RENZO TONIN & ASSOCIATES
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Acoustics
Vibration
Structural Dynamics

3 June 2022
TK653-09F01 NPfl Letter (r3)

Mr Luke Parker
Sell & Parker

Dear Luke,

23-43 and 45 Tattersall Road, Kings Park – Noise Policy for Industry

The subject site at 23-43 and 45 Tattersall Road, Kings Park is a long established heavy industrial facility. It has been on the Kings Park site for 26 years and have held an Environment Protection Authority (EPA) license to operate for 20 years. The subject site is wholly within an area zoned IN1. Adjacent residential areas to the industrial neighbourhood can be classified as located within an industrial interface. Background noise levels for these residential areas is heavily influenced by traffic noise from major roads and other general industrial activity from the industrial area.

The Planning Secretary's Environmental Assessment Requirements (SEARs) was issued on 19 December 2019 for the State Significant Development (SSD-10396) Kings Park Metal Recovery and Recycling Facility Expansion. Those SEARs set out specific noise and vibration impact assessment requirements to be addressed as part of the EIS. The SEARs refer to the following standards, policies and guidelines:

Noise and Vibration	
Noise	Noise Policy for Industry (EPA 2017)
	NSW Road Noise Policy (EPA 2011)
	Environmental Criteria for Road Traffic Noise (EPA 1999)
	Interim Construction Noise Guideline (DECC 2009)
Vibration	Assessing Vibration: A Technical Guideline (DEC 2006)
	Technical Basis for Guidelines to Minimise Annoyance Due to Blasting Overpressure and Ground Vibration (ANZECC 1990)

Our firm was engaged to undertake the subject noise and vibration assessment for this SSD-10396. Our assessments and subsequently submitted reports have been prepared in accordance with the above listed standards, policies and guidelines and all potentially annoying noise characteristics from the subject site have been assessed in accordance with the aforementioned documents as referenced in the SEARs.

In September 2021, our client received a request for additional information from the Department of Planning and Environment (DPE). As part of that additional request, the DPE indicated that it wanted to understand and/or be provided with comfort that our methodology and reporting had been carried out in accordance with best practice. In that request letter it provided the example of Australian Standard AS1055:2018 Acoustics – Description and measurement of environmental noise (AS1055).

Please accept this letter as confirmation that, where applicable and appropriate, the measurement and reporting advice from the following policy and standard have been considered:

1. Noise Policy for Industry (NPfI) - in particular section 7,

2. AS1055 - in particular section 7

Both these documents were considered when undertaking our services and in the provision of the information in our reports. Our further supplementary reports (attached) include measurement methodology, activity descriptions and other key information in line with both the NPfI and AS1055, in particular;

- equivalent continuous sound pressure levels (LAeq(t)),
- range of noise levels (LAmax(t) and LAmin(t)),
- percent exceedance noise levels (LA90(t)),
- duration of measurement and number of maximum noise events,
- how sound pressure level was converted to sound power level, including the setback distance from each noise generating activity to the measurement location, and
- contemporaneous notes recorded during the attended noise survey identifying how the variety of observed sounds contributed to LAeq(t) and the character/nature of sound.

It should be noted that both the AS1055 and the NPfI are non-statutory documents. As expert noise consultants, and as directed by the SEARs, we have relied upon the NSW specific NPfI, as the NPfI sets out a framework for the derivation of project noise trigger levels that are used to assess the potential impacts of noise from industry and indicate the noise level at which feasible and reasonable noise management measures should be considered. It also provides a process for predicting noise levels and determining achievable statutory noise limits and operational requirements for licences, consents and other statutory instruments.

The stated objectives of the NPfI are to:

- provide the noise levels that are used to assess both change in noise level and long-term noise levels,
- provide a clear and consistent framework for assessing environmental noise impacts from industrial premises and industrial development proposals,

- promote the use of best-practice noise mitigation measures that are feasible and reasonable where potential impacts have been identified, and
- support a process to guide the determination of achievable noise limits for planning approvals and/or licences, taking into account the matters that must be considered under the relevant legislation (such as the economic and social benefits and impacts of industrial development).

The NPfI is used by DPE to provide a framework and criteria for the consistent assessment when assessing State Significant Development proposals under the Environmental Planning and Assessment Act. It is also used by the EPA for the establishment of license conditions when regulating and managing noise from large industrial developments. Therefore, the NPfI is typically used for noise assessments of facilities of a similar nature to the subject site, which is consistent with the SEARs that this site received as part of the State Significant Development application.

Regards,

Peter Karantonis
MEngSc (Acoustics), BE (Mech), MIEAust, CPEng, RPEQ, NER, APEC Engineer, IntPE(Aus), MAAS
Director

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21 April 2022
TK653-07D01 Supplementary Noise Information (r0).docx

Sell & Parker
Mr Jordan Rodgers

From: William Chan [William.Chan@renzotonin.com.au]

23-43 and 45 Tattersall Road, King Park - Supplementary Noise Information

1 Model validation using L_{Amax} events

Renzo Tonin & Associates has undertaken a validation of the noise model using L_{Amax} events, as per EPA's request. Concurrent noise monitoring of L_{Amax} noise levels was undertaken at two locations on site and at three residential receiver locations to the east of the Premises. The concurrent noise monitoring was undertaken on Tuesday 5 April 2022, between 10:00am and 4:30pm.

The concurrent attended noise monitoring locations are outlined in Table 1 and shown in Figure 1.

Table 1 – Attended noise monitoring locations

ID	Location	Description
On-site noise measurements		
S1	Viewing platform for the hammer Mill	The sound level meter was placed on the viewing platform to the south of the hammer mill. This location is at an elevated position. All metal processing activities on the western side of the site can be seen from this location
S2	Viewing platform for the shear	The sound level meter was placed on the viewing platform to the east of the shear. This location is at an elevated position. All metal processing activities on the eastern side of the site can be seen from this location

ID	Location	Description
Residential receiver noise measurements		
S3	11/13 Anthony Street, Blacktown	The monitor was placed on the footpath adjacent to the boundary fence separating 11 and 13 Anthony Street. This location is at an elevated position from the subject site. The arms of material handlers at the subject site can be seen from this location. This is one of the key residential locations suggested by DPIE.
S4A	2 Eggleton Street, Blacktown (Eggleton Street side)	The monitor was placed on the footpath on Eggleton Street in line with the western facade of the dwelling. This location is at an elevated position from the subject site. There is no line of sight to the subject site. This is one of the key residential locations suggested by DPIE. After 45 minutes of attended measurements at this location and no L_{Amax} events from the subject site could be heard, this location was abandoned for an alternate position along Charles Street (ID: S4B)
S4B	2 Eggleton Street, Blacktown (Charles Street side)	The monitor was placed on the footpath on Charles Street in line with the southern boundary of the dwelling. This location is at an elevated position from the subject site. There is no line of sight to the subject site. This is one of the key residential locations suggested by DPIE.
S5	23 Anthony Street, Blacktown	The monitor was placed on the footpath in line with the southern facade of the dwelling. This location is at an elevated position from the subject site. The arms of material handlers at the subject site can be seen from this location.

Figure 1 – Site and noise monitoring locations

All sound level meters used were synchronised for time so that measurement data could be correlated accordingly. One engineer was continuously measuring at Location S1 and continuously noting down L_{Amax} events occurring on the western side of the site, including the distance from the sound level meter to the particular activity causing the L_{Amax} event. A second engineer was continuously measuring at Location S2 and continuously noting down L_{Amax} events on the eastern side of the site, including the

distance from the sound level meter and the particular activity causing the L_{Amax} event. A third engineer conducted measurements at Locations S3, S4A, S4B and S5 in an attempt to correlate any L_{Amax} events heard at these locations with any events noted at either Location S1 or S2.

It is noted that throughout the measurement period in excess of 60 L_{Amax} events were noted at the residential receiver locations as coming from the direction of the Premises with noise characteristics similar to metal handling/ processing. However, less than a third of these events could be correlated to any activities that were happening on site.

Where a correlation was found between an event on site (at Locations S1 or S2) and an event at a receiver (at Locations S3, S4B or S5), the sound power level of the L_{Amax} event was calculated based on the noted distance from the sound level meter to the activity, and the recorded sound pressure level. The location of the noted L_{Amax} event was then modelled as a point source in the previously developed CadnaA noise model (from the Addendum NIA) using the calculated sound power level and associated spectrum. It is noted that the previously developed CadnaA noise model was not altered in any way and uses the modelling parameters previously presented in the Addendum NIA. Predicted noise levels at the relevant receiver locations based on the calculated L_{Amax} event noise levels were then compared with the measured L_{Amax} noise levels. A summary of the comparison results is shown in Table 2.

Table 2 – Comparison of measured and predicted receiver noise levels, dB(A)

ID	Time	Site Notes	Calculated On Site L_{Amax}	Measured Receiver L_{Amax}	Predicted Receiver L_{Amax}	Difference (Predicted minus Measured)
Location S3 – 11 & 13 Anthony Street, Blacktown						
1	11:55:30	dropping bang	122.8	45.4	45.9	0.5
2	12:04:40	dropping on top of the yard	121.6	43.7	44.2	0.5
3	12:22:20	tipping	125.6	45.6	46.2	0.6
4	12:30:31	big drop	129.4	47.0	46.0	-1.0
5	12:32:50	drop	121.8	43.5	44.6	1.1
6	12:34:41	drop	121.6	46.1	46.3	0.2
7	12:36:34	drop	123.0	44.1	45.5	1.4
8	12:38:17	grabber loading	129.2	48.9	50.1	1.2
9	12:39:25	grabber loading	125.7	47.3	48.5	1.2
10	12:59:45	tipping	120.2	42.5	42.2	-0.3
Location S4B – 2 Eggleton Place, Blacktown						
11	13:50:55	grabber in the mid yard (starting to move things around)	120.9	44.9	44.3	-0.6
12	13:53:06	grabber throwing (mid yard)	118.9	42.7	42.3	-0.4
13	14:08:08	grabber loading shear	118.1	41.9	41.6	-0.3

ID	Time	Site Notes	Calculated On Site L_{Amax}	Measured Receiver L_{Amax}	Predicted Receiver L_{Amax}	Difference (Predicted minus Measured)
Location S5 – 23 Anthony Street, Blacktown						
14	15:58:03	grabber loading	121.2	42.9	43.1	0.2
15	16:20:00	moving metal	125.8	45.1	44.4	-0.7
					Average	**0.2**
					Median	**0.2**

Generally, the measured L_{Amax} noise levels at the receivers versus the predicted L_{Amax} noise levels at the receivers were within allowable modelling tolerances, with the average and median differences within ±1dB(A) and slightly on the conservative side (i.e. overpredicting). As the predicted noise levels correlate well with the measured noise levels, no calibration factor is deemed necessary.

It is concluded that the requested L_{Amax} validation exercise has shown good agreement between the predicted and measured noise levels at the nominated residential receiver locations to the east of the Premises. Confidence can be given to the CadnaA noise model utilising the CONCAWE calculation method that was developed for the Addendum NIA.

2 Objective assessment of modifying factor relevance.

As stated on page 24 of the Addendum NIA *'Measurements at locations S1 and S2 were analysed for tonal and/or low frequency characteristics as per the methodology prescribed in NPfI and were found not to exhibit any tonal of low frequency'*. The data used for the objective assessment and the outcomes are shown in the figures below.

Figure 2 – Location S1 – Tonality and low frequency assessment 1

Date/Time	23/09/2021, 19:00-19:15
Location	S1 - 29 Charles Street, Blacktown

TONALITY/ LOW FREQUENCY NOISE TEST

Frequency	Input Data - L_{eq} dB(lin)		A-Weighted - dB(A)			C-Weighted - dB(C)			NPfl Tonality Test
Hz	1/3 Octave	Octave	Corr'n	1/3 Octave	Octave	Corr'n	1/3 Octave	Octave	(need 1/3 octave data input)
25	49.4		-44.7	4.7		-4.4	45.0		-
32	48.6	54.2	-39.4	9.2	16.7	-3.0	45.6	51.2	**OK!**
40	50.1		-34.6	15.5		-2.0	48.1		**OK!**
50 Hz	50.7		-30.2	20.5		-1.3	49.4		**OK!**
63 Hz	54.5	58.2	-26.2	28.3	33.5	-0.8	53.7	57.4	**OK!**
80 Hz	54.1		-22.5	31.6		-0.5	53.6		**OK!**
100 Hz	49.7		-19.1	30.6		-0.3	49.4		**OK!**
125 Hz	48.0	53.2	-16.1	31.9	37.0	-0.2	47.8	52.9	**OK!**
160 Hz	47.0		-13.4	33.6		-0.1	46.9		**OK!**
200 Hz	42.7		-10.9	31.8		0.0	42.7		**OK!**
250 Hz	40.4	47.0	-8.6	31.8	38.7	0.0	40.4	47.0	**OK!**
315 Hz	43.1		-6.6	36.5		0.0	43.1		**OK!**
400 Hz	41.2		-4.8	36.4		0.0	41.2		**OK!**
500 Hz	40.1	45.6	-3.2	36.9	42.5	0.0	40.1	45.6	**OK!**
630 Hz	41.1		-1.9	39.2		0.0	41.1		**OK!**
800 Hz	42.0		-0.8	41.2		0.0	42.0		**OK!**
1k Hz	41.2	46.1	0.0	41.2	46.0	0.0	41.2	46.1	**OK!**
1k25 Hz	40.8		0.6	41.4		0.0	40.8		**OK!**
1k6 Hz	38.7		1.0	39.7		-0.1	38.6		**OK!**
2k Hz	37.4	41.9	1.2	38.6	43.0	-0.2	37.2	41.7	**OK!**
2k5 Hz	33.9		1.3	35.2		-0.3	33.6		**OK!**
3k15 Hz	31.6		1.2	32.8		-0.5	31.1		**OK!**
4k Hz	28.8	34.6	1.0	29.8	35.6	-0.8	28.0	33.9	**OK!**
5k Hz	28.5		0.5	29.0		-1.3	27.2		**OK!**
6k3 Hz	26.9		-0.1	26.8		-2.0	24.9		**OK!**
8k Hz	23.4	29.1	-1.1	22.3	28.5	-3.0	20.4	26.6	**OK!**
10k Hz	20.5		-2.5	18.0		-4.4	16.1		**OK!**
12.5k	17.0		-4.3	12.7		-6.2	10.8		**OK!**
16k	15.1	20.2	-6.6	8.5	14.5	-8.5	6.6	12.6	**OK!**
20k	13.5		-9.3	4.2		-11.2	2.3		**OK!**
OVERALL	**61.0**	**61.0**	**dB(A)**	**49.9**	**49.9**	**dB(C)**	**60.1**	**60.1**	**OK!**

Figure 3 – Location S1 – Tonality and low frequency assessment 2

Date/Time	23/09/2021, 19:15-19:30
Location	S1 - 29 Charles Street, Blacktown

TONALITY/ LOW FREQUENCY NOISE TEST

Frequency	Input Data - L_{eq} dB(lin)		A-Weighted - dB(A)			C-Weighted - dB(C)			NPfl Tonality Test
Hz	1/3 Octave	Octave	Corr'n	1/3 Octave	Octave	Corr'n	1/3 Octave	Octave	(need 1/3 octave data input)
25	50.1		-44.7	5.4		-4.4	45.7		-
32	47.7	54.5	-39.4	8.3	17.1	-3.0	44.7	51.5	**OK!**
40	50.7		-34.6	16.1		-2.0	48.7		**OK!**
50 Hz	49.9		-30.2	19.7		-1.3	48.6		**OK!**
63 Hz	51.3	55.5	-26.2	25.1	30.5	-0.8	50.5	54.7	**OK!**
80 Hz	51.0		-22.5	28.5		-0.5	50.5		**OK!**
100 Hz	49.6		-19.1	30.5		-0.3	49.3		**OK!**
125 Hz	49.1	53.3	-16.1	33.0	37.1	-0.2	48.9	53.1	**OK!**
160 Hz	46.4		-13.4	33.0		-0.1	46.3		**OK!**
200 Hz	43.2		-10.9	32.3		0.0	43.2		**OK!**
250 Hz	40.6	47.3	-8.6	32.0	39.1	0.0	40.6	47.3	**OK!**
315 Hz	43.4		-6.6	36.8		0.0	43.4		**OK!**
400 Hz	41.3		-4.8	36.5		0.0	41.3		**OK!**
500 Hz	39.7	45.5	-3.2	36.5	42.4	0.0	39.7	45.5	**OK!**
630 Hz	41.1		-1.9	39.2		0.0	41.1		**OK!**
800 Hz	42.0		-0.8	41.2		0.0	42.0		**OK!**
1k Hz	41.4	46.3	0.0	41.4	46.2	0.0	41.4	46.3	**OK!**
1k25 Hz	41.0		0.6	41.6		0.0	41.0		**OK!**
1k6 Hz	40.0		1.0	41.0		-0.1	39.9		**OK!**
2k Hz	38.1	42.8	1.2	39.3	43.9	-0.2	37.9	42.7	**OK!**
2k5 Hz	34.4		1.3	35.7		-0.3	34.1		**OK!**
3k15 Hz	31.1		1.2	32.3		-0.5	30.6		**OK!**
4k Hz	28.6	34.2	1.0	29.6	35.2	-0.8	27.8	33.4	**OK!**
5k Hz	27.8		0.5	28.3		-1.3	26.5		**OK!**
6k3 Hz	26.1		-0.1	26.0		-2.0	24.1		**OK!**
8k Hz	22.3	28.3	-1.1	21.2	27.7	-3.0	19.3	25.8	**OK!**
10k Hz	19.7		-2.5	17.2		-4.4	15.3		**OK!**
12.5k	18.3		-4.3	14.0		-6.2	12.1		**OK!**
16k	19.5	22.5	-6.6	12.9	16.7	-8.5	11.0	14.8	**OK!**
20k	13.6		-9.3	4.3		-11.2	2.4		**OK!**
OVERALL	**60.0**	**60.0**	**dB(A)**	**50.1**	**50.1**	**dB(C)**	**59.0**	**59.0**	**OK!**

Figure 4 – Location S1 – Tonality and low frequency assessment 3

Date/Time	23/09/2021, 19:30-19:45
Location	S1 - 29 Charles Street, Blacktown

TONALITY/ LOW FREQUENCY NOISE TEST

Frequency	Input Data - L_{eq} dB(lin)		A-Weighted - dB(A)			C-Weighted - dB(C)			NPfl Tonality Test
Hz	1/3 Octave	Octave	Corr'n	1/3 Octave	Octave	Corr'n	1/3 Octave	Octave	(need 1/3 octave data input)
25	53.1		-44.7	8.4		-4.4	48.7		-
32	51.2	57.0	-39.4	11.8	19.1	-3.0	48.2	53.9	**OK!**
40	52.3		-34.6	17.7		-2.0	50.3		**OK!**
50 Hz	52.5		-30.2	22.3		-1.3	51.2		**OK!**
63 Hz	55.8	59.0	-26.2	29.6	33.9	-0.8	55.0	58.2	**OK!**
80 Hz	53.9		-22.5	31.4		-0.5	53.4		**OK!**
100 Hz	50.9		-19.1	31.8		-0.3	50.6		**OK!**
125 Hz	51.9	56.0	-16.1	35.8	40.3	-0.2	51.7	55.8	**OK!**
160 Hz	50.7		-13.4	37.3		-0.1	50.6		**OK!**
200 Hz	46.0		-10.9	35.1		0.0	46.0		**OK!**
250 Hz	44.0	49.6	-8.6	35.4	41.0	0.0	44.0	49.6	**OK!**
315 Hz	44.2		-6.6	37.6		0.0	44.2		**OK!**
400 Hz	42.7		-4.8	37.9		0.0	42.7		**OK!**
500 Hz	40.9	46.8	-3.2	37.7	43.7	0.0	40.9	46.8	**OK!**
630 Hz	42.4		-1.9	40.5		0.0	42.4		**OK!**
800 Hz	43.0		-0.8	42.2		0.0	43.0		**OK!**
1k Hz	43.1	47.4	0.0	43.1	47.4	0.0	43.1	47.4	**OK!**
1k25 Hz	41.8		0.6	42.4		0.0	41.8		**OK!**
1k6 Hz	40.6		1.0	41.6		-0.1	40.5		**OK!**
2k Hz	38.2	43.2	1.2	39.4	44.3	-0.2	38.0	43.1	**OK!**
2k5 Hz	34.6		1.3	35.9		-0.3	34.3		**OK!**
3k15 Hz	31.9		1.2	33.1		-0.5	31.4		**OK!**
4k Hz	28.8	34.7	1.0	29.8	35.7	-0.8	28.0	33.9	**OK!**
5k Hz	27.9		0.5	28.4		-1.3	26.6		**OK!**
6k3 Hz	27.7		-0.1	27.6		-2.0	25.7		**OK!**
8k Hz	24.1	29.9	-1.1	23.0	29.3	-3.0	21.1	27.4	**OK!**
10k Hz	21.5		-2.5	19.0		-4.4	17.1		**OK!**
12.5k	22.2		-4.3	17.9		-6.2	16.0		**OK!**
16k	14.9	23.4	-6.6	8.3	18.5	-8.5	6.4	16.6	**OK!**
20k	13.4		-9.3	4.1		-11.2	2.2		**OK!**
OVERALL	**62.8**	**62.8**	**dB(A)**	**51.3**	**51.3**	**dB(C)**	**61.8**	**61.8**	**OK!**

Figure 5 – Location S1 – Tonality and low frequency assessment 4

Date/Time	23/09/2021, 19:45-20:00
Location	S1 - 29 Charles Street, Blacktown

TONALITY/ LOW FREQUENCY NOISE TEST

Frequency	Input Data - L_{eq} dB(lin)		A-Weighted - dB(A)			C-Weighted - dB(C)			NPfl Tonality Test
Hz	1/3 Octave	Octave	Corr'n	1/3 Octave	Octave	Corr'n	1/3 Octave	Octave	(need 1/3 octave data input)
25	50.0		-44.7	5.3		-4.4	45.6		-
32	49.2	55.4	-39.4	9.8	18.4	-3.0	46.2	52.6	**OK!**
40	52.1		-34.6	17.5		-2.0	50.1		**OK!**
50 Hz	52.4		-30.2	22.2		-1.3	51.1		**OK!**
63 Hz	53.6	57.3	-26.2	27.4	31.7	-0.8	52.8	56.5	**OK!**
80 Hz	51.4		-22.5	28.9		-0.5	50.9		**OK!**
100 Hz	51.4		-19.1	32.3		-0.3	51.1		**OK!**
125 Hz	50.7	55.1	-16.1	34.6	38.8	-0.2	50.5	54.9	**OK!**
160 Hz	48.2		-13.4	34.8		-0.1	48.1		**OK!**
200 Hz	45.0		-10.9	34.1		0.0	45.0		**OK!**
250 Hz	42.5	49.2	-8.6	33.9	40.9	0.0	42.5	49.2	**OK!**
315 Hz	45.2		-6.6	38.6		0.0	45.2		**OK!**
400 Hz	41.4		-4.8	36.6		0.0	41.4		**OK!**
500 Hz	40.2	46.0	-3.2	37.0	42.9	0.0	40.2	46.0	**OK!**
630 Hz	41.8		-1.9	39.9		0.0	41.8		**OK!**
800 Hz	41.8		-0.8	41.0		0.0	41.8		**OK!**
1k Hz	42.1	46.4	0.0	42.1	46.3	0.0	42.1	46.4	**OK!**
1k25 Hz	40.9		0.6	41.5		0.0	40.9		**OK!**
1k6 Hz	39.6		1.0	40.6		-0.1	39.5		**OK!**
2k Hz	37.3	42.3	1.2	38.5	43.4	-0.2	37.1	42.1	**OK!**
2k5 Hz	34.0		1.3	35.3		-0.3	33.7		**OK!**
3k15 Hz	31.9		1.2	33.1		-0.5	31.4		**OK!**
4k Hz	29.3	34.7	1.0	30.3	35.7	-0.8	28.5	33.9	**OK!**
5k Hz	27.2		0.5	27.7		-1.3	25.9		**OK!**
6k3 Hz	26.8		-0.1	26.7		-2.0	24.8		**OK!**
8k Hz	23.2	29.0	-1.1	22.1	28.4	-3.0	20.2	26.5	**OK!**
10k Hz	20.0		-2.5	17.5		-4.4	15.6		**OK!**
12.5k	17.3		-4.3	13.0		-6.2	11.1		**OK!**
16k	16.4	20.8	-6.6	9.8	15.1	-8.5	7.9	13.2	**OK!**
20k	13.6		-9.3	4.3		-11.2	2.4		**OK!**
OVERALL	**61.4**	**61.4**	**dB(A)**	**50.4**	**50.4**	**dB(C)**	**60.5**	**60.5**	**OK!**

Figure 6 – Location S1 – Tonality and low frequency assessment 5

Date/Time	24/09/2021, 6:00-6:15
Location	S1 - 29 Charles Street, Blacktown

TONALITY/ LOW FREQUENCY NOISE TEST

Frequency	Input Data - L_{eq} dB(lin)		A-Weighted - dB(A)			C-Weighted - dB(C)			NPfl Tonality Test
Hz	1/3 Octave	Octave	Corr'n	1/3 Octave	Octave	Corr'n	1/3 Octave	Octave	(need 1/3 octave data input)
25	54.3		-44.7	9.6		-4.4	49.9		-
32	54.6	61.8	-39.4	15.2	25.7	-3.0	51.6	59.3	**OK!**
40	59.8		-34.6	25.2		-2.0	57.8		**OK!**
50 Hz	65.6		-30.2	35.4		-1.3	64.3		**OK!**
63 Hz	66.6	72.8	-26.2	40.4	48.7	-0.8	65.8	72.1	**OK!**
80 Hz	70.3		-22.5	47.8		-0.5	69.8		**OK!**
100 Hz	63.2		-19.1	44.1		-0.3	62.9		**OK!**
125 Hz	60.5	66.3	-16.1	44.4	50.0	-0.2	60.3	66.0	**OK!**
160 Hz	60.1		-13.4	46.7		-0.1	60.0		**OK!**
200 Hz	57.5		-10.9	46.6		0.0	57.5		**OK!**
250 Hz	52.9	60.2	-8.6	44.3	51.4	0.0	52.9	60.2	**OK!**
315 Hz	54.7		-6.6	48.1		0.0	54.7		**OK!**
400 Hz	55.1		-4.8	50.3		0.0	55.1		**OK!**
500 Hz	54.4	59.4	-3.2	51.2	56.2	0.0	54.4	59.4	**OK!**
630 Hz	54.4		-1.9	52.5		0.0	54.4		**OK!**
800 Hz	55.0		-0.8	54.2		0.0	55.0		**OK!**
1k Hz	54.5	59.2	0.0	54.5	59.1	0.0	54.5	59.2	**OK!**
1k25 Hz	53.7		0.6	54.3		0.0	53.7		**OK!**
1k6 Hz	51.5		1.0	52.5		-0.1	51.4		**OK!**
2k Hz	51.0	55.4	1.2	52.2	56.6	-0.2	50.8	55.2	**OK!**
2k5 Hz	49.1		1.3	50.4		-0.3	48.8		**OK!**
3k15 Hz	46.1		1.2	47.3		-0.5	45.6		**OK!**
4k Hz	44.3	49.2	1.0	45.3	50.2	-0.8	43.5	48.5	**OK!**
5k Hz	42.1		0.5	42.6		-1.3	40.8		**OK!**
6k3 Hz	39.8		-0.1	39.7		-2.0	37.8		**OK!**
8k Hz	36.9	42.4	-1.1	35.8	41.7	-3.0	33.9	39.8	**OK!**
10k Hz	34.6		-2.5	32.1		-4.4	30.2		**OK!**
12.5k	30.3		-4.3	26.0		-6.2	24.1		**OK!**
16k	25.5	31.8	-6.6	18.9	26.9	-8.5	17.0	25.0	**OK!**
20k	18.7		-9.3	9.4		-11.2	7.5		**OK!**
OVERALL	**74.5**	**74.5**	**dB(A)**	**63.3**	**63.3**	**dB(C)**	**73.8**	**73.8**	**OK!**

Figure 7 – Location S1 – Tonality and low frequency assessment 6

Date/Time	24/09/2021, 6:15-6:30
Location	S1 - 29 Charles Street, Blacktown

TONALITY/ LOW FREQUENCY NOISE TEST

Frequency	Input Data - L_{eq} dB(lin)		A-Weighted - dB(A)			C-Weighted - dB(C)			NPfl Tonality Test
Hz	1/3 Octave	Octave	Corr'n	1/3 Octave	Octave	Corr'n	1/3 Octave	Octave	(need 1/3 octave data input)
25	53.6		-44.7	8.9		-4.4	49.2		-
32	54.2	59.4	-39.4	14.8	22.3	-3.0	51.2	56.6	**OK!**
40	55.8		-34.6	21.2		-2.0	53.8		**OK!**
50 Hz	58.1		-30.2	27.9		-1.3	56.8		**OK!**
63 Hz	58.0	62.8	-26.2	31.8	37.5	-0.8	57.2	61.9	**OK!**
80 Hz	58.0		-22.5	35.5		-0.5	57.5		**OK!**
100 Hz	55.6		-19.1	36.5		-0.3	55.3		**OK!**
125 Hz	53.9	58.9	-16.1	37.8	42.7	-0.2	53.7	58.7	**OK!**
160 Hz	52.4		-13.4	39.0		-0.1	52.3		**OK!**
200 Hz	48.7		-10.9	37.8		0.0	48.7		**OK!**
250 Hz	46.2	52.4	-8.6	37.6	43.8	0.0	46.2	52.4	**OK!**
315 Hz	47.5		-6.6	40.9		0.0	47.5		**OK!**
400 Hz	48.4		-4.8	43.6		0.0	48.4		**OK!**
500 Hz	48.3	53.2	-3.2	45.1	50.0	0.0	48.3	53.2	**OK!**
630 Hz	48.5		-1.9	46.6		0.0	48.5		**OK!**
800 Hz	48.3		-0.8	47.5		0.0	48.3		**OK!**
1k Hz	47.3	52.2	0.0	47.3	52.0	0.0	47.3	52.2	**OK!**
1k25 Hz	46.4		0.6	47.0		0.0	46.4		**OK!**
1k6 Hz	45.9		1.0	46.9		-0.1	45.8		**OK!**
2k Hz	42.0	48.0	1.2	43.2	49.1	-0.2	41.8	47.8	**OK!**
2k5 Hz	39.0		1.3	40.3		-0.3	38.7		**OK!**
3k15 Hz	39.1		1.2	40.3		-0.5	38.6		**OK!**
4k Hz	38.9	43.0	1.0	39.9	44.0	-0.8	38.1	42.2	**OK!**
5k Hz	35.9		0.5	36.4		-1.3	34.6		**OK!**
6k3 Hz	35.7		-0.1	35.6		-2.0	33.7		**OK!**
8k Hz	25.5	36.3	-1.1	24.4	36.1	-3.0	22.5	34.2	**OK!**
10k Hz	23.4		-2.5	20.9		-4.4	19.0		**OK!**
12.5k	19.2		-4.3	14.9		-6.2	13.0		**OK!**
16k	15.4	21.5	-6.6	8.8	16.2	-8.5	6.9	14.3	**OK!**
20k	13.7		-9.3	4.4		-11.2	2.5		**OK!**
OVERALL	**66.2**	**66.2**	**dB(A)**	**56.2**	**56.2**	**dB(C)**	**65.3**	**65.3**	**OK!**

Figure 8 – Location S1 – Tonality and low frequency assessment 7

Date/Time	24/09/2021, 6:30-6:45
Location	S1 - 29 Charles Street, Blacktown

TONALITY/ LOW FREQUENCY NOISE TEST

Frequency	Input Data - L_{eq} dB(lin)		A-Weighted - dB(A)			C-Weighted - dB(C)			NPfl Tonality Test
Hz	1/3 Octave	Octave	Corr'n	1/3 Octave	Octave	Corr'n	1/3 Octave	Octave	(need 1/3 octave data input)
25	54.3		-44.7	9.6		-4.4	49.9		-
32	55.0	63.1	-39.4	15.6	27.4	-3.0	52.0	60.7	**OK!**
40	61.6		-34.6	27.0		-2.0	59.6		**OK!**
50 Hz	70.1		-30.2	39.9		-1.3	68.8		**OK!**
63 Hz	69.3	73.8	-26.2	43.1	47.9	-0.8	68.5	72.9	**OK!**
80 Hz	67.4		-22.5	44.9		-0.5	66.9		**OK!**
100 Hz	60.2		-19.1	41.1		-0.3	59.9		**OK!**
125 Hz	58.0	63.0	-16.1	41.9	46.3	-0.2	57.8	62.7	**OK!**
160 Hz	54.8		-13.4	41.4		-0.1	54.7		**OK!**
200 Hz	51.6		-10.9	40.7		0.0	51.6		**OK!**
250 Hz	51.5	56.0	-8.6	42.9	47.5	0.0	51.5	56.0	**OK!**
315 Hz	50.5		-6.6	43.9		0.0	50.5		**OK!**
400 Hz	50.8		-4.8	46.0		0.0	50.8		**OK!**
500 Hz	50.7	55.6	-3.2	47.5	52.5	0.0	50.7	55.6	**OK!**
630 Hz	51.0		-1.9	49.1		0.0	51.0		**OK!**
800 Hz	50.9		-0.8	50.1		0.0	50.9		**OK!**
1k Hz	51.9	55.7	0.0	51.9	55.6	0.0	51.9	55.7	**OK!**
1k25 Hz	49.7		0.6	50.3		0.0	49.7		**OK!**
1k6 Hz	49.3		1.0	50.3		-0.1	49.2		**OK!**
2k Hz	48.9	53.1	1.2	50.1	54.3	-0.2	48.7	53.0	**OK!**
2k5 Hz	46.4		1.3	47.7		-0.3	46.1		**OK!**
3k15 Hz	45.0		1.2	46.2		-0.5	44.5		**OK!**
4k Hz	43.8	48.5	1.0	44.8	49.5	-0.8	43.0	47.8	**OK!**
5k Hz	41.9		0.5	42.4		-1.3	40.6		**OK!**
6k3 Hz	39.1		-0.1	39.0		-2.0	37.1		**OK!**
8k Hz	34.6	41.0	-1.1	33.5	40.5	-3.0	31.6	38.6	**OK!**
10k Hz	32.3		-2.5	29.8		-4.4	27.9		**OK!**
12.5k	29.2		-4.3	24.9		-6.2	23.0		**OK!**
16k	25.4	30.9	-6.6	18.8	25.9	-8.5	16.9	24.0	**OK!**
20k	17.3		-9.3	8.0		-11.2	6.1		**OK!**
OVERALL	**74.7**	**74.7**	**dB(A)**	**60.3**	**60.3**	**dB(C)**	**73.8**	**73.8**	**OK!**

Figure 9 – Location S1 – Tonality and low frequency assessment 8

Date/Time	24/09/2021, 6:45-7:00
Location	S1 - 29 Charles Street, Blacktown

TONALITY/ LOW FREQUENCY NOISE TEST

Frequency	Input Data - L_{eq} dB(lin)		A-Weighted - dB(A)			C-Weighted - dB(C)			NPfl Tonality Test
Hz	1/3 Octave	Octave	Corr'n	1/3 Octave	Octave	Corr'n	1/3 Octave	Octave	(need 1/3 octave data input)
25	54.4		-44.7	9.7		-4.4	50.0		-
32	54.5	61.5	-39.4	15.1	25.3	-3.0	51.5	58.9	**OK!**
40	59.3		-34.6	24.7		-2.0	57.3		**OK!**
50 Hz	62.0		-30.2	31.8		-1.3	60.7		**OK!**
63 Hz	63.9	68.1	-26.2	37.7	43.1	-0.8	63.1	67.2	**OK!**
80 Hz	63.7		-22.5	41.2		-0.5	63.2		**OK!**
100 Hz	57.5		-19.1	38.4		-0.3	57.2		**OK!**
125 Hz	59.4	62.5	-16.1	43.3	46.4	-0.2	59.2	62.3	**OK!**
160 Hz	55.4		-13.4	42.0		-0.1	55.3		**OK!**
200 Hz	51.2		-10.9	40.3		0.0	51.2		**OK!**
250 Hz	50.4	55.4	-8.6	41.8	46.8	0.0	50.4	55.4	**OK!**
315 Hz	50.1		-6.6	43.5		0.0	50.1		**OK!**
400 Hz	51.3		-4.8	46.5		0.0	51.3		**OK!**
500 Hz	50.4	55.4	-3.2	47.2	52.1	0.0	50.4	55.4	**OK!**
630 Hz	50.0		-1.9	48.1		0.0	50.0		**OK!**
800 Hz	50.8		-0.8	50.0		0.0	50.8		**OK!**
1k Hz	50.3	54.6	0.0	50.3	54.4	0.0	50.3	54.6	**OK!**
1k25 Hz	47.7		0.6	48.3		0.0	47.7		**OK!**
1k6 Hz	47.3		1.0	48.3		-0.1	47.2		**OK!**
2k Hz	47.5	51.4	1.2	48.7	52.6	-0.2	47.3	51.3	**OK!**
2k5 Hz	44.7		1.3	46.0		-0.3	44.4		**OK!**
3k15 Hz	43.0		1.2	44.2		-0.5	42.5		**OK!**
4k Hz	41.1	46.2	1.0	42.1	47.2	-0.8	40.3	45.5	**OK!**
5k Hz	39.5		0.5	40.0		-1.3	38.2		**OK!**
6k3 Hz	37.0		-0.1	36.9		-2.0	35.0		**OK!**
8k Hz	35.9	41.1	-1.1	34.8	40.1	-3.0	32.9	38.2	**OK!**
10k Hz	36.0		-2.5	33.5		-4.4	31.6		**OK!**
12.5k	30.8		-4.3	26.5		-6.2	24.6		**OK!**
16k	23.8	31.8	-6.6	17.2	27.0	-8.5	15.3	25.1	**OK!**
20k	17.9		-9.3	8.6		-11.2	6.7		**OK!**
OVERALL	**70.3**	**70.3**	**dB(A)**	**59.0**	**59.0**	**dB(C)**	**69.5**	**69.5**	**OK!**

Figure 10 – Location S2 – Tonality and low frequency assessment 1

Date/Time	23/09/2021, 19:00-19:15
Location	S2 - 23 Anthony Street, Blacktown

TONALITY/ LOW FREQUENCY NOISE TEST

Frequency	Input Data - L_{eq} dB(lin)		A-Weighted - dB(A)			C-Weighted - dB(C)			NPfl Tonality Test
Hz	1/3 Octave	Octave	Corr'n	1/3 Octave	Octave	Corr'n	1/3 Octave	Octave	(need 1/3 octave data input)
25	45.6		-44.7	0.9		-4.4	41.2		-
32	44.6	49.8	-39.4	5.2	11.8	-3.0	41.6	46.7	**OK!**
40	44.8		-34.6	10.2		-2.0	42.8		**OK!**
50 Hz	46.8		-30.2	16.6		-1.3	45.5		**OK!**
63 Hz	48.2	52.5	-26.2	22.0	27.5	-0.8	47.4	51.7	**OK!**
80 Hz	48.0		-22.5	25.5		-0.5	47.5		**OK!**
100 Hz	47.3		-19.1	28.2		-0.3	47.0		**OK!**
125 Hz	45.4	50.8	-16.1	29.3	34.7	-0.2	45.2	50.5	**OK!**
160 Hz	44.9		-13.4	31.5		-0.1	44.8		**OK!**
200 Hz	40.4		-10.9	29.5		0.0	40.4		**OK!**
250 Hz	38.8	45.0	-8.6	30.2	36.8	0.0	38.8	45.0	**OK!**
315 Hz	41.1		-6.6	34.5		0.0	41.1		**OK!**
400 Hz	38.4		-4.8	33.6		0.0	38.4		**OK!**
500 Hz	37.3	42.7	-3.2	34.1	39.6	0.0	37.3	42.7	**OK!**
630 Hz	38.1		-1.9	36.2		0.0	38.1		**OK!**
800 Hz	37.8		-0.8	37.0		0.0	37.8		**OK!**
1k Hz	37.0	41.7	0.0	37.0	41.5	0.0	37.0	41.7	**OK!**
1k25 Hz	35.6		0.6	36.2		0.0	35.6		**OK!**
1k6 Hz	33.7		1.0	34.7		-0.1	33.6		**OK!**
2k Hz	31.6	36.7	1.2	32.8	37.8	-0.2	31.4	36.5	**OK!**
2k5 Hz	29.3		1.3	30.6		-0.3	29.0		**OK!**
3k15 Hz	26.7		1.2	27.9		-0.5	26.2		**OK!**
4k Hz	22.8	29.2	1.0	23.8	30.3	-0.8	22.0	28.5	**OK!**
5k Hz	22.6		0.5	23.1		-1.3	21.3		**OK!**
6k3 Hz	23.5		-0.1	23.4		-2.0	21.5		**OK!**
8k Hz	17.5	25.3	-1.1	16.4	24.7	-3.0	14.5	22.8	**OK!**
10k Hz	17.6		-2.5	15.1		-4.4	13.2		**OK!**
12.5k	14.7		-4.3	10.4		-6.2	8.5		**OK!**
16k	13.0	18.6	-6.6	6.4	12.6	-8.5	4.5	10.7	**OK!**
20k	13.6		-9.3	4.3		-11.2	2.4		**OK!**
OVERALL	**56.7**	**56.7**	**dB(A)**	**45.9**	**45.9**	**dB(C)**	**55.8**	**55.8**	**OK!**

Figure 11 – Location S2 – Tonality and low frequency assessment 2

Date/Time	23/09/2021, 19:15-19:30
Location	S2 - 23 Anthony Street, Blacktown

TONALITY/ LOW FREQUENCY NOISE TEST

Frequency	Input Data - L_{eq} dB(lin)		A-Weighted - dB(A)			C-Weighted - dB(C)			NPfl Tonality Test
Hz	1/3 Octave	Octave	Corr'n	1/3 Octave	Octave	Corr'n	1/3 Octave	Octave	(need 1/3 octave data input)
25	47.3		-44.7	2.6		-4.4	42.9		-
32	46.5	51.2	-39.4	7.1	12.7	-3.0	43.5	48.0	**OK!**
40	45.3		-34.6	10.7		-2.0	43.3		**OK!**
50 Hz	48.1		-30.2	17.9		-1.3	46.8		**OK!**
63 Hz	48.7	54.7	-26.2	22.5	30.5	-0.8	47.9	54.0	**OK!**
80 Hz	52.0		-22.5	29.5		-0.5	51.5		**OK!**
100 Hz	47.4		-19.1	28.3		-0.3	47.1		**OK!**
125 Hz	44.9	50.1	-16.1	28.8	33.4	-0.2	44.7	49.9	**OK!**
160 Hz	42.1		-13.4	28.7		-0.1	42.0		**OK!**
200 Hz	38.8		-10.9	27.9		0.0	38.8		**OK!**
250 Hz	38.5	44.1	-8.6	29.9	36.1	0.0	38.5	44.1	**OK!**
315 Hz	40.5		-6.6	33.9		0.0	40.5		**OK!**
400 Hz	34.9		-4.8	30.1		0.0	34.9		**OK!**
500 Hz	35.0	40.1	-3.2	31.8	37.1	0.0	35.0	40.1	**OK!**
630 Hz	36.0		-1.9	34.1		0.0	36.0		**OK!**
800 Hz	35.8		-0.8	35.0		0.0	35.8		**OK!**
1k Hz	35.6	40.1	0.0	35.6	39.9	0.0	35.6	40.1	**OK!**
1k25 Hz	34.3		0.6	34.9		0.0	34.3		**OK!**
1k6 Hz	31.7		1.0	32.7		-0.1	31.6		**OK!**
2k Hz	29.2	34.2	1.2	30.4	35.3	-0.2	29.0	34.0	**OK!**
2k5 Hz	24.9		1.3	26.2		-0.3	24.6		**OK!**
3k15 Hz	20.0		1.2	21.2		-0.5	19.5		**OK!**
4k Hz	18.3	23.7	1.0	19.3	24.6	-0.8	17.5	22.9	**OK!**
5k Hz	18.1		0.5	18.6		-1.3	16.8		**OK!**
6k3 Hz	22.6		-0.1	22.5		-2.0	20.6		**OK!**
8k Hz	13.3	24.1	-1.1	12.2	23.5	-3.0	10.3	21.6	**OK!**
10k Hz	17.1		-2.5	14.6		-4.4	12.7		**OK!**
12.5k	14.3		-4.3	10.0		-6.2	8.1		**OK!**
16k	12.8	18.4	-6.6	6.2	12.3	-8.5	4.3	10.4	**OK!**
20k	13.6		-9.3	4.3		-11.2	2.4		**OK!**
OVERALL	**57.6**	**57.6**	**dB(A)**	**44.2**	**44.2**	**dB(C)**	**56.6**	**56.6**	**OK!**

Figure 12 – Location S2 – Tonality and low frequency assessment 3

Date/Time	23/09/2021, 19:30-19:45
Location	S2 - 23 Anthony Street, Blacktown

TONALITY/ LOW FREQUENCY NOISE TEST

Frequency	Input Data - L_{eq} dB(lin)		A-Weighted - dB(A)			C-Weighted - dB(C)			NPfl Tonality Test
Hz	1/3 Octave	Octave	Corr'n	1/3 Octave	Octave	Corr'n	1/3 Octave	Octave	(need 1/3 octave data input)
25	49.6		-44.7	4.9		-4.4	45.2		-
32	49.0	54.1	-39.4	9.6	16.3	-3.0	46.0	51.1	**OK!**
40	49.4		-34.6	14.8		-2.0	47.4		**OK!**
50 Hz	49.8		-30.2	19.6		-1.3	48.5		**OK!**
63 Hz	49.6	54.4	-26.2	23.4	29.0	-0.8	48.8	53.5	**OK!**
80 Hz	49.4		-22.5	26.9		-0.5	48.9		**OK!**
100 Hz	47.9		-19.1	28.8		-0.3	47.6		**OK!**
125 Hz	48.5	52.7	-16.1	32.4	36.9	-0.2	48.3	52.5	**OK!**
160 Hz	47.3		-13.4	33.9		-0.1	47.2		**OK!**
200 Hz	42.9		-10.9	32.0		0.0	42.9		**OK!**
250 Hz	41.8	46.9	-8.6	33.2	38.3	0.0	41.8	46.9	**OK!**
315 Hz	41.6		-6.6	35.0		0.0	41.6		**OK!**
400 Hz	38.1		-4.8	33.3		0.0	38.1		**OK!**
500 Hz	37.8	43.0	-3.2	34.6	40.0	0.0	37.8	43.0	**OK!**
630 Hz	38.8		-1.9	36.9		0.0	38.8		**OK!**
800 Hz	39.3		-0.8	38.5		0.0	39.3		**OK!**
1k Hz	38.5	43.2	0.0	38.5	43.1	0.0	38.5	43.2	**OK!**
1k25 Hz	37.2		0.6	37.8		0.0	37.2		**OK!**
1k6 Hz	34.2		1.0	35.2		-0.1	34.1		**OK!**
2k Hz	31.5	36.8	1.2	32.7	37.9	-0.2	31.3	36.6	**OK!**
2k5 Hz	28.4		1.3	29.7		-0.3	28.1		**OK!**
3k15 Hz	24.3		1.2	25.5		-0.5	23.8		**OK!**
4k Hz	21.4	27.0	1.0	22.4	28.0	-0.8	20.6	26.3	**OK!**
5k Hz	19.7		0.5	20.2		-1.3	18.4		**OK!**
6k3 Hz	19.3		-0.1	19.2		-2.0	17.3		**OK!**
8k Hz	14.6	21.5	-1.1	13.5	20.8	-3.0	11.6	18.9	**OK!**
10k Hz	14.5		-2.5	12.0		-4.4	10.1		**OK!**
12.5k	13.0		-4.3	8.7		-6.2	6.8		**OK!**
16k	12.8	17.9	-6.6	6.2	11.5	-8.5	4.3	9.6	**OK!**
20k	13.6		-9.3	4.3		-11.2	2.4		**OK!**
OVERALL	**59.1**	**59.1**	**dB(A)**	**47.0**	**47.0**	**dB(C)**	**58.0**	**58.0**	**OK!**

Figure 13 – Location S2 – Tonality and low frequency assessment 4

Date/Time	23/09/2021, 19:45-20:00
Location	S2 - 23 Anthony Street, Blacktown

TONALITY/ LOW FREQUENCY NOISE TEST

Frequency	Input Data - L_{eq} dB(lin)		A-Weighted - dB(A)			C-Weighted - dB(C)			NPfl Tonality Test
Hz	1/3 Octave	Octave	Corr'n	1/3 Octave	Octave	Corr'n	1/3 Octave	Octave	(need 1/3 octave data input)
25	46.4		-44.7	1.7		-4.4	42.0		-
32	46.5	52.5	-39.4	7.1	15.8	-3.0	43.5	49.8	**OK!**
40	49.6		-34.6	15.0		-2.0	47.6		**OK!**
50 Hz	48.5		-30.2	18.3		-1.3	47.2		**OK!**
63 Hz	49.4	53.8	-26.2	23.2	28.7	-0.8	48.6	53.0	**OK!**
80 Hz	49.1		-22.5	26.6		-0.5	48.6		**OK!**
100 Hz	48.6		-19.1	29.5		-0.3	48.3		**OK!**
125 Hz	47.0	51.8	-16.1	30.9	35.4	-0.2	46.8	51.6	**OK!**
160 Hz	44.6		-13.4	31.2		-0.1	44.5		**OK!**
200 Hz	42.3		-10.9	31.4		0.0	42.3		**OK!**
250 Hz	41.0	46.5	-8.6	32.4	38.0	0.0	41.0	46.5	**OK!**
315 Hz	41.7		-6.6	35.1		0.0	41.7		**OK!**
400 Hz	39.3		-4.8	34.5		0.0	39.3		**OK!**
500 Hz	38.7	44.2	-3.2	35.5	41.2	0.0	38.7	44.2	**OK!**
630 Hz	40.2		-1.9	38.3		0.0	40.2		**OK!**
800 Hz	40.2		-0.8	39.4		0.0	40.2		**OK!**
1k Hz	41.1	45.0	0.0	41.1	44.9	0.0	41.1	45.0	**OK!**
1k25 Hz	39.1		0.6	39.7		0.0	39.1		**OK!**
1k6 Hz	36.5		1.0	37.5		-0.1	36.4		**OK!**
2k Hz	33.3	38.7	1.2	34.5	39.8	-0.2	33.1	38.5	**OK!**
2k5 Hz	29.0		1.3	30.3		-0.3	28.7		**OK!**
3k15 Hz	25.3		1.2	26.5		-0.5	24.8		**OK!**
4k Hz	22.5	28.0	1.0	23.5	29.0	-0.8	21.7	27.3	**OK!**
5k Hz	20.5		0.5	21.0		-1.3	19.2		**OK!**
6k3 Hz	17.8		-0.1	17.7		-2.0	15.8		**OK!**
8k Hz	15.1	20.6	-1.1	14.0	19.8	-3.0	12.1	17.9	**OK!**
10k Hz	13.4		-2.5	10.9		-4.4	9.0		**OK!**
12.5k	12.6		-4.3	8.3		-6.2	6.4		**OK!**
16k	13.3	18.0	-6.6	6.7	11.5	-8.5	4.8	9.6	**OK!**
20k	13.6		-9.3	4.3		-11.2	2.4		**OK!**
OVERALL	**58.3**	**58.3**	**dB(A)**	**48.1**	**48.1**	**dB(C)**	**57.4**	**57.4**	**OK!**

Figure 14 – Location S2 – Tonality and low frequency assessment 5

Date/Time	24/09/2021, 6:00-6:15
Location	S2 - 23 Anthony Street, Blacktown

TONALITY/ LOW FREQUENCY NOISE TEST

Frequency	Input Data - L_{eq} dB(lin)		A-Weighted - dB(A)			C-Weighted - dB(C)			NPfl Tonality Test
Hz	1/3 Octave	Octave	Corr'n	1/3 Octave	Octave	Corr'n	1/3 Octave	Octave	(need 1/3 octave data input)
25	51.3		-44.7	6.6		-4.4	46.9		-
32	53.3	64.0	-39.4	13.9	28.9	-3.0	50.3	61.8	**OK!**
40	63.3		-34.6	28.7		-2.0	61.3		**OK!**
50 Hz	70.9		-30.2	40.7		-1.3	69.6		**OK!**
63 Hz	70.3	74.6	-26.2	44.1	48.4	-0.8	69.5	73.6	**OK!**
80 Hz	67.6		-22.5	45.1		-0.5	67.1		**OK!**
100 Hz	61.1		-19.1	42.0		-0.3	60.8		**OK!**
125 Hz	54.0	62.3	-16.1	37.9	44.8	-0.2	53.8	62.1	**OK!**
160 Hz	52.4		-13.4	39.0		-0.1	52.3		**OK!**
200 Hz	50.7		-10.9	39.8		0.0	50.7		**OK!**
250 Hz	55.0	58.1	-8.6	46.4	50.0	0.0	55.0	58.1	**OK!**
315 Hz	53.4		-6.6	46.8		0.0	53.4		**OK!**
400 Hz	50.7		-4.8	45.9		0.0	50.7		**OK!**
500 Hz	52.8	56.8	-3.2	49.6	53.8	0.0	52.8	56.8	**OK!**
630 Hz	52.2		-1.9	50.3		0.0	52.2		**OK!**
800 Hz	52.8		-0.8	52.0		0.0	52.8		**OK!**
1k Hz	54.3	58.2	0.0	54.3	58.1	0.0	54.3	58.2	**OK!**
1k25 Hz	52.9		0.6	53.5		0.0	52.9		**OK!**
1k6 Hz	50.7		1.0	51.7		-0.1	50.6		**OK!**
2k Hz	51.7	55.6	1.2	52.9	56.8	-0.2	51.5	55.4	**OK!**
2k5 Hz	49.9		1.3	51.2		-0.3	49.6		**OK!**
3k15 Hz	48.2		1.2	49.4		-0.5	47.7		**OK!**
4k Hz	47.2	51.8	1.0	48.2	52.8	-0.8	46.4	51.0	**OK!**
5k Hz	45.1		0.5	45.6		-1.3	43.8		**OK!**
6k3 Hz	41.5		-0.1	41.4		-2.0	39.5		**OK!**
8k Hz	36.7	43.2	-1.1	35.6	42.7	-3.0	33.7	40.8	**OK!**
10k Hz	33.0		-2.5	30.5		-4.4	28.6		**OK!**
12.5k	28.8		-4.3	24.5		-6.2	22.6		**OK!**
16k	24.5	30.4	-6.6	17.9	25.4	-8.5	16.0	23.5	**OK!**
20k	17.5		-9.3	8.2		-11.2	6.3		**OK!**
OVERALL	**75.5**	**75.5**	**dB(A)**	**62.5**	**62.5**	**dB(C)**	**74.6**	**74.6**	**OK!**

Figure 15 – Location S2 – Tonality and low frequency assessment 6

Date/Time	24/09/2021, 6:15-6:30
Location	S2 - 23 Anthony Street, Blacktown

TONALITY/ LOW FREQUENCY NOISE TEST

Frequency	Input Data - L_{eq} dB(lin)		A-Weighted - dB(A)			C-Weighted - dB(C)			NPfl Tonality Test
Hz	1/3 Octave	Octave	Corr'n	1/3 Octave	Octave	Corr'n	1/3 Octave	Octave	(need 1/3 octave data input)
25	50.5		-44.7	5.8		-4.4	46.1		-
32	51.7	56.7	-39.4	12.3	19.6	-3.0	48.7	53.9	**OK!**
40	53.1		-34.6	18.5		-2.0	51.1		**OK!**
50 Hz	56.4		-30.2	26.2		-1.3	55.1		**OK!**
63 Hz	55.1	60.5	-26.2	28.9	35.2	-0.8	54.3	59.7	**OK!**
80 Hz	55.7		-22.5	33.2		-0.5	55.2		**OK!**
100 Hz	52.0		-19.1	32.9		-0.3	51.7		**OK!**
125 Hz	49.2	54.6	-16.1	33.1	37.8	-0.2	49.0	54.3	**OK!**
160 Hz	46.6		-13.4	33.2		-0.1	46.5		**OK!**
200 Hz	44.1		-10.9	33.2		0.0	44.1		**OK!**
250 Hz	44.4	49.1	-8.6	35.8	40.8	0.0	44.4	49.1	**OK!**
315 Hz	44.5		-6.6	37.9		0.0	44.5		**OK!**
400 Hz	44.5		-4.8	39.7		0.0	44.5		**OK!**
500 Hz	45.7	49.9	-3.2	42.5	46.9	0.0	45.7	49.9	**OK!**
630 Hz	45.2		-1.9	43.3		0.0	45.2		**OK!**
800 Hz	45.3		-0.8	44.5		0.0	45.3		**OK!**
1k Hz	44.5	48.9	0.0	44.5	48.7	0.0	44.5	48.9	**OK!**
1k25 Hz	42.0		0.6	42.6		0.0	42.0		**OK!**
1k6 Hz	39.5		1.0	40.5		-0.1	39.4		**OK!**
2k Hz	35.5	41.8	1.2	36.7	42.9	-0.2	35.3	41.6	**OK!**
2k5 Hz	34.0		1.3	35.3		-0.3	33.7		**OK!**
3k15 Hz	35.2		1.2	36.4		-0.5	34.7		**OK!**
4k Hz	34.1	38.3	1.0	35.1	39.3	-0.8	33.3	37.6	**OK!**
5k Hz	29.1		0.5	29.6		-1.3	27.8		**OK!**
6k3 Hz	26.3		-0.1	26.2		-2.0	24.3		**OK!**
8k Hz	18.2	27.2	-1.1	17.1	26.9	-3.0	15.2	25.0	**OK!**
10k Hz	15.1		-2.5	12.6		-4.4	10.7		**OK!**
12.5k	12.9		-4.3	8.6		-6.2	6.7		**OK!**
16k	12.7	17.8	-6.6	6.1	11.4	-8.5	4.2	9.5	**OK!**
20k	13.5		-9.3	4.2		-11.2	2.3		**OK!**
OVERALL	**63.4**	**63.4**	**dB(A)**	**52.4**	**52.4**	**dB(C)**	**62.3**	**62.3**	**OK!**

Figure 16 – Location S2 – Tonality and low frequency assessment 7

Date/Time	24/09/2021, 6:30-6:45
Location	S2 - 23 Anthony Street, Blacktown

TONALITY/ LOW FREQUENCY NOISE TEST

Frequency	Input Data - L_{eq} dB(lin)		A-Weighted - dB(A)			C-Weighted - dB(C)			NPfl Tonality Test
Hz	1/3 Octave	Octave	Corr'n	1/3 Octave	Octave	Corr'n	1/3 Octave	Octave	(need 1/3 octave data input)
25	51.6		-44.7	6.9		-4.4	47.2		-
32	52.3	58.9	-39.4	12.9	22.7	-3.0	49.3	56.4	**OK!**
40	56.7		-34.6	22.1		-2.0	54.7		**OK!**
50 Hz	61.9		-30.2	31.7		-1.3	60.6		**OK!**
63 Hz	59.6	65.6	-26.2	33.4	40.1	-0.8	58.8	64.7	**OK!**
80 Hz	60.7		-22.5	38.2		-0.5	60.2		**OK!**
100 Hz	54.8		-19.1	35.7		-0.3	54.5		**OK!**
125 Hz	51.3	57.2	-16.1	35.2	40.3	-0.2	51.1	56.9	**OK!**
160 Hz	49.2		-13.4	35.8		-0.1	49.1		**OK!**
200 Hz	47.0		-10.9	36.1		0.0	47.0		**OK!**
250 Hz	48.5	52.6	-8.6	39.9	44.4	0.0	48.5	52.6	**OK!**
315 Hz	48.0		-6.6	41.4		0.0	48.0		**OK!**
400 Hz	47.1		-4.8	42.3		0.0	47.1		**OK!**
500 Hz	47.6	52.2	-3.2	44.4	49.1	0.0	47.6	52.2	**OK!**
630 Hz	47.5		-1.9	45.6		0.0	47.5		**OK!**
800 Hz	48.0		-0.8	47.2		0.0	48.0		**OK!**
1k Hz	48.4	52.4	0.0	48.4	52.3	0.0	48.4	52.4	**OK!**
1k25 Hz	46.3		0.6	46.9		0.0	46.3		**OK!**
1k6 Hz	45.0		1.0	46.0		-0.1	44.9		**OK!**
2k Hz	43.1	48.1	1.2	44.3	49.2	-0.2	42.9	47.9	**OK!**
2k5 Hz	41.0		1.3	42.3		-0.3	40.7		**OK!**
3k15 Hz	38.6		1.2	39.8		-0.5	38.1		**OK!**
4k Hz	37.5	42.0	1.0	38.5	43.0	-0.8	36.7	41.3	**OK!**
5k Hz	34.9		0.5	35.4		-1.3	33.6		**OK!**
6k3 Hz	32.5		-0.1	32.4		-2.0	30.5		**OK!**
8k Hz	27.8	34.2	-1.1	26.7	33.7	-3.0	24.8	31.8	**OK!**
10k Hz	23.9		-2.5	21.4		-4.4	19.5		**OK!**
12.5k	20.2		-4.3	15.9		-6.2	14.0		**OK!**
16k	15.3	22.1	-6.6	8.7	16.9	-8.5	6.8	15.0	**OK!**
20k	13.9		-9.3	4.6		-11.2	2.7		**OK!**
OVERALL	**67.4**	**67.4**	**dB(A)**	**56.1**	**56.1**	**dB(C)**	**66.5**	**66.5**	**OK!**

Figure 17 – Location S2 – Tonality and low frequency assessment 8

Date/Time	24/09/2021, 6:45-7:00
Location	S2 - 23 Anthony Street, Blacktown

TONALITY/ LOW FREQUENCY NOISE TEST

Frequency	Input Data - L_{eq} dB(lin)		A-Weighted - dB(A)			C-Weighted - dB(C)			NPfl Tonality Test
Hz	1/3 Octave	Octave	Corr'n	1/3 Octave	Octave	Corr'n	1/3 Octave	Octave	(need 1/3 octave data input)
25	52.6		-44.7	7.9		-4.4	48.2		-
32	52.6	60.9	-39.4	13.2	25.2	-3.0	49.6	58.5	**OK!**
40	59.4		-34.6	24.8		-2.0	57.4		**OK!**
50 Hz	67.0		-30.2	36.8		-1.3	65.7		**OK!**
63 Hz	60.4	68.7	-26.2	34.2	41.8	-0.8	59.6	67.7	**OK!**
80 Hz	61.4		-22.5	38.9		-0.5	60.9		**OK!**
100 Hz	56.5		-19.1	37.4		-0.3	56.2		**OK!**
125 Hz	52.7	58.7	-16.1	36.6	41.7	-0.2	52.5	58.4	**OK!**
160 Hz	50.2		-13.4	36.8		-0.1	50.1		**OK!**
200 Hz	46.7		-10.9	35.8		0.0	46.7		**OK!**
250 Hz	47.3	52.0	-8.6	38.7	43.7	0.0	47.3	52.0	**OK!**
315 Hz	47.5		-6.6	40.9		0.0	47.5		**OK!**
400 Hz	46.8		-4.8	42.0		0.0	46.8		**OK!**
500 Hz	48.0	52.3	-3.2	44.8	49.2	0.0	48.0	52.3	**OK!**
630 Hz	47.7		-1.9	45.8		0.0	47.7		**OK!**
800 Hz	47.8		-0.8	47.0		0.0	47.8		**OK!**
1k Hz	46.7	51.4	0.0	46.7	51.2	0.0	46.7	51.4	**OK!**
1k25 Hz	44.9		0.6	45.5		0.0	44.9		**OK!**
1k6 Hz	43.1		1.0	44.1		-0.1	43.0		**OK!**
2k Hz	42.8	47.0	1.2	44.0	48.2	-0.2	42.6	46.9	**OK!**
2k5 Hz	40.5		1.3	41.8		-0.3	40.2		**OK!**
3k15 Hz	40.5		1.2	41.7		-0.5	40.0		**OK!**
4k Hz	40.8	45.1	1.0	41.8	46.0	-0.8	40.0	44.3	**OK!**
5k Hz	39.6		0.5	40.1		-1.3	38.3		**OK!**
6k3 Hz	36.2		-0.1	36.1		-2.0	34.2		**OK!**
8k Hz	30.3	37.5	-1.1	29.2	37.1	-3.0	27.3	35.2	**OK!**
10k Hz	26.2		-2.5	23.7		-4.4	21.8		**OK!**
12.5k	22.3		-4.3	18.0		-6.2	16.1		**OK!**
16k	16.3	23.8	-6.6	9.7	18.8	-8.5	7.8	16.9	**OK!**
20k	14.0		-9.3	4.7		-11.2	2.8		**OK!**
OVERALL	**70.0**	**70.0**	**dB(A)**	**55.8**	**55.8**	**dB(C)**	**68.9**	**68.9**	**OK!**

3 Sound power levels for site activities

Below is the updated Table 7.2 from the Addendum NIA, including EPA's requested information.

(Updated) Table 7.2 – L_{Amax} sound power level of existing activities, dB(A) re. 1pW

Activities	L_{Amax} Sound Power Level (per activity)	Derivation Details		
		Distance from L_{Amax} source, m	Measured L_{Amax} Sound Pressure Level	Notes
General operations (6am – 9pm)				
Hammer milling – includes noise from hammer mill, front end loaders pushing materials, crane loading materials into hammer mill and trucks dumping materials into stockpiles	127	20	93.4	Measurements of several cycles of the metal recycling activities were conducted Typically higher L_{Amax} events are due to front end loaders pushing steel materials and trucks dumping materials into stockpiles. The highest recorded L_{Amax} level was due to a truck dumping material into stockpiles

Activities	L_{Amax} Sound Power Level (per activity)	Derivation Details		
		Distance from L_{Amax} source, m	Measured L_{Amax} Sound Pressure Level	Notes
Metal shearing – includes noise from metal shear, crane loading materials into shear, excavator sorting materials and trucks dumping materials into stockpiles	129	20	94.5	Measurements of several cycles of the metal recycling activities were conducted Typically higher L_{Amax} events are crane loading materials and trucks dumping materials into stockpiles. The highest recorded L_{Amax} level was due to a crane loading material.
Maintenance and cleaning (24 hours)				
Maintenance and cleaning – includes noise from forklift, hand tools, pressure hose and crane	117	-	-	Taken from Renzo Tonin & Associates noise database

Notes: 1. Only the noisiest and most dominant noise activities have been presented

4 Predicted noise levels in Addendum NIA Table 7.7 and Table 7.8

Below are the updated Table 7.7 and Table 7.8 results from the Addendum NIA for the morning shoulder period, including EPA's request for inclusion of temperature inversion events for the shoulder period.

(Updated - shoulder period results only) Table 7.7 – Predicted operational noise levels at nearest potentially affected receivers, $L_{Aeq,15min}$

Receiver Location	Project Trigger Noise Levels, dB(A)				Predicted Noise Levels, dB(A)									
					Shoulder									
	Shoulder	Day	Evening	Night	Calm	SSW Wind	SW Wind	WSW Wind	W Wind	Temp. Inv.	Temp. Inv. with SSW Wind	Temp. Inv. with SW Wind	Temp. Inv. with WSW Wind	Temp. Inv. with W Wind
NCA1A / Receiver R1A – 189 Sunnyholt Road, Blacktown	*53*	*53*	*48*	*38*	41	39	41	42	42	43	42	42	42	42
NCA1B / Receiver R1B – 2 Anthony Street, Blacktown	*51*	*50*	*48*	*38*	42	44	44	44	44	45	45	45	45	45
NCA1C / Receiver R1C – 40 Charles Street, Blacktown	*41*	*43*	*43*	*37*	40	42	41	41	41	43	43	42	42	42
NCA1D / Receiver R1D – 2 Eggleton Street, Blacktown	*42*	*44*	*43*	*38*	40	42	42	42	42	43	43	43	43	43
NCA1E / Receiver R1E – 11 Anthony Street, Blacktown	*40*	*42*	*42*	*38*	37	40	40	40	40	41	41	41	41	41
NCA2 / Receiver R2 – 249 Madagascar Drive, Kings Park	*47*	*47*	*43*	*37*	37	41	41	41	41	40	41	41	41	41
NCA3 / Receiver R3 – 3 Railway Road, Marayong	*43*	*43*	*42*	*38*	34	32	34	34	34	38	35	35	35	36
Receiver R4 – 38 Tattersalls Road, Kings Park	*68*	*68*	*68*	*68*	60	61	60	60	60	61	61	61	61	61
Receiver R5 – 57-69 Tattersalls Road, Kings Park	*68*	*68*	*68*	*68*	54	54	54	54	54	54	54	54	54	54
Receiver R6 – 21 Tattersalls Road, Kings Park	*68*	*68*	*68*	*68*	50	50	50	50	51	51	51	51	51	51
Receiver R7 – 38 Forge Street, Blacktown	*63*	*63*	*63*	*63*	65	64	64	64	65	66	65	65	66	66

(Updated - shoulder period results only) Table 7.8 – Predicted L_{Amax} sleep disturbance noise levels at nearest potentially affected residential receivers, dB(A)

Receiver Location	Sleep disturbance assessment level (10pm to 7am)		Predicted Noise Levels, dB(A)									
			Shoulder									
	Night	Shoulder	Calm	SSW Wind	SW Wind	WSW Wind	W Wind	Temp. Inv.	Temp. Inv. with SSW Wind	Temp. Inv. with SW Wind	Temp. Inv. with WSW Wind	Temp. Inv. with W Wind
NCA1A / Receiver R1A – 189 Sunnyholt Road, Blacktown	*57*	*71*	55	52	54	54	54	57	55	55	55	55
NCA1B / Receiver R1B – 2 Anthony Street, Blacktown	*57*	*61*	53	55	54	54	54	56	56	55	55	55
NCA1C / Receiver R1C – 40 Charles Street, Blacktown	*52*	*52*	50	52	51	51	51	53	54	53	53	53
NCA1D / Receiver R1D – 2 Eggleton Street, Blacktown	*57*	*52*	50	52	52	52	52	53	54	53	53	53
NCA1E / Receiver R1E – 11 Anthony Street, Blacktown	*52*	*52*	48	50	50	50	50	51	52	51	51	51
NCA2 / Receiver R2 – 249 Madagascar Drive, Kings Park	*52*	*57*	49	53	53	53	53	52	53	53	53	53
NCA3 / Receiver R3 – 3 Railway Road, Marayong	*52*	*53*	45	43	45	45	46	49	46	47	47	48

Based on the updated Table 7.7, negligible exceedances of the $L_{Aeq,15min}$ criteria during the shoulder period were predicted for Receivers 1C, 1D and 1E of 2dB(A), 1dB(A) and 1dB(A), respectively. A marginal exceedance of 3dB(A) was predicted for Receiver 7 during the shoulder period; however, this receiver is a car rental business and does not operate during the shoulder period.

Based on the updated Table 7.8, negligible exceedances of 2dB(A) of the sleep disturbance criteria during the shoulder period were predicted for Receivers 1C and 1D.

Document control

Date	Revision history	Non-issued revision	Issued revision	Prepared	Instructed	Reviewed / Authorised
21.04.2022	Generate memo	0	1	W. Chan	-	M. Chung

File Path: R:\AssocSydProjects\TK651-TK700\TK653 wc Kings Park Recycling Facility Mod\TASK 7\1 Docs\TK653-07D01 Supplementary Noise Information (r0).docx

APPENDIX A Glossary of terminology

The following is a brief description of the technical terms used to describe noise to assist in understanding the technical issues presented.

Adverse weather	Weather effects that enhance noise (that is, wind and temperature inversions) that occur at a site for a significant period of time (that is, wind occurring more than 30% of the time in any assessment period in any season and/or temperature inversions occurring more than 30% of the nights in winter).
Ambient noise	The all-encompassing noise associated within a given environment at a given time, usually composed of sound from all sources near and far.
Assessment period	The period in a day over which assessments are made.
Assessment point	A point at which noise measurements are taken or estimated. A point at which noise measurements are taken or estimated.
Background noise	Background noise is the term used to describe the underlying level of noise present in the ambient noise, measured in the absence of the noise under investigation, when extraneous noise is removed. It is described as the average of the minimum noise levels measured on a sound level meter and is measured statistically as the A-weighted noise level exceeded for ninety percent of a sample period. This is represented as the L90 noise level (see below).
Decibel [dB]	The units that sound is measured in. The following are examples of the decibel readings of every day sounds: 0dB The faintest sound we can hear 30dB A quiet library or in a quiet location in the country 45dB Typical office space. Ambience in the city at night 60dB CBD mall at lunch time 70dB The sound of a car passing on the street 80dB Loud music played at home 90dB The sound of a truck passing on the street 100dB The sound of a rock band 115dB Limit of sound permitted in industry 120dB Deafening
dB(A)	A-weighted decibels. The A- weighting noise filter simulates the response of the human ear at relatively low levels, where the ear is not as effective in hearing low frequency sounds as it is in hearing high frequency sounds. That is, low frequency sounds of the same dB level are not heard as loud as high frequency sounds. The sound level meter replicates the human response of the ear by using an electronic filter which is called the "A" filter. A sound level measured with this filter switched on is denoted as dB(A). Practically all noise is measured using the A filter.
dB(C)	C-weighted decibels. The C-weighting noise filter simulates the response of the human ear at relatively high levels, where the human ear is nearly equally effective at hearing from mid-low frequency (63Hz) to mid-high frequency (4kHz), but is less effective outside these frequencies.
Frequency	Frequency is synonymous to pitch. Sounds have a pitch which is peculiar to the nature of the sound generator. For example, the sound of a tiny bell has a high pitch and the sound of a bass drum has a low pitch. Frequency or pitch can be measured on a scale in units of Hertz or Hz.
Impulsive noise	Having a high peak of short duration or a sequence of such peaks. A sequence of impulses in rapid succession is termed repetitive impulsive noise.
Intermittent noise	The level suddenly drops to that of the background noise several times during the period of observation. The time during which the noise remains at levels different from that of the ambient is one second or more.
L_{Max}	The maximum sound pressure level measured over a given period.
L_{Min}	The minimum sound pressure level measured over a given period.

L_1	The sound pressure level that is exceeded for 1% of the time for which the given sound is measured.
L_{10}	The sound pressure level that is exceeded for 10% of the time for which the given sound is measured.
L_{90}	The level of noise exceeded for 90% of the time. The bottom 10% of the sample is the L90 noise level expressed in units of dB(A).
L_{eq}	The "equivalent noise level" is the summation of noise events and integrated over a selected period of time.
Reflection	Sound wave changed in direction of propagation due to a solid object obscuring its path.
SEL	Sound Exposure Level (SEL) is the constant sound level which, if maintained for a period of 1 second would have the same acoustic energy as the measured noise event. SEL noise measurements are useful as they can be converted to obtain Leq sound levels over any period of time and can be used for predicting noise at various locations.
Sound	A fluctuation of air pressure which is propagated as a wave through air.
Sound absorption	The ability of a material to absorb sound energy through its conversion into thermal energy.
Sound level meter	An instrument consisting of a microphone, amplifier and indicating device, having a declared performance and designed to measure sound pressure levels.
Sound pressure level	The level of noise, usually expressed in decibels, as measured by a standard sound level meter with a microphone.
Sound power level	Ten times the logarithm to the base 10 of the ratio of the sound power of the source to the reference sound power.
Tonal noise	Containing a prominent frequency and characterised by a definite pitch.