



Southwest Metro Corridor and Bankstown Early Works Construction Monitoring Report – September 2021- February 2022

SMCSWSSJ-JHL-WEC-EM-REP-000025

Document and Revision History

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Compliance Matrix

Condition	Requirement	Reference
C14	The results of the Construction Monitoring Programs must be submitted to the Planning Secretary, and relevant regulatory agencies, for information in the form of a Construction Monitoring Report at the frequency identified in the relevant Construction Monitoring Program.	Section 1.1

1. Introduction

The Construction Monitoring Program is being implemented to monitor impacts on surrounding surface water quality resources and impacts from noise and vibration on the surrounding areas during the construction phase. The surface water monitoring program and noise and vibration monitoring program are also both designed to assess the effectiveness of the mitigation measures applied as part of the Southwest Metro Corridor Works (SMC) and Bankstown Early Works (BEW).

1.1 Submission Requirements

In accordance with condition C14, this will be submitted to the following agencies for information:

- City of Canterbury Bankstown
- Inner West Council
- DPE (Formerly DPIE)

The Independent Environmental Representative will review the report prior to submission.

1.2 Surface Water

The project site is located within the rail corridor on the T3 Bankstown line between Sydenham and Bankstown, NSW.

The Project site forms part of the overall Cooks River, Coxs Creek and Salt Pan Creek catchment areas. The water from the area discharges into these water catchments via local stormwater drainage or overland flow. The surrounding catchment areas are urbanised with a mix of residential, commercial, and industrial properties.

Water quality is measured on an ongoing basis for the wider Cooks River catchment by the *Environment, Energy and Science - NSW DPE* as part of the Beach watch programme. The monitoring point is at Kyeemagh Baths at the mouth of the Cooks River in Port Botany. Water quality within the Cooks River catchment is influenced by stormwater, fertilisers, industrial discharge and sewage contamination.

The EIS, referring to the Salt Pan Creek catchments, states “A number of beaches in the lower Georges River are monitored as part of DPE-EES’s Beachwatch program. The most recent State of the Beaches annual report noted that these locations were graded as ‘good’, meaning that the quality of the water was appropriate for swimming most of the time”. It is noted however that the catchment is impacted by development, including construction impacts and litter, as well as other influences such as wastewater overflows and a landfill operation.

Please refer to the Construction Soil and Water Management Plan for further information on surface water within the project area.

Objectives for water quality management during construction are:

- Minimise pollution of surface water through appropriate erosion and sediment control
- Maintain existing water quality of surrounding surface watercourses

1.3 Noise and Vibration

The area surrounding the SMC project contains a variety of land-use types and receivers, including residential receivers, commercial, industrial, sensitive non-residential receivers. These land-uses are mixed within the identified noise catchments, though in general there are clusters of industrial and commercial areas surrounding stations, and primarily residential areas between stations. The area surrounding the project is affected by rail noise and vibration.

Majority of the works will occur within the rail corridor between stations, works will mainly occur adjacent to residential properties.

There are a number of sensitive non-residential receivers identified within the vicinity of the project works. The full list of receivers can be found within the CNVIS (SMCSWSSJ-JHL-WEC-EM-REP-000011-Construction Noise and Vibration Impact Statement-Rev00) A summary of the sensitive receivers are;

- 17 Childcare and Early Learning Centres
- 25 Primary and High Schools
- 24 Hospitals, Medical Centres, clinics and Aged Care Facilities
- 23 Places of Worship

Objectives for noise and vibration management on the project are:

- Minimise unreasonable noise and vibration impacts on residents and businesses
- Avoid structural damage to buildings or heritages items as a result of construction vibration
- Maintain positive, co-operative relationships with schools, childcare centres, local residents and building owners, and undertake active community consultation

Construction noise levels for some SMC activities are expected to exceed the external noise management level at times, particularly during works outside of standard hours, resulting in noise impacts to outdoor spaces. Internal and external noise levels will be assessed as part of the OOHW protocol and monitored accordingly.

2. Methodology

2.1 Surface Water

Surface water quality monitoring is undertaken in accordance with the Water Quality Monitoring Programme within the Construction Soil and Water Management Plan (refer to Section 7).

The water quality monitoring methodology as stated within the CSWMP is as follows;

“Following rain events of greater than 20mm in a 24 hour period, JHLOR will undertake post rainfall inspections of works areas and outlets to determine if there is any change in water quality. Visual inspections will include the following monitoring parameters:

- *Water clarity and colour*
- *Odour*
- *Description of flow and quantity*
- *Oil and Grease determination*
- *Details of any foreign objects within the water, and*
- *Visible runoff (into the water body)*

JHLOR will maintain a record of the inspections (including photographs) within the SMC Project drive.

Where water quality issues are visibly observed JHLOR will investigate further to determine if the source of the issue is related to JHLOR construction activities (where possible, noting safe access limitations). The JHLOR Environmental Manager or delegate will discuss changes in water quality associated with Construction with the JHLOR Construction Team to determine if further controls may be implemented, noting that any controls must be feasible and reasonable.”

Water quality monitoring locations are included within Appendix F of the CSWMP. Canterbury Racecourse BOM weather observations were used to determine the amount of rainfall in a 24hr period, forming the basis of when monitoring occurred.

Pre-construction (baseline) monitoring was undertaken prior to the start of Construction in late March 2021, noting that works did not commence across the entire project site in March. The baseline for water quality monitoring was updated with two extra sites (eastern-side canterbury compound and BEW) during May and September of 2021. Monitoring was undertaken during dry conditions (no rainfall within the last 24hrs). Pre-construction monitoring was undertaken with the same visual and qualitative approach as described above.

The results of the Construction Water Quality Monitoring Programme are included in Section 3.

There are currently no active sediment basins on the project, and none have been identified during the construction phase of the project to date.

2.2 Noise and Vibration monitoring

As part of the Noise and Vibration Assessment within the Sydney Metro Sydenham to Bankstown Upgrade Environmental Impact Statement, the area surrounding the entire Project site was divided into 13 Noise Catchment Areas (NCAs). SMC works occur across all 13 NCA's depending on where works will reside, there are some locations where works are more consistent than others. Noise monitoring was undertaken in 2016 to determine the Rating Background Level for the 13 noise catchments. The Rating Background Levels for all NCAs are shown in Table 1.

Table 1 - RBLs for SSJ Noise Catchment Areas

NCA	Daytime RBL (7am to 6pm)	Evening RBL (6pm to 10pm)	Night RBL (10pm to 7am)
1	38	38	33
2	38	38	33
3	38	38	34
4	40	40	35
5	36	36	32
6	45	42	35
7	41	41	35
8	47	47	41
9	44	44	36
10	47	47	41
11	47	47	39
12	54	51	42
13	42	42	39

Based on planned work in the construction phase, impacts were largely spread across the noise catchments.

Figure 1 shows the noise catchment boundaries across the project.

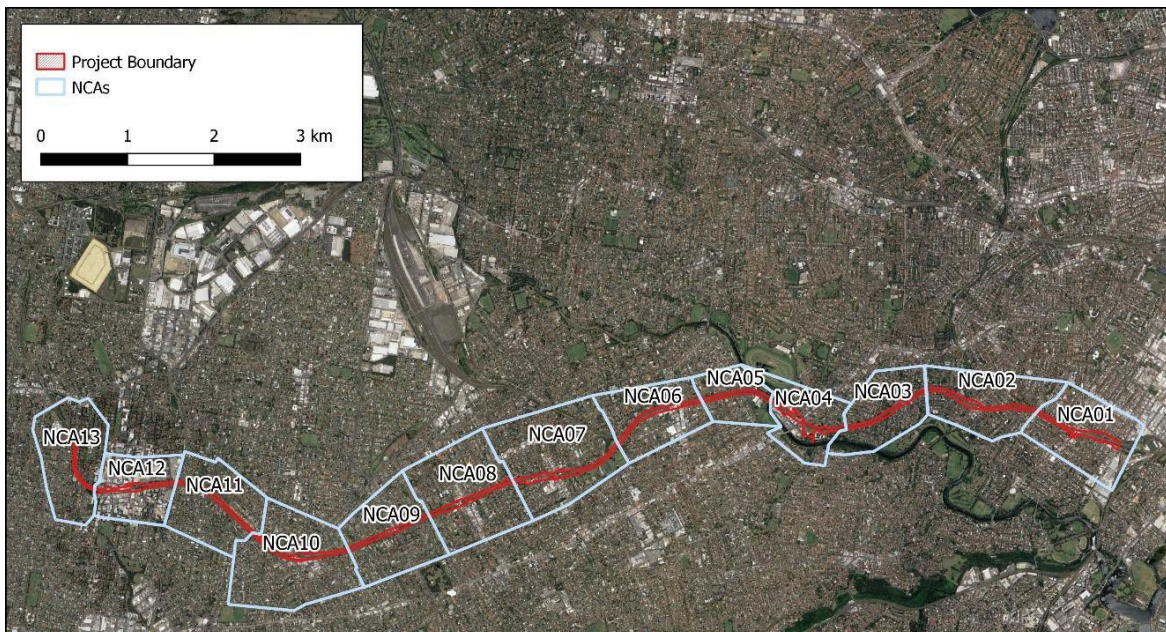


Figure 1 Sydenham to Bankstown Noise Catchment Areas

Monitoring is undertaken during construction activities (including out of hours works) where required in accordance with Section 8 of the CNVS and for validation purposes. Attended noise monitoring is undertaken in the event of a noise complaint. Where a complaint occurs, monitoring will be undertaken at the complainant's property, nearest to any work.

Vibration monitoring will be undertaken before and during works where buildings or structures exist within the safe work distances of vibratory plant. Monitoring will also be undertaken where vibration generating activities that have the potential to impact on heritage items. Monitoring will be undertaken for vibration causing "activities" at a structure and applied as indicative across the project area in similar circumstances (e.g. the methods and plant used for the compaction of batters is consistent across the site, as such the monitoring at one structure is representative of the impacts at other structures). Representative monitoring should be undertaken at the most sensitive structure for which it is to be applied. In accordance with the requirements of the CNVS, the vibration limits have been set out in the British Standard BS 7385-2:1993.

3. Results

3.1 Surface Water

Water quality monitoring inspections were undertaken a total of 7 times during the period.

One baseline monitoring inspection was conducted in March 2021 (02/03/2021) and updated with 2 additional locations including BEW (10/09/2021 – see figure 2) and Canterbury compound (14/04/2021 – see figure 3). Refer to Table 2 for a summary.

Full monitoring inspections, including commentary and photographs are maintained on the JHLOR Project Drive. These are available upon request. Where monitoring indicates adverse impacts associated with JHLOR works this Section of the CMR will explore the details and corrective actions in detail. However, there were no adverse impacts identified during the period.

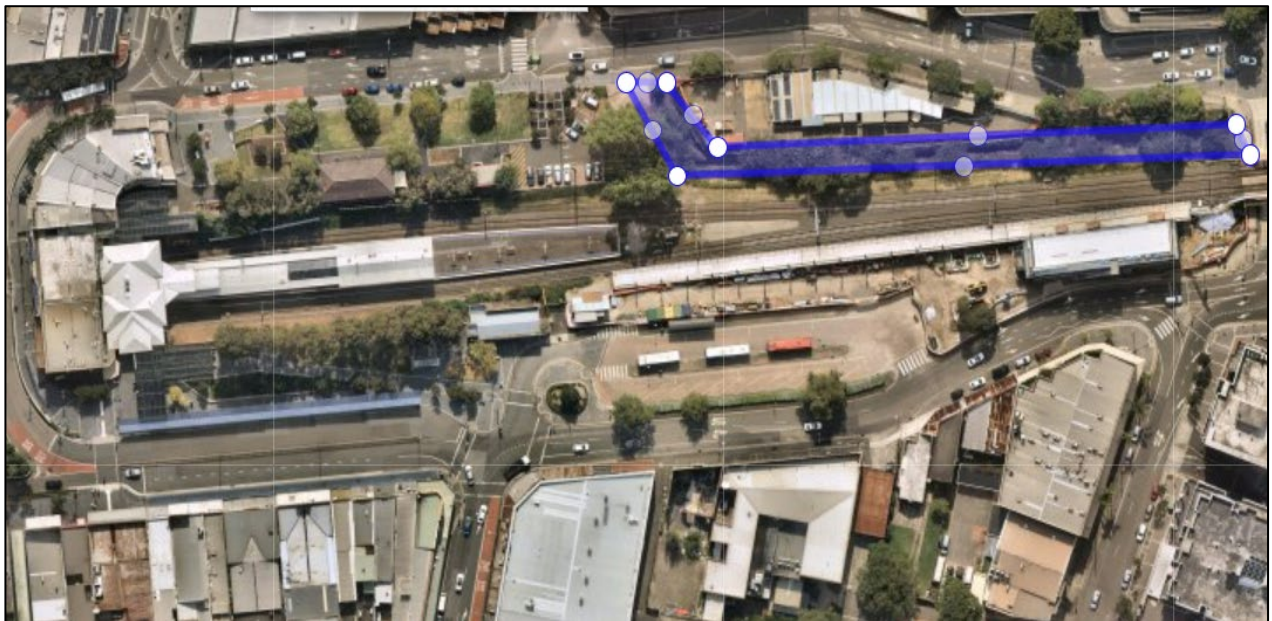


Figure 2. Bankstown early works (water quality location 9)



Figure 3. Canterbury Compound (water quality location 8)

Table 2 - Surface Water Monitoring Results for Pre-construction and Construction Phases for wet weather events (20mm rain)

Date	Total Rainfall (mm)	Rainfall Event (hours)	Adverse Impacts relating to JHLOR works recorded	Notable Observations	Observations relating to JHLOR impacts	Follow up actions with construction team
14/09/2021	30.4	24	No	<p>Ewart Street, Dulwich Hill: Low flow dirty water from main/under track culvert. No JHLOR works on Ewart St, however Station Contractor has site alongside water channel/stockpiling material & equipment alongside the waterway on either side. Council Contactor works under Ness St bridge.</p> <p>Wiley Park: NO JHLOR works in area. Station contractor works northside "upstream" station (building retaining wall). Flow is from South to North side under embankment/tracks. flows through culvert systems are clear. No debris other than leaf litter and settled sands/soils in culverts.</p> <p>Canterbury compound (east side): NO JHLOR works in area. Very turbid/dirty water typical of previous rain events. Unknown source of slightly turbid/cloudy water. Low to nil flow of water off asphalt parking surface.</p>	None	N/A
14/10/2021	31.8	120	No	<p>Ewart St, Dulwich Hill: Small side tributary (LHS) – source of upstream brown cloudiness/dirty water unknown other than Council Contactor works under Ness St bridge. – no JHLOR works in area.</p> <p>Canterbury Compound: slightly turbid / cloudy water cascading on ARTC side of culvert. No works in area.</p>	None	N/A
12/11/2021	20	48	No	<p>Ewart St, Dulwich Hill: Small side tributary (LHS) – source of upstream brown cloudiness/dirty water unknown other than Council Contactor works under Ness St bridge. – no JHLOR works in area.</p> <p>Hurlstone Park: JHLOR installing engineered earth ramp upstream from culvert. Controls in place and ramp structure stabilised with "little" sign of scour flowing into heavily vegetated area (upstream of culvert).</p> <p>Wiley Park: Station Contractor works near culverts. Pre-construction baseline inspections and early Construction period inspections indicate turbid water within this drain at times. No indication SM works causing turbidity.</p> <p>Canterbury Compound: turbid/cloudy water observed in creek. No JHLOR works.</p>	None	N/A

22/11/2021	25	72	No	Wiley Park: Evidence of heavy sediment load though in most eastern culvert. JHLOR work in area - WP3. Access checked no dirty water flowing from stabilised access. Sediment load only seen on upstream (South side) section. Followed evidence of the sediment load in culvert further upstream but unable to determine source of sediment.	None	N/A
26/11/2021	40	96	No	Ewart St, Dulwich Hill: turbid/dirty water observed in Kerbs & Gutters Wiley Park: Pre-construction baseline inspections and early Construction period inspections indicate turbid water within this drain at times. No indication SM works causing turbidity. (North side) Dirty water in the west and middle culverts. WE19 possessions works at gate WP3, contractor works above culverts.	None	N/A
06/01/2022	21.4	72	No	Hurlstone Park: JHLOR work in area – construction of RW D. Ramp (onto track) established and stabilized. No sign of sediment movement down slopes of batter. Wiley Park: Downstream (Nth side) Slightly cloudy water in the west with cloudy in middle culverts. Potential source from disturbance of silts on bottom of culvert. Wiley Park Station Contractor works alongside culverts.	None	N/A
22/02/2022	21.4	144	No	Ewart St, Dulwich Hill: turbid/dirty water observed in kerbs and Gutters Wiley Park: NO JHLOR works in area. High flow turbid water in the western culvert, including small inlet from the side (Source unknown), potentially from concrete GLT.	None	N/A

3.2 Noise and Vibration Monitoring

Attended noise monitoring was undertaken as required for OOHW and possessions, where noise modelling predicted significant exceedance of Rating Background Levels or otherwise required validation using this method.

Attended noise monitoring has been conducted for activities with significant predicted exceedances of noise management levels, mostly occurring where works are conducted in the evening or night-time periods. SMC have committed to review impacts and mitigation of construction activity and document outcomes where an exceedance is recorded or a complaint is made related to project construction activities.

Results from attended noise monitoring are summarised in Table 3. Noise monitoring results from the reporting period indicated that works occurred at noise levels at or below predicted levels, with the exception of two exceedances during the Week 19 Possession (06/11/2021-07/11/2021) JHLOR have undertaken an investigation into the exceedance at South Terrace in accordance with Section 8.4 of the CNVMP (& Condition R4.3 of the EPL) and a Noise Exceedance Report was submitted to the ER and NSW EPA (refer *SMCSWSSJ-JHL-WEC-EM-REP-000022 - Noise Exceedance Review- Week 19 Possession Works*). The investigation into the exceedance determined that a larger drill was used on site than had been included in the model. The model has since been updated to include the noise level associated with larger drilling equipment. The exceedance at Uranga Parade has no further information documented other than the noise data collected on site and was suspected to be related to ULX construction activities.

It is noted that wind speeds exceeded the recommended maximum level for noise monitoring as described within “*AS1055-2018 Description and measurement of environmental noise*” on several occasions, leading to exceedances. Monitoring was undertaken during these periods to provide indicative noise monitoring results only.

As part of attended noise monitoring, significant extraneous noise has been recorded as impacting receivers and monitoring results, including throughout the night-time period, well above the given RBLs. Monitoring locations and timing has been adjusted where necessary to try to isolate construction impact, however this is often not feasible. Common extraneous noise sources include:

- Noise from passing freight trains on the ARTC line
- Road traffic, particularly rail replacement buses during rail possessions

There was four noise complaints made within the period that were found to be relevant to JHLOR works.

1. 17/10/2021 Dulwich Hill – Overhead wire works – AA/respite offered and not accepted – Unavoidable.
2. 08/01/2022 Hurlstone Park – Tamping – notification issued to residents in proximity to works – Unavoidable.
3. 06/02/2022 Hurlstone Park – CSR Install – No trigger for respite of AA – noise within modelled levels – Unavoidable.
4. 18/02/2022 Marrickville – OOHW clean up activities – Outline investigation and corrective actions / apologies extended to stakeholder – Avoidable.

Real time vibration monitoring was conducted on two occasions within the period in order to assess noise and vibration impacts and that works fall within relevant criteria. Continuous real-time vibration monitoring was undertaken at Bankstown medical imaging centre on 22/10/2021 to generate a baseline for upcoming compaction works however static rolling was utilised instead of vibratory rolling and secondary vibration monitoring in relation to the proposed works was not undertaken. Attended and continuous real time vibration monitoring was undertaken during WE32 possession on 05-06/02/2022 at Hurlstone Park during the reporting period. Vibration monitoring was undertaken during representative periods of the above works to demonstrate that vibration screening was within relevant criteria. The data has been made available in real-time as per condition C11 and all detailed records are maintained.

To date, there has been no exceedances of vibration from construction activities, and recorded vibration (PPV in mm/s) has been well below cosmetic vibration limits for affected structures. As above, attended noise and vibration monitoring has identified that external non-construction noise and vibration sources are frequent in the areas, which is also expected to reflect in the results of any real-time continuous monitoring.

Table 3 - Attended Noise Monitoring Results

NCA	Date	Time (hrs)	Duration (Mins)	Construction Activities	Audible noise from SSJ construction activities	Main source of noise	LA(eq)	LA _{Max}	Period	Predicted construction sound pressure level (LA(eq,15min))	Compliance	Comments
NCA12	12/10/2021	22:05	15	Stacey Street Vegetation Prune/clearing	Construction activities barely audible	Traffic from Stacey St and South Terrace.	67.0	78.4	Night	76	Yes	Stacey Street Vegetation Clearance - Monitoring at 35m. ID #: L584. Bridge deck and column supports acting as noise curtain during vegetation prune/clear activities. Use of battery & petrol chainsaws. Commenced activities closest to residents (early evening) with work conducted further away during the late evening period. No mulching on site and no work after midnight.
NCA12	16/10/2021	8:13	15	South Terrace Bankstown - None - this was a pre-start background reading	None	Traffic	68.0	82.9	Day	65	Yes	WE16 Possession - Between the hours of 8:30am and 12:30pm a NML of 65dBA was set at the Medical Imaging Centre. This round of monitoring was undertaken prior to works commencing. It was found that the background level exceeded the target of 65dBA due to constant traffic (particularly buses) LA _{max} associated with passing buses
NCA12	16/10/2021	8:33	15	South Terrace Bankstown - Tree felling	Chainsaws intermittent	Traffic	67.7	80.7	Day	65	Yes	WE16 Possession - Chainsaw use was intermittent - short bursts then arborist repositioned. Monitoring indicates that works are not increasing noise levels in area. Note: According to BOM data, wind speeds were in excess of 18km/hr (above Australian Standard Recommendation and reason for exceedance) - as such monitoring is indicative only. Note: predicted noise level once medical facility closes is 74dBA.
NCA12	16/10/2021	8:58	15	West Terrace - Tree felling	Chainsaws intermittent	Traffic	66.0	81.5	Day	74	Yes	WE16 Possession - This location was further away than the medical imaging centre. Chainsaw use was intermittent - short bursts then arborist repositioned. Monitoring indicates that works are not increasing noise levels in area. Given that the noise level is similar here to the modelling taken at 248 South Terrace, it appears that traffic is consistently creating the majority of noise in the area. Note: According to BOM data, wind speeds were in excess of 18km/hr (above Australian Standard Recommendation) - as such monitoring is indicative only.

NCA	Date	Time (hrs)	Duration (Mins)	ConstructionActivities	Audible noise from SSJ construction activities	Main sourceof noise	LA(eq)	LAMax	Period	Predicted construction soundpressure level (LA(eq,15min))	Compliance	Comments
NCA2	16/10/2021	20:22	11	Sugar House Road, Canterbury - Bridge Bolts	Yes, Powertools on Bridge	Powertools (canterbury station audible)	59.0	71.0	Evening	63	Yes	WE16 Possession
NCA2	16/10/2021	21:05	15	Livingstone Road, Marrickville - Bridge Repair and Foundation	Yes, Generator bridge work	Generator	62.4	76.7	Evening	70	Yes	WE16 Possession
NCA1	16/10/2021	21:50	15	Meeks Road, Marrickville - Fencing	Faint, mostly traffic	Traffic	59.3	75.1	Night	60	Yes	WE16 Possession
NCA7	16/10/2021	21:41	15	Wilfred Lane, Campsie - Bridge bolts	Yes, Power tools	Powertools	64.4	71.1	Night	65	Yes	WE16 Possession
NCA8	16/10/2021	23:03	15	Loftus Street, Belmore - ULX construction	Yes, Excavator	Excavator	64.1	85.1	Night	69	Yes	WE16 Possession
NCA2	16/10/2021	23:41	15	Railway Parade, Lakemba - ULX construction	Yes, Excavator, Hydreema	Excavator / Hydreema	60.5	81.8	Night	68	Yes	WE16 Possession
NCA2	17/10/2021	0:57	15	Bedford Crescent, Dulwich Hill - Redundant OHW removal	Yes, OHW stripping (not-loud)	EWP	49.8	64.7	Night	58	Yes	WE16 Possession
NCA2	17/10/2021	3:35	15	The Parade, Dulwich Hill - General 'on track' construction activities. Excavator digging & loading material to dumpers. Loading 1 truck for transfer of spoil off site. Oxy cutting & removal of steel structures	All activities are just audible	Plant moving along tracks	56.2	69.4	Night	63	Yes	WE16 Possession - Few passing vehicles. Monitoring with plant moving along track between 40-60m from instrument. ID #: L595 No jackhammer work during this period
NCA2	17/10/2021	4:40	15	Livingstone Road, Marrickville - Crews working on scaffolding under the bridge - not audible. Compressor behind noise mats - audible	Compressor behind noise mats	Compressor behind noise mats	57.5	72.6	Night	60	Yes	WE16 Possession - Monitoring at residence, 15m from compound fence (with surrounding noise mats). ID #: L596

NCA	Date	Time (hrs)	Duration (Mins)	ConstructionActivities	Audible noise from SSJ construction activities	Main sourceof noise	LA(eq)	LAMax	Period	Predicted construction soundpressure level (LA(eq,15min))	Compliance	Comments
NCA2	17/10/2021	6:25	15	The Parade, Dulwich Hill - General 'on track' construction activities. Excavator digging & loading material to dumpers. Transfer of spoil off site. Oxy cutting & removal of steel structures	All activities are just audible	Plant moving along tracks	57.0	73.8	Night	63	Yes	WE16 Possession - Few passing vehicles. Monitoring with plant moving along track between 40-60m from instrument. ID #: L598 No jackhammer work during this period Another contractor working on Ewert St side of tracks.
NCA2	20/10/2021	23:38	15	Loftus Street, Belmore -Hand Tamping	Yes	Construction activities	34.3	66.9	Night	69	Yes	Belmore emergency Works - Infrequent noise from hand tamping
NCA8	21/10/2021	23:56	15	Railway Road, Lakemba - Hand Tamping	Yes	Traffic and Construction activities	54.7	78.1	Night	65	Yes	Belmore emergency Works - Infrequent noise from hand tamping
NCA7	24/10/2021	1:16	15	Loftus Street, Belmore Excavation	Yes	Construction activities	60.2	71.3	Night	68	Yes	WE17 - Possession
NCA11	23/10/2021	23:38	15	Stansfield Avenue, Bankstown - Excavation	Yes	Construction activities	62.4	89.7	Night	71	Yes	WE17 - Possession
NCA12	06/11/2021	16:23	15	West Terrace, Bankstown - Concrete Pump	None	Traffic	67.8	85.4	Evening	57	Yes	WE19 Possession - Construction Works inaudible, traffic constant, wind gusts above monitoring standards. Wind is reason for exceedance.
NCA8	06/11/2021	22:37	15	Bellevue Avenue, Lakemba - Excavator moving along corridor	Excavator	Traffic	55.3	71	Night	68	Yes	WE19 Possession - Lamax from Traffic
NCA8	06/11/2021	23:02	15	Dennis Street, Lakemba - Excavator and Hydreema	Excavator and Hydreema	Construction	59.4	90.1	Night	65	Yes	WE19 Possession
NCA9	06/11/2021	23:25	15	Defoe Street, Wiley Park - Excavator	Excavator	Construction	56.5	75.6	Night	65	Yes	WE19 Possession - Lamax from Traffic
NCA10	06/11/2021	23:43	15	Uranga Parade, Punchbowl - Excavator and Truck and Dog	Excavator	Construction	67.8	85.4	Night	65	No	WE19 Possession - Exceedance from excavation activities related to ULX construction – No further information available, no complaints received. A second monitoring session was not conducted.
NCA4	07/11/2021	2:55	15	Church St - Repairs under the bridge. Generator running. No compressor.	Small generator	Construction	52.5	70.3	Night	66	Yes	WE19 Possession - "2# freight trains passing on ARTC tracks during monitoring period.

NCA	Date	Time (hrs)	Duration (Mins)	ConstructionActivities	Audible noise from SSJ construction activities	Main sourceof noise	LA(eq)	LAMax	Period	Predicted construction soundpressure level (LA(eq,15min))	Compliance	Comments
NCA11	07/11/2021	5:35	15	South Terrace, Bankstown - Drilling holes into the concrete on the outside of the bridge.	Handheld drilling equipment	Construction	77	Unknown Data	Night	67	No	WE19 Possession - Drilling activities suspended. Continued installing & grouting bolts into holes. Exceedance related to: - A larger drill was used to drill the holes, compared to similar activities along the alignment on other rail bridges. - Works occurred closer to the resident than modelled – the model assumed the average case (drilling occurring in the middle of the bridge) rather than the worst case (drilling occurring closer to the residents), Unable to record LMax due to equipment shutdown.
NCA1	13/11/2021	21:55	15	Meeks Road, Marrickville - Shotcrete to inside of tunnel under Meeks Rd	Yes - barely audible	Construction	56.2	69.0	Night	59	Yes	WE20 Meeks Road - Monitoring at 60m. ID #: L624. Noise was barely audible as a hissing, white noise in the distant background. Meeks Rd was wet with occasional passing vehicles and 2 light trucks
NCA9	19/12/2021	2:40	15	Railway Parade, Lakemba - CSR	Excavator, LVs, light towers, dump truck	Construction	57.7	76.3	Night	63.0	Yes	WE25 Possession
NCA6	19/12/2021	3:10	15	Loch Street, Campsie - ULX	Excavator, Wacker packer, light tower	Construction	56.6	74.1	Night	67.0	Yes	WE25 Possession
NCA4	19/12/2021	3:50	15	Sugar House Road, Canterbury - Bridge works	Hand tools, light towers	Construction	49.3	57.5	Night	68.0	Yes	WE25 Possession
NCA8	19/12/2021	5:10	15	Bellevue Avenue, Lakemba - Install ULX 12. Excavator, dumper, hand tools	Activity barely audible	construction	58.1	70.2	Night	63	Yes	WE25 Possession - ID# L630. Works at ULX 12 across track. Construction noise barely audible with non- possession related vehicles (taxi) and trucks passing near monitor.
NCA10	26/12/2021	4:57	15	Urunga Parade, Punchbowl - Tamping hi-rail pad	Tamping	Construction	67.8	79.4	Night	73	Yes	Xmas Shutdown - Tamper moving back and forth
NCA12	26/12/2021	8:35	15	West Terrace, Bankstown - GST install including on West Terrace bridge, ULX and ground beam at Station	Excavator	Traffic	65.4	78.6	Day	70	Yes	Xmas Shutdown - Heavy traffic on South Terrace. Excavator was operating intermittently

NCA	Date	Time (hrs)	Duration (Mins)	ConstructionActivities	Audible noise from SSJ construction activities	Main sourceof noise	LA(eq)	LAMax	Period	Predicted construction soundpressure level (LA(eq,15min))	Compliance	Comments
NCA6	26/12/2021	1:13	15	Anglo Road, Campsie - GST works	Excavator	Construction	52.1	68.3	Day	68	Yes	Xmas Shutdown - Some traffic also audible but construction was main contributor Wind exceeded AS reqs
NCA8	26/12/2021	1:58	15	Ernest Street, Lakemba - GST works	Excavator	Construction	57	75.6	Day	68	Yes	Xmas Shutdown - Wind exceeded AS reqs
NCA1	29/12/2021	8:10	15	Myrtle Street, Marrickville - Driven Piles Victoria Rd bridge RWB	Hydreema	Traffic/ARTC Train	64.3	85.3	Day	78	Yes	Xmas Shutdown - Main noise source came from traffic
NCA2	29/12/2021	8:40	15	Ewart Street, Dulwich Hill - Retaining Wall and Hi-rail pad	Nil	Traffic (Bus Route)	60.7	80.9	Day	74	Yes	Xmas Shutdown - Main noise source came from traffic, buses and ARTC train
NCA3	29/12/2021	9:10	15	Hurlstone Avenue, Hurlstone Park - Retaining Wall D - access via Melford St	Excavator	Construction	57.1	75.4	Day	67	Yes	Xmas Shutdown - Loudest noise source came from ARTC train
NCA6	29/12/2021	9:35	15	Sugar House Road, Canterbury - Church St Footbridge Bolts	Drill	Construction	55.3	69.7	Day	70	Yes	Xmas Shutdown - Loudest noise source came from ARTC train
NCA7	29/12/2021	1:15	15	Loftus Street, Belmore - Local Routes and Hi-rail Pad install - pads & concreting	Drill and excavator	Construction	62.2	80.7	Day	74	Yes	Xmas Shutdown - Loudest noise source came from ARTC train Dropped ballast on rail 79dB
NCA10	29/12/2021	1:50	15	Urunga Parade, Punchbowl - Hi-rail Pad - pads & concreting	Excavator and tampering	Construction	62	73.3	Day	62	Yes	Xmas Shutdown - Some traffic, construction was main noise contributor
NCA11	29/12/2021	2:25	15	South Terrace, Bankstown - Stacey St ULX	Nil	Traffic	68.9	84.6	Day	68	Yes	Xmas Shutdown - Main noise source came from traffic – reason for exceedance
NCA11	30/12/2021	8:55	15	Wattle Street, Bankstown - Stacey St ULX	Nil	Construction	59.7	69.9	Day	68	Yes	Xmas Shutdown - Some traffic, construction was main noise contributor
NCA11	1/01/2022	8:10	15	South Parade, Bankstown - Stacey St ULX	Excavator	Traffic	66.3	85.8	Day	70	Yes	Xmas Shutdown - Construction noise was consistent Main noise source came from buses passing
NCA4	2/01/2022	8:20	15	Hurlstone Avenue, Hurlstone Park - Retaining Wall D	Drill	Construction	56	73.6	Day	67	Yes	Xmas Shutdown - Construction noise was main source
NCA1	3/01/2022	9:05	15	Charlotte Avenue, Marrickville - Retaining Wall B	Generator	Construction	65.1	77.2	Day	77	Yes	Xmas Shutdown - Generator was main source of construction, noise blankets now placed around generator

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NCA	Date	Time (hrs)	Duration (Mins)	ConstructionActivities	Audible noise from SSJ construction activities	Main sourceof noise	LA(eq)	LAMax	Period	Predicted construction soundpressure level (LA(eq,15min))	Compliance	Comments
NCA7	3/01/2022	10:05	15	Redman Parade, Belmore - GST	Nil	Traffic	58.7	79.5	Day	63	Yes	Xmas Shutdown - Traffic main source Ferrycarrig busses 77.7dB
NCA8	3/01/2022	10:45	15	Railway Parade, Lakemba - GST	Excavator and truck offloading stockpiles	Construction	58.7	68.8	Day	68	Yes	Xmas Shutdown - Construction was main noise source Loudest noise was truck and excavator offloading stockpiles
NCA7	3/01/2022	1:45	15	Lilian Lane, Campsie - GST	Excavation	Construction	56.2	73.9	Day	68	Yes	Xmas Shutdown - Construction noise was main source; however it was intermittent Loudest noise was ARTC train passing and honking 73dB
NCA6	3/01/2022	2:45	15	Sugar House Road, Canterbury - HD Bolt Drilling	Drill	Construction	50	65.9	Day	77	Yes	Xmas Shutdown - Consistent noise came from cicadas Flock of birds flying overhead Drilling noise was intermittent, occurred once during monitoring session
NCA12	3/01/2022	23:25	15	West Terrace, Bankstown - Minor works, Welding, track clean-up with an excavator	Nil	Traffic	65	83.6	Night	60	Yes	Xmas Shutdown - Monitoring at 120m from only activity (on city side of vehicle underpass). ID #: L651. Construction activities not audible. Exceedance is from busy intersection - numerous buses replacing trains and vehicles accelerating through intersection.
NCA4	4/01/2022	11:40	15	Hurlstone Avenue, Hurlstone Park - Concrete Pouring	Concrete Agi	Construction	69.7	88.7	Day	67	Yes	Xmas Shutdown - ARTC Train Passing recording 87dB (Leq) – Reason for exceedance Construction main source of noise, ARTC train was significantly louder
NCA12	5/01/2022	11:45	15	West Terrace, Bankstown - OHW	EWP	Traffic	65.1	80.1	Day	66	Yes	Xmas Shutdown - Traffic main noise source, bus passing recorded 75dB
NCA4	6/01/2022	8:05	15	Burwood Road, Belmore - ST Tamping at Station UP track countryside, alongside platform.	Tamper	Tamper	76.9	90	Day	78	Yes	Xmas Shutdown - Monitoring at 20m from work on track ID #: L658. Tamper delayed and only arrived on site at 07:45 to commenced work at 07:50 and progressed from west to east along UP track first.
NCA12	6/01/2022	7:07	15	West Terrace, Bankstown - General construction activities - alongside track on countryside of bridge.	Construction activities barely audible	Traffic/buses and vehicles accelerating through intersection	66.8	81.4	Day	67	Yes	Xmas Shutdown - Monitoring at 100m from work on track ID #: L657. Construction activities were barely audible. There wast two occasions where there was short misty rain in the area.

NCA	Date	Time (hrs)	Duration (Mins)	ConstructionActivities	Audible noise from SSJ construction activities	Main sourceof noise	LA(eq)	LAMax	Period	Predicted construction soundpressure level (LA(eq,15min))	Compliance	Comments
NCA4	7/01/2022	12:35	15	Dunroon Street, Hurlstone Park - ST Tamping at Station UP track countryside, alongside platform.	Tamper	Tamper	78.6	93.6	Day	84	Yes	Xmas Shutdown - Monitoring at 25m (representative location for 103 Dunroon St) from work on track ID #: L661. Tamper delayed (by Station Contractor. Was supposed to be 06:00 commence) and only arrived on site at 12:00 to commenced work at 12:35 and progressed from west to east along UP track first.
NCA4	8/01/2022	7:30	15	Charles Street, Canterbury - Service Searching, excavating and loading out ballast	Excavating	Excavating	55.8	75.1	Day	69	Yes	Xmas Shutdown - HSE Construction site was ~300m away to our works, they were the loudest and continuous noise source
NCA4	8/01/2022	9:05	15	Melford Street, Hurlstone Park - Piling works, excavator with attachment	Excavating	Excavator	61.6	70.1	Day	77	Yes	Xmas Shutdown - ARTC De-clipping works occurring under Melford St Bridge (loudest noise source) JHLORJV Piling works is most consistent noise source
NCA6	8/01/2022	9:30	15	Anglo Road, Campsie - GST	Hammering	Construction	60.6	76.5	Day	68	Yes	Xmas Shutdown - Construction was main noise source
NCA7	8/01/2022	10:15	15	Redman Parade, Belmore - GST	Hammering	Construction	61.7	82.2	Day	68	Yes	Xmas Shutdown - Trucks with spoil heading to and from Belmore Triangle reached 82
NCA2	8/01/2022	11:50	15	Randall Street, Marrickville - OHW removal	Drill	Construction	59.6	79	Day	70	Yes	Xmas Shutdown - ARTC de-clipping occurring on ARTC line next to works, 79dB recorded JHLORJV main and most consistent construction noise
NCA2	8/01/2022	23:02	15	Charles Street, Canterbury - Seg Fence Piling	Augur	Traffic/Augur Intermittent	61.6	85.3	Night	74	Yes	Xmas Shutdown - LaMax from passing non-project van
NCA4	9/01/2022	8:05	15	Sugar House Road, Canterbury- Asphalt removal	Excavator	Excavator	53.9	69.2	Day	70	Yes	Xmas Shutdown - Construction main noise source
NCA12	5/02/2022	6:20	15	West Terrace, Bankstown - Rigging up 400T mobile crane	Rigging works when no traffic passing through intersection	traffic/construction	66.5	93.9	Night	72	Yes	WE32 Possession - Rigging up 400T mobile crane
NCA11	5/02/2022	7:20	15	Stansfield Avenue, Punchbowl - Excavation of area to enable construction of concrete pit.	Excavator	Excavator	62.9	71.9	Night	69	Yes	WE32 Possession - Excavation of area to enable construction of concrete pit.
NCA3	5/02/2022	8:15	15	Melford Street, Hurlstone Park - Jackhammering rock, Removal of spoil & scaffold erection	Construction activities	Construction activities	71.4	87.9	Day	74	Yes	WE32 Possession - Jackhammering rock, Removal of spoil & scaffold erection

NCA3	5/02/2022	19:12	15	Melford Street, Hurlstone Park - Jackhammering rock	Construction activities	Construction activities	71.7	89.6	Evening	74	Yes	WE32 Possession - Jackhammering rock
NCA12	5/02/2022	23:04	15	West Terrace, Bankstown - Crane Lift of Plant and Steel	Crane winching	Traffic and Construction activities	66.7	91.4	Night	69	Yes	WE32 Possession - Crane Lift of Plant and Steel
NCA8	6/02/2022	23:37	15	Quigg Street, Lakemba - Excavator auguring GST post	Construction activities	Construction activities	58	82.8	Night	65	Yes	WE32 Possession - Excavator auguring GST post

NCA	Date	Time (hrs)	Duration (Mins)	ConstructionActivities	Audible noise from SSJ construction activities	Main sourceof noise	LA(eq)	LAMax	Period	Predicted construction soundpressure level (LA(eq,15min))	Compliance	Comments
NCA6	6/02/2022	0:08	15	Loftus Street, Blemore - Excavator and Hydreema backfilling material	Construction activities	Construction activities	51.7	70.1	Night	68	Yes	WE32 Possession - Excavator audible, occasional hydreema delivering material, LaMax from material placement
NCA3	6/02/2022	0:41	15	Lilian Lane, Belmore - Excavator lifting pit into place	Excavator lifting	Audible but quiet, passing traffic infrequent but louder	47.5	74.3	Night	70	Yes	WE32 Possession - Pit installation activities only, GST installation did not occur LaMax from traffic (cars passing)
NCA3	6/02/2022	7:20	15	Melford Street, Hurlstone Park - Jackhammering rock	Construction activity barely audible /audible	Construction	52.2	77.2	Night	50	Yes - Traffic dominant - construction barely audible	COMPLAINT WE32 Possession - Monitoring at 80m. ID #: L683. Resident is located on the down slope of a hill (south of road) with a line of houses and steep cutting, bushes offering noise attenuation Construction noise was barely audible/audible and seemed like a noise in the distant background. Numerous vehicle movements causing most noise.
NCA3	6/02/2022	19:21	15	Hurlstone Parade, Hurlstone Park - Load-out of spoil	Construction activities	Excavator loading spoil and single bogie trip, occasion non-construction traffic	61.9	84.2	Evening	67.0	Yes	WE32 Possession - Single Loud car passing responsible for LaMax
NCA12	16/02/2022	22:27	15	Melford Street, Hurlstone Park - Excavation of stormwater connection	Excavator and lighting tower	Traffic	66.7	-	Night	75	Yes	BEW Services Connection - Quieter than expected as vac truck was not required for works
NCA1	19/02/2022	22:30	15	West Terrace, Bankstown - Repair work inside of tunnel under Meeks Rd	Yes - barely audible	construction	57.3	74.7	Night	70	Yes	WE34 Meeks Road - Monitoring at 35m. ID #: L686. Noise was barely audible. Repairs to tunnel walls and structure. EWP working inside tunnel. Compressors and generators on site but not audible. No plant working outside tunnel portals. Can only

3.3 Vibration

Vibration monitoring was required twice during the period. No exceedances of vibration from construction activities during the reporting period.

4. Mitigation Measures

4.1 Noise and Vibration

Standard mitigation measures were implemented as per Section 7 of the Construction Noise and Vibration Management Plan, and Sections 6.2 and 6.4 of the Construction Noise and Vibration Impact Statement. These were effective during the reporting period.

In response to the noise exceedance recorded on 6th- 7th November 2021, JHLOR has updated the noise model to include larger drilling equipment and all drilling activities was stopped as an exceedance mitigation measure.

4.2 Water

Standard mitigation measures were implemented as per Section 6 of the Construction Soil and Water Management Plan. Controls were repaired as required and were effective during the reporting period.

5. Conclusion

Pre-construction surface water monitoring began in March 2021, with results showing several instances of poor water quality due to detritus and turbidity. Monitoring during the September 2021 – February 2022 period indicated no adverse impacts associated with JHLOR activities.

Erosion-sediment control plans are maintained and reviewed regularly, and JHLOR conducts weekly and post rain environmental inspections. The Environment Representative also conducts bi-weekly inspections, and any observations are closed out within agreed timeframes.

Monitoring records have validated modelled noise and are consistent with the predicted impact of construction activities on noise catchment areas, including sensitive receivers. Two exceedances involving noise and vibration monitoring were reported during the period and one noise complaint.