



Construction Monitoring Report – March 2020 to August 2020

SMCSWSSJ-JHL-WSS-EM-REP-000008

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Compliance Matrix

Condition	Requirement	Reference
C16	The results of the Construction Monitoring Programs must be submitted to the Secretary for information, 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 (CMP) 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 SMu Project.

This report provides the results of the CMP for the period March 2020 to August 2020.

1.1 Submission Requirements

In accordance with condition C16, this will be submitted to the following agencies for information:

- NSW EPA
- Inner West Council
- DPIE

The previous CMP was submitted on 16/04/2020 to stakeholders for information. No further request was received from any of the agencies following the submission of the previous monitoring report.

1.2 Surface Water

The project site is located within the rail corridor at Sydenham Station and several hundred metres to the north and south of the station, 11 Sydenham Road, Marrickville, NSW, the Sydenham Pit and Drainage Pump Station and future precinct areas on Railway Parade and Burrows Avenue, Sydenham, NSW.

The Project site forms part of the overall Cooks River catchment with water from the area discharging into the Cooks River via the Eastern Channel. The catchment area is highly urbanised with mixed residential, commercial and industrial properties. The closest watercourses to the project are man-made, the eastern channel and connecting culverts bordering the project. These collect urban stormwater from the surrounding area and typically exhibit low flow rates outside of rain events and the operation of Sydenham drainage pump.

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.

The Project site also includes the Sydenham Pit. The Sydenham Pit is a large stormwater detention structure that captures stormwater from the Marrickville and Newtown area. The water is detained temporarily before being pumped out into the Eastern Channel. The Sydenham Pit is owned and operated by Sydney Water. The project has specific requirements when working within Sydenham Pit regarding water quality and management, which are contained in the project EPL (21147) and Construction Soil and Water Management Plan (CSWMP).

Objectives for water quality management during construction are:

- The prevention of pollution of surface water through appropriate erosion and sediment control
- Maintain existing water quality of surrounding surface watercourses
- Construct the Project in accordance with the NSW Water Quality Objectives

1.3 Noise and Vibration

The area surrounding the SMu project contains a variety of land-use types and receivers, including residential receivers, commercial, industrial, and 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 north of the rail corridor, and primarily residential areas to the south of the rail corridor. The area surrounding the project is affected by rail noise and vibration and is also underneath flight paths from Sydney Airport. There are therefore a number of residential properties under the Sydney Airport Noise Management Plan. Many, though not all, of these residential receivers have been fitted with double glazed windows, leading to lower internal noise levels originating from outdoor sources, when compared with standard windows.

There are three noise sensitive areas potentially affected by the proposed construction:

- Edgware Road / Lord Street – Located within NCA5. Many residences potentially affected by the construction works in this area have been fitted with heavy double glazing as part of the Sydney Airport Noise Management Plan, but some residences still retain standard single glazed windows.
- Burrows Avenue / Railway Road Area – Located within NCA3. All potentially affected residences in this area have been fitted with heavy double glazing as part of the Sydney Airport Noise Management Plan;
- Meeks Road Area – Located within NCA1. Many residences potentially affected by the construction works in this area have been fitted with heavy double glazing as part of the Sydney Airport Noise Management Plan, but some residences still retain standard single glazed windows.

In addition, two sensitive non-residential receivers have been identified as potentially being affected by noise during the project, Tempe High School and Tillman Park Early Learning Centre (both located within NCA2) – see Figure 1. To date, no construction activities have taken place which were identified as significantly affecting these sensitive receivers during their operating hours.



Figure 1 - Surrounding Land-use and Sensitive Non-Residential receivers

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 SMu work 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 project EPL and monitored accordingly.

Most construction works in this area 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 in Railway Road. At Meeks Road, construction noise levels may exceed the noise management levels at residences at times. However, given that most of the construction works are well removed from Meeks Road, noise impact would be expected to be limited. Equally, vibration levels above the criteria are unlikely to occur in Meeks Road.

No blasting will be undertaken, and ground-borne noise and vibration is also unlikely to occur on the SSJ project as it is typically generated by underground activities such as tunnelling.

2. Methodology

2.1 Surface Water

Surface water monitoring is undertaken at two points, one upstream (EC1) and one downstream (EC 2) of the construction footprint. Both are located in the man-made eastern channel running alongside the rail corridor – See Figure 2. 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 20mm), with limited vegetation. Water sources are diverse urban run-off from collected stormwater.

The two locations identified for surface water monitoring are the only locations that offer safe access. There are several other drainage outlets along the length of the Eastern Channel that may convey water into the channel between the upstream and downstream monitoring locations, however gaining access to the channel at these point is not possible due to obstructions and safety reasons. Note that during the reporting period, the western channel was bypassed to allow construction of new downstream culverts, meaning that upstream flow only passed through the Eastern channel during August, rather than being split between a high and low culvert.

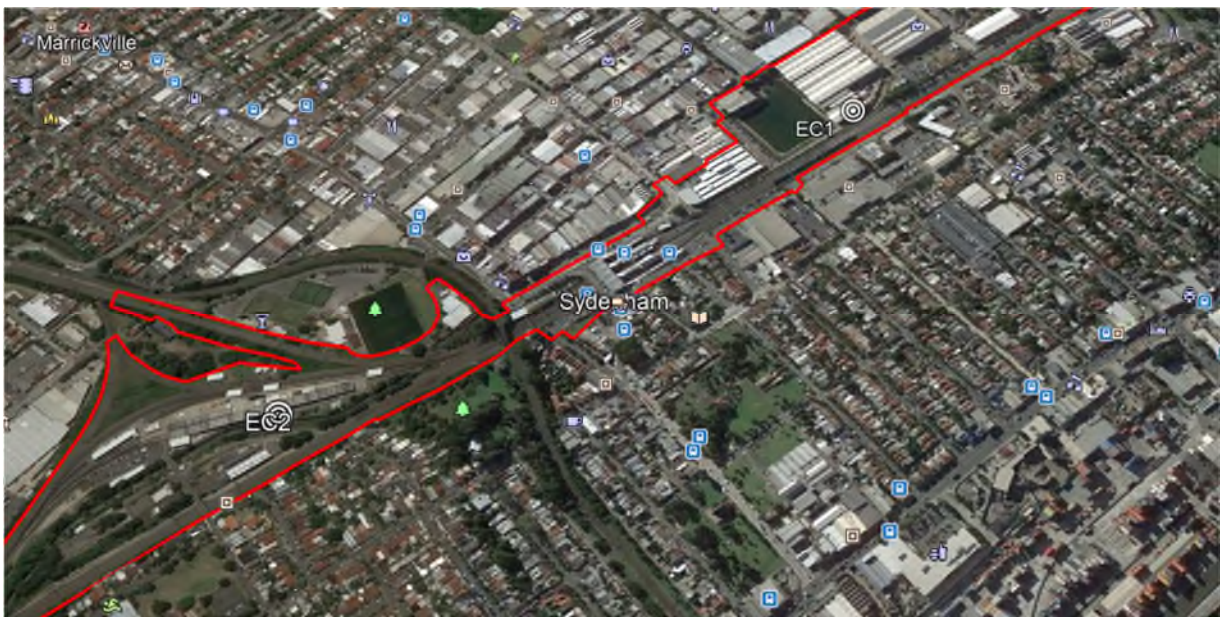


Figure 2 - Surface Water Monitoring Locations

Surface water quality monitoring will be undertaken as follows for the parameters in Table 1:

- Pre-construction – monthly following site control
- SSJ construction stage – every three months & up to 4 wet weather events per year

Pre-construction monitoring was conducted at points EC1 and EC2 monthly, once the project was given site control. 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 SSJ Works given that:

- Waterways along the site are mostly ephemeral

- Water quality from urban areas is highly variable and changes according to prevailing weather patterns and day-to-day during rainfall.

In the event of access issues, surface water monitoring will be taken from an accessible point nearby the culvert or eastern channel where feasible and noted in monitoring results. There were no occasions where an alternative monitoring point was required during this monitoring period. Equipment used was as following:

Type of Meter	Model	Serial Number	Date of Calibration
Water quality monitor multprobe	Horiba U52	YTEVT4TK	9/10/2019
Low range optical suspended solids analyser	Insite IG 3150L	35LS1903	11/05/2020

The Environment Protection Licence (#21147) provides the project with criteria to discharge off-site through approved discharge points. These criteria must be met prior to discharge. A record of monitoring for dewatering on the project is maintained and made available on the EPA website. There are currently no active sediment basins on the project, and none have been identified during the construction phase of the project to date.

Sydney Airport Bureau of Meteorology (BOM) weather observations were used to report the amount of rainfall 24hrs prior to monitoring and determine when a reportable rain event occurs.

SSJ also monitors water quality prior to any planned discharges to ensure water quality is within the parameters listed within the Environmental Protection Licence (No.21147), to minimise any potential impacts to surrounding waterways. This data is published monthly on the project website.

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	-		

2.2 Noise and Vibration Monitoring

As part of the Noise and Vibration Assessment within the Modification Report and Submissions Report, the area surrounding the Project site was divided into 3 Noise Catchment Areas (NCAs). Noise monitoring was undertaken in 2015 and 2016 to determine the Rating Background Level for these catchments. During the development of the Construction Noise and Vibration Impact Statement (CNVIS) further background noise monitoring was undertaken within the surrounding area between 18th & 27th June 2018. The additional monitoring has taken place at the following locations;

- NCA2 – 25 Bridge St, Tempe
- NCA3 – 4 Burrows Avenue, Sydenham
- NCA4 - 80 Unwins Bridge Road, St Peters

Following the development of the CNVIS and the additional monitoring, the area surrounding the project has now been split into 6 Noise Catchment Areas. Current 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*	47	45	40
2	41	46	40
3	51	49	42
4	58	51	43
5**	58	52	38
6***	52	43	38

*Noise levels adopted from Sydenham to Bankstown EIS

**Noise levels adopted from Chatswood to Sydenham EIS

***Noise levels adopted from TSE Marrickville Dive Construction Site

Note: Reported RBLs are as per CNVIS findings, including in NCA2 where daytime is lower than evening. Noise management levels are RBL + 5dB.

Based on planned work in the construction phase, the areas most regularly impacted by construction noise and vibration are expected to be NCA1 and NCA3. These two catchments contain a number of residential properties – See Figure 3 below.

Monitoring equipment used as follows:

Type of Meter	Model	Serial Number	Date of Calibration
Handheld Noise monitor	Svantek SVAN 971	61522	15/05/2020
Sound level calibrator	Svantek SV-33A	90201	15/05/2020
Triaxial accelerometer	Svantek SV-84	H3408	21/08/2020
Sound and vibration analyser	Svantek Svan-958A	69013	21/08/2020
Sound and vibration analyser	Svantek Svan-958A	69017	25/06/2020
Triaxial accelerometer	Svantek SV-84	H3407	25/06/2020

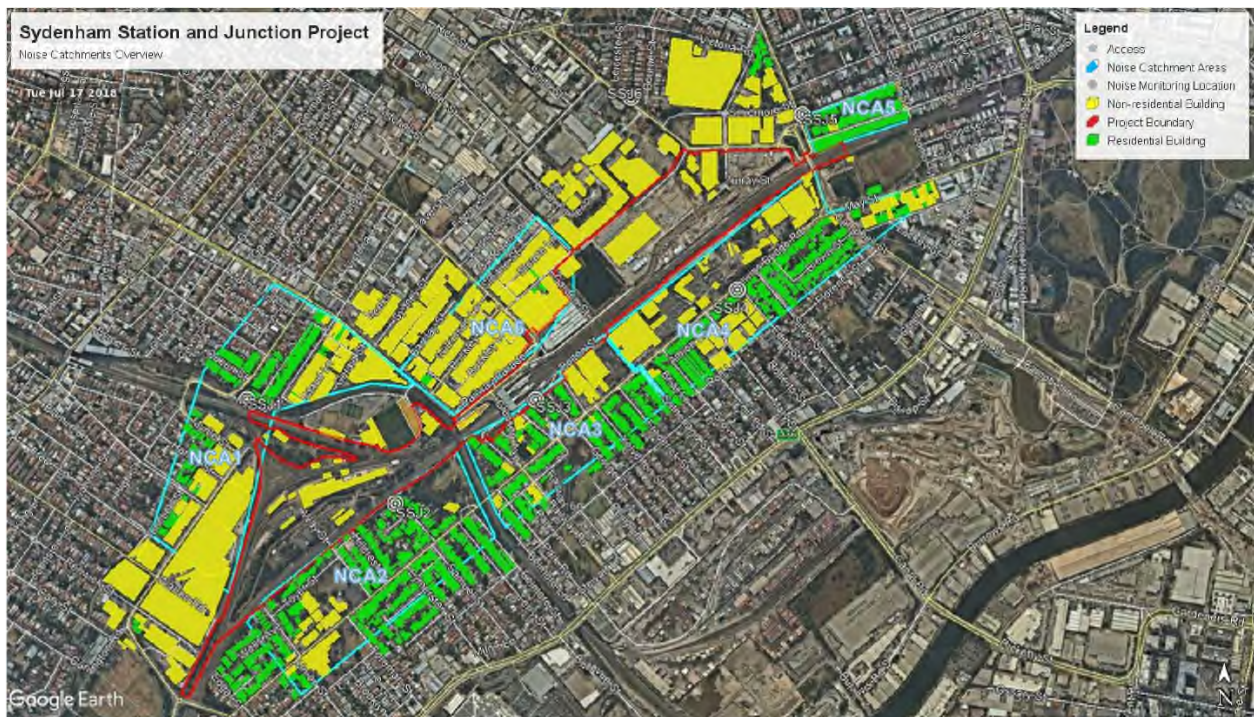


Figure 3 - NCAs and identified residential and non-residential receivers

Monitoring is required to be undertaken during construction activities (including out of hours works) where required in accordance with Section 8 of the CNVIS and for validation purposes. Attended noise monitoring is also undertaken in the event of a noise complaint. 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 have the potential to impact on heritage items. In accordance with CoA – E28 and the requirements of the CNVIS, the vibration limits have been set out in the British Standard BS 7385-2:1993.

The Modification Report states that “based on the typical nature of buildings around the proposed modification, the cosmetic damage screening criteria of 7.5mm/s for unreinforced or light framed structures has been uniformly applied. This same screening criteria is also relevant for heritage items”. No heritage items in the footprint of the project have been screened as ‘structurally unsound.’

During activities that are expected to generate maximum noise levels at impacted receivers, as identified in the CNVIS, continuous real-time noise and vibration monitoring will be undertaken. Continuous real-time noise and vibration monitoring will be undertaken on the project boundary adjacent to one of the closest residences in the Burrows Avenue / Railway Road Area, at one of the closest residences in the Meeks Road Area, and at one of the closest residences in Lord Street/Edgeware Road to determine the LAeq15min and LAMax levels during times of nearby work.

There will be periods of time where no works will be occurring and it is not reasonable to have the real-time system in operation during these periods. There is a high likelihood that ambient noise and vibration levels from non-construction sources will need to be accounted for, particularly on the boundary of the rail corridor. Where the noise and vibration alert levels are exceeded as a result of project related works, the construction method and equipment will be reviewed/modified.

3. Results

3.1 Surface Water

Pre-construction monitoring took place over 3 months from June-August 2018, with 4 samples collected from two identified points. As noted in section 1.2 and surface water background results, the culvert has several inflows from the surrounding urban environment, including between the two monitoring points due to access limitations. As recorded in baseline monitoring, this has been noted as accounting for the high base Total Suspended Solids (TSS) recorded and turbidity noted in subsequent surface water monitoring, particularly when taken after a rain event. Turbid inflows of water from urban stormwater into the culvert have been visually confirmed in post-rainfall inspections.

Monitoring during the reporting period took place once per quarter at each of the two monitoring locations (EC1 and EC2), dated 26/03/2020 and 10/07/2020. In addition, sampling was conducted at EC1 and EC2 during four wet weather events on 01/05/2020, 23/05/2020, 09/06/2020 and 28/07/2020. – see results in Table 3.

One result on 9th June, post-rainfall, fell slightly above pH range. It was noted that levels were higher upstream of works and no discernible source could be identified (no observation of materials or inflows in channel). Change in pH between upstream and downstream monitoring points otherwise varied within the acceptable range. Temperature varied significantly, likely due to the low flow levels in the concrete culvert during monitoring, which in turn with varying flow rate is likely to contribute to a higher range of dissolved oxygen levels. Salinity varies due to tidal inflows and level of rainfall prior to monitoring.

As noted, Turbidity (NTU) levels within the channel have been exceeded in some baseline readings, and exceedances were recorded at both EC1 and EC2 even when no construction activities have taken place. Previously this has been observed particularly after high rainfall prior to monitoring, which is consistent with baseline readings obtained after a rain event. In combination with prior identification of the ephemeral nature of the watercourse, it is considered likely that external factors (e.g. industry/residence in the area and other rail/residential building projects nearby) are connected to the higher turbidity readings, including from inflows present from between EC1 and EC2 where a discrepancy has been noted.

Table 3 - Surface Water Monitoring Results for Pre-construction and Construction Phases

Date	Site Activities	Total Rainfall in Previous 24hrs (mm)	Comments	EC 1									EC 2								
				Time	TSS (mg/l)	Temp (°C)	pH	Salinity (ms/cm)	Turbidity (NTU)	DO%	TDS (g/l)	Visible Oil / Grease	Time	TSS (mg/l)	Temp (°C)	pH	Salinity (ms/cm)	Turbidity (NTU)	DO%	TDS (g/l)	Visible Oil/Grease
26/03/2020	Culvert installation, Confluence pour, Retaining Wall	18.2	Quarterly Monitoring: Low flows of dark water with some litter/debris at both sample points	15:06	122	23.19	8.19	0.341	113	99.1	0.222	No	15:20	122	22.76	8.03	0.301	117	85	0.416	No
1/05/2020	Culvert, Station Piling, Confluence install, Deliveries for Possession	22.2	Post Rainfall: medium flows of turbid water at both points	15:26	161	15	8.25	0.334	117	91.4	0.218	No	16:07	150	15.15	8.26	0.231	126	79.8	0.15	No
23/05/2020	WE47 Possession (Drainage, Station Concourse Work)	2.6 (31.6 in previous 24 Hrs)	Post Rainfall: low flows of turbid water	17:39	199	16.23	8.36	0.414	169	81.8	0.269	No	18:22	150	16	8.23	0.457	124	75.5	0.297	No
9/06/2020	Aqueduct Test, Garden St Sewer, Retaining Wall, Station Works, CSR Geotec	34.4	Post Rainfall: medium flows of turbid water at both points	16:18	168	18.79	8.62	0.004	257	190.3	0.002	No	17:06	121	18.57	8.55	0.004	196	124.3	0.002	No
10/07/2020	Retaining wall, CSR, culvert and confluence works, station pour and refit	0	Quarter Monitoring: Low Flows Clear with build up of sediment visible	15:14	116	18.9	8.23	0.421	81.7	84	0.269	No	16:11	108	18.42	8.32	0.312	78.2	91.6	0.192	No
28/07/2020	Excavation of SEC pit. Station Works, Culvert/Confluence Works	24.2	Post Rainfall: High flows, fast moving, Eastern Channel noticeably more turbid than western channel (likely due to current stage of cutover, partial closure and bulkhead at western channel)	9:01	139	16.4	8.06	0.254	126	107.1	0.165	No	9:42	177	17.11	8.1	0.223	190	170.9	0.145	No

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. As modelled in the CVNIS, the majority of noise and vibration impacts have occurred in NCA 3 as a result of required out-of-hours work, during both rail and local possession, under lower evening and night-time RBLs. 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:

- Loud noise from air traffic, as area is part of Sydney Airport Noise Management Plan and heavily affected by flight-path
- Road traffic, particularly near Gleeson Ave, as nearby industrial, commercial and other nearby construction projects use cause frequent heavy trucks trafficking the area
- Rail replacement buses during rail possessions
- Noise from trains passing and train signalling horns

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. This occurred for seven rail possessions and seven local area works within the reporting period. SSJ 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 assessed as relating to ongoing construction activities on the project. All elevated noise levels above predicted levels recorded by attended monitoring have been attributed to extraneous noise rather than construction activity. These are detailed in the results shown below in Table 4

Continuous real-time noise and vibration monitoring has been undertaken during three rail possessions, and during demolition works on Platform 1, 2 and 6 of Sydenham Station during the reporting period, in order to assess noise and vibration impacts and that works fall within relevant criteria. Vibration monitoring was undertaken during a representative period of demolition works near retained Sydenham Station Buildings and compacting of Bedwin rd track slab adjacent to properties on rail corridor 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. Several rail possessions conducted during the reporting period were considered low risk due to work only taking place at height or limited in scope. One was considered low risk for noise and vibration with significant external works taking place in close proximity, therefore only attended noise monitoring was undertaken. One possession no valid real-time monitoring could be undertaken due to inclement weather (high winds and heavy rainfall). 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. As above, attended noise and vibration monitoring has identified that external non-construction noise and vibration sources are frequent in the area, which is also expected to reflect in the results of any real-time continuous monitoring.

Table 4 - Attended Noise Monitoring Results

Date	Time (hrs)	Duration (mins)	Location	Construction Activities	Main source of noise	LA(eq)	LA(max)	Period	Audible noise from SSJ construction activities	NML (dBA LAeq15)	Predicted construction sound pressure level (LA(eq,15min))	Compliance	Comment
03/08/20	7:42	15	110 Railway	Piling	Traffic (bus idling) Planes	61.6	80.2	Night	Yes	47	72	Yes	La(Max) associated with external source
26/03/20	23:39	15	30 Hogan Ave	Road Repair on Bolton St	Road Traffic	40.2	69	Night	Faint	47	57	Yes	La(Max) associated with external source
11/04/20	11:06	15	30 Hogan Ave	Demolition of Building 1	Excavator breaking concrete slab	72.7	98.7	Day	Yes	56	75	Yes	
12/04/20	23:39	15	136 George St	Beam Installation	Lighting Towers	54.8	70.3	Night	Faint	47	75	Yes	
22/04/20	21:50	15	30 Hogan	Vac Truck of Pit	Vac Truck	68.5	95.8	Night	Yes	47	76	Yes	La(Max) associated with external source
23/04/20	20:58	15	24 Hogan	Vac Truck of Pit	Vac Truck	66.9	77.5	Evening	Yes	54	72	Yes	
25/04/20	22:25	15	134 George St	Glazing	Traffic, primarily rail replacement buses, external sandblasting audible	66	88.6	Night	Faint	47	69	Yes	La(Max) associated with external source
3/05/20	14:16	15	30 Hogan Ave	Piling and Drainage Works	Traffic including Planes	63.7	85.1	Day	No	56	61	Yes	Exceedance due to significant extraneous noise only. La(Max) associated with external source
23/05/2020	22:46	15	30 Hogan Ave	Vac of Drainage Line, EWP concourse platform 3/4	Vac Truck, Traffic	58.8	76.5	Night	Yes	47	65	Yes	La(Max) associated with external source
23/05/2020	23:19	15	108 Railway Rd	Excavation of Drainage	Traffic (buses)	61.2	83.3	Night	Faint	47	73	Yes	La(Max) associated with external source
24/05/2020	13:07	15	30 Hogan Ave	Canopy roofing	Traffic	63.2	84.7	Day	Faint	56	65	Yes	La(Max) associated with external source
1/06/2020	20:40	15	30 Hogan Ave	Linemarking	Handtools, Traffic	54.9	81.2	Evening	Yes	54	65	Yes	La(Max) associated with external source

20/06/2020	6:51	15	358 Edgeware Rd	Telehandler moving materials	TSE, planes and traffic	64.1	82.2	Night	Yes	43	71	Yes	La(Max) associated with external source
26/06/2020	22:50	15	1-3 Meeks Rd	Vac Truck of Cables	Vac Truck	69.7	79.2	Night	Yes	45	70	Yes	
27/06/2020	18:28	15	24 Hogan	Excavator	Excavator	66.7	81.2	Evening	Yes	54	71	Yes	
27/06/2020	20:10	15	30 Hogan	Excavator	Traffic	57.4	71.9	Evening	Yes	54	74	Yes	
29/06/2020	21:46	15	18 Hogan	Excavator	Traffic/Excavator	60.5	84.1	Evening	Yes	54	71	Yes	La(Max) associated with external source
1/08/2020	0:26	15	110 Railway Rd	Excavator	Excavator, passing trains	50.9	67.8	Night	Faint	47	59	Yes	La(Max) associated with external source
1/08/2020	7:36	15	110 Railway Rd	Excavation of Retaining wall	Buses and Trains	61.9	82.1	Night	Faint	47	59	Yes	Exceedance due to significant extraneous noise only. La(Max) associated with external source
1/08/2020	9:00	15	30 Hogan	Concrete pour	Road and rail traffic	64.4	82.8	Day	Faint	56	58	Yes	Exceedance due to significant extraneous noise only. La(Max) associated with external source
3/08/2020	1:24	15	30 Hogan	Oversized Delivery	Traffic	50.7	75.7	Night	Barely audible	47	57	Yes	La(Max) associated with external source
8/08/2020	1:17	15	110 Railway Rd	Excavation of Ballast	Trains/Buses	60.8	72.5	Night	Yes	47	72	Yes	La(Max) associated with passing trains
8/08/2020	1:41	15	30 Hogan Ave	Lifting of Station Concourse	Crane/Trains	53.6	76.7	Night	Yes	47	74	Yes	La(Max) associated with passing traffic
8/08/2020	3:18	15	133 Meeks Rd	Point Install	Pem-lems	59.5	72.5	Night	Yes	45	62	Yes	
8/08/2020	17:26	15	133 Meeks Rd	Track Install	Excavator	60.2	77	Day	Yes	45	62	Yes	La(Max) associated with passing traffic
9/08/2020	4:39	15	110 Railway Rd	Excavation of ULX	Vac Truck, Excavator	61.9	85.1	Night	Yes	47	72	Yes	La(Max) associated with external source
9/08/2020	5:16	15	133 Meeks Rd	Point install, tamper	Tamper	60.4	78.4	Night	Yes	45	62	Yes	
16/08/2020	11:31	15	110 Railway Rd, Sydenham	RW08 Construction - excavator	Wind	64.1	86	day	Faint	56	64	Yes	Wind exceeded levels identified in AS1055 LA(Max) noise was associated with plane overhead Exceedance due to significant extraneous noise only.
16/08/2020	22:52	15	30 Hogan Ave	Roofing and Glazing Works on Concourse above live tracks	EWP, Lighting Tower	68.4	91.3	night	Yes	47	70	Yes	La(Max) associated with external source

29/08/2020	22:37	15	30 Hogan Ave	Roofing and Glazing Works on Concourse above live tracks	EWP, Lighting Tower	61.3	78	night	Yes	47	62	Y	
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3.3 Vibration

Table 5 - Vibration monitoring data

Monitoring Location	Date	Works being carried out	Attended or continuous	Event Base Monitoring Y/N	Measured PPV (mm/s)	Cosmetic Damage criteria (mm/s)	Compliant Y/N	Comments
Geotec	7/03/2020-8/03/2020	Piling Activity - no night shift	Continuous	Y	0.447	7.5	Y	Monitoring undertaken during weekend rail possession
Platform 2/3 Station Building - City End	10/03/2020-13/03/2020	Demolition of Platform 1 wall	Continuous	Y	0.505	7.5	Y	
Platform 2/3 Station Building - City End	16/03/2020-20/03/2020	Demolition of Platform 2 breaking asphalt	Continuous	Y	0.749	7.5	Y	
Platform 2/3 Station Building - City End	23/03/2020	Demolition of Platform 2 wall	Continuous	Y	0.8	7.5	Y	
Platform 4/5 Station Building - City End	11/04/2020-15/04/2020	Demolition of Building Platform 6	Attended and Continuous	Y	0.462	7.5	Y	Monitoring undertaken during weekend rail possession

Geotec	23/05/2020- 24/05/2020	Retaining Wall Demolition	Continuous	Y	2.455	7.5	Y	Monitoring undertaken during weekend rail possession
Bedwin Road	06/08/2020	Static Rolling and Excavation of Track Slab	Attended and Continuous	Y	0.728	7.5	Y	

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 considered 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

Pre-construction surface water monitoring began in June 2018, with results showing potentially high turbidity and fluctuations due to urban environment. Construction monitoring results from locations upstream and downstream of the channel show parameters vary between rain events and channel conditions, including between upstream and downstream samples. Surface water data does not provide a clear correlation between construction activities and water quality, due to channel access issues and the ephemeral nature of the channel.

Erosion-sediment control plans are maintained and reviewed regularly, and JHLOR conducts weekly, pre- and post-rainfall environmental inspections. The Environment Representative also conducts bi-weekly inspections and any observations are actioned by the project.

Noise monitoring records have validated modelling and are consistent with the predicted impact of construction activities on noise catchment areas, including sensitive receivers. There have not been any recorded exceedances regarding noise and vibration impacts attributed to construction activities.

Real time noise and vibration monitoring is conducted during relevant periods of construction. Both real-time and attended noise monitoring has observed exceedances due to non-construction sources, such as air, road and rail traffic.