Southwest Metro Early Works Construction Monitoring Report – August to November 2021

SMCSWSSJ-JHL-WEC-EM-REP-000021

Document and Revision History

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Title	Construction Monitoring Report
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Revisions

Revision	Date	Description	Prepared by	Reviewed by
A	14/01/2022	Issued for comment	Dan Keegan	Tony Waters
B	20/01/2022	Updated for Sydney Metro Comments	Dan Keegan	Tony Waters

Management reviews

Review date	Details	Reviewed by

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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 Early Works (SMEW).

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
- 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 Campsie, NSW.

The Project site forms part of the overall Cooks River catchment with water from the area discharging into the Cooks River via local stormwater drainage or overland flow. The catchment area is highly urbanised with mixed residential, commercial and industrial properties.

Project works occur adjacent to the Cooks River at the Canterbury (Cooks River) Underbridge. Project works occurring adjacent to the Cooks River include embankments stabilisation, combined service route installation and construction of security fencing.

Water quality is measured on an ongoing basis for the wider Cooks River catchment by the NSW Office of Environment and Heritage as part of the Beachwatch 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 discharges and sewage contamination.

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 SMEW 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.

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

A number of sensitive non-residential receivers have been identified within the vicinity of the project works. These include;

- Casimir Catholic College
- St Maroun's College
- Dulwich Hill Childcare Centre
- Canterbury Family Day Care

No noise or vibration intensive construction activities have taken place in in the vicinity of these facilities during the period.

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 SMEW 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.

Most construction works will not generate vibration which would be perceptible within the nearest residences, but some works, such as compaction by vibratory roller may generate vibration levels above the vibration criteria at the nearest residences on Garnet Street, Dulwich Hill and Charles Street, Canterbury.

2. Methodology

2.1 Surface Water

Surface water monitoring is undertaken at four points adjacent to the Canterbury Cooks River Underbridge, two upstream (Cooks River East 1 and Cooks River West 1) and two downstream (Cooks River East 2 and Cooks River West 2). All locations are located at the bank of the Cooks River as these are the locations that are generally accessible. Refer to Figure 1 for sampling locations.

The Cooks River is tidal at the test locations. During low tide events some sample locations are inaccessible.

The channel is uncovered for the majority of its length along the project. The water level in the channel is generally fairly shallow outside of significant rain events (less than 20cm), with limited vegetation. Water sources are diverse urban run-off from collected stormwater.

The locations identified for surface water monitoring are the only locations that generally offer safe access. There are several drainage outlets between the upstream and downstream sampling points on both sides of the Cooks River.

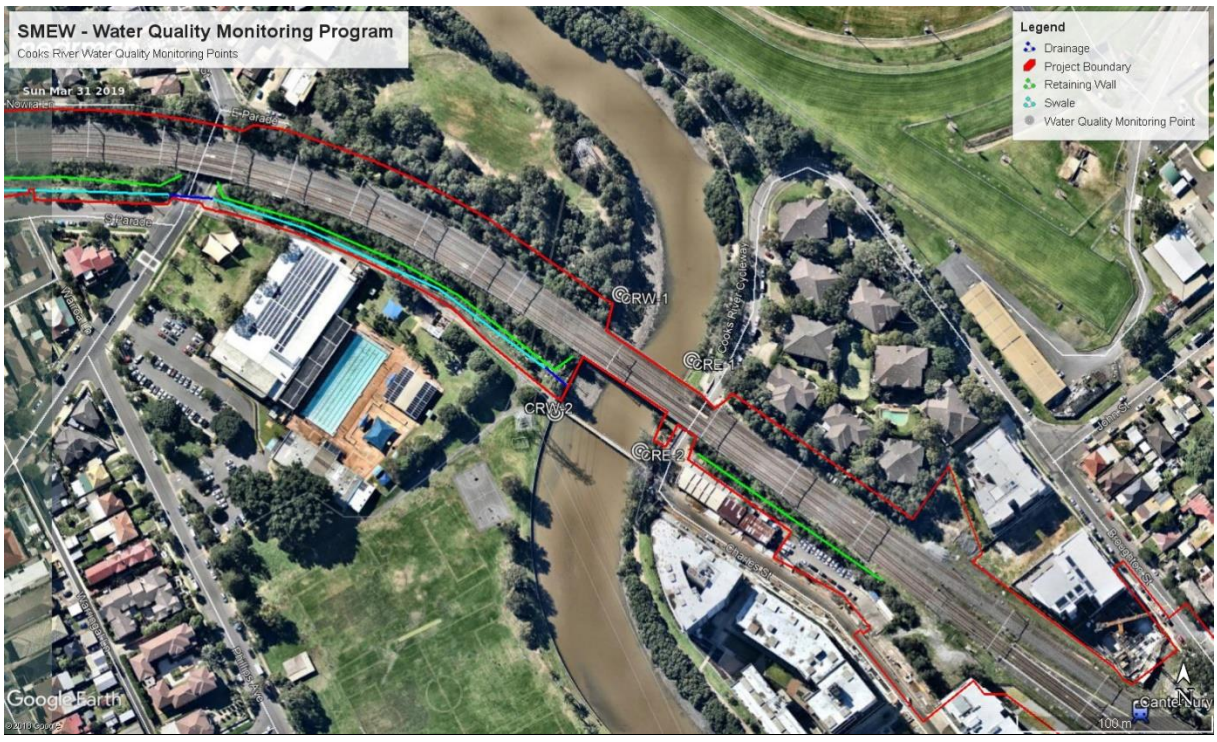

Figure 1 - Surface Water Monitoring Locations

In accordance with the Monitoring Program, surface water quality monitoring is to be undertaken as follows for the parameters in Table 1:

- Pre-construction – monthly, pending safe access
- SMEW construction stage – every three months & following wet weather events (>20mm in 24hrs), pending safe access

Pre-construction monitoring was undertaken monthly prior to the start of Construction in August 2019. Surface water quality monitoring of the receiving environment prior to construction is highly unlikely to define suitable standards or benchmarks for water quality discharges from the SMEW site given that water quality from urban areas that contribute water to the Cooks River between upstream and downstream test locations are highly variable and change according to activities within the local catchment, prevailing weather patterns and day-to-day during rainfall.

Canterbury Racecourse BOM weather observations were used to report the amount of rainfall 24hrs prior to monitoring and to determine when reportable rain event occurs.

The Environment Protection Licence (#21147) provides the project with criteria to discharge off-site through approved discharge points. Discharge points are located within both SSJ and SMEW. These criteria must be met prior to discharge. A record of monitoring for dewatering on the project is maintained and made available on the Project website. Discharges into the local stormwater system occurred on one occasion during the reporting period. This discharge was related to the emptying of water filled barriers.

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

Table 1 - Water Monitoring Parameters

Parameter	Sampling Methods	Analytical Method	ANZECC Criteria* Freshwater	Proposed Trigger Values	Proposed Actions
Temperature (°C)	Probe	Field analysis	> 80%ile < 20%ile	Downstream results are > than upstream results in rainfall events up to and including the significant event threshold of >20mm in 24 hours.	Environment Manager (or delegate) to re-test to confirm results and undertake an inspection of the adjacent works and propose actions where required.
Dissolved Oxygen (DO)	Probe	Field analysis	Lower limit – 85 Upper limit – 110		
Turbidity (NTU)	Probe	Field analysis	6 – 50		
Oil and grease	Visual analysis, then grab sample if required	Visual assessment. Confirmed with lab analysis if required	-		
pH	Probe, grab sample if required	Field analysis, lab analysis if required	Lower limit – 6.5 Upper limit – 8.5		
Salinity (EC)	Probe	Field analysis	125 – 2200		
Total Suspended Solids (TSS)	Probe, grab sample if required	Field analysis, lab analysis if required	-		
Total phosphorus	Grab sample	Lab analysis	25ug/L		
Total nitrogen	Grab sample	Lab analysis	350ug/L		
Chlorophyll-a	Grab sample	Lab analysis	3ug/L		

It is noted that due to SMEW embankment stabilisation works finishing within the vicinity of the water quality test locations, the water quality monitoring programme was ceased with an update to the SMEW Construction Soil and Water Management Plan, endorsed on 21/04/2021. As such no water quality monitoring was necessary during the period.

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). SMEW works have predominately occurred between NCA1 and NCA10. Noise monitoring was undertaken in 2016 to determine the Rating Background Level for the 13 noise catchment areas within the Sydenham to Bankstown Project area. The Rating Background Levels for all NCAs are shown in Table 2.

Table 2 - 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, the area most regularly impacted by construction noise and vibration was NCA4, adjacent to Canterbury Compound establishment. This catchment contains a number of residential properties – See Figure 2 below.

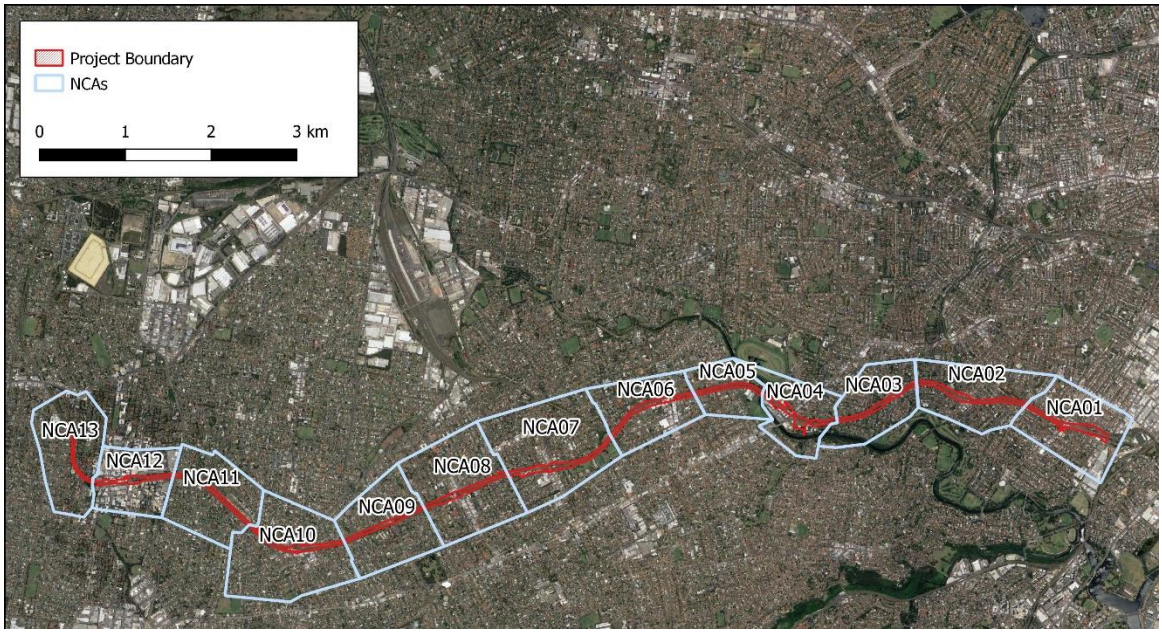

Figure 2 – Noise Catchment Areas

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 is 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 actives 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 Noise

Attended noise monitoring was undertaken for verification purposes during the Canterbury Bowling Club Demolition.

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.

SMEW 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. To date there have been no exceedances of predicted construction related noise levels or complaints assessed as relating to ongoing construction activities on the project. All exceedances recorded by attended monitoring have been attributed to extraneous noise rather than construction activity. The results for the reporting period are detailed in the results shown below in Table 3

Table 3 - Attended Noise Monitoring Results

NCA	Date	Time (hrs)	Duration	Time Units	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
NCA4	28/10/2021	11:37	15	Min	Demolition works to Canterbury Bowls Club building	Yes - barely audible	Vehicle movement & delivery trucks at gate.	52.0	81.5	Day	65	Yes	Monitoring at 50m ('top' of Close St cul-de-sac). ID #: L608. Existing bowl's club building & dense bush strip offers noise attenuation at monitoring location
NCA4	28/10/2021	11:40	15	Min	Demolition works to Canterbury Bowls Club building	Yes - audible	Demolition works	58.6	78.1	Day	70	Yes	Monitoring at 50m ('bottom' of Close St cul-de-sac alongside access gate). ID #: L610. No noise attenuation at monitoring location as line of sight is open to demo activities
NCA4	29/10/2021	12:00	15	Min	Demolition works to Canterbury Bowls Club building	Yes - audible	Demolition works	67.3	82.4	Day	70	Yes	Monitoring at 50m ('bottom' of Close St cul-de-sac alongside access gate). ID #: L611. No noise attenuation at monitoring location as line of sight is open to demo activities

Note: Yellow highlighted boxes appear where an exceedance to the predicted noise levels have occurred due to extraneous sources but where compliance has still be achieved based on observations during attended monitoring.

3.2 Vibration

As part of the compound laydown establishment the Canterbury Bowls Club was demolished. This included the jack-hammering of a number of footings.

Although the nearest receiver is well outside the safe working distances for a medium sized hydraulic hammer, JHLOR undertook vibration monitoring at the work site as the public often perceives demolition as an activity that can cause damage by vibration.

Vibration monitoring was undertaken on the eastern side of the compound area adjacent to residential properties. It is noted that due to access constraints to the residential property and a Sydney Water Culvert between the property boundary and work site, the vibration monitor was placed approximately 15m closer to the works than it would have during standard testing. As such, the results are very conservative.

No exceedances were recorded during the period. Refer to Table 4 for vibration monitoring results from the reporting period.

To date, there have 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.

Table 4 Vibration Monitoring Results

Date	Monitoring Location	Attended or continuous monitoring	Event based monitoring (Y/N)	Parameter eg.PPV	Unit	Minimum value for month	Maximum value for month	Goals/Targets	Comment
25/10/2021 - 1/01/2021 (noting that the hammering of footings took place on 28/10/2021)	Canterbury Site Office - Boundary	Continuous – over 7 days	Y	PPV	mm/s	0.087	2.541	7.5	Demolition of Canterbury Bowling Club It is noted that from the data set this max appears to be a spike, likely unrelated to the works - potentially from checking on monitor battery. In general, several peaks where observed around 0.8mm/s – this is likely more representative of the works

4. Mitigation Measures

4.1 Noise and Vibration

Standard mitigation measure 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.

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

Monitoring records have validated modelled noise and vibration are consistent with the predicted impact of construction activities on nearby sensitive receivers. There have not been any recorded exceedances or project-related complaints regarding noise and vibration impacts.