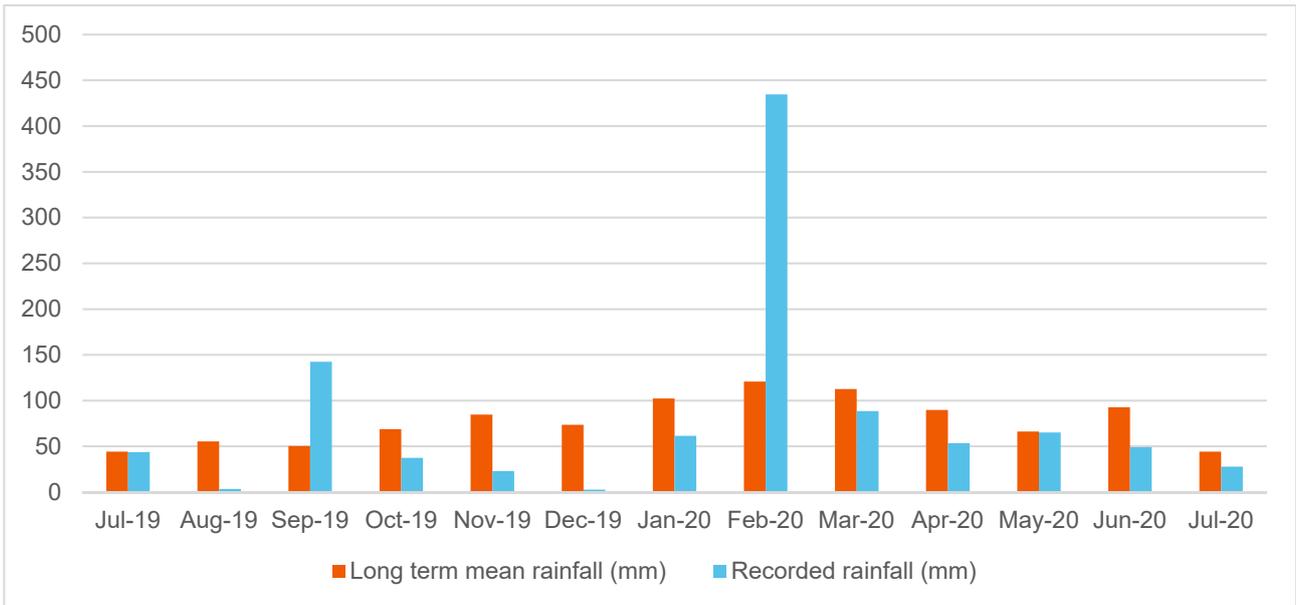


Figure 3-1 Monthly rainfall comparison

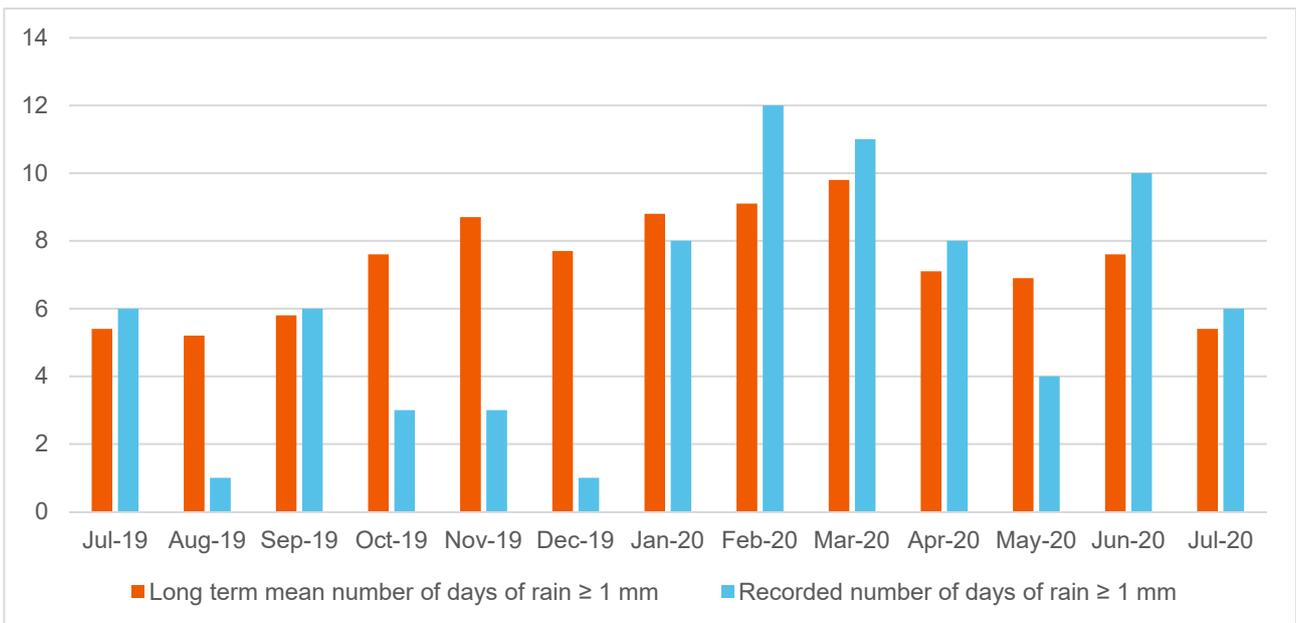


Figure 3-2 Monthly rain days comparison

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**. It is noted that recorded noise levels (Leq15min) during the reporting period were consistently below the predicted noise levels.

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).

Vibration monitoring events completed during the reporting period are summarised in **Table 3-4** and detailed results and comments are presented in **Appendix A-2**. All monitoring events were compliant with vibration targets.



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

Monitoring for the Health Administration Corporation (HAC) is being undertaken at the medical facilities in Westmead as they have been identified as sensitive receivers. Three vibration monitors and four noise monitors are being used for continuous monitoring by Renzo Tonin which will be ongoing for twelve months. Locations of this monitoring can be found in **Table 3-6**.

Table 3-3 Summary of noise monitoring July 2020

Date	Monitoring Location	Description
30/06/2020	42 Hassel Street	Excavating
30/06/2020	200 George Street	Excavation
24/07/2020	1 Noller Parade	Saw cutting and excavating
24/07/2020	1A Noller Parade	Excavation
26/06/2020	Westmead Institute for Medical Research (Sleep Lab)	Continuous monitoring
26/06/2020	Westmead Institute for Medical Research (Brain Dynamics Centre)	Continuous monitoring
26/06/2020	Children's Medical Research Institute (Microscopy Labs)	Continuous monitoring
26/06/2020	Cumberland Hospital (Clinical psychology rooms)	Continuous monitoring

Table 3-4 Summary of vibration monitoring July 2020

Date	Monitoring Location	Description
10/07/2020	3 Barrack Lane	Demolition works
15/07/2020	3 Barrack Lane	Demolition works
15/07/2020	Barrack Lane Wall	Demolition works – hammering foundations at the substation
16/07/2020	Barrack Lane Wall	Demolition works – hammering foundations at the substation
16/07/2020	Pennant Hills Rd overbridge	Bored pilling for deflection wall
17/07/2020	Barrack Lane Wall	Demolition works – hammering foundations at the substation
16/06/2020	Westmead Institute for Medical Research (HAL incubators)	Continuous monitoring
16/06/2020	Westmead Institute for Medical Research (Microscopy Labs)	Continuous monitoring



Date	Monitoring Location	Description
16/06/2020	Children's Medical Research Institute (Microscopy Labs)	Continuous monitoring

Table 3-5 Noise and Vibration Monitors and NATA Calibration

Equipment ¹	Serial Number	Calibration Date
Noise Level Meter	00973277	4/12/2020
Noise Level Meter	00661732	19/05/2021
Vibration Monitor	BE15042	19/07/2020
Vibration Monitor	BE14639	5/12/2020
Vibration Monitor	BE14638	5/08/2020

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.

¹Continuous monitoring equipment in place at the Westmead Institute for Medical Research and the Children's Medical Research Institute is owned and operated by Renzo Tonin.

Table 3-6 HAC Noise and Vibration Monitor Locations¹

Monitor Type	Organisation	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

3.4. Soil and Water

3.4.1. Water quality (turbidity) in receiving waters

Water quality monitoring is based upon on pre-construction screening to verify the water quality objectives established on the baseline data presented in the EIS Technical Paper 6 – Water Quality Assessment.

During the reporting period, one wet weather monitoring event was undertaken as summarised in Table 3-6 and detailed in Table A-3-1. The monitoring was undertaken following a 25 mm rain event that occurred from 8 July 2020 to 15 July 2020. Water levels were higher than usual and minimal debris was present in all waterways when sampling.



Majority of the recorded sampling results were in accordance with the baseline water quality objectives, outlined in Table D-3 of the Soil and Water Management Plan, as well as the ANZACC Guidelines. The turbidity value for location PR3 and AC2 was above the objective value as well as the value for electrical conductivity for CC2.

Table 3-6 Water quality (turbidity) in receiving waters

Date	Type	Type of Results	Wet / Dry	Locations
15/07/2020	Pre-construction screening	Lab	Wet	Parramatta River: PR1; PR3; PR4; PR5; PR6 Domain Creek: DC1 Clay Cliff Creek: CC1, CC2 Vineyard Creek: VY1; VY2 Subiaco Creek: SC1 A'becketts Creek: AC1, AC2

3.4.2. Discharge and dewatering

Detailed water quality (turbidity) monitoring results and comments for July 2020 are presented in **Appendix A-3-2**.

There was 1 discharge event during the reporting period. Additional events were undertaken by a sub-contractor during the reporting period at the Arthur Street compound; outstanding data will be included in the August report.

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/m² before the commencement of construction activities at 13A Grand Avenue.

During the reporting period, two additional dust deposition gauges were installed at Rydalmere and Dundas Station. The dust monitoring results for the July 2020 reporting period are yet to be received.

Table 3-7 Summary of dust deposition data

Date	Monitoring Location	Total Insoluble Matter g/m ² /month
20/01/2020	13a Grand Avenue	3.9
24/03/2020	13a Grand Avenue	4
27/04/2020	13a Grand Avenue	4.1
28/05/2020	13a Grand Avenue	4.9



Date	Monitoring Location	Total Insoluble Matter g/m²/month
26/06/2020	13a Grand Avenue	3.5
July	13a Grand Avenue	-
July	Rydalmere Station	-
July	Dundas Station	-



Appendices

A-1 Weather Observations

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

Date	Temps		Rain	Temp	RH	9:00 AM		
	Min	Max				Cld	Dir	Spd
	°C	°C	mm	%	8th			
26/06/2020	6.4	19.5	0	11.5	70	2	NW	2
27/06/2020	8	16.6	0	11.2	80	6	NW	2
28/06/2020	6.8	15.6	1	12	79	6	WSW	2
29/06/2020	6.5	17.1	0	12.8	73	4	SSW	4
30/06/2020	5.3	18.3	0.2	9.8	97	0	NW	2
1/07/2020	4.5	21.3	0	10.4	95	4	W	2
2/07/2020	7.8	22.8	0	18	62	1	NW	13
3/07/2020	6.8	18	0	13	70	0	NNW	4
4/07/2020	6.3	16.3	0.6	9.5	87	6	SW	2
5/07/2020	6.3	18.3	0	13	70	0	SW	2
6/07/2020	5.3	18.3	0	10.4	66	0	SW	2
7/07/2020	7.5	16.5	0	11.8	75	4	NW	4
8/07/2020	8.5	15.5	3	11.5	99	7	SW	2
9/07/2020	4.5	18.2	0	8.7	99	2	W	4
10/07/2020	7.5	16.8	0	11	97	6	NW	2
11/07/2020	10.2	18.5	3.2	12.6	97	8	SW	2
12/07/2020	8.5	17.5	1.2	10.5	99	7	SW	4
13/07/2020	5.6	17.6	6	9.9	97	0	W	2
14/07/2020	9.2	16.2	11	11.4	95	8	SSW	33
15/07/2020	10.8	15.6	1.6	12.7	71	6	WSW	19
16/07/2020	8.8	16.6	0	11.8	67	6	WSW	11
17/07/2020	10.2	16.2	0	12.2	74	6	WSW	15
18/07/2020	8.2	17.2	0	13	77	3	W	2
19/07/2020	4.6	19.2	0	10.6	96	3	WNW	2
20/07/2020	6.8	18	0	13.2	51	0	SW	22
21/07/2020	3.6	17.2	0	10	75	0	WSW	4
22/07/2020	3.6	18.2	0	10.4	74	6	W	2
23/07/2020	4.2	19.4	0	10	80	0	NW	4
24/07/2020	5	18.8	0	10.2	97	0	NW	4
25/07/2020	5.8	18.2	0	9.8	99	6	W	2



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

Date	Max Wind Gust			9:00 AM		3:00 PM	
	Dir	Spd	Time	Dir	Spd	Dir	Spd
		km/h	local		km/h		km/h
26/06/2020	WNW	19	9:41	WNW	9	SE	9
27/06/2020	SE	26	14:05	WNW	9	ESE	15
28/06/2020	SSE	24	14:17	WNW	7	SSE	9
29/06/2020	SE	20	11:54	WNW	7	SE	13
30/06/2020	WNW	17	9:58	NW	2	ENE	2
1/07/2020	N	20	19:17	*	Calm	N	11
2/07/2020	*	*	*	NNW	13	NNW	15
3/07/2020	WNW	31	12:33	NNW	7	W	13
4/07/2020	SW	30	10:21	WNW	7	SW	11
5/07/2020	W	26	10:50	W	7	WSW	9
6/07/2020	WSW	17	9:58	NW	6	ESE	9
7/07/2020	SSE	24	18:41	WNW	6	SSE	6
8/07/2020	ESE	15	12:56	*	Calm	ESE	2
9/07/2020	NW	15	8:56	NW	9	NNE	7
10/07/2020	NW	17	9:54	WNW	2	NW	6
11/07/2020	NW	15	13:24	NNW	2	W	6
12/07/2020	WNW	26	16:07	NW	9	ESE	7
13/07/2020	S	17	16:32	NW	7	NE	2
14/07/2020	SW	44	15:46	SW	20	SSW	20
15/07/2020	SSW	39	13:22	WSW	11	SSW	11
16/07/2020	SSW	39	13:31	W	9	SSW	19
17/07/2020	S	30	14:09	W	9	SSW	11
18/07/2020	WNW	17	9:22	NW	9	*	Calm
19/07/2020	WNW	28	18:33	*	Calm	NNW	9
20/07/2020	SSW	33	9:39	W	13	W	9
21/07/2020	SSW	24	11:41	W	9	SSE	9
22/07/2020	N	20	14:13	NW	9	NNW	7
23/07/2020	ESE	20	16:29	WNW	11	E	4
24/07/2020	WNW	17	8:35	NW	9	N	7
25/07/2020	E	19	14:15	NW	4	E	11

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	L _{Amax}	Recorded L _{eq, 15min} (dBA)	Exceedance of Predicted (dBA)	Exceedance of predicted	Comments
30/06/2020	22:21	OOHW Period 2	Excavating	Harris/Macquarie Street	42 Hassel Street	39	69	PN, V, RP, SN, DR	70.1	53.1	-15.9	No	Highly Noise Intrusive Works Works included: backfilling/excavating trenches and removing road plates Construction heard in the distance and included: idling of engines 52dB, squawkers, banging of bucket/road plates (75dB) and moving fence panels
30/06/2020	23:18	OOHW Period 2	Excavation	George Street	200 George Street	39	79	PN, V, RP, SN, DR	91.6	70.8	-8.2	No	Highly Noise Intrusive Works Banging of chains on truck at 80dB Truck idling at 70dB then 67dB Rattle gun at 74dB
24/07/2020	22:01	OOHW Period 2	Saw cutting and excavating	Noller Parade/George Street	1 Noller Parade	39	95	PN, V, RP, SN, DR	66.7	48.8	-46.2	No	Highly Noise Intrusive Works 1 min into monitoring – car leaving parking spot 67 dB Excavator moving on tracks 51 dB Saw cutting occurred early in the monitoring
24/07/2020	22:29	OOHW Period 2	Excavation	Noller Parade/George Street	1A Noller Parade	39	95	PN, V, RP, SN, DR	86.4	69.8	-25.2	No	Highly Noise Intrusive Works 15t excavator loading out trench in bogey Disconnection of bucket 80dB
26/06/2020	Continuous monitoring		Construction works	Hawkesbury Road works	Westmead Institute for Medical Research (Sleep Lab)	40	*	*	*	*	*	No	No comment
26/06/2020	Continuous monitoring		Construction works	Hawkesbury Road works	Westmead Institute for Medical Research (Brain Dynamics Centre)	60	*	*	*	*	*	No	No comment
26/06/2020	Continuous monitoring		Construction works	Hawkesbury Road works	Children's Medical Research Institute (Microscopy Labs)	60	*	*	*	*	*	No	No comment
26/06/2020	Continuous monitoring		Construction works	Cumberland Hospital	Cumberland Hospital (Clinical psychology rooms)	60	*	*	*	*	*	No	No comment

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
- b) 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	Recorded PVS (Max values)	Exceedance of Target	Construction vibration exceedance	Comments
10/07/2020	19:40-20:35	OOHW Period 1	Demolition	1 Barrack Lane	3 Barrack Lane	6.5 mm/s	20.77 mm/s	No	No	Baseline monitoring for demo works Spike due to vehicles passing close to wall/kerb
10/07/2020	19:40-20:35	OOHW Period 1	Demolition	1 Barrack Lane	3 Barrack Lane	7.5 mm/s	19.58 mm/s	No	No	Baseline monitoring for demo works Spike due to vehicles passing close to wall/kerb
10/07/2020	19:40-20:35	OOHW Period 1	Demolition	1 Barrack Lane	3 Barrack Lane	7.5 mm/s	3.57 mm/s	No	No	Baseline monitoring for demo works
10/07/2020	22:50-20:00 11/07	Continuous monitoring	Demolition works	1 Barrack Lane	3 Barrack Lane	6.5 mm/s	1.86 mm/s	No	No	No comment
10/07/2020	20:30-20:55	OOHW Period 1	Demolition	1 Barrack Lane	Barrack Lane Wall	2.5 mm/s	1.06 mm/s	No	No	Baseline levels for heritage
10/07/2020	20:30-07:30 13/07	Continuous monitoring	Demolition	1 Barrack Lane	Barrack Lane Wall	7.5 mm/s	5 mm/s	No	No	No comment
15/07/2020	09:15-15:50	Standard work hours	Demolition works	1 Barrack Lane	3 Barrack Lane	7.5 mm/s	1.909 mm/s	No	No	No comment
15/07/2020	08:35-17:30	Standard work hours	Demolition works	1 Barrack Lane	3 Barrack Lane	7.5 mm/s	2.00 mm/s	No	No	No comment
15/07/2020	08:25-18:35	Standard work hours	Demolition works	1 Barrack Lane	3 Barrack Lane	7.5 mm/s	0.91 mm/s	No	No	No comment
15/07/2020	09:00-15:05	Standard work hours	Demolition works – hammering foundations at substation	1 Barrack Lane	Barrack Lane Wall	7.5 mm/s	6.8 mm/s	No	No	Demolition works Large spike at end was when the monitor was taken off the wall Vibration works near heritage structure
16/07/2020	08:20-11:00	Standard work hours	Demolition works – hammering foundations at substation	1 Barrack Lane	Barrack Lane Wall	7.5 mm/s	4.46 mm/s	No	No	Demolition works Vibration works near heritage structure
16/07/2020	08:33-08:48	Standard work hours	Bored piling for deflection wall	Pennant Hills Rd overbridge	Pennant Hills Rd overbridge	20 mm/s	14 mm/s	No	No	No comment
17/07/2020	08:00-18:30	Standard work hours	Demolition works – hammering foundations at substation	1 Barrack Lane	Barrack Lane Wall	7.5 mm/s	2.83 mm/s	No	No	Demolition works Vibration works near heritage structure
26/06/2020		Continuous monitoring	Hawkesbury Road works	Hawkesbury Road	Westmead Institute for Medical Research (HAL incubators)	0.1 mm/s	*	No	No	No comment
26/06/2020		Continuous monitoring	Hawkesbury Road works	Hawkesbury Road	Westmead Institute for Medical Research (Microscopy Labs)	0.1 mm/s	*	No	No	No comment
26/06/2020		Continuous monitoring	Hawkesbury Road works	Hawkesbury Road	Children’s Medical Research Institute (Microscopy Labs)	0.1 mm/s	*	No	No	No comment

A-3 Water Sampling and Discharge Results

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

Location	Waterway	Upstream/ Downstream of works	Type	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
PR1	Parramatta River	Upstream	Wet	15/07/2020	8:08	7.41	254	17.8	Sunny weather. Normal current. Minimal leaf litter. No oil or grease. No rubbish. Water murky (as usual for this spot). 25mm within the 11 days of the rainfall event.
PR2	Parramatta River	Downstream	Wet	15/07/2020	Access blocked, sampling unachievable				
DC1	Domain Creek	N/A	Wet	15/07/2020	8:34	7.33	215	18.6	Sunny weather. Normal current. Stream vegetation was minimal. No oil or grease. No rubbish. Water murky. 25mm within the 11 days of the rainfall event.
PR3	Parramatta River	Upstream	Wet	15/07/2020	9:00	7.59	352	352	Water murky. No oil, grease or rubbish. Minimal leaf litter. Sunny weather. 25mm within the 11 days of the rainfall event.
PR4	Parramatta River	Downstream	Wet	15/07/2020	13:26	7.68	350	18.6	Cloudy. Normal current. No leaf litter or rubbish. No oil or grease visible. Water semi murky (with 100mm of clarity). 25mm within the 11 days of the rainfall event
PR5	Parramatta River	N/A	Wet	15/07/2020	12:15	7.6	11100	11.2	Cloudy. Normal current. No rubbish or leaf litter. No oil or grease visible. Moderately Clear 25mm within the 11 days of the rainfall event
PR6	Parramatta River	N/A	Wet	15/07/2020	10:25	7.59	13000	25.28	Water clear. No rubbish, leaf litter or visible oil or grease. Sunny weather. 25mm within the 11 days of the rainfall event.
CC1	Clay Cliff Creek	Upstream	Wet	15/07/2020	11:15	8.46	1280	18.3	Cloudy. No rubbish or leaf litter. No oil or grease visible. Water murky. 25mm within the 11 days of the rainfall event
CC2	Clay Cliff Creek	Downstream	Wet	15/07/2020	12:00	7.88	6740	13.7	Cloudy. No rubbish or leaf litter. No oil or grease visible. Murky water. 25mm within the 11 days of the rainfall event
VY1	Vineyard Creek	Upstream	Wet	15/07/2020	10:00	7.54	324	8.8	Water murky. Minimal rubbish. Leaf litter moderate. No visible oil or grease. Sunny weather. 25mm within the 11 days of the rainfall event.
VY2	Vineyard Creek	Downstream	Wet	15/07/2020	10:05	7.62	325	13.8	Water murky. No oil, grease or rubbish. Moderate leaf litter. Sunny weather. 25mm within the 11 days of the rainfall event.
AC1	A'becketts Creek	Upstream	Wet	15/07/2020	11:15	7.91	806	13.8	Cloudy. Normal current. No rubbish or leaf litter. No oil or grease visible. Moderately Clear. 25mm within the 11 days of the rainfall event
AC2	A'becketts Creek	Downstream	Wet	15/07/2020	12:30	7.85	912	166	Cloudy. Weak current. LOTS of rubbish and leaf litter. Hydrocarbons visible. Water was very murky. Stream sample unlikely to be indicative as turbidity increased due to sampling because of a low water level. 25mm within the 11 days of the rainfall event.
SC1	Subiaco Creek	N/A	Wet	15/07/2020	9:30	7.56	2080	48	Cloudy. Normal current. No rubbish or leaf litter. No oil or grease visible. Water very murky. 25mm within the 11 days of the rainfall event

1. ANZECC Waterway types: LR: Lowland River (PR1, PR2, PR3, PR4, DC1, CC1, CC2, VY1 and VY2); E: Estuary (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.

Table A-3-2 Discharge water quality

Discharge monitoring Point ID	P1.2 Identification Number	Type of Monitoring Point	Type of Discharge Point	Date	Discharge Permit #	Oil and Grease (Not visible)	pH (6.5 - 8.5)	Total Suspended Solids (31 mg/L)	Comments
A3.22	1	Basins and settling containers	Stormwater inlet	2/07/2020	DW-A3_008	Not visible	6.86	2	Discharge from dewatering from deep excavation at Grand Avenue

