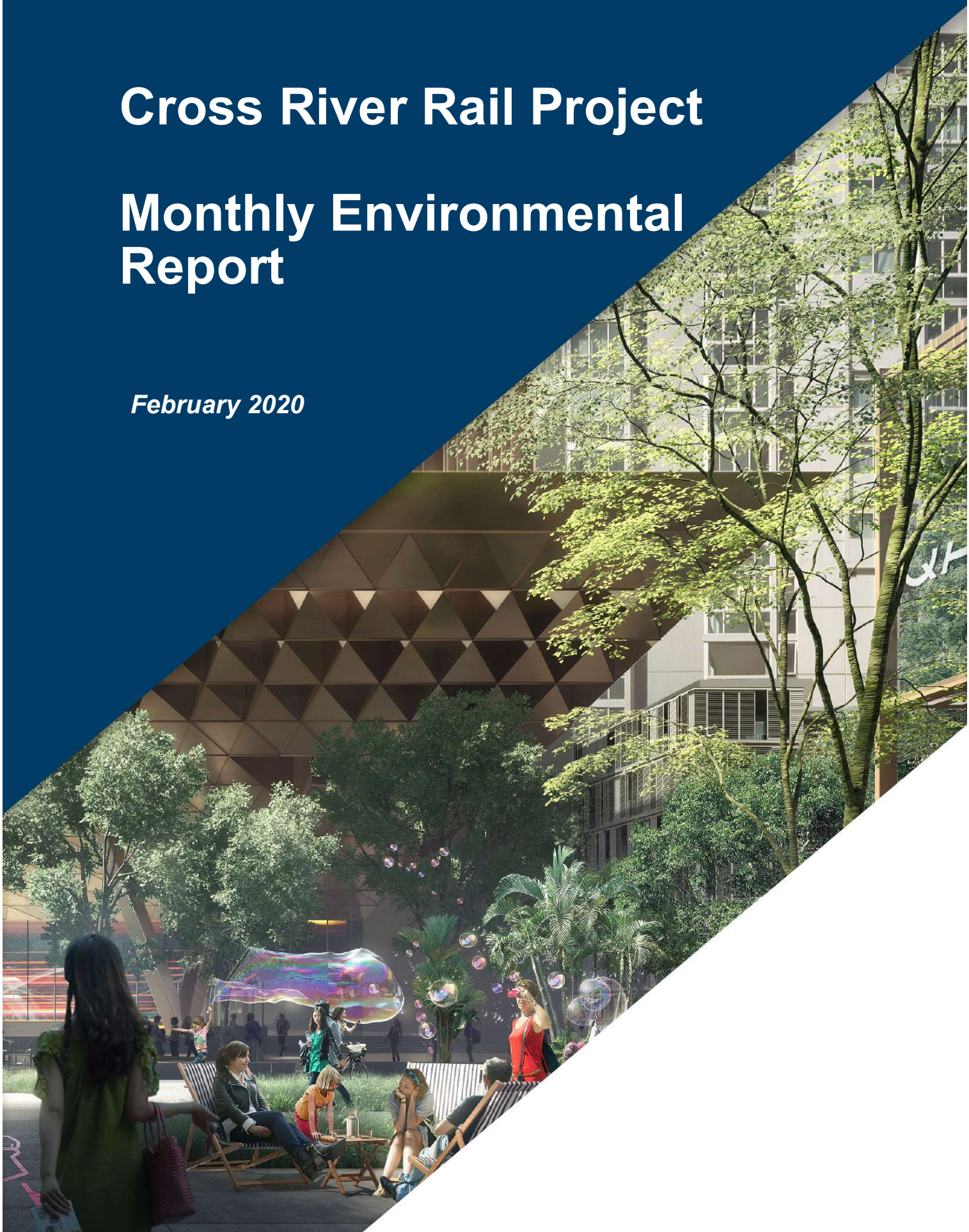
Cross River Rail Project

Monthly Environmental Report

February 2020



Executive Summary

This monthly report has been produced for Project Works undertaken on site for February 2020 for the Rail, Integration and Systems (RIS), and Tunnel, Stations and Development (TSD) packages. This monthly report addresses the obligations outlined in the Coordinator-General's change report – condition change (hours of works) 2019 (CGCR, October 2019) and the Project's Outline Environmental Management Plan.

The Construction Environmental Management Plans (CEMPs) prepared for the Relevant Project Works being delivered by both Unity Alliance (RIS Contractor) and CBGU JV (TSD Contractor) were endorsed by the Environmental Monitor and submitted to the Coordinator General in accordance with Condition 4 (a) and 4 (b) respectively.

The following Project Works were completed in February 2020 –

Mayne Area -

- Cultural Heritage test pit excavations (Jagera Daran) completed along Breakfast Creek at Mayne Yard without any significant findings; and
- Continued Contaminated land sampling and services identification.

Northern Area -

- Continued site establishment at Herston Avenue and RNA Showgrounds;
- Demolition of buildings and foundations in Normanby section of rail corridor;
- Continued widening of the existing access road in Victoria Park;
- Continued utilities or underground services identification;
- Continued geotechnical, contaminated land and ASS investigations.
- The removal of the cattle crossing overpass bridge adjacent to O'Connell Terrace; and
- Subgrade verification and test pits across Northern Area to Bowen Bridge Road have been completed.

Central Area -

- Continued site establishment and clearance, including vegetation removal, fencing and utility works;
- Continued demolition of Lot 1 on Albert Street
- Removal of an existing traffic island on Mary Street;
- Underground water main pressure testing on Vulture Street and Main Street conducted to investigate the existing condition;
- Continued demolition works at Roma Street
- Piling preparation and piling across the sites; and
- Shaft Excavation (Roma Street, Woolloongabba and Albert Street).
- Relocation of existing utility infrastructure along Joe Baker Street and Boggo Road completed

Southern Area -

- OHLE mast foundation installation works completed at Fairfield and Yeronga stations; and
- Geotechnical and survey works complete (Fairfield to Salisbury route).

Key applicable environmental elements

Noise –
Attended noise monitoring was undertaken at Yeronga to validate the noise model for key noise intensive activities being concrete sawing and use of vacuum trucks.
All results were within the Coordinator-General's nominated performance goals.

The predictive noise modelling for the Victoria Park Access Road works did not trigger the need to undertake noise. Attended noise monitoring was also undertaken during demolition of the Cattle Overpass within the Rail Corridor, and the Biomedical Technology Services (BTS) building located adjacent to Victoria Park, Gregory Terrace at Spring Hill. All results were within the Coordinator-General's nominated performance goals.

Noise monitoring was undertaken at the Albert Street, Roma Street and Woolloongabba precincts on twenty-one (21) occasions throughout the month. The contractors indicate the project requirements were met but little interpretation is provided. No monitoring was undertaken at the Boggo Road site.

Vibration –
Unattended vibration monitoring was undertaken at the Energex substation for the demolition works in the northern corridor. All results were within the Coordinator-General's nominated performance goals. Vibration monitoring was conducted on twenty-two occasions within February, primarily at Boggo Road and Roma Street, for the TSD works. The contractors confirmed results indicated the project requirements were adhered to.

Air Quality –
Three dust deposition monitoring gauges have been established to date for the RIS scope of works One monitoring location was established in Victoria Park and the second in the RNA showgrounds. The third passive dust deposition gauge was established in Victoria Park near the Centenary pool in mid-January 2020. Unity has received air quality monitoring results for the monitoring period between 13 January and 13 February 2020. Due to the wet weather during this period, the dust deposition gauges overtopped, therefor the results are deemed invalid. Air quality observations continued at the two existing Transurban Air Quality Monitoring Stations (external to the Project) near the northern corridor at East Victoria Park and Eastern Centenary Pool. Both locations recorded an exceedance of PM10 criteria on 20 February 2020. Unity also reviewed the DES air quality results for PM10 from the other central monitoring stations (Brisbane CBD and South Brisbane) for the reporting period. These monitoring stations also recorded exceedances of PM10 criteria on 20 February. The consistency of the PM10 goal exceedances and results (order of magnitude, day, duration) at stations located away from the direct zone of influence from the works confirms that the exceedances recorded at Transurban's monitoring stations are not relating to the project works.

Dust deposition monitoring was conducted at Albert St, and Woolloongabba precinct sites during the month. The monitoring results showed levels within the project's air quality goal. The dust deposition monitoring results for the Roma Street and Boggo Road sites were retrieved from monitoring stations located outside the precinct areas. The TSD contractor also reviewed the DES air quality results for PM10 from the monitoring stations (Brisbane CBD, South Brisbane and Woolloongabba) for the month of February. Exceedances to the PM10 criteria were recorded on the 20 and 21 February at both the Brisbane CBD and South Brisbane monitoring stations. As mentioned above, due to the consistency in exceedances in the results from stations located in the greater Brisbane area, the exceedances were confirmed not related to the project works.

Water Quality –

No surface water discharges from site were reported by Unity. Unity conducted two (2) rounds of surface water monitoring across nine (9) monitoring locations in February. One round consisted of post rain event monitoring. Monitoring results confirmed there was no project related impacts to the down-stream watercourse.

The TSD Contractor conducted water quality monitoring at seven locations after a significant rainfall event. Each monitoring result showed exceedances of the project water surface quality criteria and goals, however, as the results were consistent with the baseline monitoring data, the contractor confirmed the project requirements were met. Seven (7) more surface water quality monitoring samples were taken later in the month and revealed readings were consistent with the baseline data, again the contractor confirmed there was no project related impacts to the down-stream watercourse.

Erosion and Sediment Control – An overarching Erosion and Sediment Control Plan (ESCP) has been prepared for the RIS work package. Site specific ESCPs have also been developed for Mayne Yard, Victoria Park, Northern Portal, Fairfield and Yeronga work sites and endorsed by the Environmental Monitor prior to the commencement of works. Additional site specific ESCPs have also been prepared and updated for the permanent sites (Boggo Road, Woolloongabba Station, Albert Street and Roma Street).

A significant rainfall event on 6 February occurred heavily affecting the Woolloongabba and Boggo Road sites in particular. Further investigations of the ESCP's and the implemented mitigation measures for the two sites is being undertaken by the Environmental Monitor and the TSD contractor.

Compliance

The Environment Monitor began investigations into four (4) possible non-compliance events on the TSD worksites. The outcome of these will be presented in the March/April reports when the conclusions are confirmed. These relate to deliveries outside of hours, air quality monitoring, erosion and sediment control and reporting. A compliance table against each condition is presented in **Section 3** of the report.

Complaints:

The TSD contractors report, in Appendix C, report indicate three (3) noise complaints were reported in February. Two (2) complaints were related to works undertaken during evening hours and one (1) complaint was related to works undertaken during standard work hours on a Saturday. Attended noise monitoring took place and the TSD contractor states that project requirements have been met in their report.

The key planned Project Works for the coming months include:

Mayne Area –

- Earthworks (clear and grub) for preload works; and
- Implementing Ground Surface Treatments, settlement plates and surcharge loading in Mayne Yard North ahead of permanent works.

Northern Area –

- Earthworks for winning preload material to transfer to Mayne Yard North;
- Intersection and signalling works at Gregory Terrace;
- Continued removal of redundant QR lighting towers, OHLE footings, communication services and pits and
- Continued geotechnical, contaminated land and ASS investigations.

Central Area –

- Roma Street - continued demolition, with site establishment, site preparation work on going. Shaft excavation will continue, and the acoustic shed will continue to go up;
- Albert Street – continued site preparation, geotechnical work and piling continues on Lots 1 and 2. Work will continue on the acoustic shed and shaft excavation on Lot 2;
- Woolloongabba – site establishment and piling pad preparation with continued piling and shaft decline excavation from March onwards. Installation of power and other utility services required for tunnelling and site operations. Blasting activities are also expected to commence in late May;

Boggo Road - site clearance activities, site office set up, piling preparations and works on the freight flyover; and continued geotechnical, contaminated land and ASS investigations.

Southern Area –

- OHLE masts and portals at Yeronga and Fairfield; and
- Continued utilities and underground services identification.

Monthly Reporting

It is noted that the monthly report for the TSD contract still has deficiencies in detail and this is acknowledged in the Environment Monitor's endorsement letter.

The Environment Monitor endorsement letter is provided in **Appendix A**.

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1. Definitions

Table 1: Definitions

Acronym	Definition
ARI	Average Recurrence Interval - The average or expected value of the periods between exceedances of a given rainfall total accumulated over a given duration.
CEMP(s)	The Project's Construction Environmental Management Plan
CG	Coordinator-General
CGCR	Coordinator-General's Change Report
CGER	Coordinator-General's Evaluation Report
Community Relations Monitor	The Community Relations Monitor engaged in accordance with Imposed Condition 8
Contractor	The Contractors appointed to design, construct and commission the Project
Coordinator-General	The corporation sole preserved, continued and constituted under section 8 of the SDPWO Act
CRR	Cross River Rail
EIS	Environmental Impact Statement
EMP	Environmental Management Plan (refers to the OEMP, CEMP, COEMP including any Project sub-plans)
Environmental Monitor	The Environmental Monitor engaged in accordance with Imposed Condition 7
ETCS	European Train Control Systems
Imposed condition/s	A condition/s imposed by the Coordinator-General under section 54B of the SDPWO Act for the Project
MRTS52	Transport and Main Roads Specifications MRTS52 Erosion and Sediment Control
NCE	Non-Compliance Event
OEMP	The Project's Outline Environmental Management Plan
Project	The Cross River Rail Project
Project Works	As defined in the Imposed Conditions
Proponent	The Cross River Rail Delivery Authority
QR	Queensland Rail
RfPC	Requests for Project Change
RIS	Rail Integration and Systems
SDPWO Act	*State Development and Public Works Organisation Act* 1971
Sub-plan	Any sub-plan to an EMP
The Authority	The Cross River Rail Delivery Authority
TSD	Tunnel, Stations and Development

2. Introduction

2.1 Background

The Cross River Rail Project (the Project) is a declared coordinated project under the *State Development and Public Works Organisation Act 1971* (SDPWO Act). The CRR EIS was evaluated by the Coordinator-General who recommended the Project proceed, subject to Imposed Conditions and recommendations. Since the evaluation of the EIS, five Requests for Project Change (RfPCs) have been evaluated by the Coordinator-General. The CRR Project, as currently evaluated by the Coordinator-General, including the RfPCs, is referred to as the Evaluated Project.

The Coordinator-General has imposed conditions on the Project that apply throughout the design, construction and commissioning phases. These are referred to as the Imposed Conditions. In addition, the Coordinator-General has approved the Project's Outline Environmental Management Plan (OEMP) which outlines the environmental management framework for the Project. The OEMP includes Environmental Outcomes and Performance Criteria which must be achieved for the Project.

Imposed Conditions 5 and 6 nominate the compliance and reporting requirements for the Project. This monthly report addresses these requirements.

2.2 Project Delivery

The Delivery Authority is responsible for planning and delivering the Project.

The two main delivery packages which require reporting under the Coordinator General's imposed conditions are:

- **Tunnel, Stations and Development (TSD)** being delivered by CBGU JV; and
- **Rail, Integration and Systems (RIS)** being delivered by Unity Alliance.

The Delivery Authority has appointed separate Contractors to deliver TSD and RIS packages. CBGU JV is delivering TSD package while RIS package is being delivered by the Unity Alliance.

The Project is geographically divided into four areas as identified in **Figures 1 and 2** –

- Mayne Area
- Northern Area
- Central Area
- Southern Area

During initial Project Delivery phase, the Project has established environmental management plans and secured some of the secondary environmental approvals in addition to enabling works.

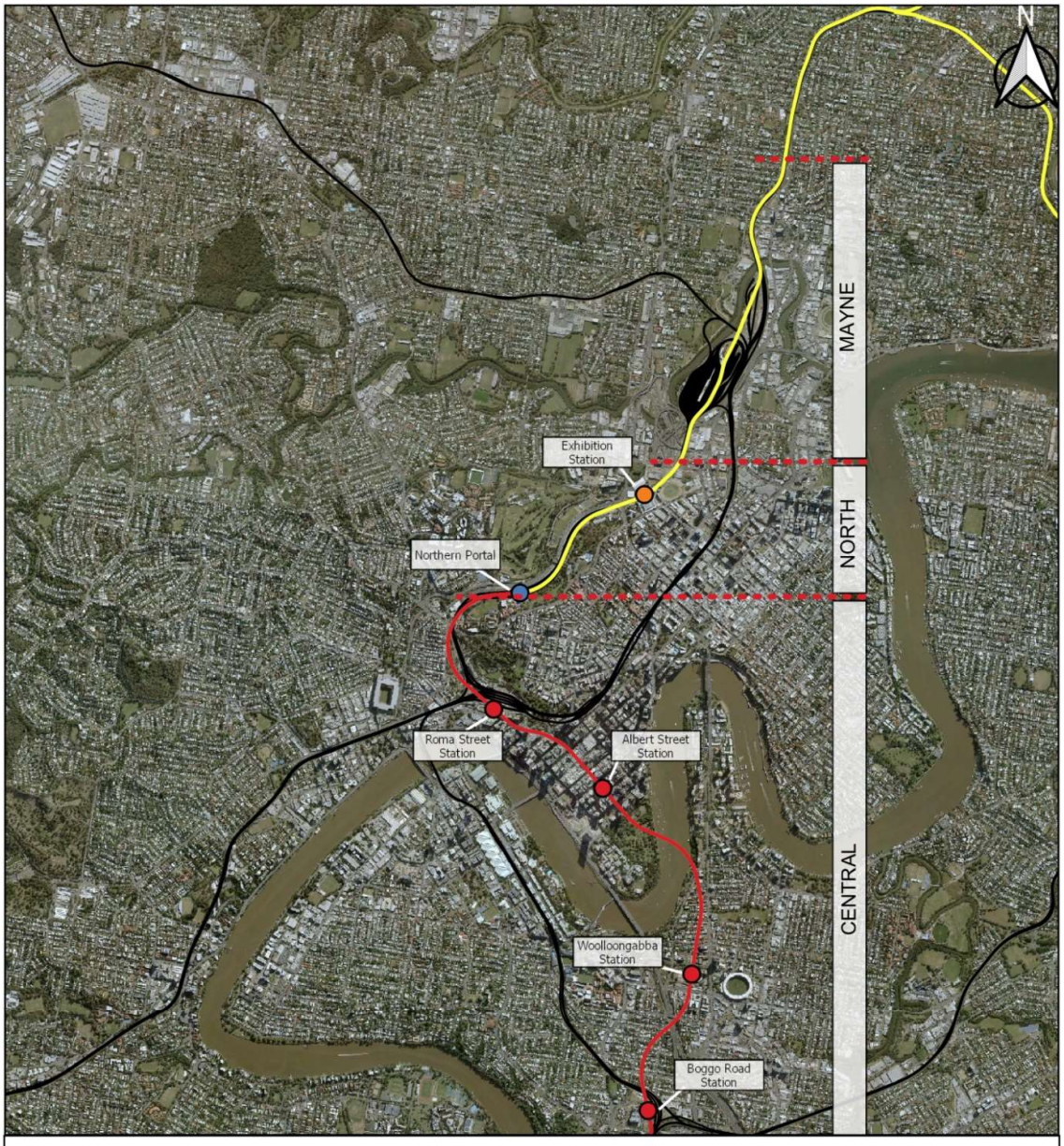

Figure 1 : Project Geographical Areas - North

Legend

- Above Ground Alignment
- Tunnel Alignment
- Above Ground Station
- Underground Station
- Tunnel Portal
- Existing Railway Network

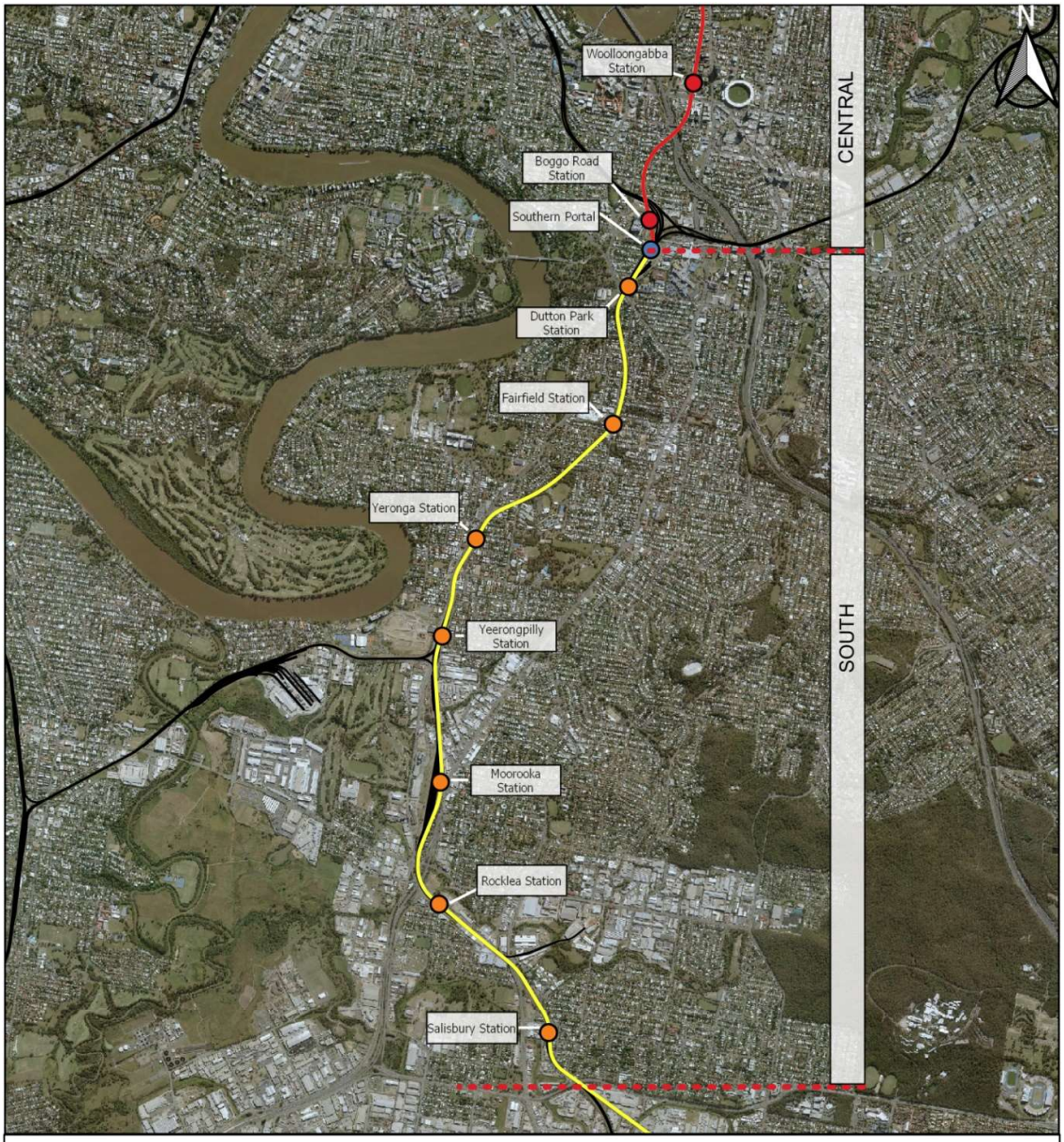

Figure 2: Project Geographical Areas - South

Legend

- Above Ground Alignment
- Tunnel Alignment
- Above Ground Station
- Underground Station
- Tunnel Portal
- Existing Railway Network

2.3 Reporting Framework

This report has been prepared to comply with Conditions 6 and 7 of the Coordinator-General Change Report (CGCR) and includes:

- Monitoring data and associated interpretation of the results required by the imposed conditions and Construction Environmental Management Plan (CEMP);
- Details of any Non-Compliance Event (NCE), including incidents, corrective actions and preventative actions; and
- Details of any complaints, including description, responses and corrective actions.

Reporting on environmental elements will be captured in these monthly environmental reports and the annual environmental reports, which will be endorsed by the Environmental Monitor.

3. Compliance with Imposed Conditions

This Monthly Report has been reviewed and endorsed by Environmental Monitor as per Condition 7 of the Coordinator-General Change Report (CGCR) **(Appendix A)**.

Compliance against Imposed Conditions are provided in **Table 2** below and detail is provided in **Appendices B and C**.

Table 2: Compliance Status – CG Imposed Conditions

CG Condition	Requirement Summary	Compliance Met (Yes/No/NA)	Comment
1.	**General conditions** – compliance with the Project Changes relevant to the Contractor's scope	Yes	Ongoing
2.	**Outline Environmental Management Plan** – timely submission to the Coordinator General including required sub plans	Yes	No further amendments to the OEMP proposed
3.	**Design** - achievement of the Environmental Design Requirements	NA	
4.	**Construction Environmental Management Plan** – all relating to Relevant Project Works	Yes	TSD – CEMP Rev 0 was in place for through to 11 February when CEMP Rev 3 became effective. RIS – CEMP endorsed for Enabling and Advanced Works on 23 August 2019. CEMP for upcoming Northern Portal (Stage 1) works is currently being developed for submission to the OCG.
5.	**Compliance and Incident management** - Non-compliance events, notifications and reporting	NA	
6.	**Reporting** – Monthly and Annual reporting	Yes	Reporting falls short of requirements for the TSD contractor. The DA currently working with the EM and Contractor to address this issue.
7.	**Environmental Monitor** - engaged and functions resumed	Yes	Ongoing
8.	**Community Relations Monitor** - engaged and functions resumed	Yes	Ongoing
9.	**Community engagement plan** - developed and endorsed by Environmental Monitor	Yes	CEMP's endorsed with Community Engagement Plan
10.	**Hours of work** – works undertaken during approved hours	Yes	All works were undertaken during approved 'Hours of work'
11.	**Noise** – Work must aim to achieve internal noise goals for human health and well-being	Yes	Refer to **Appendices B and C**.
	Vibration - Works must aim to achieve vibration goals for cosmetic damage, human comfort and sensitive building contents.	Yes	Refer to **Appendices B and C**.
12.	**Property damage** relating to ground movement	Yes	TSD – need to prepare this for upcoming blasting and excavation works, some surveys completed in February. RIS - No specific management plan required due to low risk construction works.

CG Condition	Requirement Summary	Compliance Met (Yes/No/NA)	Comment
13.	**Air quality** - Works must aim to achieve air quality goals for human health and nuisance.	No	Not all sites are monitoring the required air quality parameters at site. The DA is currently working with the EM and Contractor to address this issue.
14.	**Traffic and transport** - Works must minimise adverse impacts on road safety and traffic flow.	Yes	TSD - Traffic Management Plan covered in the CEMP
15.	**Water quality** - Works must not discharge surface water and groundwater from the construction site above the relevant environmental values and water quality objectives.	Yes	Four discharge events took place in January (one at Boggo Road and three at Woolloongabba).
16.	**Water resources** – evaluate potential impact, plan works, implement controls and monitor inflow of groundwater associated with drawdown	Yes	Ongoing
17.	**Surface water** - Must be designed to avoid inundation from stormwater due to a 2-year (6hr) ARI rainfall event and flood waters due to a 5-year ARI rainfall event and constructed to avoid afflux or cause the redirection of uncontrolled surface water flows, including stormwater flows, outside of worksites.	NA	
18.	**Erosion and sediment control** - Provisions for erosion and sediment control must be consistent with the Guidelines for Best Practice Erosion and Sediment Control (International Erosion Control Association, 2008) and the Department of Transport and Main Roads' Technical Standard MRTS52.	Yes	TSD - Erosion and Sediment Control Plan and individual site plans have been prepared and under review. RIS – Overarching ESCP has been prepared, followed by site specific ESCP for each work sites. All Erosion and Sediment Control Plans for current work sites are endorsed by the Environmental Monitor.
19.	**Acid sulfate soils** managed as per the *Queensland Acid Sulfate Soil Technical Manual.*	Yes	TSD - CEMP covers Acid Sulfate Soils Management Plan RIS – Not applicable for Relevant Project Works.
20.	**Landscape and open space** – general requirement to minimise impacts on landscapes and open space values and specific requirements around Victoria park	Yes	RIS – Site Environmental Plan prepared and implemented for Victoria Park Access Road works.
21.	**Worksite rehabilitation** – worksites rehabilitated as soon as practicable upon completion of works or commissioning, and in consultation with Brisbane City Council.	NA	

Total Non-Compliance Events Reports:

There were no Non-Compliance Events reported against imposed conditions in February.

Appendix A – Environmental Monitor Endorsement Letter

Appendix B – RIS Monthly Report

Monthly CGCR Report – February 2020

Cross River Rail – Rail, Integration and Systems Alliance

Assured Integration for a New Era

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1 Progress Summary

1.1 Summary of Project Works

The following *Project Works* continued in February 2020

- Enabling works within the Northern Corridor (College Road to Bowen Bridge Road)
- Geotechnical, Contaminated land and Acid Sulphate Soils along the corridor length with a focus on Fairfield to Salisbury
- Utilities / Underground services identification along the corridor and within the project footprint.
- Site establishment of the Main Site Office at Herston
- Widening of the existing Access Road in Victoria Park which will become the main paved access into the Northern Corridor for the Pulse and Unity Consortia.

The following *Project Works* started in February 2020

- OHLE mast foundation installation in Fairfield and Yeronga during an approved rail possession
-

1.2 Progress Photos

Plate 1:February Possession Works – Fairfield Station

2 Non-Compliance Events

The below section summarises the events to be reported in accordance with condition 5 and condition 6(b)(ii) of the CGCR.

A Non-Compliance Event is defined as Project Works that do not comply with the Imposed Conditions.

2.1 Non- Compliance Events Summary

Table 1: Summary of Non-Compliance Events

Event Title	Location, Date and time of event	Date the Event was Formally Notified to CG/IEM	Conditions Affected	Date the Event Report Formally Sent to CG/IEM	Status of Event
None for this reporting period					

3 Complaints

The below section summarises the complaints relating to the Project Works to be reported in accordance with condition 6(b)(iii) of the CGCR.

Table 2: Summary of Complaints

Date	Location	Issue	CGCR Non-Compliance	Status
None for this reporting period				

4 Environmental Monitoring Results

The below section summarises the monitoring results to be reported in accordance condition 6(b)(i) of the CGCR.

4.1 Acoustics

Condition 11(b) of the CGCR requires that during construction, monitoring and reporting on noise and vibration in accordance with the Noise and Vibration Management Plan, a sub-plan of the Construction Environmental Management Plan occurs.

4.1.1 Noise Monitoring

The predictive noise modelling for the Victoria Park Access Road works did not trigger the need to undertake noise monitoring.

The predictive noise modelling for 09 February 2020 Possession works at Fairfield and Yeronga triggered the need to undertake noise monitoring at Yeronga to validate the model for key noise intensive activities being:

- Concrete sawing, and
- Use of Vacuum Trucks

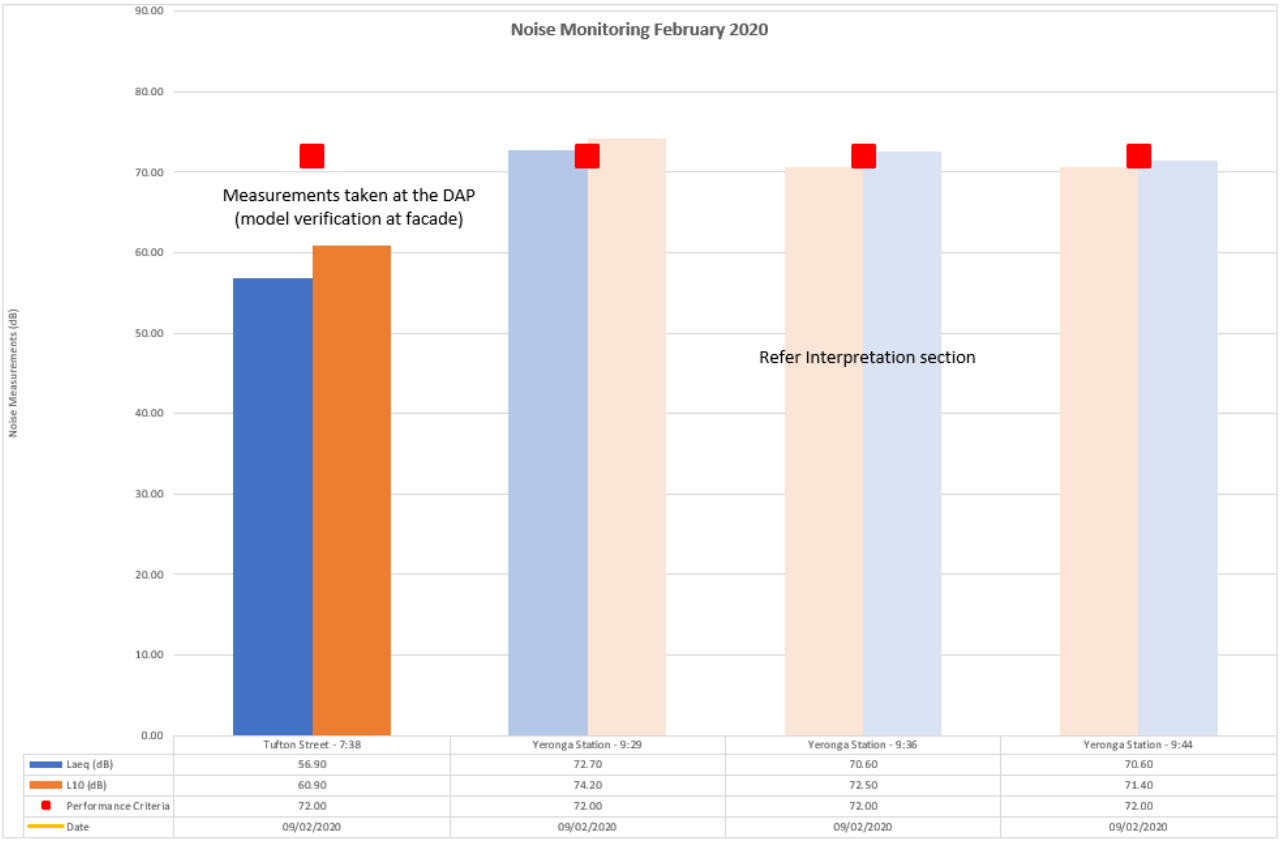
Unity also undertook attended noise monitoring for activities associated with the demolition of buildings and structures on State Owned Land (not classified as Relevant Project Works for the purpose of the CGCR).

These activities included:

- Rock Breaking associated with the demolition of the Cattle Overpass in the Rail Corridor at the Brisbane Exhibition Grounds (RNA). Monitoring was undertaken along Tufton Street high-rise residential development (relevant receiver).
- The demolition of BTS building near the Energex Office and associated substation (relevant receiver).

Noise monitoring because of complaints was not triggered. No noise complaints occurred during the works.

4.1.2 Noise monitoring Results



	Tufton Street - 7:38	Yeronga Station - 9:29	Yeronga Station - 9:36	Yeronga Station - 9:44
Laeq (dB)	56.90	72.70	70.60	70.60
L10 (dB)	60.90	74.20	72.50	71.40
Performance Criteria	72.00	72.00	72.00	72.00
Date	09/02/2020	09/02/2020	09/02/2020	09/02/2020

4.1.3 Vibration Monitoring

The predictive vibration modelling for the Victoria Park Access Road works did not trigger the need to undertake vibration monitoring.

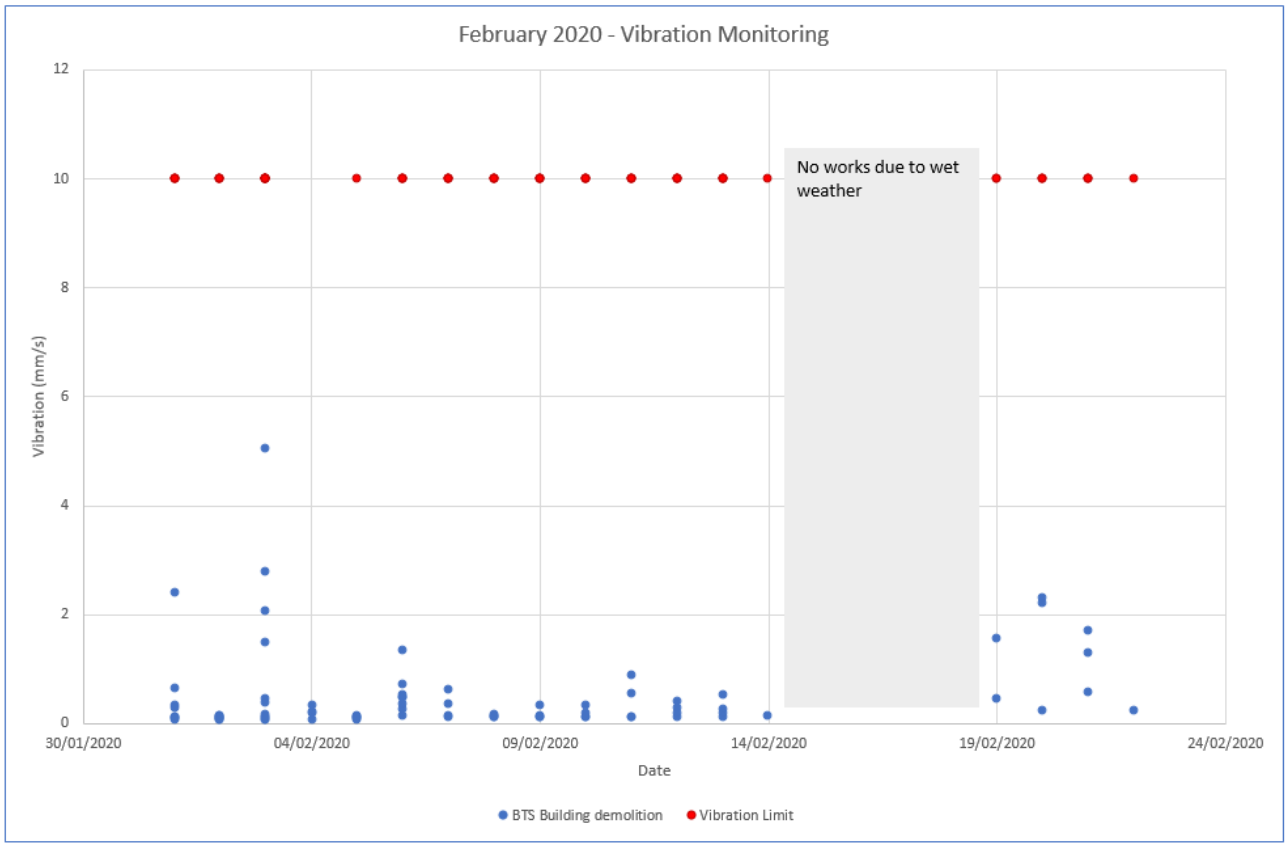
Unity however undertook unattended vibration monitoring at the Energex substation associated with the demolition of buildings and structures on State Owned Land (not classified as *Relevant Project Works* for the purpose of the CGCR).

Indeed, during project consultation it was identified that Energex's substation contained sensitive equipment (direct buried lines). The demolition of the BTS building near the Energex Substation required for the concrete base slabs to be removed. The removal required the use of a hydraulic hammer which was the main source of vibration that could have affected the direct buried lines.

Energex confirmed with the project team the direct buried lines could sustain vibrations up to 10mm/s before actions would require to be taken.

Vibration monitoring because of complaints was not triggered. No complaints triggered the need to undertake vibration monitoring.

4.1.4 Vibration Monitoring Results



4.1.5 Interpretation

4.1.5.1 Noise Monitoring

Monitoring of saw cutting activities at Yeronga could not be undertaken at the façade of the DAP residence. It was therefore undertaken as close as possible from the DAP (ca. 25 m away).

Therefore, the measurements recorded are reflective of the noise levels 20m away from the source.

The attended measurement validated the predictive model. Indeed at 20 m away from the source the model predicted noise emissions of 81dBA, i.e. 8dBA higher than what was measured (73 dBA).

The model predicted the indoor noise levels would be 62dBA at the DAP's residence.

On the basis of the validation readings, the actual noise levels inside the DAP's residence are likely to have been less than 62dBA and therefore less than the upper noise goal for out of hours works (62dBA).

Monitoring of Vacuum Truck activities at Yeronga could not be undertaken at the façade of the DAP residence. It was therefore undertaken as close as possible from the DAP (ca. 25 m away)

Therefore, the measurements recorded are reflective of the noise levels 20m away from the source.

The attended measurement validated the predictive model. Indeed at 20 m away from the source the model predicted noise emissions of 73dBA, i.e. 2.5dBA higher than what was measured (70.5 dBA)

The model predicted the indoor noise levels would be 56dBA at the DAP's residence.

On the basis of the validation readings the actual noise levels inside the DAP's residence are likely to have been less than 56dBA and therefore less than the upper noise goal for out of hours works (62dBA).

Therefore

4.1.5.2 Vibration Monitoring

All monitoring results demonstrated the activities undertaken did not adversely affect sensitive receivers. This is further supported by the fact that no nuisance complaints were received during the month of February 2020.

4.2 Air Quality

Condition 13(b) of the CGCR requires that during construction, monitoring and reporting on air quality in accordance with the Air Quality Management Plan, a sub-plan of the Construction Environmental Management Plan occurs.

Visual Monitoring was undertaken during routine environmental inspections. A total of fifteen (15) inspections were undertaken. No issues were identified that required corrective actions to be raised.

4.2.1 Dust results

Unity Alliance established one (1)additional passive dust deposition gauge in Victoria Park near the Centenary pool in mid-January 2020, despite the ongoing predicted low impact nature of the Relevant Project Works.

Since passive dust deposition gauges are analysed on a monthly basis, results span from 13 January 2020 to 13 February 2020.

The dust deposition gauges result for the reporting period are detailed below and complied with Condition 13(b) of the CGCR.

Table 3: 13 January 2020 to 13 February 2020

CGCR Criterion ($mg/m^2/day$)	AQ-01 Results - RNA Showgrounds ($mg/m^2/day$)	AQ-02 Results - BGGS ($mg/m^2/day$)	AQ-03 Centenary Pool ($mg/m^2/day$)
120	20	16.67	23.33
Total Rainfall during Period	329.2mm	329.2mm	309.2mm

4.2.2 Interpretation

Due to the wet weather during the monitoring period, the dust deposition gauges overtopped. Therefore, the results are deemed invalid.

Visual monitoring during routine inspections did not identify any issues it is therefore standard dust mitigation measures were effective at managing dust during the inspections.

4.2.3 Particulates results

Unity Alliance has not yet established particulates monitoring stations due to the predicted low impact nature of the Relevant Project Works.

Transurban Queensland operates the Legacy Way tunnel in accordance with conditions established by the Queensland Co-ordinator General.

Transurban has engaged third parties to establish External Ambient Air Quality Monitoring Stations along their footprint. Two of the monitoring stations are located near the Northern Corridor Area, within 1km from where the works occurred.

They are

- East Victoria Park (E1) which is located approximately 300m due north from the northern corridor, and
- Eastern Centenary Pool (E2) which is located approximately 150m due east from the northern corridor.

External Ambient Air Quality data is collected for Carbon monoxide (CO), Nitrogen dioxide (NO2), Particulate matter less than 10 µm (PM10), and Particulate matter less than 2.5 µm (PM2.5).

PM_{10} is one of the indicators for which the Coordinator General has imposed a goal of 50 µg/m^3 (over an averaging period of 24 hours) the project must aim to achieve under Condition 13(a) of the CGCR.

The same goal has been imposed on the Cross-River Rail Project.

Validated air quality data for the Legacy Way tunnel is shown below. The information has been sourced from the Legacy Way website. The data used on this webpage is collected by third parties using equipment which is not controlled by Transurban Queensland and as such may be subject to faults or errors by third parties, external weather or environmental events, or server access issues.

The data has been extracted from the February 2020 report published on the linkt website (https://brisbanenetwork.linkt.com.au/wp-content/uploads/2020/03/Transurban-QLD-Legacy-Way-Monthly-Report-February-2020.pdf).

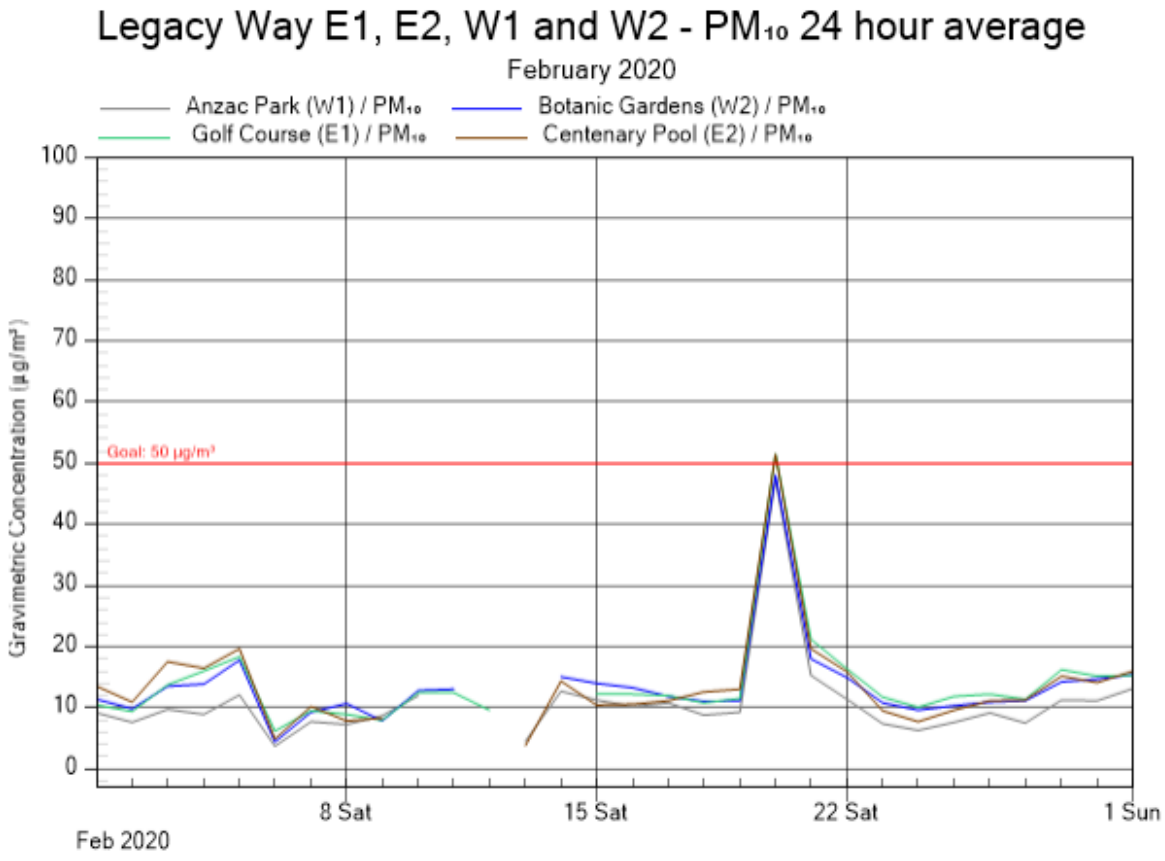


Figure 5: Transurban QLD Legacy Way (E1, E2, W1 and W2) - PM_{10} graph for February 2020

Figure 1: Transurban QLD Legacy Way (E1, E2, W1 and W2) - PM10 graph for February 2020 (reproduction from the monthly report accessed 20 March 2020)

4.2.4 Interpretation

The following exceedances were recorded for the reporting period for PM_{10} near the northern corridor.

Parameter	Location	Time Period	Value of Exceedance	Date of Exceedance
PM_{10} (µg/m^3)	Victoria Park (E1)	24 hours	51	20/02/2020
PM_{10} (µg/m^3)	Centenary Pool (E2)	24 hours	52	20/02/2020

Unity also reviewed the DES air quality results for PM10 from other stations in Brisbane for the reporting period. The results were as follows:

- Brisbane CBD: PM_{10} 2 (two) exceedances of the 50 µg/m^3 (24hr avg) were reported on 20 and 21 February. (https://apps.des.qld.gov.au/air-quality/chart/?station=cbd&parameter=18&date=1/11/2019&timeframe=month)
- South Brisbane (Woolloongabba): PM_{10} daily Maximum average: **172.1 µg/m^3** with 12 daily exceedances of the 50 µg/m^3 (24hr avg). (https://apps.des.qld.gov.au/air-quality/chart/?station=woo&parameter=18&date=1/11/2019&timeframe=month)

The graphical representation of the DES air quality data is presented in the below charts.

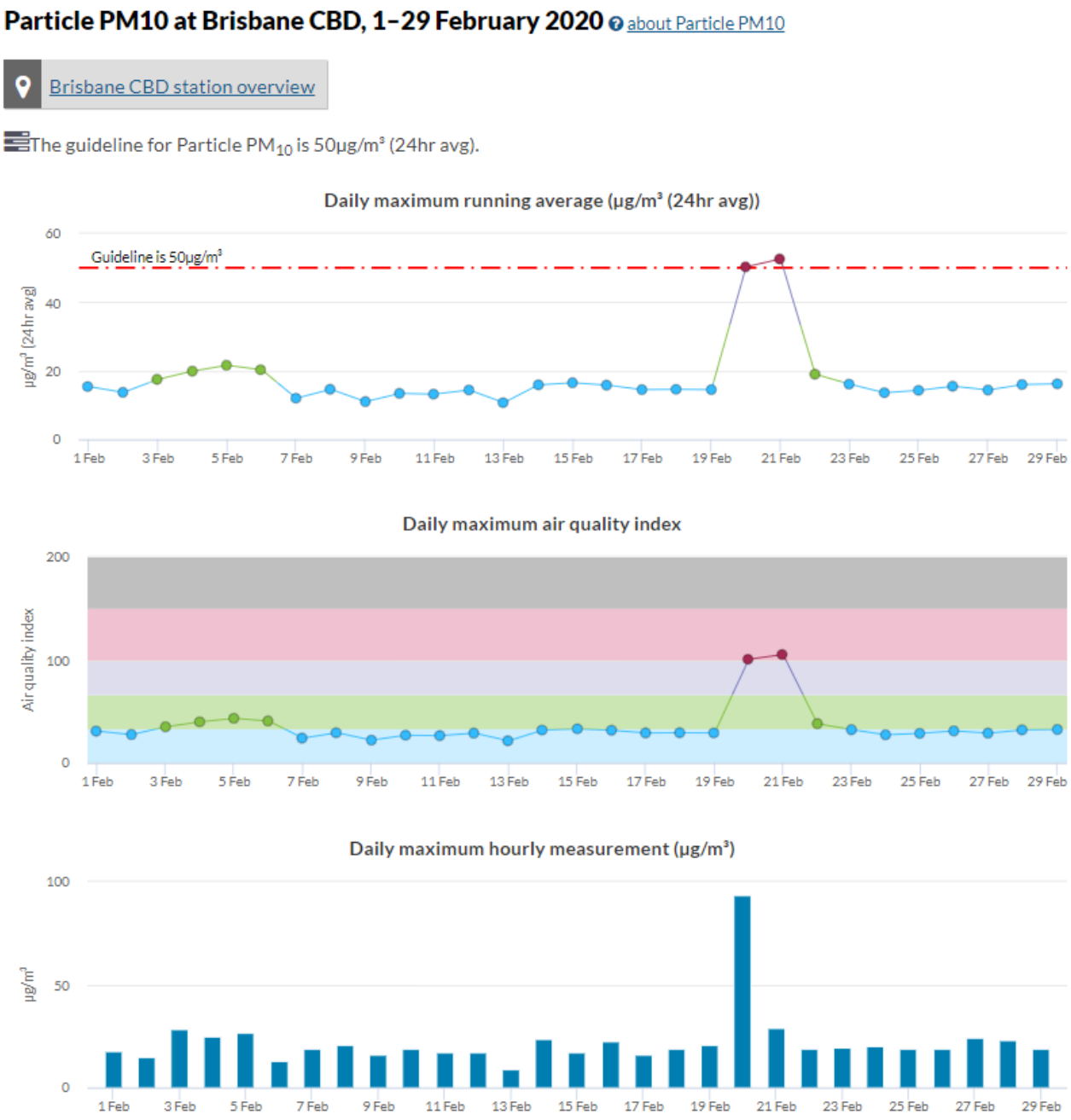


Figure 2: Brisbane CBD – DES Station - PM10 graph for February 2020 (reproduction from the DES website accessed 20 March 2020)

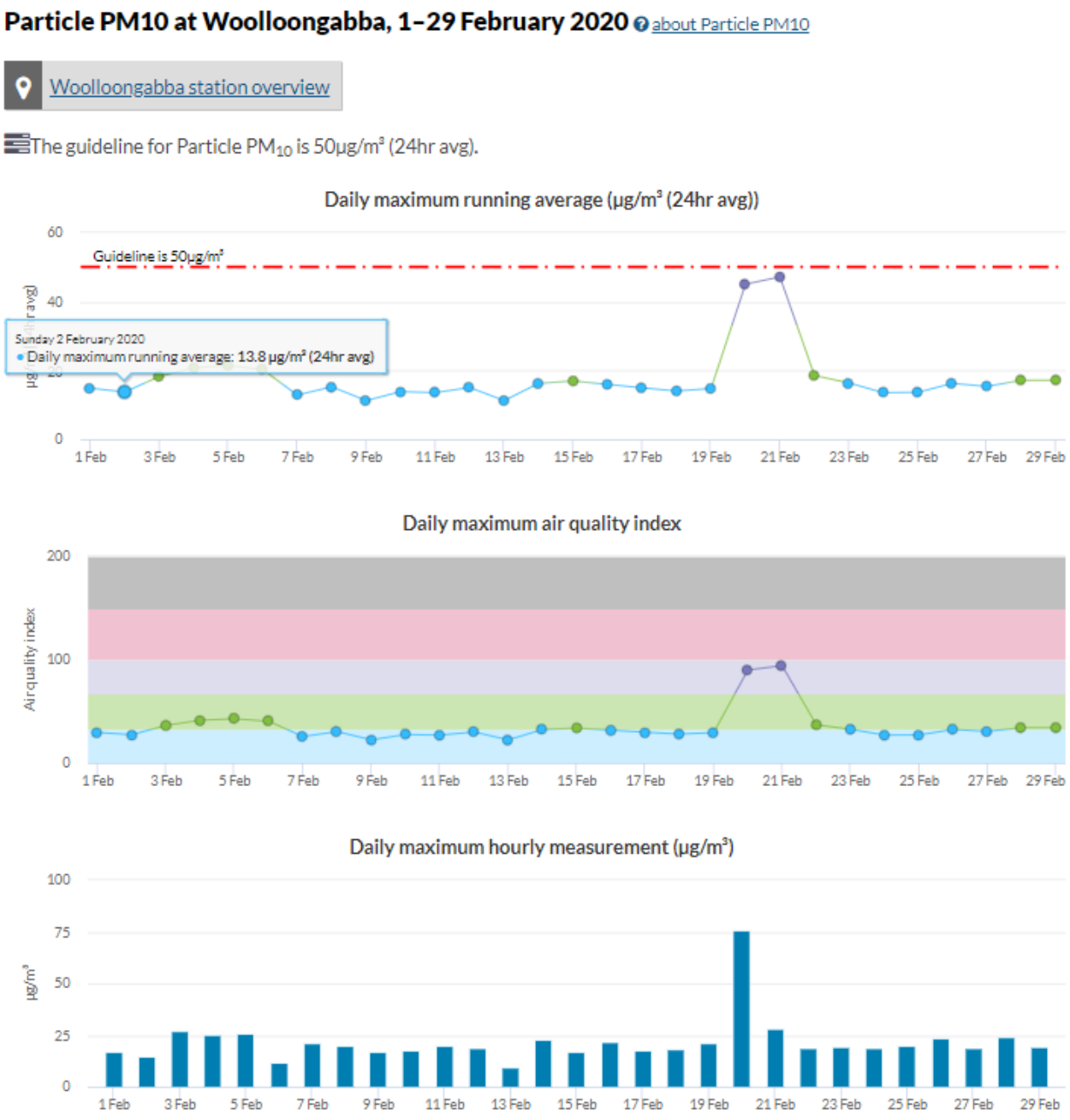


Figure 3: South Brisbane – DES Station - PM10 graph for February 2020 (reproduction from the DES website accessed 20 March 2020)

The consistency of the PM_{10} goal exceedances and results (order of magnitude, day, duration) at stations located away from the direct zone of influence from the works confirms that the exceedances of the PM_{10} air quality goal over a 24hours averaging period is not relating to the Project Works.

Ambient air quality measurements may be influenced by external events outside of Unity's control (e.g. road traffic, dust storms, fires).

4.3 Water Quality – Surface Water

Condition 15(a) requires that discharges of surface water and groundwater from Project Works must comply with the Brisbane River Estuary environmental values and water quality objectives (Basin no.143 – mid-estuary) in the Environment Protection (Water) Policy 2009.

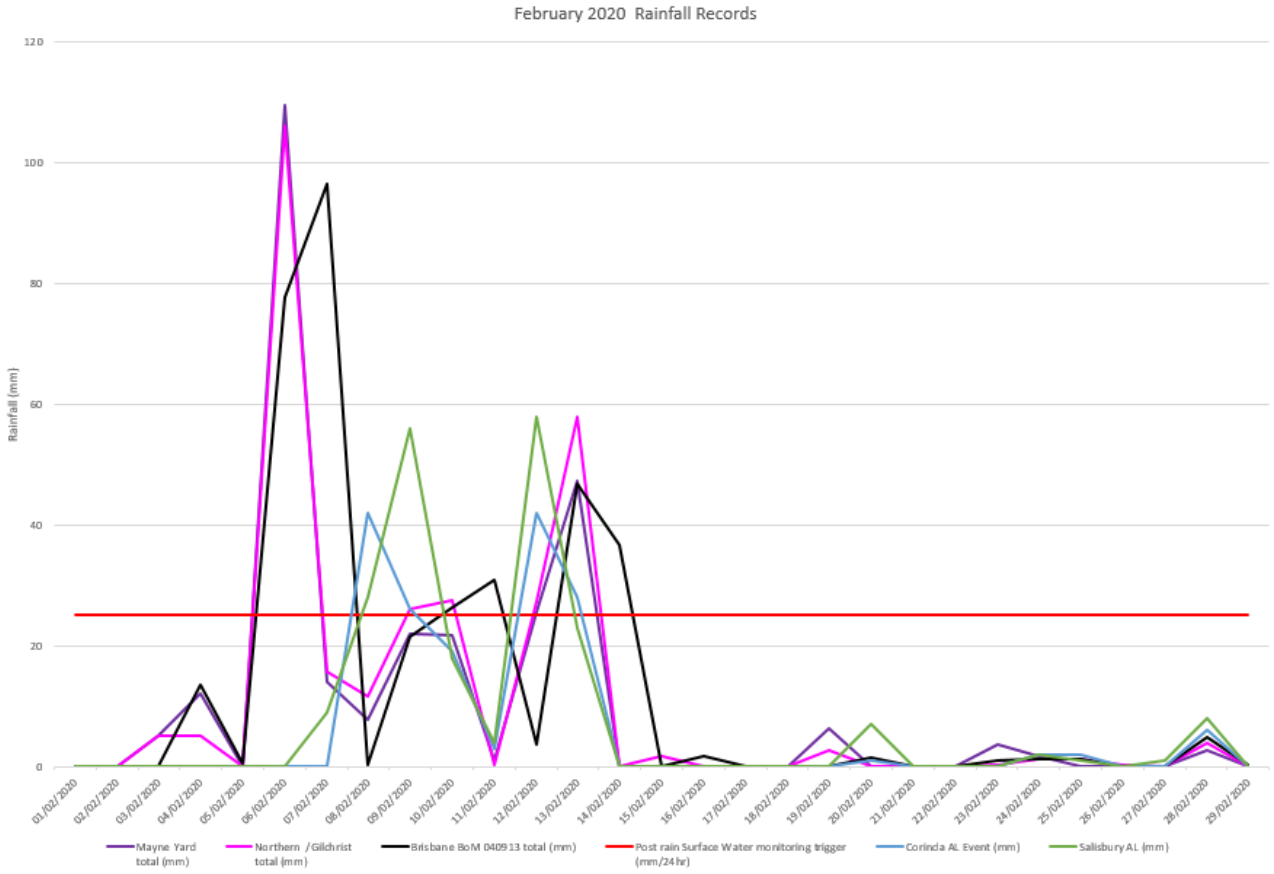
Water Quality monitoring to demonstrate compliance with Condition 15(a) was not triggered. There were no surface water either active (e.g. dewatering through pumping, sediment basin release) or visibly passive (through temporary or permanent stormwater drainage) from site.

There were no groundwater discharges.

Condition 15(b) of the CGCR requires that during construction, monitoring and reporting on water quality in accordance with the Water Quality Management Plan, a sub-plan of the Construction Environmental Management Plan occurs.

During February 2020, Unity undertook two (2) surface water sampling rounds. One round consisted of background conditions monitoring. One round consisted of post rain event monitoring.

4.3.1 Rainfall Records



4.3.2 Discharge Monitoring

Nil for this reporting period.

4.3.3 C-EMP Monitoring

The following sections summarise the water quality results from the rounds of monitoring undertaken in February 2020.

4.3.3.1 Breakfast Creek

Breakfast Creek is the surface water receiver for all work at Mayne Yard. Bolded results in blue in Table 4 did not comply with the WQOs for Basin no. 143 - mid-estuary waters.

Very few physico-chemical water quality parameters complied with the WQOs for Basin no. 143 - mid-estuary waters, either during routine monitoring or post rain monitoring.

Post rain monitoring rounds were undertaken whilst no active earthworks or otherwise significant ground disturbance were occurring in Mayne Yard. The area of Mayne Yard (Mayne Yard North) were Unity undertook enabling works activities in October 2019 is stabilised and has effective and sufficient ground cover to achieve compliance with condition 18 of the CGCR.

There were no active or known discharges from site at the time of the sampling events.

Based on this information, Unity has assessed that exceedances of WQOs as imposed by Condition 15(a) are not a result of Project Works and therefore the results are not deemed Non-Compliance Events.

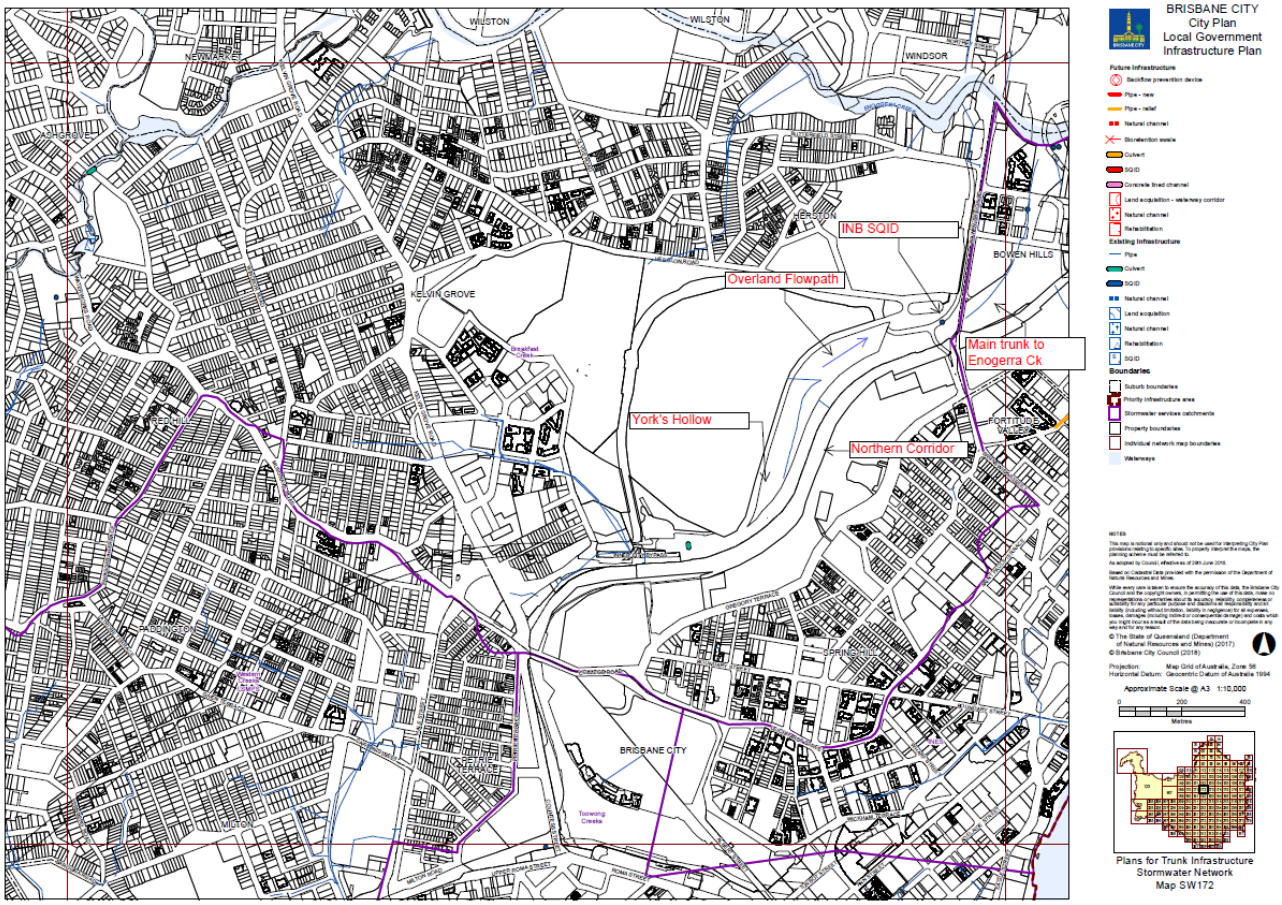
Table 4: Breakfast Creek WQ Data - Physico Chemical Parameters

Date	Tide	Sampling Purpose	SW 1- Upstream				SW2 - Mayne Yard				SW3 - Downstream			
			Turbidity (NTU) 8NTU	TSS (mg/L) 20	pH 7.0-8.4	DO (%) 85 – 105% saturation	Turbidity (NTU) 8NTU	TSS (mg/L) 20	pH 7.0-8.4	DO (%) 85 – 105% saturation	Turbidity (NTU) 8NTU	TSS (mg/L) 20	pH 7.0-8.4	DO (%) 85 – 105% saturation
06/02/2020	Falling Brackish to Marine conditions	Post Rain Monitoring	**64.1**	121	**6.8**	**82.2**	**229**	390	7.06	**75.4**	**142**	**163**	7.03	**80.1**
18/02/2020	Falling Brackish to Marine conditions	Background	5.2	<5	**5.36**	98	**18.7**	<5	**5.73**	90.7	**17.6**	<5	**5.61**	86.4

4.3.3.2 York's Hollow

York's Hollow has been identified as a potential receiver for run off from the Northern Corridor. Since the surface water runoff in and around the Northern Corridor gets redirected to field drop inlets and underground stormwater drainage it is unclear how much of the Northern Corridor effectively discharges into York's Hollow. It is also likely that run off from the Northern Corridor is also drained directly into the main stormwater trunk which is connected to overland flow paths near the Inner Northern Busway (INB) and travels underneath the RNA showground to eventually discharge into Enogerra / Breakfast creek.

York's Hollow also is the main sensitive receiver for run-off from the Inner City Bypass and Victoria Park Gold Course.



Bolded results in blue in Table 4 did not comply with the WQOs for Basin no. 143 - mid-estuary waters.

Very few physico-chemical water quality parameters complied with the WQOs for Basin no. 143 - mid-estuary waters, either during routine monitoring or post rain monitoring.

It is however noted that York's Hollow is not classified as a mid-estuary receiver under the Environmental Protection Policy (Water and Wetland Biodiversity) 2019. The recognised values under this policy are those if a lowland stream with a level of protection for moderately disturbed aquatic ecosystem. Using the relevant WQOs for lowland streams would introduce alternative screening criteria to pursue investigation into site practices around the management of Erosion and Sediment and Discharges. These criteria are also presented in Table 5.

Similar to the Mayne Yard site settings, there were limited ground disturbance activities occurring during February and where disturbance had occurred, the areas had been stabilised with erosion control measures or sediment control devices were in places. Overall, the northern corridor currently remains an active rail corridor with effective and sufficient ground cover to mitigate impacts to the receiving environment.

There were no active or known discharges from site at the time of the sampling events.

Finally, water quality parameters during post rain monitoring were consistent with if not better with (e.g. near neutral pH, lower E.C, lower turbidity) than during Ambient conditions monitoring.

Based on this information, Unity has assessed that exceedances of WQOs as imposed by Condition 15(a) are not a result of Project Works and therefore the results are not deemed Non-Compliance Events.

Table 5: York's Hollow WQ Data - Physico Chemical Parameters

Date	Sampling Purpose	SW4 - Downstream				
		Turbidity (NTU) 8NTU	TSS (mg/L) 20	pH 7.0-8.4	DO (%) 85 – 105% saturation	EC (µS/cm) N/A
	Lowland Streams WQO	Turbidity (NTU) 50NTU	TSS (mg/L) **6**	pH 6.5-8.0	DO (%) 85 – 115% saturation	EC (µS/cm) 600
06/02/2020	Post Rain Monitoring	**13**	**12**	**6.62**	93.6	102
18/02/2020	Background	**26.4**	<5	**5.62**	**94.1**	**863**

4.3.3.3 Moolabin Creek, Rocky Water Holes Creek and Stable Swamp Creek

Moolabin Creek, Rocky Water Holes Creek and Stable Swamp Creek have been identified as the surface water receivers for Moorooka Station / Clapham Yard, Rocklea Station and Salisbury Station respectively

Moolabin Creek and Rocky Water Holes Creek are also currently intersected by the existing rail corridor via means of bridge Structures

Stable Swamp Creek is not intersected by the Corridor South of the Project Boundaries. As it is located 100m due east from Salisbury Station, Unity has deemed it prudent to collect data prior to construction works commencing.

Very few physico-chemical water quality parameters complied with the WQOs for Basin no. 143 - mid-estuary waters, either during routine monitoring or post rain monitoring.

It is however noted that none of these three (3) creeks are classified as a mid-estuary receiver under the Environmental Protection Policy (Water and Wetland Biodiversity) 2019.

The recognised values under this policy are those if a lowland stream with a level of protection for moderately disturbed aquatic ecosystem under the Oxley Creek catchment. Using the relevant WQOs for lowland streams would introduce alternative screening criteria to pursue investigation into site practices around the management of Erosion and Sediment and Discharges. These criteria are also presented in the tables.

The ground disturbance activities that occurred during February where limited to discrete and localised PUP and geotechnical investigations and OHLE works at Fairfield and Yeronga. Overall, the southern corridor currently remains an active rail corridor with effective and sufficient ground cover to mitigate impacts to the receiving environment.

There were no active or known discharges from site at the time of the sampling events.

The water quality downstream of the rail corridor was compared to the upstream water quality at Moolabin and Rocky Water Holes Creeks. The water quality downstream was similar to and sometimes better (e.g. less turbid) than the upstream quality.

Based on this information, Unity has assessed that exceedances of WQOs as imposed by Condition 15(a) are not a result of Project Works and therefore the results are not deemed Non-Compliance Events.

Table 6: Moolabin Creek WQ Data - Physico Chemical Parameters

Date	Sampling Purpose	SW5 -Upstream					SW6 - Downstream				
		Turbidity (NTU) 8NTU	TSS (mg/L) 20	pH 7.0-8.4	DO (%) 85 – 105% saturation	EC (µS/cm) N/A	Turbidity (NTU) 8NTU	TSS (mg/L) 20	pH 7.0-8.4	DO (%) 85 – 105% saturation	EC (µS/cm) 600
Lowland Streams WQO		Turbidity (NTU) 50NTU	TSS (mg/L) **6**	pH 6.5-8.0	DO (%) 85 – 115% saturation	EC (µS/cm) N/A	Turbidity (NTU) 50NTU	TSS (mg/L) **6**	pH 6.5-8.0	DO (%) 85 – 115% saturation	EC (µS/cm) N/A
06/02/2020	Post Rain Monitoring	**26.7**	**52**	**6.77**	92.9	81	**19.5**	**22**	**6.63**	90.9	92
18/02/2020	Background	**11.6**	<5	**5.3**	90.6	1150	6.9	<5	**5.26**	91.8	1070

Table 7: Rocky water Holes Creek WQ Data - Physico Chemical Parameters

Date	Sampling Purpose	SW7 -Upstream					SW8 - Downstream				
		Turbidity (NTU) 8NTU	TSS (mg/L) 20	pH 7.0-8.4	DO (%) 85 – 105% saturation	EC (µS/cm) N/A	Turbidity (NTU) 8NTU	TSS (mg/L) 20	pH 7.0-8.4	DO (%) 85 – 105% saturation	EC (µS/cm) N/A
Lowland Streams WQO		Turbidity (NTU) 50NTU	TSS (mg/L) **6**	pH 6.5-8.0	DO (%) 85 – 115% saturation	EC (µS/cm) N/A	Turbidity (NTU) 50NTU	TSS (mg/L) **6**	pH 6.5-8.0	DO (%) 85 – 115% saturation	EC (µS/cm) N/A
06/02/2020	Post Rain Monitoring	**21.9**	**14**	**6.58**	85.7	44.8	**22.6**	**16**	**6.56**	85.5	42
18/02/2020	Background	5.1	<5	**5.09**	87.6	665	**11.6**	<5	**5.03**	88.6	660

Table 8: Stable Swamp Creek WQ Data - Physico Chemical Parameters

Date	Sampling Purpose	SW9 - Downstream				
		Turbidity (NTU) 8NTU	TSS (mg/L) 20	pH 7.0-8.4	DO (%) 85 – 105% saturation	EC (µS/cm) N/A
Lowland Streams WQO		Turbidity (NTU) 50NTU	TSS (mg/L) **6**	pH 6.5-8.0	DO (%) 85 – 115% saturation	EC (µS/cm) N/A
06/02/2020	Post Rain Monitoring	**20.4**	**18**	**6.29**	85.1	59.8
18/02/2020	Background	6.9	<5	**4.9**	90.5	770

4.3.4 Interpretation and Recommendations

Since there is limited background information available at each location selected for monitoring, it is not possible at this stage to determine whether trends can be seen between tidal cycles and water quality parameters for Breakfast creek.

Similarly, for the freshwater systems, there is insufficient background information at these locations to ascertain whether the results observed are consistent with baseline conditions.

Typical Water Quality results post rain are also subject to a very limited dataset.

Increased turbidities are expected in surface water systems particularly post significant rain events

It is however currently not possible to ascertain whether the data collected during the February post rainfall monitoring event is consistent with and reflective of baseline temporal and seasonal fluctuation of the receiving systems.

Whilst exceedances of the WQOs as imposed by Condition 15(a) were recorded, there is no evidence these exceedances are related to the Project Works.

Furthermore, WQOs are long term goals for water quality management under base flow conditions and have not been developed to set the benchmark for assessment of compliance of construction sites.

Other documentation prepared by the relevant regulatory bodies must be consulted to inform whether surface water quality of a receiving environment has been adversely affected by construction activities and therefore whether compliance is being met.

They include the following publicly available documents:

- the Queensland water quality guidelines (QWQG) prepared by DERM (now DES) which provide a technical basis for the WQOs. The QWQG also provide more detailed information on water types, water quality indicators, derivation of local water quality guidelines, application during flood events, monitoring, predicting and assessing compliance. (https://environment.des.qld.gov.au/management/water/quality-guidelines)
- Procedural guides developed by the DES to assess compliance such as the *Standard work method for the assessment of the lawfulness of releases to waters from construction sites in Queensland*. (https://environment.des.qld.gov.au/management/water/policy/urban-stormwater/erosion-sediment-control).

Unity is therefore recommending that if ongoing exceedances of the WQOs as imposed by Condition 15(a) are identified, these aforementioned documents be used to ascertain whether they are to be deemed Non-Compliance Events associated with Project Works.

5 Good News Stories

No Non-Compliance event occurred during the reporting period.

There were no complaints recorded associated with the Project Works.

Attachment 1 CGCR Non-Compliance Event Report (if required)

None for this reporting period.

Appendix C – TSD Monthly Report

Extracts from Progress Report

1.9 Environmental and Cultural Heritage Management

- Site activities continued throughout February 2020 in accordance with the CEMP (Rev 3) endorsed by the Independent Environmental Monitor on 10 January 2020.
- Less than 2 weeks after receiving endorsement for CEMP Rev 3, on 23 January 2020 CBGU submitted CEMP (Rev 4) to the Independent Environmental Monitor (IEM) to enable all future project works to proceed until project completion. All other remaining Environmental Sub-Plans were submitted throughout November - December 2019. CBGU consider comments have been suitably addressed but are yet to receive any endorsed plans from the IEM. The delayed receipt of endorsement presents a potential risk to project delivery.
- The IEM raised three (3) Non-Compliance Events relating to Erosion & Sediment Controls and Truck Sightings during February. CBGU demonstrated in their response that the claims do not constitute a non-compliance.
- CBGU is preparing information to contribute to a Request for Project Change (RfPC#6). Proposed changes relate to permitted hours (track possessions & vehicle movements).
- Regulatory approvals are progressing according to the below schedule.

Table 13 Approvals & Permits Schedule

Approval / Permit / Licence	Regulatory Authority	Responsibility / Timeframe	Items approved	Scheduled Approval
Completed (Last Month)				
Soil Disposal Permits (Woolloongabba Site)	DES	Environment and Sustainability Manager 15 BD	Removal of contaminated material from site	19 Feb 2020 Gained: 13 Feb 2020
Waste Levy Exemption (Woolloongabba Site)	DES	Environment and Sustainability Manager 20 BD	Removal of contaminated material from site	28 Feb 2020 Gained: 2 Mar 2020
Heritage Exemption Certificate #3	DES	Environment and Sustainability Manager 30 BD	Working on a Queensland heritage place (Roma St Station ventilation grates)	21 Feb 2020 Gained: 13 Feb 2020
Upcoming				
Heritage Exemption Certificate #4	DES	Environment and Sustainability Manager 30 BD	Working on a Queensland heritage place (General tunnelling beneath heritage places)	20 April 2020 (Subject to Landowner Consent – Perry House)
Soil Disposal Permits (for ongoing works)	DES	Environment and Sustainability Manager 15 BD	Removal of contaminated material from site	TBC – Contamination determined by soil analysis (EMR sites)
Waste Levy Exemption (for ongoing works)	DES	Environment and Sustainability Manager 20 BD	Removal of contaminated material from site	TBC – reliant on soil analysis (above). No exemption required for clean material.

February 2020 Monthly Report Summary

Monitoring Summary

It is the project's intent to aim for the Goals and Objectives relevant to vibration, noise, air quality and water monitoring within the practical extent of delivering the project.

Vibration monitoring was conducted on twenty-two (22) occasions, and noise monitoring was conducted on twenty-one (21) occasions during February 2020. Each vibration and noise monitoring event confirmed project requirements were adhered to.

Ambient air quality monitoring was conducted at the Roma Street, Albert St, Woolloongabba and Boggo Rd precinct sites during February 2020. Air quality monitoring confirmed project requirements were adhered to. Between the 20th to the 21st February 2020, the Brisbane CBD and South Brisbane Department of Environment and Science (DES) air quality stations recorded elevated particulate concentrations. Elevated readings were recorded throughout the greater Brisbane area at the time. The elevated levels were not project related.

Water quality monitoring was conducted prior to the release of water from the site on six (6) occasions. Each monitoring event confirmed project requirements were adhered to. Two (2) rounds of surface water quality monitoring were also conducted that confirmed no project impacts.

Environmental Monitoring Results

Monitoring data is provided below in accordance with Condition 6(b)(i) of the Coordinator-General Change Report.

Vibration

Vibration monitoring was conducted during February 2020.

All vibration monitoring adhered to project requirements and is detailed in the table below.

Table 1: Vibration Monitoring Data

Start Date	Time	Finish Date	Location	Purpose of Monitoring	Average Vibration levels (mm/s)	Max Vibration Level (mm/s)	Adhered to Project Requirements (Yes / No)
3/02/2020	11:35:00 AM	4/02/2020	Albert St	Construction Monitoring at Sensitive Places	0.5	5.9	Yes
3/02/2020	8:07:00 AM	3/02/2020	Boggo Rd	Construction Monitoring at Sensitive Places	0.09	0.14	Yes
3/02/2020	8:31:00 AM	3/02/2020	Boggo Rd	Construction Monitoring at Sensitive Places	0.54	1.86	Yes
12/02/2020	11:41:00 AM	14/02/2020	Albert St	Construction Monitoring at Sensitive Places	1.0	0.1	Yes
14/02/2020	8:30:00 AM	14/02/2020	Albert St	Construction Monitoring at Sensitive Places	0.7	10.9	Yes
17/02/2020	7:49:00 AM	17/02/2020	Roma St	Construction Monitoring at Sensitive Places	0.093	0.14	Yes
18/02/2020	12:57:00 PM	18/02/2020	Albert St	Construction Monitoring at Sensitive Places	1.5	0.2	Yes

18/02/2020	2:36:00 PM	18/02/2020	Albert St	Construction Monitoring at Sensitive Places	NA	0.2	Yes
18/02/2020	2:37:00 PM	18/02/2020	Albert St	Construction Monitoring at Sensitive Places	NA	0.8	Yes
18/02/2020	2:37:00 PM	18/02/2020	Albert St	Construction Monitoring at Sensitive Places	NA	0.5	Yes
18/02/2020	2:38:00 PM	18/02/2020	Albert St	Construction Monitoring at Sensitive Places	NA	0.1	Yes
18/02/2020	2:36:00 PM	18/02/2020	Albert St	Construction Monitoring at Sensitive Places	NA	0.1	Yes
19/02/2020	12:58:00 PM	19/02/2020	Roma St	Model Verification	0.23	1	Yes
19/02/2020	2:44:00 PM	21/02/2020	Albert St	Construction Monitoring at Sensitive Places	0.6	6.5	Yes
19/02/2020	2:48:00 PM	19/02/2020	Albert St	Construction Monitoring at Sensitive Places	NA	0.2	Yes
19/02/2020	2:50:00 PM	19/02/2020	Albert St	Construction Monitoring at Sensitive Places	NA	0.2	Yes
19/02/2020	2:52:00 PM	19/02/2020	Albert St	Construction Monitoring at Sensitive Places	NA	5.0	Yes
19/02/2020	2:53:00 PM	19/02/2020	Albert St	Construction Monitoring at Sensitive Places	NA	6.0	Yes
19/02/2020	2:54:00 PM	19/02/2020	Albert St	Construction Monitoring at Sensitive Places	NA	5.7	Yes
20/02/2020	9:26:00 AM	20/02/2020	Roma St	Model Verification	0.155	0.49	Yes

21/02/2020	7:28:00 AM	21/02/2020	Roma St	Construction Monitoring at Sensitive Places	0.10	0.16	Yes
21/02/2020	1:39:00 PM	22/02/2020	Gabba	Construction Monitoring at Sensitive Places	0.12	1.21	Yes

**Attended monitoring*

Noise

Attended noise monitoring was conducted during February 2020.

All noise monitoring data adhered to project requirements and is provided in the table below.

Table 2: Noise Monitoring Data

Date	Time	Location	Purpose of Monitoring	Activity	Noise level LA10[1]	Noise level LAeq[2]	Adhered to Project Requirements (Yes / No)
3/02/2020	11:52:00 AM	Roma St	Model Verification	Construction	67.8	65.4	Yes
3/02/2020	12:13:00 PM	Roma St	Model Verification	Demolition	73.1	70.3	Yes
4/02/2020	11:22:00 AM	Albert St	Model Verification	Construction Stage 1	74.4	74.2	Yes
4/02/2020	11:41:00 AM	Albert St	Model Verification	Construction Stage 1	68.5	68.1	Yes
12/02/2020	11:50:00 AM	Albert St	Model Verification	Construction Stage 1	77	76.5	Yes
13/02/2020	11:37:00 AM	Gabba	Model Verification	Site Establishment	68.6	68.6	Yes
17/02/2020	3:38:00 PM	Roma St	Model Verification	Construction	62.1	60.7	Yes
19/02/2020	11:20:00 AM	Albert St	Model Verification	Construction Stage 1	83	78.7	Yes
19/02/2020	1:30:00 PM	Roma St	Model Verification	Construction/Demolition	64.9	62.4	Yes
19/02/2020	1:53:00 PM	Roma St	Model Verification	Demolition	73.7	70.4	Yes
24/02/2020	9:21:00 PM	Gabba	Background Data	Site Establishment	72	68.8	Yes
25/02/2020	8:52:00 PM	Gabba	Model Verification	Site Establishment	73.5	70.5	Yes
26/02/2020	10:18:00 PM	Roma St	Model Verification	Construction/Demolition	69	65.4	Yes
26/02/2020	10:37:00 PM	Roma St	Model Verification	Construction/Demolition	69.4	66.5	Yes

27/02/2020	8:49:00 PM	Albert St	Model Verification	Utility works	72.8	71	Yes
27/02/2020	9:10:00 PM	Albert St	Model Verification	Utility works	77.3	75.1	Yes
27/02/2020	9:27:00 PM	Albert St	Model Verification	Utility works	77.1	72.6	Yes
28/02/2020	11:55:00 AM	Albert St	Model Verification	Construction Stage 1	77.8	75.1	Yes
28/02/2020	12:14:00 PM	Albert St	Model Verification	Construction Stage 1	76.8	73.9	Yes
29/02/2020	3:00:00 PM	Gabba	Model Verification	Site Establishment	72.9	71.2	Yes
29/02/2020	3:22:00 PM	Gabba	Model Verification	Site Establishment	67.8	65.7	Yes

- [1] Intermittent noise goal (LA10)
- [2] Continuous noise goal (LAeq)

Air

Air quality monitoring was conducted during February 2020.

All monitoring data adhered to project requirements and is provided in the table below.

Table 3: Air Quality Monitoring Data

Location	Project Wide Air Quality Criteria & Goals[1]			Monitoring results	Comments
	Criterion	Air Quality Indicator	Goal		
Roma St Precinct/ Northern Portal	Nuisance	Deposited dust	120 mg/m2/day	23.3 mg/m2/day	*Air quality monitoring was performed during the reporting period. All construction-related monitoring adhered to project requirements.*
Albert St Precinct				30.0 mg/m2/day	
Woolloongabba Precinct				26.7 mg/m2/day 20.0 mg/m2/day	
Boggo Rd Precinct/ Southern Portal				26.67 mg/m2/day 70.0 mg/m2/day	

[1] Project works must aim to achieve construction air quality goals. The *Coordinator-General Change Report – Whole of Project Refinements 2019* acknowledges instances exist that these goals may not be achieved.

CBGU JV also reviewed the DES air quality results for PM10 from nearby air quality stations during the reporting period. The results were as follows:

- Brisbane CBD: PM_{10} daily Maximum average: **52.6 µg/m³** with two (2) daily exceedances of the 50 µg/m³ (24hr avg) (https://apps.des.qld.gov.au/air-quality/chart/?station=cbd&parameter=18&date=1/02/2020&timeframe=month)
- South Brisbane: PM_{10} daily Maximum average: **54.8 µg/m³** with two (2) daily exceedances of the 50 µg/m³ (24hr avg) (https://apps.des.qld.gov.au/air-quality/chart/?station=sbr&parameter=18&date=1/02/2020&timeframe=month)
- Woolloongabba: PM_{10} daily Maximum average: **47.2 µg/m³**. (https://apps.des.qld.gov.au/air-quality/chart/?station=woo&parameter=18&date=1/02/2020&timeframe=month)

The graphical representation of the DES air quality data is presented in the below charts (refer to Figure 1-3).

The consistency of the PM_{10} goal exceedances (order of magnitude, day, duration) at stations located away from the direct zone of influence from the works confirms that the exceedances of the PM_{10} air quality goal over a 24hours averaging period are not relating to CBGU JV's works.

Brisbane had experienced elevated particulate concentration during the 20th to the 21st February 2020 due to regional-scale events, which likely had a significant impact on reported particulate concentrations.

Ambient air quality measurements can be influenced by external events outside of CBGU JV's control (e.g. road traffic, dust storms, fires).

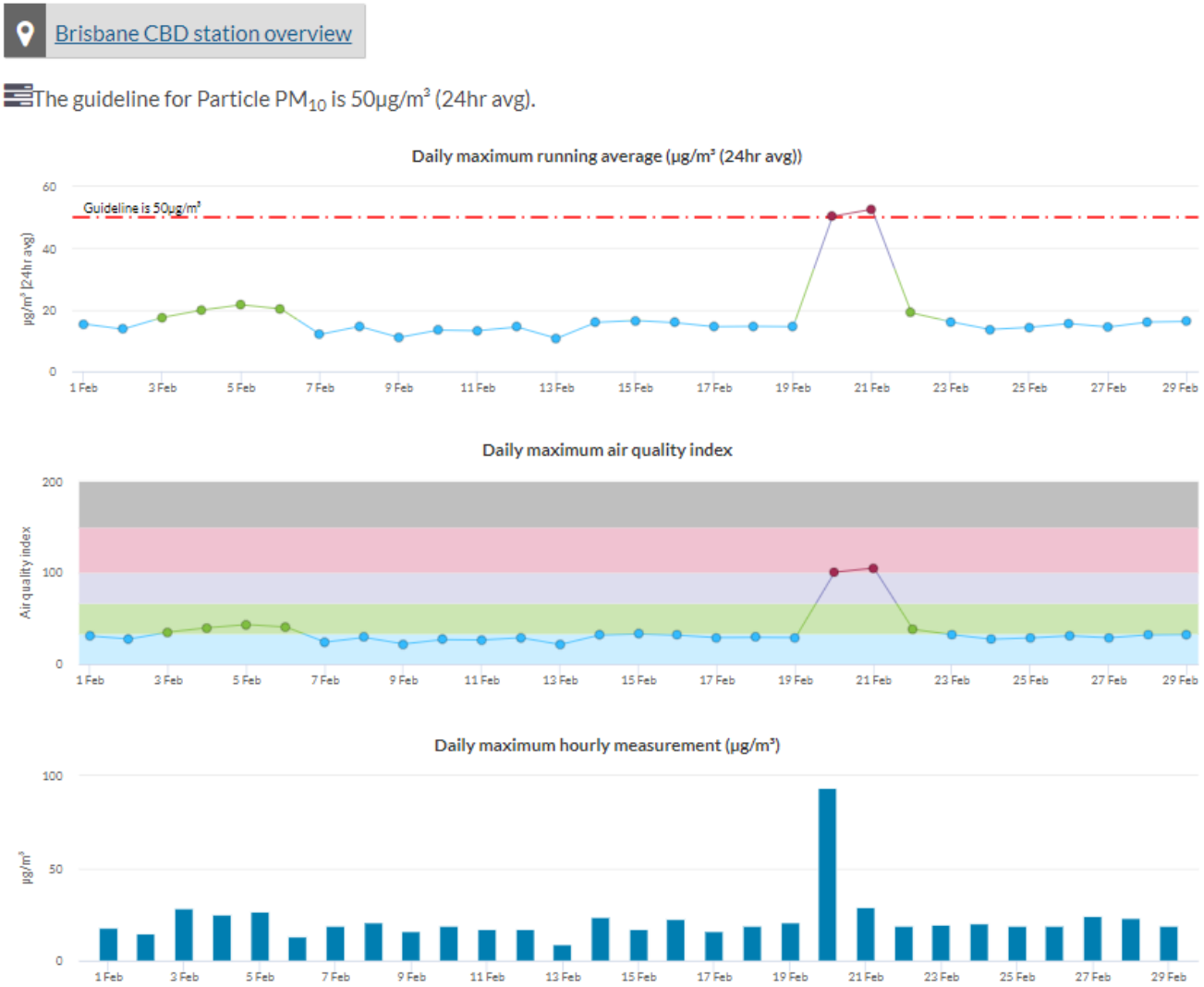


Figure 1: Brisbane CBD – DES Station - PM10 graph for February 2020 (reproduction from the DES website accessed March 2020)

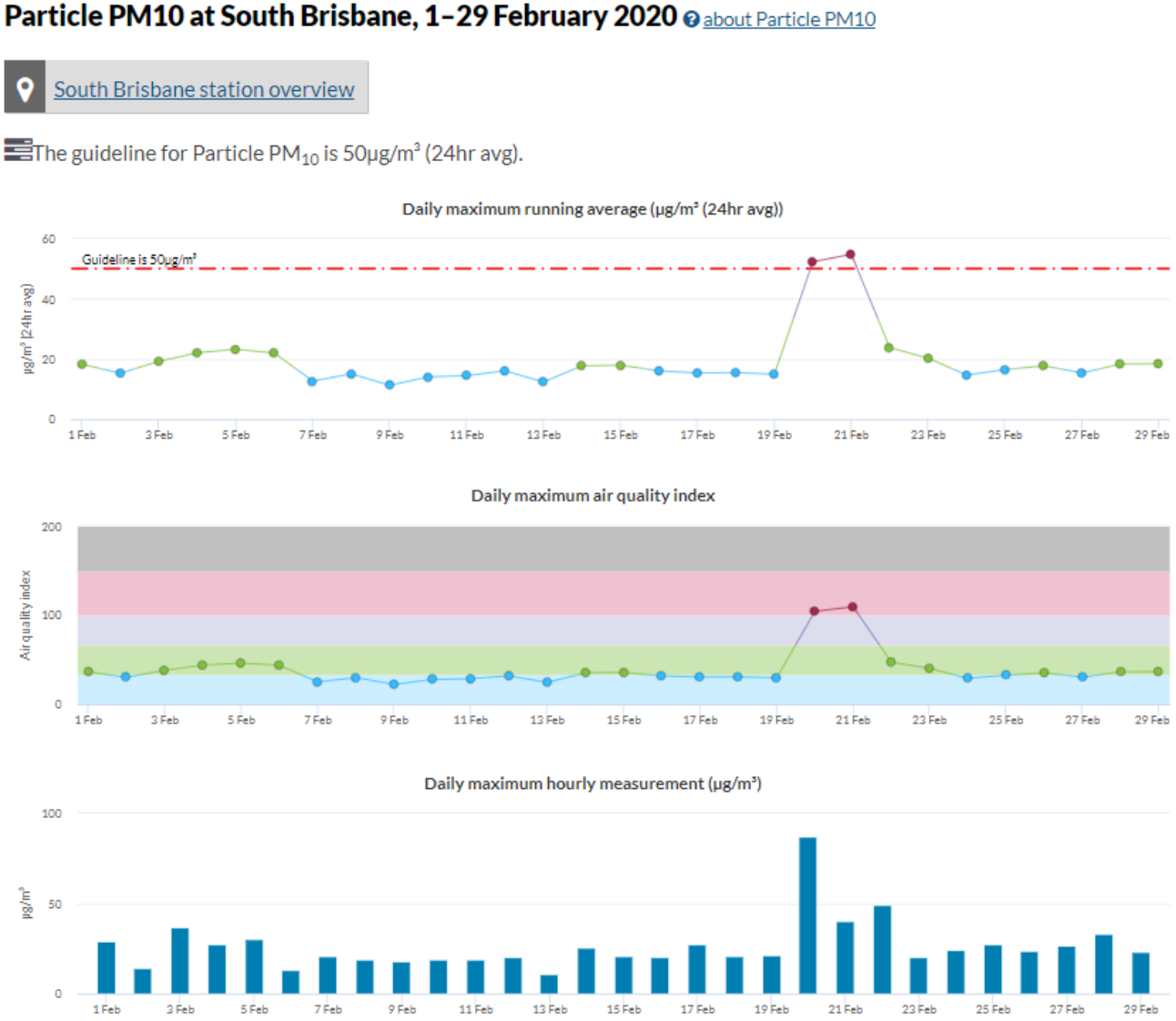


Figure 2: South Brisbane – DES Station - PM10 graph for February 2020 (reproduction from the DES website accessed March 2020)

Particle PM10 at Woolloongabba, 1–29 February 2020 about Particle PM10

Woolloongabba station overview

The guideline for Particle PM_{10} is 50µg/m³ (24hr avg).

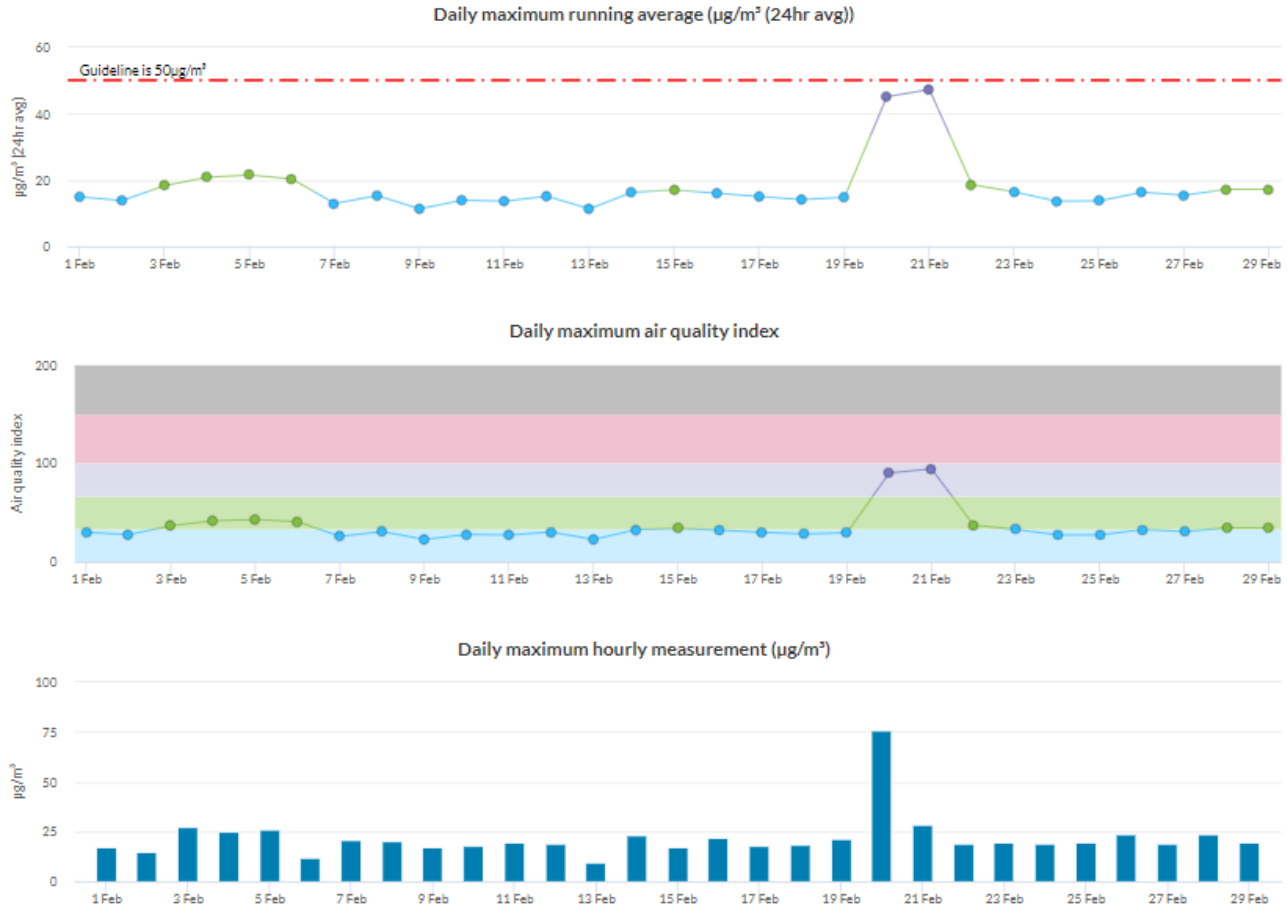


Figure 3: Woolloongabba – DES Station - PM10 graph for February 2020 (reproduction from the DES website accessed March 2020)

Water Quality

Water quality monitoring was conducted (prior to release from site) during February 2020.

Water quality monitoring data is provided in the table below.

Table 4: Water Quality Monitoring Data

Location	Date	Water Quality Objectives											Adhered to Project Requirements (Yes / No)
		Turbidity	Suspended solids	Chlorophyll a	Total nitrogen	Oxidised N	Ammonia N	Organic N	Total phosphorus	Filterable reactive phosphorus	Dissolved oxygen	pH	
Roma Street	7/02/2020	4.17	12.00	<1	0.20	0.06	0.02	-*	0.02	0.01	73.83#	8.10	Yes
Roma Street	10/02/2020	7.80	42.00^	<2	0.20	0.09	0.04	-*	0.01	0.01	79.88#	7.38	Yes
Roma Street	14/02/2020	2.38	5.00	<1	0.30	0.08	0.02	-*	0.02	0.01	99.25	8.27	Yes
Gabba	15/02/2020	6.47	13.00	<1	0.60	0.36	0.06	0.10	0.01	0.01	102.88	7.20	Yes
Gabba	17/02/2020	7.50	16.00	<1	0.01	0.08	0.01	0.10	0.01	0.01	96.82	7.20	Yes
Gabba	19/02/2020	7.60	13.00	19.00+	0.10	0.01	0.01	0.10	0.01	0.01	99.25	7.35	Yes

The project's discharge procedure is designed to minimise environmental impact and aim to achieve the water quality objectives. Water quality objectives are defined as goals within the Brisbane River estuary environmental values and water quality objectives document.

Adhered to project requirements in regard to aiming to achieve the water quality objective. The dissolved oxygen samples were acquired prior to discharge from site. Pumping of the water will have inadvertently aerated the water thus increasing dissolved oxygen level.

^ Adhered to project requirements in regard to aiming to achieve the water quality objective. Suspended solids were sampled prior to discharge. Water discharge is a protracted process which in time the suspended solids would have continued to reduce. The Suspended Solids are demonstrated to be below the level of the receiving environment (demonstrated within Table 5 below) and lower than the construction "Urban Stormwater Quality Planning Guidelines" (DERM 2010) referred to in Section 3.1.4 of the Brisbane River estuary environmental values and water quality objectives document.

+ Adhered to project requirements in regard to aiming to achieve the water quality objective. Considered an abnormal result (incosistent with other site results).

* Organic N was not sampled on this occasion. Previous site monitoring indicates Organic N would have been within allowable limits and data to date indicates site activities will not affect Organic N. Monitoring of these parameters to recommence next monitoring period.

During February 2020, CBGU JV undertook two (2) rounds of surface water sampling at four (4) locations (upstream and downstream). The monitoring locations are representative of the broader catchment and since no significant offsite discharges were occurring at the time of monitoring, no results are attributed to the project.

Table 5: Offsite Upstream & Downstream Water Quality Data

Location	Date	Purpose of Monitoring	Turbidity	Suspended solids	EC (µS/cm)	Dissolved oxygen	pH	Adhered to Project Requirements (Yes / No)
Albert St Precinct - Upstream	10/02/2020	Post Rainfall	54.2	86	>3999	65.36	7.61	Yes
Albert St Precinct - Downstream	10/02/2020	Post Rainfall	47.8	35	>3999	67.78	7.58	Yes
Boggo Rd Precinct/ Southern Portal – Beginning of the Surface Catchment*	10/02/2020	Post Rainfall	42.6	36	382.1	65.36	7.59	Yes
Woolloongabba Precinct - Upstream	10/02/2020	Post Rainfall	22.1	60	>3999	75.04	7.35	Yes
Woolloongabba Precinct - Downstream	10/02/2020	Post Rainfall	40.7	71	>3999	73.83	7.46	Yes
Roma St Precinct - Upstream	10/02/2020	Post Rainfall	60.9	174	>3999	59.31	7.49	Yes
Roma St Precinct - Downstream	10/02/2020	Post Rainfall	54.9	182	>3999	64.15	7.56	Yes
Albert St Precinct - Upstream	20/02/2020	Monthly	57.2	43	>3999	64.15	7.62	Yes
Albert St Precinct - Downstream	20/02/2020	Monthly	62.2	68	>3999	81.09	7.58	Yes
Woolloongabba Precinct - Upstream	20/02/2020	Monthly	52.4	53	>3999	77.46	7.41	Yes

Woolloongabba Precinct - Downstream	20/02/2020	Monthly	19.2	26	>3999	75.04	7.42	Yes
Boggo Rd Precinct/ Southern Portal – Beginning of the Surface Catchment*	20/02/2020	Monthly	38.1	12	412.3	33.89	7.35	Yes
Roma St Precinct - Upstream	20/02/2020	Monthly	60.9	43	>3999	58.09	7.49	Yes
Roma St Precinct - Downstream	20/02/2020	Monthly	54.9	61	>3999	56.88	7.56	Yes

* Monitoring at the Boggo Rd site occurs at a pipe outlet at the beginning of the surface catchment. There is no upstream/downstream monitoring point as such. The pipe outlet receives water released from the site, as well as a broader stormwater catchment.

Non-Compliances

A Non-Compliance Event is defined as Project Works that do not comply with the Imposed Conditions. Nil non-compliances occurred during the monitoring period.

Non- Compliance Events Summary

Table 6: Non-Compliance Events

Event Title	Location, Date and time of the event	Date the Event was Formally Notified to CG/IEM	Conditions Affected	Date the Event Report Formally Sent to CG/IEM	Status of Event
Nil for this reporting period					

Complaints

The below section summarises the complaints to be reported in accordance with Condition 6(b)(iii) of the CGCR.

Table 7: Summary of Complaints

Date	Location	Issue	CGCR Non-Compliance	Status of Event
29/02/2020	Mary Street	Noise complaint	A complaint was raised regarding project works undertaken during standard work hours on Saturday. Attended noise monitoring confirmed that works adhered to project requirements.	Closed
27/02/2020	Mary Street	Noise complaint	A complaint was raised regarding project works undertaken during evening hours. Attended noise monitoring confirmed that works adhered to project requirements.	Closed
24/02/2020	Mary Street	Noise complaint	A complaint was raised regarding project works undertaken evening hours. Attended noise monitoring confirmed that works adhered to project requirements.	Closed

Appendix D - Non-Compliance Event Reports

There was no non-compliance events raised in February 2020.