Sydney Cricket Ground Trust

ALLIANZ STADIUM: EVENT NOISE MONITORING - MICHAEL BUBLE (CLOSING SHOW CEREMONY), 4 AND 5 OCTOBER 2018

October 2018

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Project Reference: 5510

Document Title: ALLIANZ STADIUM: EVENT NOISE MONITORING - MICHAEL BUBLE (CLOSING SHOW CEREMONY), 4 and 5 OCTOBER 2018

Client: Sydney Cricket Ground Trust

Document Reference: /Network/Projects/5510/Reporting/Event/5510_BUBLE_V02.odt

Version:	Description:	Date:	Author:	Checked by:	Approved by:
00	Draft for internal review	10/10/18	JD	BW	BW
01	Draft for Client	10/10/18	JD	BW	BW
02	Final for Client	11/10/18	JD	BW	BW
03					
04					

Company:
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Executive Summary

Monitoring of noise levels at sensitive receptors in the area surrounding Allianz Stadium was undertaken during sound checks, rehearsals, and the Closing Show Celebration concert on the 4th and 5th October 2018 to determine compliance with the following noise criteria defined in the site's Noise Management Plan (NMP):

> *'During sound test(s), rehearsal(s) and concert(s), L_{Amax} and the L_{Cmax} measured at the specified locations described in Section 15.4 will not exceed:*
>
> *ii) For activities conducted at the SFS: 80 dB(A) and 100dB(C).'*

Throughout the monitoring, noise levels were recorded every two minutes, and observations were made as to the source of noise and potential exceedances at each location. The noise level recorded represents the highest RMS noise level recorded during the two minute period. Hence, even where exceedances are identified it is possible that for the majority of the two minute period, receptor noise levels were compliant with the NMP criteria.

During the sound checks on the 4th October (intermittently from 2:00 pm until 7:00 pm) monitoring was completed to confirm compliance and to determine if adjustments to the sound system were necessary to achieve compliance. Typically noise levels were well below established criteria throughout the testing, with one measured exceedance occurring during a soundcheck of the loudest anticipated song. Adjustments to maintain subsequent compliance were programmed into the set by the FOH operators based on advice from the Event Monitoring staff. All amplification ceased ahead of the 7:00 pm curfew.

It is noted that the measured exceedance does not constitute an actual exceedance due to the allowances for elevated winds during the period, and allowance for initial adjustments outlined in the NMP.

During the sound checks of 5th October 2018, advice was provided by ENM staff on operating levels likely to result in compliance in accordance with the sound checks, and change in weather. Adjustments were made to the system and programmed for the event.

During all performances the operating levels were generally below the criteria by 3 dB or more, however some occasions the measured levels were within 1 dB of the criteria.

No exceedences occurred during the event day, on the 5th October 2018.

During the event no complaints were received by the Trust during the line checks of 4th October, or sound checks and performance of 5th October 2018.

The main performance finished at 10:30 pm, immediately followed by a 4 minute fireworks display ending at 10:35 pm. It is noted the event, and therefore the commencement of fireworks were delayed due to the weather and extended beyond the 10:30pm curfew.

CONTENTS

1 INTRODUCTION

1.1 SCOPE OF ASSESSMENT

Sydney Cricket Ground Trust commissioned Air Noise Environment Pty Ltd to conduct event noise monitoring during the closing show ceremony concert as required under the Noise Management Plan (NMP) for the facility[1].

This report presents a summary of the results of the monitoring and a comparison with the noise criteria for the event as defined in the NMP.

1.2 EVENT DETAILS

The concert event and line checks were held at Allianz Stadium (SFS) on on Thursday 4th Octber and Friday 5th October 2018. This report presents the noise monitoring methodology and results for the line checks and performance.

The approximate schedule for the amplified line checks, sound checks and event performances were as follows:

Thursday:
- Line checks: 1:00 pm - 5:00 pm.
- Rehearsal/sound checks: 5:00 pm – 7:00 pm.

Friday:
- Rehearsal/sound checks: 10:00 am – 2:30 pm.
- Guy Sebastian / sound check: 2:30 pm – 3:15 pm
- Busby Marou / sound check: 3:30 pm – 4:00 pm
- Event: 5:00 pm – 10:30 pm

It was noted as a result of inclement weather, the timing of soundchecks and some of the main show were adjusted slightly, and in some instances reduced in duration.

The event was attended by 29,219 patrons.

1.3 EVENT NOISE CRITERIA

Noise limits for concert events held at Allianz Stadium are provided in the site's NMP as follows:

> ***'3.2.2 Concerts, Rehearsals and Sound Tests***
>
> *Both dB(A) and dB(C) limits are specified for concerts as a particular impact on local receptors of amplified music is low-tone bass sounds – measured in dB(C).*
>
> *During sound test(s), rehearsal(s) and concert(s), L_{Amax} and the L_{Cmax} measured at the monitoring locations will not exceed:*

[1] *Sydney Cricket and Sports Ground Trust (SCGT) Noise Management Plan for Sydney Cricket and Sports Ground Trust (January 2017)*

- *For activities conducted at the SFS: 80 dB(A) and 100dB(C). '*

Section 6.2.1 of the NMP details the monitoring positions that must be considered as follows:

> ***'Monitoring Locations***
>
> *For both sporting events and concerts attended monitoring locations will be as set out below.*
>
> ***For activities taking place at Allianz Stadium:***
>
> - *At a point within one (1) metre of the boundary nearest to Allianz Stadium at 234 Moore Park Road, Paddington; and*
> - *At a point within one (1) metre of the boundary nearest to Allianz Stadium of 10 Alexander Street, Paddington'*

The NMP also presents the following considerations relevant to concert performance noise:

- An exceedance of the noise level limit by a maximum of 5 dB(A) and/or 5 dB(C) during a single (5) minute period during the first ten (10) minutes of the performance of each new act will not be taken to be a breach of the limits.
- Noise levels measured when wind speed exceeds 5 m/s (at microphone height) should not be used to measure compliance with noise limits in the Notice, as wind generated noise may limit measurement accuracy. During periods of wind greater than 5 m/s the Trust must continue to take all reasonable and feasible actions to minimise noise.
- **Concerts**: A concert must not commence prior to 1000 hours or finish after 2230 hours on any day. Not withstanding the above, concerts may continue until 2300 hours if an occurrence beyond the control of the Trust delays the concert. The total length of a concert must not be greater than five (5) hours.
- **Rehearsals**: Rehearsals will not commence prior to 1000 hours or finish after 1900 hours. The total duration of rehearsals will be kept to an absolutely minimum; and
- **Sound Tests**: Sound test(s) will not commence prior to 1000 hours or finish after 1900 hours. The total duration of sound tests will be kept to an absolute minimum.

The exemption for exceedances at the start of new performances is intended to give the mixing desk operators time to respond to changes in conditions (e.g. meteorology), or unfamiliarity with the system (new operator). Subsequent exceedances will be considered as normal.

2 MONITORING METHODOLOGY

2.1 MONITORING POSITIONS

Monitoring during the sound checks and rehearsal were undertaken at two fixed monitoring positions as required by the NMP. Table 2.1 presents a summary of the monitoring locations assessed during the event, with the monitoring positions identified on Figure 1.

TABLE 2.1: SUMMARY OF MONITORING POSITIONS

Position	Description
1	Fixed monitoring position located within 1 m of the front boundary of 234 Moore Park Road
2	Fixed monitoring position located within 1 m of the front boundary of 10 Alexander Street

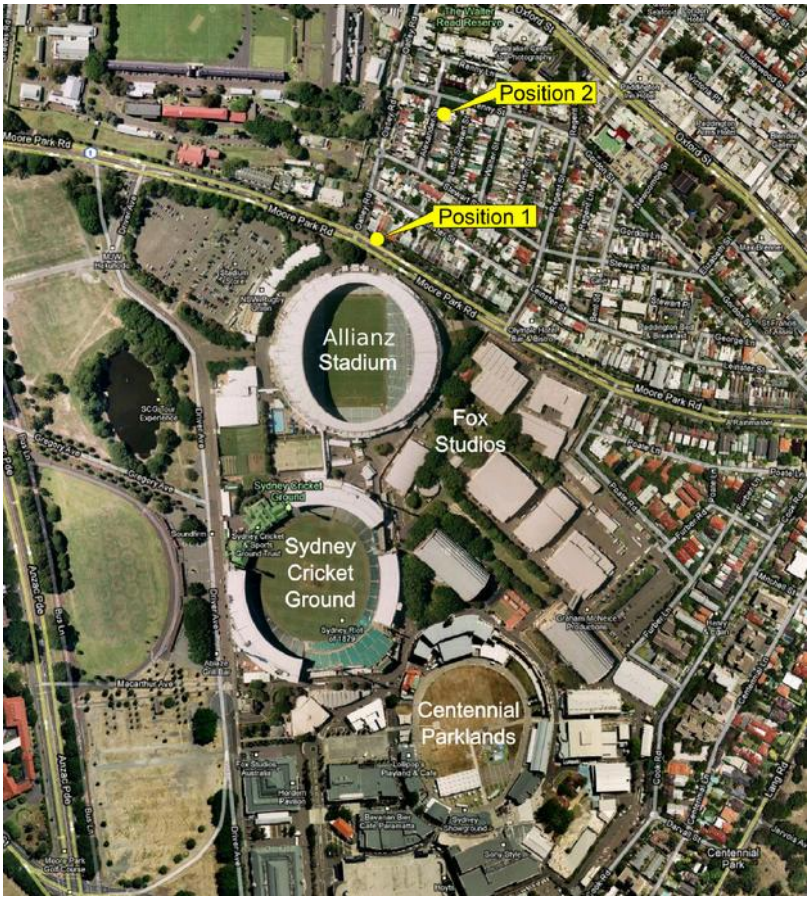

Figure 1: Noise Monitoring Positions (External Fixed Locations)

In addition to the external compliance monitoring, Event Noise Management staff were present at the front of house (FOH) position to advise the compliance status of noise levels to the production team throughout the event. It was noted that a dedicated sound engineer was in control of the overall volumes throughout the show (despite various mixing desk operators for specific performing artists), and ENM personnel were positioned in close proximity allowing swift

advice when changes were required to operating volumes to maintain compliance.

2.2 OPERATORS

During the monitoring undertaken on 4th and 5th October 2018, Air Noise Environment personnel were located at each position identified in Figure 1. The monitoring exercise was undertaken by the following personnel:

- Mixing Desk (FOH): Beau Weyers, BEng(Mech), RPEQ, MAAS;
- Position 1: James Daramola: BEng(Mech); and
- Position 2: Roger Treagus: BA, MA Env. Stud, MAAS.

2.3 MONITORING EQUIPMENT

Table 2.2 presents a summary of the equipment used the monitoring. The sound level meters used for the monitoring conform to Australian Standard 1259 "Acoustics - Sound Level Meters", (1990) Type 1 (precision sound level meter), and have an accuracy suitable for both field and laboratory use.

The sound level meters and calibrator have been checked, adjusted and aligned to conform to the Type 1 specifications by a third party NATA accredited laboratory within the last 24 months and issued with a conformance certificate.

TABLE 2.2: SUMMARY OF MONITORING EQUIPMENT

Position	Instrument Model	Instrument Serial	Instrument Calibration Due Date	Field Pre-Calibration	Field Post-Calibration
Front of House	Bruel & Kjaer 2250L	2741104	21/11/19	94.2	94.0
	Bruel & Kjaer 2250L	2741105	23/01/19	94.0	94.0
	Norsonic 140	1404619	27/06/19	94.0	93.9
1	Norsonic 140	1404663	29/06/19	93.5 93.6	94.0 94.1
2	Norsonic 140	1404664	12/06/19	94.2 94.0	94.0 94.5
Field Calibrator	Svantek SV03A	358	21/11/18	-	-

Field calibrations of each of the instruments were also undertaken prior to and immediately after the monitoring was completed. Less than 0.5 dB drift occurred over the measurement periods. All instruments were fitted with a windshield and monitoring was completed at a height of 1.5 m above ground level.

2.4 WEATHER CONDITIONS DURING THE EVENT

For the duration of amplified activities moderate south-south-westerly winds dominated the rehearsal afternoon, on Thursday 4th October, and southerly winds dominated the event day on Friday 5th October.

Rain was prevalent throughout both days, the rehearsal on the Thursday, and the event day on the Friday. The only sustained break in heavy rain during the event day was noted to occur during the headline performance (Michael Buble).

Stratus clouds (observed as a huge gray blanket that hangs low in the sky) were prevalent throughout both days, with cumulus clouds, also low lying, forming around 9:30 pm, which have the potential to elevate noise levels outside the venue (via reflections).

Table 2.3 presents a summary of the meteorological data from Sydney Airport for the rehearsal afternoon and performance evening. In addition, observations regarding rain and wind intensity were made during the event.

TABLE 2.3: SUMMARY OF METEOROLOGICAL DATA

Date / Time	Temperature	Cloud	Cloud Base (m)	Cloud Type	Pressure Tendency	Rain (mm)	Weather	Wind Direction	Wind Speed (km/hr)	Gust (km/hr)	Relative Humidity
Thursday											
04/10:00am	12.3	Mostly clear	180	Stratus	-	1	-	SSW	24	35	94
04/10:30am	11.9	Mostly clear	180	Stratus	-	1.8	Rain	SSW	26	37	95
04/11:00am	10.9	Mostly clear	180	Stratus	-	1.8	-	S	33	41	94
04/11:30am	9.8	Mostly clear	180	Stratus	-	1.8	-	SSW	39	50	92
04/12:00pm	11.2	Cloudy	100	-	F	1.8	Distant precip.	S	33	43	91
04/12:30pm	9.9	Mostly clear	240	Stratus	-	1.8	-	S	39	48	90
04/01:00pm	10.5	Mostly clear	240	Stratus	-	1.8	-	S	35	44	90
04/01:30pm	9.2	Mostly clear	240	Stratus	-	1.8	Rain	S	39	48	91
04/01:41pm	9.6	Mostly clear	240	Stratus	-	1.8	Rain	S	37	56	91
04/02:00pm	9.5	Mostly clear	240	Stratus	-	1.8	-	S	37	48	92
04/02:30pm	9.3	Mostly clear	240	Stratus	-	2	Rain	S	37	46	93
04/03:00pm	10.2	Cloudy	200	-	R	2.4	Rain	SSW	32	39	94
04/03:30pm	10.6	Partly cloudy	300	Stratus	-	3.2	Rain	SSW	30	39	94
04/04:00pm	10.5	Partly cloudy	300	Stratus	-	4.6	-	SSW	30	37	95
04/04:30pm	10.3	Mostly clear	180	Stratus	-	5.8	Rain	SSW	33	44	96
04/05:00pm	10.5	Mostly clear	180	Stratus	-	6.2	-	SSW	33	39	96
04/05:30pm	10.9	Mostly clear	180	Stratus	-	6.6	Rain	S	32	37	96
04/06:00pm	11.6	Cloudy	100	-	F	7	Rain	SSW	28	35	95
04/06:30pm	11.9	Mostly clear	180	Stratus	-	7.4	Rain	SSW	26	32	95
04/07:00pm	12.6	Mostly clear	240	Stratus	-	7.6	-	SSW	24	32	95
04/07:30pm	12.4	Mostly clear	180	Stratus	-	7.8	Rain	SSW	26	33	94
04/08:00pm	12.6	Mostly clear	180	Stratus	-	7.8	-	SSW	26	32	94
Friday											
05/10:00am	7.3	Mostly clear	540	Stratus	-	0.6	-	S	41	56	92
05/10:30am	8.7	Mostly clear	600	Stratus	-	0.6	Showers	SSE	39	50	89
05/10:44am	8.4	Mostly clear	660	Stratus	-	0.6	Showers	SSE	41	59	83
05/10:51am	7.7	Mostly clear	540	Stratus	-	0.8	Showers	SSE	43	59	89
05/11:00am	8	Mostly clear	540	Stratus	-	0.8	-	SSE	43	59	88
05/11:30am	7.6	Mostly clear	660	Cumulus	-	0.8	Showers	SSE	46	57	84
05/12:00pm	8.9	Cloudy	600	-	R	0.8	Showers	S	41	54	85
05/12:30pm	7	Partly cloudy	450	Stratus	-	1.2	Rain	S	44	57	86
05/01:00pm	8.6	Partly cloudy	540	Stratus	-	1.4	-	S	43	54	91
05/01:30pm	7.1	Partly cloudy	420	Stratus	-	1.6	Rain	SSE	46	59	95
05/02:00pm	8.2	Partly cloudy	300	Stratus	-	2	-	S	43	56	96
05/02:14pm	7.6	Partly cloudy	300	Stratus	-	2	Rain	S	46	56	97
05/02:30pm	8.3	Partly cloudy	300	Stratus	-	2.2	Rain	S	41	52	97
05/03:00pm	7.5	Cloudy	200	-	R	2.2	Rain	S	43	56	97
05/03:14pm	7.1	Partly cloudy	270	Stratus	-	3.6	Rain	S	44	57	98
05/03:24pm	7	Partly cloudy	270	Stratus	-	4.2	Showers	S	43	61	98
05/03:30pm	7.9	Partly cloudy	270	Stratus	-	4.2	Showers	S	41	61	98
05/03:50pm	7.1	Partly cloudy	270	Stratus	-	4.4	-	S	44	61	97
05/04:00pm	7.3	Partly cloudy	300	Stratus	-	4.6	-	S	43	56	97
05/04:12pm	7.8	Partly cloudy	300	Stratus	-	5.6	Showers	S	39	50	97
05/04:23pm	9.1	Partly cloudy	270	Stratus	-	7.2	Showers	SSE	35	54	98
05/04:30pm	8.4	Partly cloudy	270	Stratus	-	8	Showers	SSE	39	56	98
05/04:35pm	7.9	Partly cloudy	270	Stratus	-	8	Showers	S	39	57	98
05/05:00pm	7.5	Partly cloudy	330	Stratus	-	8.6	-	S	41	54	98
05/05:09pm	8.3	Partly cloudy	300	Stratus	-	9.2	Showers	S	37	56	98
05/05:16pm	9.3	Partly cloudy	330	Stratus	-	9.2	Showers	SSE	33	48	98
05/05:23pm	7.8	Partly cloudy	300	Stratus	-	9.2	Showers	SSE	39	50	96
05/05:30pm	6.9	Partly cloudy	270	Stratus	-	10	Showers	SSE	43	54	97
05/05:48pm	8.6	Mostly clear	270	Stratus	-	10.6	Showers	SSE	33	48	97
05/06:00pm	8.8	Mostly cloudy	200	-	R	10.6	Showers	SSE	33	48	96
05/06:14pm	10.4	Mostly clear	270	Stratus	-	11	Showers	SSE	28	39	96
05/06:18pm	9.9	Mostly clear	270	Stratus	-	11.2	Showers	SSE	30	54	96
05/06:27pm	7.3	Mostly clear	270	Stratus	-	11.2	Showers	S	46	59	96
05/06:30pm	6.6	Mostly clear	240	Stratus	-	11.4	Showers	S	46	59	96
05/06:57pm	8.5	Mostly clear	240	Stratus	-	11.8	Showers	S	35	56	95
05/07:00pm	7.1	Mostly clear	240	Stratus	-	11.8	-	S	41	57	94
05/07:30pm	8.2	Mostly clear	240	Stratus	-	11.8	Showers	S	37	56	95
05/07:45pm	7.4	Mostly clear	240	Stratus	-	12.4	Showers	S	39	50	96
05/08:00pm	8.5	Mostly clear	180	Stratus	-	13.4	-	SSW	35	52	97
05/08:20pm	6.9	Mostly clear	180	Stratus	-	13.4	Showers	SSW	41	50	96
05/08:30pm	6.8	Mostly clear	240	Stratus	-	13.6	Showers	SSW	41	50	96
05/09:00pm	9.1	Mostly cloudy	200	-	F	13.8	Recent precip.	SSW	30	35	96
05/09:30pm	8.2	Mostly clear	540	Cumulus	-	13.8	Showers	SSE	33	41	85
05/10:00pm	10.1	Mostly clear	450	Stratus	-	13.8	-	SSE	32	41	81
05/10:30pm	10.3	Mostly clear	450	Stratus	-	13.8	-	SSE	32	43	80
05/11:00pm	9.3	Mostly clear	600	Cumulus	-	13.8	-	SSE	35	48	84
05/11:30pm	9	Mostly clear	600	Cumulus	-	13.8	-	SSE	37	48	82

3 RESULTS OF MONITORING

3.1 MONITORING RESULTS

Noise monitoring results were recorded at each location every[2] two minutes of amplification throughout the monitoring periods:

- Thursday – 2:00 pm to 7:00 pm
- Friday – 12:00 pm to 10:30 pm

During each two minute period notes were also made regarding the sources of noise in the area and the source of any potential exceedances of the noise criteria. It is noted that the noise level recorded represents the highest RMS noise level recorded during the two minute period. Hence, even where exceedances are identified it is possible that for the majority of the two minute period, receptor noise levels were compliant with the NMP criteria.

During the line checks/sound checks and event of the 4th and 5th of October Event Noise Management (ENM) staff completed tests to determine adjustments and acceptable volumes for the sound system to maintain compliance for external noise levels. These changes included reduction of the volume of specific frequencies and identification of speaker arrays with potential to influence noise external to the venue. The sound engineer made adjustments to maintain achieve compliance, and programmed them into the system.

During the sound checks on the 4th October (intermittently from 2:00 pm until 7:00 pm) Event Noise Management (ENM) staff monitored externally to confirm compliance and to determine if adjustments to the sound system were necessary to reduce external noise levels to achieve compliance. Typically noise levels were well below established criteria throughout the testing, with one exceedance occurring during a soundcheck of the loudest anticipated song. Following the measured exceedences, adjustments were immediately made to the system volumes and programmed for subsequent testing and performances.

It is noted that the measured exceedance does not constitute an actual exceedance due to the allowances for elevated winds during the period, and allowance for initial adjustments outlined in the NMP.

It was noted that south-south-easterly winds were prevalent during the checks, and were expected to continue through the event day.

All amplification on the 4th October 2018 ceased prior to the curfew time (7:00 pm).

During the sound checks of 5th October, each of the three acts performed sound checks for a short duration due to the heavy rainfall. During this time advice was provided by ENM staff on operating levels likely to result in compliance based on measurements completed on the 4th, during the current sound checks, and changes in the weather. Adjustments were made to the system and programmed for the event. There were no measured exceedences during the sound testing, associated with the venue noise.

Throughout the duration of the main event, from 5:00 pm until conclusion, all external measured levels complied with the noise criteria. The ENM staff monitoring externally were diligent and quick to inform FOH when the noise levels were within 3 dB of the noise criteria.

[2] *Short periods of rain impedance and battery changes resulted in brief periods of pause. Observations were continued throughout.*

In all cases of measured elevated levels, the operators were very responsive to instruction from ENM staff to reduce levels, and the general programming remained at least 3 dB below the criteria.

With regards to weather conditions, rain occurred during the majority of performances, with low cloud levels. Winds were predominately south-south-westerly. Naturally, these winds would direct noise towards the nearest off-site sensitive receivers, however, due to localised buildings, the nearest receptors are shielded from these winds. Hence, south-westerlies were a minor disadvantage because of the potential to elevate noise levels at the nearest receptors and the monitoring location at 234 Moore Park Road.

During the show, SCGT staff and Event Noise Management staff continually informed the sound engineers whenever levels were approaching the criteria (within 3 dB) in order to maintain compliant operating volumes. It was acknowledged that the low cloud and wet surfaces resulted in greater propagation of noise than normal, and despite a brief (< 5 seconds) exceedance of the criteria during the sound testing, the operators were found to be highly responsive to requests, and planned to remain below the criteria with a buffer to allow for the 'big notes'.

The event personnel were informed that the NMP requires the event to conclude at 10:30 pm. The stage performance and all amplification conclude at 10:30 pm.

A fireworks display (to farewell Allianz Stadium) occurred at approximately 10:31 pm and lasted for approximately 4 minutes, concluding at 10:35 pm. As is required in the NMP, the local residents were informed of the desire to operate fireworks as part of the performance. It is however noted that the NMP identifies that fireworks are not to occur after 10:30 pm. However the event, and therefore the commencement of fireworks were delayed due to the weather and extended beyond the 10:30pm curfew.

Appendix B presents a summary of the recorded noise levels and observations during the sound check and rehearsal.

3.2 CONCERT HOTLINE

No complaints were received by the Trust during the line checks on 4th October and the main event on 5th October

3.3 REVIEW OF EXCEEDANCES

Table 3.1 presents a summary of the 2-minute monitoring periods, where amplified music from the venue resulted in an L_{Cmax} exceeding the criteria.

One exceedence occurred on Thursday 4th October, during Michael Buble's rehearsal, at approximately 5:54 pm. The operator at Position 1 – 234 Moore Park Road, recorded an exceedence of 104 dBC, reportedly from the orchestra playing a loud note (the crescendo of the anticipated loudest song).

ENM staff at FOH were informed of the exceedance and relayed the information to the mixing desk operators of the specific dB level beyond which the criteria exceeded externally. The necessary adjustment was programmed such that the resulting 'loudest song' would comply externally (i.e. a -4dBC correction at FOH). All subsequent measurements complied with the criteria, throughout the rehearsals, soundchecks and event of the 5th October 2018.

It was noted on all occasions that the mixing desk operators were responsive to requests to reduce and adjust the operating volumes. Some amendment to the system was required as a result of the rain (elevated humidity, low cloud, and wet surfaces can result in greater propagation of noise, especially at low frequencies). It is also noted that the majority of monitoring was also completed in the rain, which may have influenced the measurements.

The Noise Management Plan identifies that:

- Exemption for exceedences at the start of new performances: An exceedence of the noise level limit in condition 15(a) by a maximum of 5 dB(A) and/or 5 dB(C) during a single five (5) minute period during the first ten (10) minutes of the performance of each new act will not be taken to be a breach of condition 15.

- Noise levels measured when wind speed exceeds 5 m/s (at microphone height) should not be used to measure compliance with noise limits in the Notice, as wind generated noise may limit measurement accuracy. During periods of wind greater than 5 m/s the Trust must continue to take all reasonable and feasible actions to minimise noise

Review of these allowances identify that the single measured elevated level, occuring during elevated winds, does not constitute and exceedance of the NMP criteria.

Overall the volume of the event was well managed, with mixing desk operators working actively to minimise their impact on surrounding neighbourhood, and rehearsals were kept to a minimum.

TABLE 3.1: SUMMARY OF MEASURED EXCEEDANCES

Time	L_{max} dB(A)	L_{max} dB(C)	Description of Noise
Thursday – Rehearsal			
5:54 pm	82.0	104.0	**Exceedence:** Amplification defining dBC , Car max dBA. FOH informed of exceedance, requested to reduce at least 4 dBC. ENM staff at FOH relayed: 'the set has been adjusted – 4dBC, as that was the loudest the expected song of the set'.

APPENDIX A

ACOUSTIC GLOSSARY

APPENDIX A: GLOSSARY OF ACOUSTIC TERMINOLOGY

A-Weighting	A response provided by an electronic circuit which modifies sound in such a way that the resulting level is similar to that perceived by the human ear.
dB (decibel)	This is the scale on which sound pressure level is expressed. It is defined as 20 times the logarithm of the ratio between the root-mean-square pressure of the sound field and the reference pressure (0.00002 N/m^2).
dB(A)	This is a measure of the overall noise level of sound across the audible spectrum with a frequency weighting (i.e. 'A' weighting) to compensate for the varying sensitivity of the human ear to sound at different frequencies.
dB(C)	This is a standard weighting of the audible frequencies, commonly used for the measurement of Peak Sound Pressure level.
Facade Noise Level	Refers to a sound pressure level determined at a point close to an acoustically reflective surface (in addition to the ground). Typically a distance of 1 metre is used.
Free Field	Refers to a sound pressure level determined at a point away from reflective surfaces other than the ground with no significant contribution due to sound from other reflective surfaces; generally as measured outside and away from buildings.
Hertz (Hz)	A measure of the frequency of sound. It measures the number of pressure peaks per second passing a point when a pure tone is present.
L_{Aeq} **Equivalent Continuous Sound Level**	This is the equivalent steady sound level in dB(A) containing the same acoustic energy as the actual fluctuating sound level over the given period. For a steady sound with small fluctuations, its value is close to the average sound pressure level.
$L_{A90,T}$	This is the dB(A) level exceeded 90% of the time, T.
$L_{A10,T}$	This is the dB(A) level exceeded 10% of the time, T.
L_{Amax}	is the maximum A-weighted sound pressure level recorded over the period stated.
L_{Cmax}	is the maximum C-weighted sound pressure level recorded over the period stated.

APPENDIX B

DETAILED MONITORING DATA (FIXED POSITIONS)

EVENT NOISE MANAGEMENT

Project Number:	5510	**Date:**	THUR 04/10/2018
Project Description:	BUBLE 2018 (Rehearsal/Line-checks)		
Monitoring Location:	1 - SFS at 234 Moore Park Road, Paddington		
Operator:	James Daramola		
Instrument:	Nor 10	**Calibrator Model:**	Svantek SV03A
Instrument Serial:	1404663	**Calibrator Serial:**	358
Instrument NATA Calibration Date:	29/06/19	**Calibrator NATA Calibration Date:**	21/11/18
Pre-calibration:	93.5	**Post calibration:**	94.0

Time	L_{max} dB(A)	L_{max} dB(C)	Description of Noise
14:12	80.9	90	Car max, low frequency amplification audible
14:14	83.5	90.6	Car max, low frequency amplification audible
14:16	78.5	88.5	Car max
14:18	79.6	91.3	Car max, no audible amplification
14:20	82.6	94.5	Car max, no audible amplification
14:22	78.6	90.3	Car max, low frequency amplification audible
14:24	79.7	91.6	Car max, low frequency amplification audible
14:26	85.2	89.9	Local pedestrian conversation with operator
14:28	83.8	91	Car max, low frequency amplification audible
14:30	78.6	86.4	Car max, low frequency amplification audible
14:32	83.7	91.8	Car max, low frequency amplification audible
14:34	79.6	86.4	Car max, low frequency amplification audible
14:36	79.5	90.8	Car max
14:38	83.9	88.8	Car max
14:40	80.5	90.2	Car max. Amplification short break.
14:42	79	83.6	Car max
14:52	78.7	88.4	Car max
14:54	81.4	88.9	Car max
14:56	80.1	94.1	Car max
14:58	78.2	88.5	Car max
15:00	79	92.8	Car max
15:02	81.4	95.3	Car max
15:04	81.6	90	Car max
15:06	83.6	97.7	Car max
15:08	80.9	92.9	Car max

Time	L_{max} dB(A)	L_{max} dB(C)	Description of Noise
15:10	82.3	92.5	Car max
15:12	79.3	89	Car max
15:14	86.2	94	Coles delivery truck max
15:16	80.3	86.3	Car max
15:18	79.1	84.7	Car max
15:20	79.7	90.3	Car max
15:22	82.1	86	Car max
15:24	79.1	86.4	Car max
15:26	83	90.1	Car max, low frequency amplification audible
15:28	82.1	90.3	Car max
15:30	79.8	93.6	Car max, low frequency amplification audible
15:32	81.3	93.4	Car max
15:34	79.5	90	Car max
15:36	99	99.6	Ambulance siren max
15:38	80.5	90.6	Car max
15:40	79.2	86.8	Car max
15:42	83.1	92.9	Car max
15:44	81.3	90.9	Car max
15:46	80.5	90.6	Car max, low frequency amplification audible
15:48	78.6	91.7	Car max, low frequency amplification audible
15:50	81.9	101.8	Operator unintended impact with sound level meter.
15:52	84.1	95.8	Public bus max
15:54	79.5	89.4	Car max
15:56	79.5	93.6	Car max, no audible amplification
15:58	81.9	95.7	Car max, no audible amplification
16:00	80.5	98.5	Car max, no audible amplification
16:02	85.2	96.2	Car max, no audible amplification
16:04	80.9	90.2	Car max, no audible amplification
16:06	80.7	88.8	Car max, no audible amplification
16:08	82.5	89.6	Car max, no audible amplification
16:10	80.2	85.1	Car max, no audible amplification
16:12	83.6	94.1	Car max, no audible amplification
16:14	79.9	88.4	Car max, no audible amplification
16:16	83	90.3	Car max, no audible amplification
16:18	83.8	97.4	Motorbike max
16:20	78.6	91.6	Car max, no audible amplification
16:22	94	100.4	Motorbike max

Time	L_{max} dB(A)	L_{max} dB(C)	Description of Noise
16:24	83.4	91.5	Car max, no audible amplification
16:26	79.8	85.4	Car max, no audible amplification
16:28	78.1	87.8	Car max, no audible amplification
16:30	82.5	89.6	Car max, no audible amplification
16:32	81.7	100.1	Car max, no audible amplification
16:34	81.8	95.4	Car max, low frequency amplification audible
16:36	78.5	87	Car max, no audible amplification
16:38	83.5	87.1	Car max, no audible amplification
16:40	88	97	Public bus max
16:42	79.2	88.5	Car max
16:44	79.2	85.1	Car max
16:46	80.2	91.2	Public bus max
16:48	81.6	96.7	Car max
17:18	82.6	88.2	Car max
17:02	79	93.5	Car max
17:04	88.1	93.9	Car max
17:06	82.8	90.1	Car max
17:08	84.3	93	Car max
17:10	84.5	94.2	Car max
17:12	80.5	95.9	Car max
17:14	86.7	102.9	Car max
17:16	84.3	94.6	Car max
17:18	80.1	92.2	Car max
17:20	78.8	94.3	Car max
17:22	78.3	87.5	Car max
17:24	80.8	89.1	Motorbike max
17:26	79	86.5	Car max
17:28	90.8	98	Motorbike max
17:30	88.6	101	Motorbike max
17:32	79	85.9	Car max
17:34	79.9	85.8	Car max
17:36	80	87.6	Car max
17:38	83.8	90	Car max
17:40	80	94.5	Car max, kick drum audible
17:42	79.4	95.1	Car max
17:44	89.8	93.8	Car max
17:46	89.6	93.4	Car max

Time	L_{max} dB(A)	L_{max} dB(C)	Description of Noise
17:48	88.8	93.8	Car max
17:50	80.6	96.1	Car max, amplification audible
17:52	81.0	99.2	Car max dBA, amplification defining dBC
17:54	82.0	104.0	**Exceedence:** Amplification defining dBC , Car max dBA. FOH informed of exceedance, requested to reduce at least 4 dBC. ENM staff at FOH relayed: 'the set has been adjusted – 4dBC, as that was the loudest the expected song of the set'.
17:56	88.2	98.2	Motorbike max
17:58	78.5	91.5	Car max, low frequency amplification audible
18:00	85.1	95.9	Motorbike max
18:02	79.4	90.6	Car max
18:04	81.3	91.5	Car max
18:06	81.2	86.2	Car max, amplification audible for approx. 5s
18:08	78.7	91.9	Car max
18:10	79.3	94.3	Car max, amplification audible
18:12	78	94.8	Car max, amplification without road noise: 72dBA 93dBC
18:14	78.9	88.3	Car max
18:16	80.1	95.1	Car max, amplification audible
18:18	80.2	94.3	Car max, amplification audible
18:20	79.7	94.5	Car max, amplification audible
18:22	81.2	94.8	Car max, amplification audible
18:24	83.3	91	Car max
18:26	84.7	91.5	Car max
18:28	79.8	90.5	Car max
18:30	83	93.3	Car max, amplification without road noise: 69dBA 90dBC
18:32	79	89.8	Car max, low frequency amplification audible
18:34	78.1	89.4	Car max, no audible amplification
18:36	82.1	91.9	Car max, no audible amplification
18:38	79.2	91.4	Car max, no audible amplification
18:40	82.5	90.1	Car max, no audible amplification
18:42	79.5	83.2	Car max
18:43	78.9	89	Car max
18:44	79.8	85	Car max
18:46	78.3	87.9	Car max
18:48	79.1	91.1	Car max
18:50	83.9	93.7	Car max
18:53	79.3	85.4	Car max
18:54	78.4	91.2	Car max

Time	L_{max} dB(A)	L_{max} dB(C)	Description of Noise
18:56	80.8	91.3	Car max
18:58	81.5	93.9	Car max, rehearsal and all amplification concluded.
19:00	77.6	83.4	No amplification, minimal traffic. Car max

EVENT NOISE MANAGEMENT

Project Number:	5510	**Date:**	THUR 04/10/2018
Project Description:	BUBLE 2018 (Rehearsal/Line-checks)		
Monitoring Location:	2 – SFS at 10 Alexander Street, Paddington		
Operator:	Roger Treagus		
Instrument:	Nor 11	**Calibrator Model:**	Svantek SV03A
Instrument Serial:	1404664	**Calibrator Serial:**	358
Instrument NATA Calibration Date:	12/06/19	**Calibrator NATA Calibration Date:**	21/11/18
Pre-calibration:	94.2	**Post calibration:**	94.0

Time	L_{max} dB(A)	L_{max} dB(C)	Description of Noise
14:10	65.4	76.8	Ambient max, amplification audible 54dBA 62dBC
14:12	68.8	71.2	Ambient (traffic, trees, birds) max, amplification audible
14:14	59.8	73.7	
14:16	62.9	72.1	
14:18	64.3	72.2	
14:20	66	73.6	
14:22	71.4	73.8	
14:24	62.7	70.6	
14:26	64.5	83.2	
14:28	62.3	83.6	
14:30	80.6	83.1	
14:32	67.2	72.6	
14:34	63.1	69.7	
14:36	61.9	71.1	
14:38	78.9	77.3	Ambient (traffic, trees, birds) max, no amplification audible
14:40	64.6	71.3	
14:42	67.5	77	
14:44	77.1	78.1	
14:46	66.2	84.1	
14:48	61.3	67.4	
14:50	60.3	70.6	
14:52	76.5	78.9	
14:54	80.8	88.7	
14:56	85.6	91.2	
14:58	64.9	84.2	Ambient (traffic, trees, birds) max, no amplification audible
15:00	64.2	83.9	Ambient (traffic, trees, birds) max, no amplification audible

Time	L_{max} dB(A)	L_{max} dB(C)	Description of Noise
15:02	58.6	77.7	
15:04	61.1	72.1	
15:06	68.1	75.1	
15:08	68.3	83.4	
15:10	77.7	79.8	
15:12	74.5	83.4	
15:14	77.4	81.1	
15:16	71.4	76.2	
15:18	67.7	73.7	
15:20	70.6	75.2	
15:22	66.1	72	
15:24	67.1	77	
15:26	65.9	70.5	
15:28	84.2	92.9	
15:30	64.1	75.2	Ambient (traffic, trees, birds) max, amplification audible
15:32	75.4	78.8	
15:34	65.3	81.9	
15:36	66.2	72.4	
15:38	62.5	74.3	
15:40	62.5	76.6	
15:42	66.6	76.8	
15:44	64.1	74	
15:46	59.6	71.9	
15:48	63	81.8	
15:50	62.8	77.7	
15:52	61.8	75.2	
15:54	67.1	86.2	
15:56	71.1	80.4	
15:58	64.6	73.7	Ambient (traffic, trees, birds) max, no amplification audible
16:00	57.7	68.8	
16:02	61.1	70.9	
16:04	60.1	71.5	
16:06	79.5	87.5	Ambient (traffic, trees, birds) max, no amplification audible
16:08	61.8	73.7	
16:10	70.1	76.2	
16:12	76.2	78.8	Local resident chatting with operator
16:14	62.5	69.8	Ambient (traffic, trees, birds) max, no amplification audible

Time	L_{max} dB(A)	L_{max} dB(C)	Description of Noise
16:16	60.2	73.2	Ambient (traffic, trees, birds) max, no amplification audible
16:18	66.4	83	
16:20	71	84.5	
16:22	59.5	72.9	
16:24	59.3	72.9	
16:26	63.3	70.7	
16:28	61.5	71.3	
16:30	74.7	77.1	
16:32	68.6	74.1	
16:34	74.4	77	
16:36	60.4	67.8	
16:38	63.5	74.8	
16:40	57.5	77.4	
16:42	69.1	73.4	
16:44	65.1	70.4	
16:46	57.6	70.7	
16:48	62.1	74	
16:50	58.4	68.7	
16:52	64.3	70.8	
16:54	62.7	79.9	
16:56	66.4	75.9	
16:58	56.3	67.9	
17:00	69.2	75.9	
17:02	60.1	74.1	
17:04	58.3	74.1	
17:06	59.4	67.2	
17:08	64.1	75.7	
17:10	62.8	68.5	
17:12	66.5	83.2	
17:14	59.9	71.7	Ambient (traffic, trees, birds) max, no amplification audible
17:16	69.9	71.4	
17:18	68.1	79	Local resident chatting with operator
17:20	82.7	81.9	Ambient (traffic, trees, birds) max, no amplification audible
17:22	63.9	77.3	
17:24 – 17:46	-	-	Sound level meter power failure – replacing batteries Observations during this period – no amplification audible
17:48	72.4	81.6	Ambient (traffic, trees, birds) max, amplification audible

Time	L_{max} dB(A)	L_{max} dB(C)	Description of Noise
17:50	68.5	83.5	Ambient (traffic, trees, birds) max, amplification audible
17:52	73.4	89	
17:54	57.3	71.9	
17:56	70.3	78.7	
17:58	69.4	76.1	
18:00	72	80.6	
18:02	70.2	74.6	
18:04	71.8	73.9	
18:06	71	74.6	
18:08	67	85.8	
18:10	66.2	80.2	
18:12	66.6	78.7	
18:14	65.2	74.7	
18:16	80.9	83.3	
18:18	69.4	79.8	Traffic max, amplification audible
18:20	61.8	77.5	
18:22	70.3	76.1	
18:24	67.3	75.2	
18:26	64.2	86.6	
18:28	71.6	99.8	
18:30	61.3	78.1	
18:32	76.4	77.2	
18:34	64.2	72	
18:36	60.7	69.6	Traffic max, no amplification audible
18:38	60	74.7	
18:40	76.1	84.1	
18:42	64.6	83.1	
18:44	63	78.2	Traffic max, no amplification audible
18:46	64.9	74.4	
18:48	72.6	85	
18:50	79.4	79.7	
18:52	76.4	78.7	
18:54	79.5	79.8	
18:56	71.1	76.9	
18:58	61.7	74	
19:00	49.7	63.2	

EVENT NOISE MANAGEMENT

Project Number:	5510	**Date:**	FRI 05/10/2018
Project Description:	Buble 2018 (Event day)		
Monitoring Location:	1 - SFS at 234 Moore Park Road, Paddington		
Operator:	James Daramola		
Instrument:	Nor 10	**Calibrator Model:**	Svantek SV03A
Instrument Serial:	1404663	**Calibrator Serial:**	358
Instrument NATA Calibration Date:	29/06/19	**Calibrator NATA Calibration Date:**	21/11/18
Pre-calibration:	93.6	**Post calibration:**	94.1

Time	L_{max} dB(A)	L_{max} dB(C)	Description of Noise
11:48	77.9	85.5	Car max, amplification audible
11:50	80.7	92.3	Car max, amplification audible
11:52	85.4	95.3	Car max, no amplification audible
11:54	79.5	90.5	Car max, no amplification audible
11:56	80	87.7	Car max, amplification audible
11:58	81.7	90.7	Car max, no amplification audible
12:00	83.8	92.3	Truck max
12:02	79.3	89.1	Car max, no amplification audible
12:04	81.5	89.1	Car max, no amplification audible
12:06	79.8	86.7	Car max, no amplification audible
12:08	79.5	86.6	Car max, no amplification audible
12:10	81.9	99.3	Car max, no amplification audible
12:12	79.6	91.3	Car max, no amplification audible
12:14	83.3	94.3	Car max, no amplification audible
12:16	83.3	93.9	Car max, no amplification audible
12:18	85.8	99.1	Car max, no amplification audible
12:20	84.9	100.6	Car max, no amplification audible
12:22	78.8	86.3	Car max, no amplification audible
12:24	78.7	87.1	Car max, low frequency amplification audible
12:26	91	96.2	Truck max
12:28	79.4	89.8	Car max, amplification audible
12:30	80.8	89.8	Car max, no amplification audible
12:32	80.5	87.9	Amplification break
12:34	79.1	86.8	Car max

Time	L_{max} dB(A)	L_{max} dB(C)	Description of Noise
12:36	80.9	90.9	Car max
12:38	90.6	91.3	Car max
12:40	82.5	89.3	Car max
12:42	80.3	88.6	Car max
12:44	66.8	78.5	Car max
12:46 – 12:48	-	-	Changing Batteries, amplification generally unchanged
12:50	80.2	89.1	Car max, amplification audible
12:52	82	90	Car max, amplification audible
12:54	78.9	85.5	Car max, no amplification audible
12:56	80.7	87.8	Car max
12:58	80.5	97.5	Car max
13:00	90.3	93.9	Police siren max
13:02	79.6	88	Car max, amplification audible
13:04	82.7	92.7	Car max, amplification audible
13:06	79.9	90.4	Car max
13:08	78.8	89.9	Car max
13:10	83.5	90.9	Car max, amplification audible
13:12	81.7	93.2	Local pedestrian conversation with operator
13:14	84.6	91.8	Car max, amplification audible
13:16	78.8	97.1	Car max, no amplification audible
13:18	80.7	88.2	Car max, no amplification audible
13:20	85.2	87.9	Car max, no amplification audible
13:22	84.4	90	Car max, no amplification audible
13:24	81	87.8	Car max, no amplification audible
13:26	83.6	97.6	Car max, no amplification audible
13:28	79.2	93.2	Car max, no amplification audible
13:30	78	91.9	Car max, no amplification audible
13:32	81.8	94.5	Truck horn max
13:34	78.7	85.9	Car max
13:36	83.1	88.9	Car max
13:38	79.3	92.1	Car max
13:40	81.8	91.2	Heavy vehicle max
13:42	79.5	87.5	Bus max
13:44	94.6	104.9	Motorbike max
13:46	78.3	86.7	Car max
13:48	82.9	84.2	Scooter horn max
13:50	79.6	84	Car max

Time	L_{max} dB(A)	L_{max} dB(C)	Description of Noise
13:52	81.6	89.2	Car max, birds audible
13:54	81.7	87.5	Car max
13:56	85.9	91.8	Car max
13:58	79.8	88.4	Car max
14:00	81.3	94.1	Car max
14:02	80.3	88.8	Car max
14:04	81.1	88.4	Car max
14:06	80.9	95.2	Car max
14:08	78.2	83.4	Car max
14:10	82.9	95	Car max
14:12	77.8	86.3	Bus max
14:14	77.4	85	Car max
14:16	79.7	90.2	Car max
14:18	85.8	90.8	Local resident chatter with operator
14:20	79.9	88.3	Car max
14:22	79.2	90.3	Car max
14:24	77.2	92.1	Car max
14:26	87.6	96.3	Workman with tools nearby, low frequency amplification just audible
14:28	84.1	89.4	Car max
14:30	81	91.9	Car max
14:32	77.2	86.7	Car max, no amplification audible
14:34	76.6	94.8	Car max, no amplification audible
14:36	74	83	Car max, no amplification audible
14:38	79.3	87	Car max, no amplification audible
14:40	83.9	97.9	Car max, no amplification audible
14:42	77.9	89	Car max, no amplification audible
14:44	78.7	89.8	Car max, no amplification audible
14:46	84.7	87.8	Car max, no amplification audible
14:48	82.7	99.8	Car max
14:50	79.9	88.2	Car max
14:52	86.3	86.9	Car max
14:54	87.6	93.5	Workman loading vehicle, and chatting with operator
14:56	80.2	89	Car max
14:58	83.8	98.6	Car max
15:00	92.3	91.9	Local pedestrian chatting with operator
15:02	85.2	90.9	Car max
15:04	79.4	87.8	Car max, amplification audible

Time	L_{max} dB(A)	L_{max} dB(C)	Description of Noise
15:06	79.5	89.4	Car max, amplification audible
15:08	80.9	89.1	Car max, low frequency amplification audible
15:10	81.1	90.6	Car max, low frequency amplification audible
15:12	79.2	86.8	Car max, amplification audible
15:14	79.7	94.5	Car max, no amplification audible
15:16	76.7	92.2	Car max
15:18	79.3	94.2	Car max
15:20	83.7	91	Car max, low frequency amplification audible
15:22	81.6	92	Car max, low frequency amplification audible
15:24	81.4	92.6	Car max
15:26	82.4	90.9	Car max
15:28	83.3	92.7	Car max, amplification audible
15:30	80.4	97.4	Car max dBA, amplification audible and defining dBC, informed BW C level approaching criteria
15:32	78.7	97.2	Car max dBA, amplification dBC
15:34	96.2	96.3	Local chatting with operator
15:36	83.7	92.2	Car max
15:38	77.8	97	Car max
15:40	78.8	97.3	Car max, amplification audible
15:42	80.3	95	Car max, amplification audible
15:44	80.7	94.7	Truck max
15:46	88.2	97.8	Local chatting with operator
15:48	80	87.4	Car max, rainfall increase, informed Guy Sebastian rehearsal ended due to rainfall
15:50	84.2	95.9	Coles truck max
15:52	81.6	88.4	Public bus max
15:54	80.4	84.9	Car max
15:56	79.4	88.2	Car max
15:58	78.9	87.6	Car max
16:00	78.6	90	Car max
16:02	79.3	85.1	Car max
16:04	80.4	86.9	Car max
16:06	82.2	95.5	Car max
16:08	78.7	94.2	Car max
16:10	81.6	95.3	Car max
16:12	79.8	85.9	Car max
16:14	79.8	89.8	Car max

Time	L_{max} dB(A)	L_{max} dB(C)	Description of Noise
16:16	80.6	92.7	Car max
16:18	80.2	87.8	Car max
16:20	81.2	93.5	Car max
16:22	81.1	93	Car max
16:24	85	90.6	Car max
16:26	82.3	92	Car max, amplification audible
16:28	81	91.7	Car max, amplification audible
16:30	85.6	97.6	Motorbike max
16:32	85.3	96.5	Event security staff chatting with operator
16:34	82.1	91.3	Car max
16:36	81.4	86.6	Car max, amplification audible
16:38	79.4	85.6	Car max, no amplification audible
16:40	80.4	88.3	Car max, no amplification audible
16:42	87.6	95.4	Car max, no amplification audible
16:44	80.1	86.3	Car max, no amplification audible
16:46	78.2	85.1	Car max, no amplification audible
16:48	80.4	93.5	Car max, no amplification audible
16:50	79.9	88.6	Car max, no amplification audible
16:52	80.3	87	Car max, no amplification audible
16:54	93.3	99.3	Car max, no amplification audible
16:56	78.4	90.5	Car max, no amplification audible
16:58	83.3	96.4	Car max, no amplification audible
17:00	82.6	95.3	Car max, no amplification audible
17:02	88.4	97	Car max, no amplification audible
17:04	81.2	89	Car max, no amplification audible
17:06	87.9	91.9	Car max, no amplification audible
17:08	82.4	87.6	Car max, no amplification audible
17:10	82.7	95.9	Car max, no amplification audible
17:12	80.2	90.9	Car max, no amplification audible
17:14	98.1	98.2	Ambulance siren max
17:16	83.8	88.3	Local pedestrian chatting with operator
17:18	76.3	83.8	Car max
17:20	81.6	89.6	Car max
17:22	83.8	89.2	Car max
17:24	82.7	91.8	Car max
17:26	94.2	101.4	Car max
17:28	81.7	91.5	Car max

Time	L_{max} dB(A)	L_{max} dB(C)	Description of Noise
17:30	80.9	100.5	Car max
17:32	77.4	90.6	Car max
17:34	80.7	90.4	Car max
17:36	92.1	96.7	Car max
17:38	84.7	87.6	Car max
17:40	81.1	89.1	Car max
17:42	78.6	88.9	Car max
17:44	85.9	94.8	Car max
17:46	81.6	90.4	Car max
17:48	83.5	90.8	Car max
17:50	79.4	87.1	Car max
17:52	79.7	90.3	Car max
17:54	79.8	94	Car max
17:56	79.3	85.6	Car max
17:58	85.5	93.1	Car max
18:00	88.5	89.2	Car max
18:02	84.2	95.8	Car max
18:04	83.1	91.2	Car max
18:06	81.3	90.7	Car max
18:08	80.6	94.2	Car max
18:10	82.3	93.5	Car max
18:12	81	92.2	Car max
18:14	79	87.9	Car max
18:16	81.7	88.7	Car max
18:18	78.9	90.5	Car max
18:20	81.8	93.8	Car max
18:22	85.1	93.8	Car max
18:24	84	91.3	Car max
18:26	77.3	89.4	Car max
18:28	78.4	84.6	Car max
18:30	80.4	90.9	Car max
18:32	75.4	86.8	Car max
18:34	74.8	87.9	Car max
18:36	79	89.5	Car max, amplification audible
18:38	77.2	85	Car max, amplification audible
18:40	76.7	85	Car max, amplification audible
18:42	76.2	87.1	Car max, low frequency amplification audible

Time	L_{max} dB(A)	L_{max} dB(C)	Description of Noise
18:44	82.3	85.5	Car max, low frequency amplification audible
18:46	79.1	85.9	Car max, low frequency amplification audible
18:48	83.2	85.7	Car max, low frequency amplification audible
18:50	89.9	90.7	Car max, low frequency amplification audible
18:52	81.2	90.7	Car max, low frequency amplification audible
18:54	73.7	86.2	Car max, low frequency amplification audible
18:56	100.9	102.8	Truck horn max
18:58	99.3	98.7	Ambulance siren max
19:00	77.4	90.8	Car max
19:02	96	95.9	Local shouting near sound level meter
19:04	82.3	92.9	Car max, amplification audible
19:06	81.3	95	Car max, low frequency amplification audible
19:08	82.5	96.3	Car max
19:10	81.6	96	Car max
19:12	80.5	95.2	Car max
19:14	84.7	96	Car max
19:16	103.8	102.8	Tow truck horn max
19:18	76.2	94.7	Car max, amplification audible
19:20	80.8	93.7	Car max, amplification audible
19:22	78.3	97.9	Car max, amplification audible
19:24	78.5	97.3	Car max, amplification audible
19:26	77	89.9	Car max, amplification audible
19:28	86.3	95.8	Car max, amplification audible
19:30	87.5	95.2	Car max, amplification audible
19:32	68	81.6	Sound level meter power failure
19:38	76.3	87.4	Car max, no amplification audible
19:40	89.4	90.4	Car max, no amplification audible
19:42	79.5	92.2	Car max, amplification audible
19:44	76.3	91.8	Car max, amplification audible
19:46	76.6	96.4	Car max, amplification audible
19:48	78	97.7	Car max, amplification audible
19:50	76.7	96.1	Car door closure
19:52	81.1	95.4	Car max, amplification 94dBC
19:54	80.3	97.9	Car max, low frequency amplification audible
19:56	79.7	97.9	Car max, low frequency amplification audible
19:58	79	96.7	Car max
20:00	79.3	96.5	Car max, low frequency amplification audible

Time	L_{max} dB(A)	L_{max} dB(C)	Description of Noise
20:02	78.1	93.4	Car max, low frequency amplification audible
20:04	77.1	96.7	Car max, kick drum 96.7dBC
20:06	81.3	98.4	Car max, low frequency amplification audible
20:08	79.8	97.7	Car max, low frequency amplification audible
20:10	79.6	97.5	Car max, low frequency amplification audible
20:12	79.6	97.7	Car max, low frequency amplification audible
20:14	83.2	101.6	Car max
20:16	80.2	92.4	Car max
20:18	83.7	86.8	Car max
20:20	86.5	89.5	Car max, no amplification audible
20:22	78.6	91.5	Car max
20:24	85.8	95.5	Car max
20:26	76.5	87.3	Car max
20:28	79.8	88.8	Car max
20:30 – 20:40	-	-	Changing batteries, no amplification audible
20:42	84	85	Car max
20:44	75.2	83.9	Car max
20:46	75	88.1	Car max
20:48	81.3	90.8	Car max
20:50	87.7	88.7	Car max
20:52	76.4	88.2	Car max
20:54	82.5	84.5	Car max
20:56	76	88.5	Car max, amplification audible
20:58	78.9	90.3	Car max, amplification audible
21:00	75.5	93.4	Car max, amplification audible
21:02	81.8	94.2	Car max, amplification audible
21:04	75.1	91.3	Car max, amplification audible
21:06	78.1	91.1	Car max, amplification audible
21:08	80.3	89.3	Local resident chatter with operator
21:10	74.1	82.4	Car max
21:12	76.1	89.5	Car max, amplification just audible
21:14	82.9	91.5	Car max, amplification just audible
21:16	78.5	99.1	Car max, amplification just audible
21:18	77.5	92.7	Car max, amplification audible
21:20	76	91.7	Car max, amplification audible
21:22	76.3	93.4	Car max, amplification audible
21:24	72.6	85.8	Car max, amplification (monologue) without road noise 64.3dBA

Time	L_{max} dB(A)	L_{max} dB(C)	Description of Noise
21:26	87.4	102	Local chatting with operator
21:28	86	92.8	Local chatting with operator
21:30	74.1	94	Car max
21:32	80.2	94.8	Truck horn max
21:34	77	93.8	Public bus max, crowd noise audible
21:36	79.6	90.2	Car max
21:38	76.3	91.1	Car max, crowd noise audible
21:40	79.8	92.4	Car max, amplification audible
21:42	94.7	94.1	Tow truck horn max
21:44	83.3	99.7	Public bus max, crowd noise audible
21:46	74.4	91.3	Tow truck max, event staff installing temporary fences on Moore Park Road
21:48	75.5	93.1	Event staff installing temporary fences on Moore Park Road
21:50	76.7	89.3	Car max, amplification audible
21:52	98.2	99.2	Patron singing into sound level meter
21:54	74.3	89.2	Motorbike max
21:56	77.3	82.6	Car max
21:58	72.4	89.5	Car max, amplification audible
22:00	77.8	91.8	Motorbike max
22:02	74.8	92.8	Car max, amplification audible
22:04	82	95.2	Car max, amplification audible
22:06	80.2	92.6	Car max, amplification audible 72dBA
22:08	77	91	Tow truck activity
22:10	82	91.7	Tow truck activity
22:12	96.1	102.1	Tow truck activity
22:14	80.5	94.3	Tow truck activity
22:16	78.1	93.8	Tow truck activity
22:18	81.9	94.4	Motorbike max
22:20	78.4	91.9	Car max, amplification audible
22:22	77.2	94.1	Car max, amplification audible
22:24	78.8	100	Car max, amplification audible, single bass note strike defined dBC
22:26	72.7	88.9	Crowd noise, amplification max
22:28	79.7	90	Crowd noise, amplification max
22:30	98.5	98.9	Ambulance siren max
22:32	105.1	110.9	Fireworks
22:34	106.7	111	Fireworks

EVENT NOISE MANAGEMENT

Project Number:	5510	**Date:**	FRI 05/10/2018
Project Description:	Buble 2018 (Event day)		
Monitoring Location:	2 – SFS at 10 Alexander Street, Paddington		
Operator:	Roger Treagus		
Instrument:	Nor 11	**Calibrator Model:**	Svantek SV03A
Instrument Serial:	1404664	**Calibrator Serial:**	358
Instrument NATA Calibration Date:	12/06/19	**Calibrator NATA Calibration Date:**	21/11/18
Pre-calibration:	94.0	**Post calibration:**	94.5

Time	L_{max} dB(A)	L_{max} dB(C)	Description of Noise
11:46	73.2	77.9	Ambient (traffic, wind, birds) max, amplification audible
11:48	67.6	80.1	
11:50	66.3	75	Ambient (traffic, wind, birds) max, no amplification audible
11:52	64.7	71.2	
11:54	59.8	72.3	
11:56	63.5	72.3	
11:58	69.5	77.4	
12:00	64.9	77.6	
12:02	65.3	73.1	
12:04	66	77.5	
12:06	70.9	87.5	
12:08	62.3	71.7	
12:10	72.5	76.4	
12:12	66.6	79.7	
12:14	61.6	73.8	
12:16	62.2	71.4	
12:18	70.7	87.3	
12:20	75.9	81.4	
12:22	89	89.9	
12:24	64.9	75.2	
12:26	65.9	73.9	
12:28	66.5	77.3	
12:30	66	79	
12:32	65.9	70.6	Ambient (traffic, wind, birds) max, faint amplification audible
12:34	75.7	76.4	Ambient (traffic, wind, birds) max, faint amplification audible

Time	L_{max} dB(A)	L_{max} dB(C)	Description of Noise
12:36	63.9	71.5	
12:38	76.3	85	
12:40	70.4	76.8	
12:42	69.1	72.6	
12:44	65.1	74.3	
12:46	68.8	90	
12:48	60.4	75.7	
12:50	61.9	74.7	
12:52	65.4	74.8	
12:54	71	75.5	
12:56	61.4	75.6	
12:58	62.5	75.5	
13:00	65.1	86	
13:02	77.6	77	
13:04	67.1	77	
13:06	64.4	70.6	
13:08	65.3	75.3	
13:10	66.1	79	Ambient (traffic, wind, birds) max, amplification audible
13:12	71.6	78.9	
13:14	63.9	79.4	Ambient (traffic, wind, birds) max, no amplification audible
13:16	82	84.1	
13:18	68.9	73.4	
13:20	74.4	75.8	
13:22	63.8	72.8	
13:24	59.9	79.1	
13:26	63	78.7	
13:28	59.8	71.3	
13:30	59.5	69.1	
13:32	59.9	77.8	
13:34	76.6	78	
13:36	61	75.9	
13:38	64.6	77.9	
13:40	70.7	74.3	
13:42	65.6	72.5	
13:44	70.7	86.6	
13:46	59.2	71.4	
13:48	78	80	Ambient (traffic, wind, rain) max, no amplification audible

Time	L_{max} dB(A)	L_{max} dB(C)	Description of Noise
13:50	68	84.7	
13:52	77.7	77.1	
13:54	67.5	75.5	
13:56	66.3	73.6	
13:58	59.7	74.1	
14:00	67.8	70.8	
14:02	73.7	81.9	
14:04	77.6	76.3	
14:06	57.6	74.2	
14:08	-	-	Sound level meter power failure – replacing batteries Observations during this period – no amplification audible
14:24	69.2	77.2	Ambient (traffic, wind, rain) max, no amplification audible
14:26	67.4	84.5	
14:28	68.4	73.3	Ambient (traffic, wind, rain) max, amplification audible
14:30	63.7	75.1	
14:32	61.6	77.8	
14:34	73.9	86.8	
14:36	74.6	77.8	
14:38	60.1	78.3	
14:40	68.7	72.1	
14:42	62.7	76.9	
14:44	56.6	76.4	
14:46	59.9	74.8	Ambient (traffic, wind, rain) max, no amplification audible
14:48	64.4	80.3	
14:50	58.6	77.8	
14:52	68.9	81.6	
14:54	60.2	69.9	
14:56	68.7	79.7	
14:58	65.3	70.2	
15:00	72.3	78.1	
15:02	66	73.1	
15:04	65.2	72.8	Ambient (traffic, wind) max, amplification audible <55dBA
15:06	82.4	82.2	
15:08	66.5	72.1	
15:10	73.5	76.5	Ambient (traffic, wind) max, amplification audible
15:12	60.2	76.7	
15:14	74	73.5	

Time	L_{max} dB(A)	L_{max} dB(C)	Description of Noise
15:16	68.3	78.7	Ambient (traffic, wind) max, amplification audible
15:18	66	88.1	
15:20	82.4	82.1	
15:22	73.5	75.7	
15:24	78.3	80	
15:26	74.6	86.9	
15:28	69.6	78.1	
15:30	70.4	78.9	
15:32	65.6	74.8	
15:34	70.8	87.7	
15:36	73.4	78	
15:38	70	78.6	
15:40	70.8	84.6	Ambient (traffic, wind) max, amplification audible 67dBA 73dBC
15:42	67.3	81.1	Ambient (traffic, wind) max, amplification audible
15:44	70.9	81.5	Amplification max, ambient (traffic, wind) audible
15:46	66.4	76.2	
15:48	64.7	75.3	
15:50	66.2	72.4	
15:52	66.6	74.1	
15:54	61.4	75.1	
15:56	72.8	80.5	
15:58	61.6	80.8	Ambient (traffic, wind, rain) max, no amplification audible
16:00	62.8	75.5	
16:02	64.2	83.8	
16:04	68.3	79.6	
16:06	59.2	77.1	
16:08	64.3	72.1	
16:10	63.7	86.2	
16:12	64	77.6	
16:14	68.3	76.1	
16:16	66.7	89.7	
16:18	62.2	67.6	
16:20	78.5	80.8	
16:22	73.4	77.7	
16:24	68.4	76.8	Ambient (traffic, rain) max, amplification audible <52dBA
16:26	80.5	81	Ambient (traffic, rain) max, amplification audible <52dBA

Time	L_{max} dB(A)	L_{max} dB(C)	Description of Noise
16:28	66.7	83.8	Ambient (traffic, rain) max, amplification audible <52dBA
16:30	70.7	89.6	
16:32	73.1	84.9	
16:34	66.7	69.9	
16:36	63.9	73.8	Ambient (traffic, rain) max, no amplification audible
16:38	63.5	76.3	
16:40	70.6	82.3	
16:42	69.4	84.6	
16:44	79.4	79.6	
16:46	78.2	91.1	
16:48	70.5	85.9	Local conversation with operator
16:50	64	78	Ambient (traffic, rain) max, no amplification audible
16:52	63.6	76.1	
16:54	70.1	82.7	
16:56	74.7	77.1	
16:58	65.7	81.5	
17:00	60.4	69.6	
17:02	62.6	74	
17:04	70.1	74.2	
17:06	69	75.7	
17:08	60.1	74.8	
17:10	67.6	84.6	
17:12	63.9	84.7	
17:14	74.3	76.2	
17:16	70.8	74	
17:18	64.7	70.6	
17:20	73	75.3	
17:22	62.1	75.3	
17:24	60	79.8	Ambient (traffic, birds) max, faint amplification audible <55dBA
17:26	61.4	70.4	
17:28	65.6	74.6	
17:30	67	76.5	
17:32	67.4	77.1	
17:34	69.4	89	
17:36	65.1	76.7	Ambient (traffic, wind) max, no amplification audible
17:38	63.9	84.6	
17:40	68.8	80.2	

Time	L_{max} dB(A)	L_{max} dB(C)	Description of Noise
17:42	66.2	71.4	Ambient (traffic, wind) max, no amplification audible
17:44	71.8	83.2	
17:46	67.1	75.4	
17:48	65.9	79.5	Ambient (traffic) max, no amplification audible
17:50	61	72.6	
17:52	64.7	77.4	
17:54	69.3	78.5	
17:56	74.7	78	
17:58	76.3	84.7	
18:00	65.3	78.3	
18:02	74.7	74.5	
18:04	66.3	79.4	
18:06	69.6	79.6	
18:08	60.6	74.8	
18:10	67.8	84.8	
18:12	68.6	82.1	
18:14	64.7	88	
18:16	66.2	89.2	
18:18	62.3	76.6	
18:20	66.2	72.3	
18:22	66.1	82.1	
18:24	61.2	74.4	
18:26	62.3	73.7	
18:28	66.8	86.4	
18:30	62.6	75.2	
18:32	73.2	79.2	Ambient (traffic, birds) max, faint amplification audible <55dBA
18:34	66.3	75.9	Ambient (traffic, birds) max, faint amplification audible <55dBA
18:36	59.2	67.5	Sound level meter power failure
18:40	71.1	82.5	Ambient (traffic) max, no amplification audible Ambient (traffic) max, no amplification audible
18:42	72.1	81.8	
18:44	66.9	84.4	
18:46	75.4	84.1	
18:48	80.3	83.1	
18:50	67.4	77.6	
18:52	67.1	86.3	

Time	L_{max} dB(A)	L_{max} dB(C)	Description of Noise
18:54	71.8	83.2	Ambient (traffic) max, no amplification audible
18:56	65.3	80.4	
18:58	65.5	77.3	
19:00	70.7	90.8	
19:02	79.3	81.5	
19:04	69.6	83.1	Ambient (traffic) max, amplification audible 63dBA 71dBC
19:06	71	84.4	Ambient (traffic) max, amplification audible
19:08	64.2	83.6	
19:10	64.4	80.6	
19:12	67	84	Ambient (traffic) max, amplification audible 55dBA 70dBC
19:14	81.9	85.6	Ambient (traffic) max, amplification audible
19:16	69	84.4	
19:18	71.3	82.4	
19:20	76.7	84.1	
19:22	68.9	83.4	
19:24	74.2	82.1	
19:26	73.2	82.5	
19:28	66.3	82.6	
19:30	63	77.2	
19:32	68	82	
19:34	67.9	82.9	
19:36	85.9	86.7	
19:38	78.9	97.7	Ambient (traffic) max, amplification audible <55dBA
19:40	84.8	83.3	Ambient (traffic) max, amplification audible
19:42	76.2	85.1	
19:44	80.1	86	
19:46	69.4	83.7	
19:48	75.4	82.5	
19:50	73.8	85.2	
19:52	73.4	86.7	
19:54	73.2	86.7	Ambient (traffic) max, amplification audible 70dBA 81dBC
19:56	71.8	86.3	Ambient (traffic) max, amplification audible 69dBA 80dBC
19:58	71.2	88.7	Ambient (traffic) max, amplification audible 67dBA 80dBC
20:00	76.3	80.1	Ambient (traffic) max, amplification audible 65dBA 72dBC
20:02	74.8	84.2	Ambient (traffic) max, amplification audible 65dBA 72dBC
20:04	78.2	86.7	Ambient (traffic) max, amplification audible 70dBA 79dBC
20:06	82.1	89.6	Ambient (traffic) max, amplification audible 68dBA 76dBC

Time	L_{max} dB(A)	L_{max} dB(C)	Description of Noise
20:08	75.6	89.6	Ambient (traffic) max, amplification audible
20:10	67.6	85.4	Ambient (traffic) max, amplification audible
20:12	73.9	85	Ambient (traffic) max, amplification audible
20:14	74.4	84.9	Ambient (traffic) max, no amplification audible
20:16	64.6	77.2	
20:18	64.2	84.2	
20:20	80.9	86.6	
20:22	77.6	81.3	
20:24	69.4	80.9	
20:26	69.5	82.2	
20:28	66.7	73.4	
20:30	58.4	73	
20:32	69	79	
20:34	71.2	87.4	
20:36	70.4	86.1	
20:38	73.5	78.5	
20:40	62	76	
20:49	59.3	70.5	
20:50	68.7	84.6	
20:52	70.4	86.6	
20:54	59	68.2	
20:57	70.3	73.1	
20:58	70.1	85.6	Ambient (traffic) max, amplification audible
21:00	72.2	82.1	
21:02	64.5	79	
21:04	71.5	79.8	
21:06	70.8	82	
21:08	63.8	70.1	
21:10	64.1	74.5	
21:12	63.9	75.7	
21:14	68.6	77.3	
21:16	60.4	78.1	
21:18	67.8	77	
21:20	62.5	77.8	
21:22	68.5	83.6	Ambient (traffic) max, amplification audible
21:24	66.3	78.3	
21:26	76.2	81.2	

Time	L_{max} dB(A)	L_{max} dB(C)	Description of Noise
21:28	70.7	78.1	Ambient (traffic) max, amplification audible
21:30	71.1	80.2	
21:32	63.6	75.1	
21:34	69.4	74.4	
21:36	68.9	77.8	
21:38	72.9	81.6	
21:40	75.3	79.9	
21:42	68.9	87.5	
21:44	68.6	77.5	
21:46	70.7	79.8	
21:48	73.8	80.3	
21:50	69.7	79.6	
21:52	66.5	75.1	
21:54	80.9	81.5	
21:56	71.2	76.2	
21:58	70.2	79.5	
22:00	72.9	79.7	
22:02	75.4	81.8	
22:04	68.2	83.8	
22:06	63.3	77.5	
22:08	83.6	86.3	
22:10	65.2	80.7	
22:12	71.5	80.2	
22:14	71	80.1	
22:16	71	82.2	
22:18	71.5	82.3	
22:20	68.9	85.5	
22:22	71.4	89.1	
22:24	67	78.5	
22:26	68.2	82.1	
22:28	66.6	84.6	
22:30	88.2	89.5	
22:30	88.2	89.5	Amplification ceased Fireworks
22:32	95.9	98.7	Fireworks
22:34	89.3	93.5	
22:36	76.3	80.8	Event concluded