Noise Monitoring Cockle Bay

08/11/17 (Sensitive receivers identified in Cockle Bay Noise & Vibration assessment section 4.1.1)

Weather conditions 08/11/17

Time(AEDT)	Temp(°C)	Feels Like(°C)	Humidity (%)	Wind Direction	Wind Speed(km/h) *(knots)*	Wind Gust(km/h) *(knots)*	Pressure(hPa)	Rainfall since 9 am(mm)
10:30 am	19.5	15.2	47	S	20 *11*	–	1026.1	0.0
10:00 am	19.5	14.8	46	S	22 *12*	–	1026.0	0.0
9:30 am	17.6	13.0	48	S	20 *11*	–	1026.0	0.0
9:00 am	16.8	12.4	54	S	20 *11*	–	1025.7	0.0
8:30 am	16.6	11.2	56	SSE	26 *14*	–	1025.5	0.0
8:00 am	17.0	11.4	46	S	24 *13*	–	1025.0	0.0
7:30 am	16.9	12.1	48	SSE	20 *11*	–	1024.6	0.0

Source http://www.bom.gov.au/places/nsw/rozelle/observations/sydney---observatory-hill/

Site HMAS Vampire

09:30:33 to 09:45:34

Notes

- There was another site with a piling hammer which was audible
- Alarm sounded during the assessment process
- Windy conditions
- Data file number S171 "attached"

Site Harbourside Shopping Centre

09:51:27 to 10:06:29

Notes

- The Ferris wheel was operating during the noise assessment
- Noisy seagull fight
- Windy conditions
- Data file number S172 “attached”

Site Harbourside Shopping Centre

09:51:27 to 10:06:29

Notes

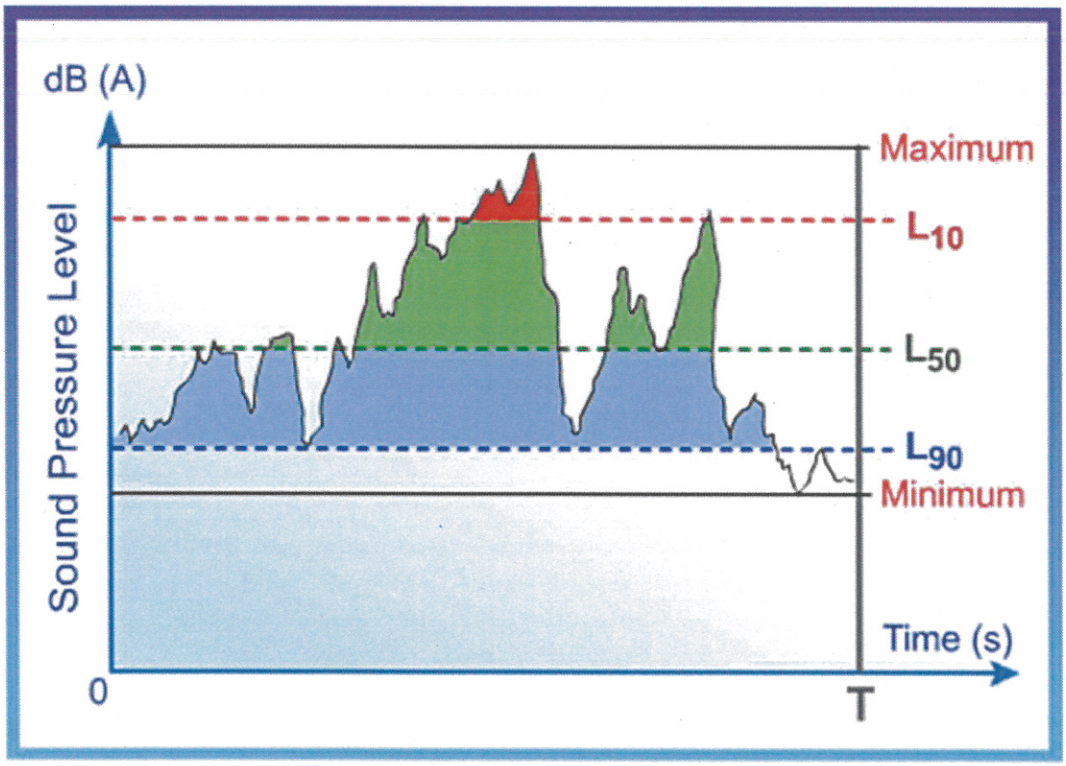
- During the assessment there where ferry horns sounding
- Large crowds of school children
- Windy conditions
- Data file number S173 “attached”

Glossary

- L_{AS}: A-weighted, Slow, Sound Level.
- L_{AS} Mx : A-weighted, Slow, Maximum, Sound Pressure Level, Over time
- L_{AS} Mn : A-weighted, Slow, Minimum, Sound Pressure Level, Over time
- L_{AS} Pk: A-weighted, Slow Maximum, Sound Pressure Level
- L_{AS} eq : A-weighted, Fast true equivalent sound pressure level measured over time

- L_{AI}: A-weighted, impulse , Sound Level.
- L_{AI} Mn : A-weighted, impulse, Minimum, Sound Pressure Level, Over time
- L_{AI} Mx : A-weighted, impulse Maximum, Sound Pressure Level, Over time
- L_{AI} Pk: A-weighted, impulse Maximum, Sound Pressure Level
- L_{AI} eq : A-weighted, impulse true equivalent sound pressure level measured over time

- L_{01} : L01 is the 1%-percent exceeded level of the over time
- L_{10} : L10 is the 10%-percent exceeded level of the over time
- L_{50} : L50 is the 50%-percent exceeded level of the over time
- L_{90} : L90 is the 90%-percent exceeded level of the over time



Please note that $L_{10} > L_{50} > L_{90}$ for the same sound or noise.

Source http://www.epd.gov.hk/epd/noise_education/web/ENG_EPD_HTML/m2/types_3.html

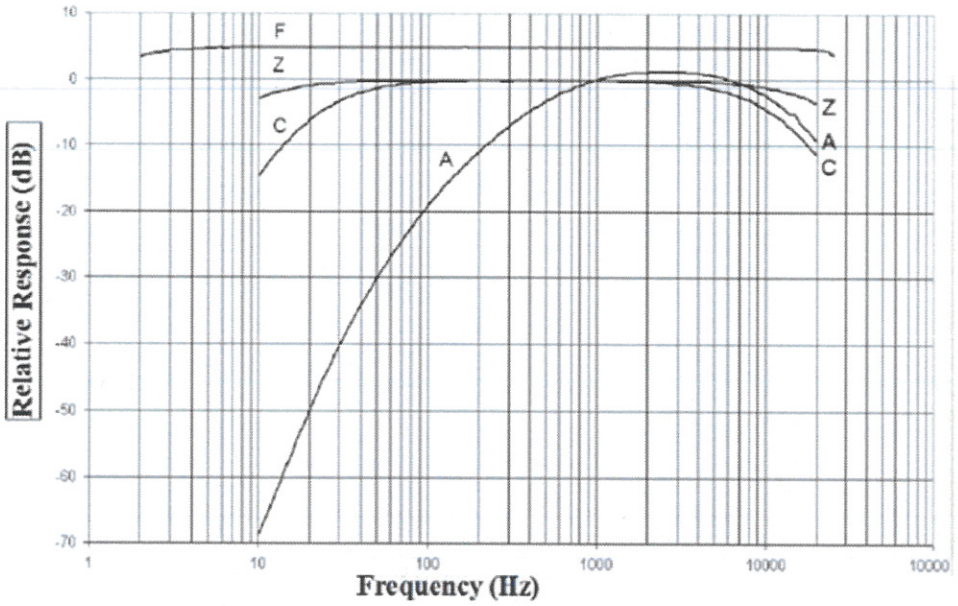
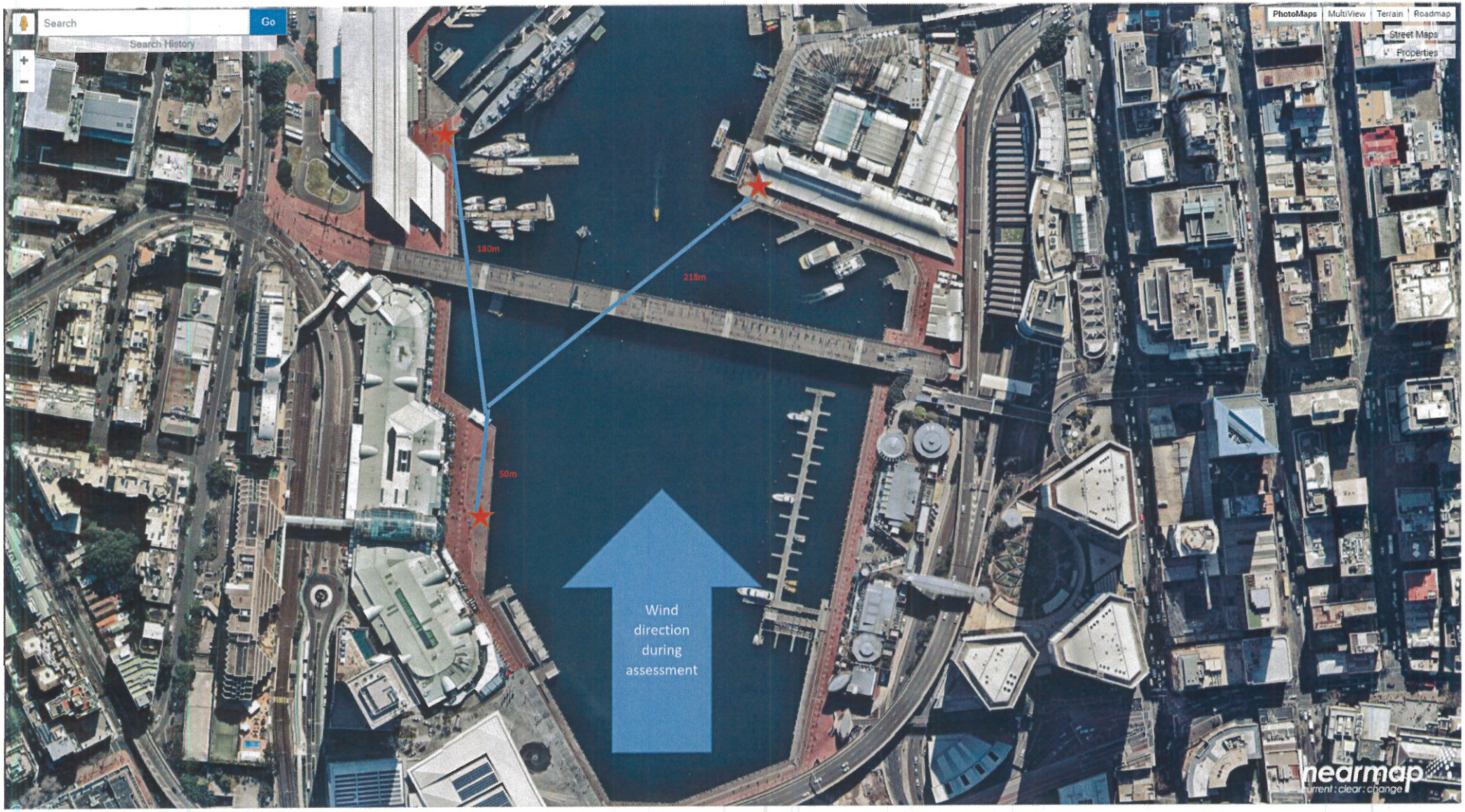


Figure B-5: All frequency weightings plotted together

Source http://multimedia.3m.com/mws/media/775567O/soundpro-se-dl-series-sound-level-meter-user-manual.pdf

Map of the sensitive receivers

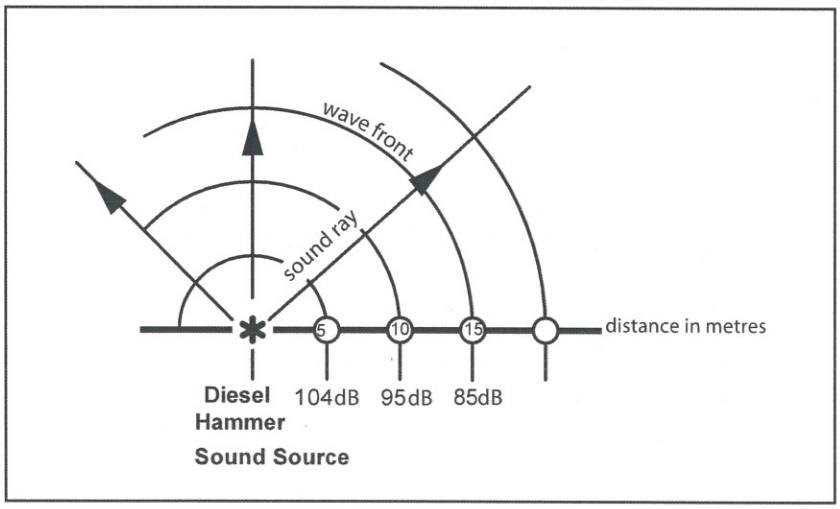


Appendix D – Contents of noise assessment report

Checklist: What should be included in a noise assessment report?	If present
When Date of Assessment 19th October 2017	☑
Who	
Name of Assessor Gareth Doran	☑
Information (background/qualifications) of assessor Project Manager	☑
Equipment used	
Type of equipment used to take measurements Calibration details for equipment Digitech QM1592	☑
	☑
How the noise measurements were taken Where measurements were taken (general area or operator ear position) measurements were taken at intervals of 5m, 10m & 15m at operatives ear height	☑
Period of time over which the measurements were taken see attached measurments	☑
What was assessed The area, plant, process, activity and workers that were assessed diesel pile hammer	☑
Source of noise The sources (plant/process/jobs) of the noise Pile driving operations	☑
Whether all the noise sources that may be operating at the time were taken into account all accounted for incl power pack	☑
Whether there were any significant noise sources that were not operating during the assessment all accounted for	☑
Systems of work	
Brief description of the work activity (how it's done; plant/process/activity/operating conditions/duration of process etc) see SWMS	☑
Hours of workshift (eg 8-hour or 12-hour shift) Assessment is for a 10Hr shift	☑
Whether assessment is for a normal/typical day or for a worst case scenario Assessment is for a typical day	☑
Results	
The results of measurements in terms of levels and durations See attached	☑
Interpretation of the results, (ie compared to exposure standards; what do the results mean etc.; ranking of noise sources) See below	☑
Action required Any obvious noise controls that could be implemented, or the need for more detailed noise control study See below	☑
Other relevant factors	
Information on and adequacy of any control measures already in place and hearing protectors used during the assessment See below	☑
Where relevant, information about the environment (types of walls, surfaces, buildings, operational state of machinery, etc.) All accounted for	☑

Nosie assessment for the Deisel hammer

Sound spreading in an open space away from reflecting surfaces and measured at a certain distance from the source is reduced by about 6 dB for each doubling of that distance. Sound is reduced less when spreading inside an enclosed space.



Diesel Piling hammer Source "5m" = 104dB
Standing on the wall nearest to the hammer
Class 5 hearing protection SLC80
104-(34) = 70

Diesel Piling hammer Source "10m" = 104dB
Standing 5 meters from the hammer
Class 5 hearing protection SLC80
95-(34) =61

Diesel Piling hammer Source "15m" = 85dB
Standing 15 meters from the hammer
85dB is under the recomended action value

Session Report

11/8/2017

Information Panel

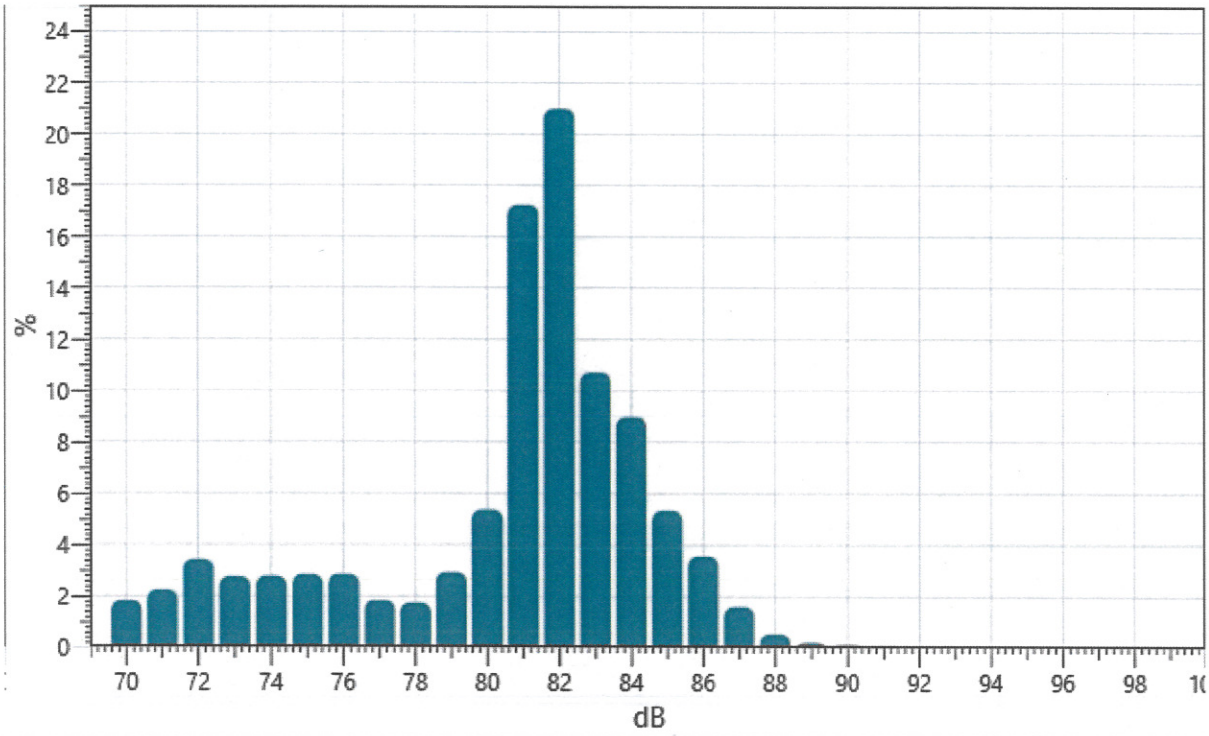
Name	S173
Start Time	8/11/2017 9:15:36 AM
Stop Time	8/11/2017 9:30:37 AM
Device Name	BIAA0001X
Model Type	SoundPro SE
Device Firmware Rev	R.13B
Comments	
Company Name	Waterway Constructions
Location	Sydney Aquarium
Run Time	00:15:01
Serial Number	BIAA0001X
User Name	Gareth Doran
Description	Background monitoring NO construction

Summary Data Panel

Description	Meter	Value	Description	Meter	Value
Leq	1	82.4 dB	Lmin	1	69.7 dB
Lmax	1	91.8 dB	Lpk	1	113.5 dB
L90	1	73.7 dB	L50	1	81.9 dB
L10	1	85.1 dB			
Exchange Rate	1	3 dB	Weighting	1	C
Response	1	SLOW	Bandwidth	1	OFF
Leq	2	85.8 dB	Lmax	2	100.2 dB
Lmin	2	70.6 dB	Lpk	2	113.5 dB
Exchange Rate	2	3 dB	Weighting	2	C
Response	2	IMPULSE			

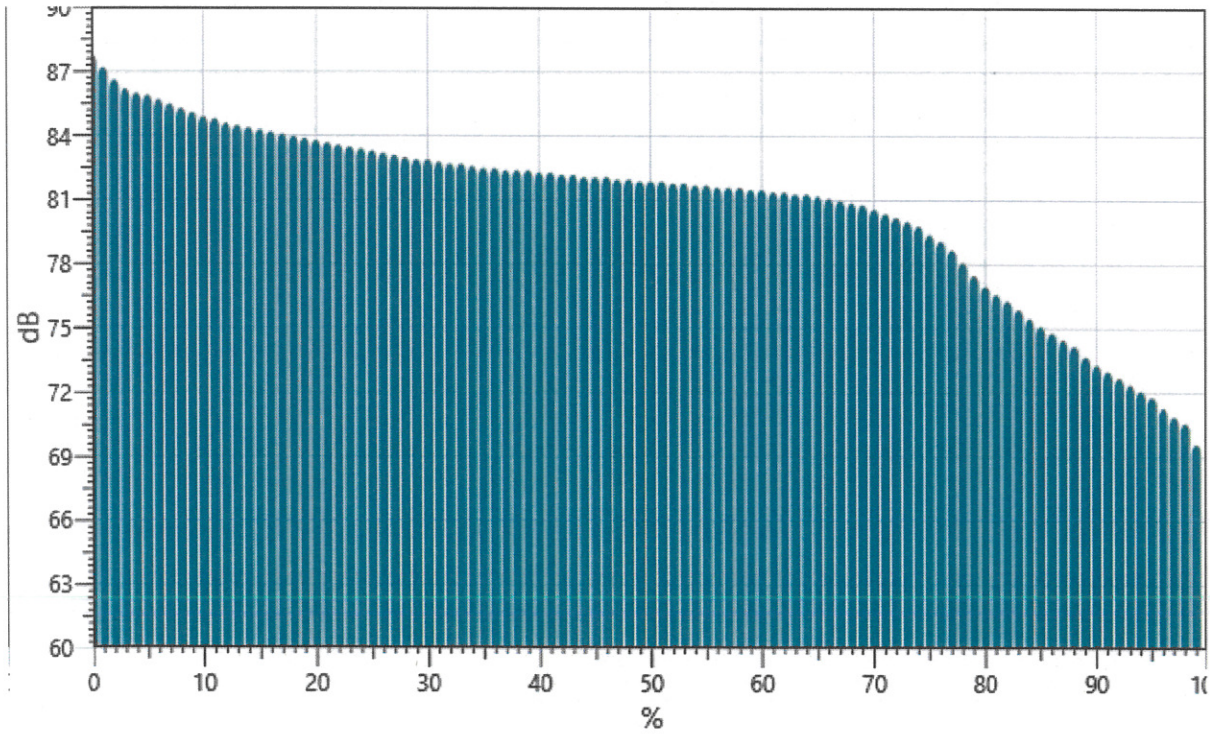
Statistics Chart

S173: Statistics Chart



Exceedance Chart

S173: Exceedance Chart



Statistics Table

dB:	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
69:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.03
70:	0.06	0.06	0.07	0.07	0.11	0.22	0.24	0.29	0.36	0.34	1.82
71:	0.25	0.27	0.32	0.28	0.33	0.24	0.14	0.14	0.12	0.15	2.24
72:	0.30	0.42	0.47	0.22	0.40	0.30	0.27	0.37	0.38	0.30	3.43
73:	0.41	0.37	0.25	0.30	0.25	0.29	0.27	0.22	0.18	0.21	2.76
74:	0.23	0.20	0.23	0.22	0.28	0.30	0.35	0.31	0.30	0.34	2.77
75:	0.33	0.32	0.35	0.22	0.25	0.32	0.26	0.22	0.25	0.32	2.83
76:	0.30	0.28	0.29	0.22	0.25	0.25	0.33	0.32	0.35	0.25	2.85
77:	0.21	0.17	0.19	0.20	0.26	0.17	0.17	0.19	0.15	0.13	1.83
78:	0.17	0.16	0.15	0.08	0.11	0.13	0.20	0.20	0.25	0.27	1.73
79:	0.29	0.32	0.33	0.32	0.27	0.29	0.27	0.22	0.28	0.31	2.92
80:	0.35	0.47	0.50	0.53	0.44	0.54	0.56	0.59	0.66	0.73	5.37
81:	0.93	1.14	1.35	0.99	1.52	1.86	2.31	2.46	2.28	2.42	17.26
82:	2.58	2.50	2.35	2.43	2.27	2.23	1.89	1.74	1.60	1.40	20.99
83:	1.33	1.33	1.25	1.08	0.98	0.88	0.96	1.00	0.97	0.95	10.73
84:	0.94	1.03	0.96	0.66	0.97	1.01	1.07	0.95	0.77	0.62	8.99
85:	0.61	0.64	0.58	0.51	0.44	0.47	0.51	0.52	0.54	0.53	5.35
86:	0.57	0.60	0.53	0.59	0.35	0.24	0.20	0.15	0.18	0.17	3.57
87:	0.16	0.16	0.17	0.11	0.20	0.20	0.20	0.15	0.13	0.09	1.59
88:	0.05	0.11	0.08	0.04	0.05	0.06	0.05	0.04	0.04	0.02	0.54
89:	0.02	0.02	0.02	0.02	0.02	0.02	0.04	0.02	0.01	0.02	0.20
90:	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.02	0.02	0.12
91:	0.02	0.02	0.02	0.00	0.01	0.00	0.01	0.02	0.01	0.00	0.09

Exceedance Table

.	0%	1%	2%	3%	4%	5%	6%	%7	%8	%9
0%:		87.8	87.2	86.6	86.2	86.0	85.9	85.7	85.5	85.3
10%:	85.1	84.9	84.8	84.6	84.5	84.4	84.3	84.2	84.1	84.0
20%:	83.9	83.8	83.7	83.6	83.5	83.4	83.3	83.2	83.1	83.0
30%:	82.9	82.9	82.8	82.7	82.7	82.6	82.5	82.5	82.4	82.4
40%:	82.4	82.3	82.3	82.2	82.2	82.1	82.1	82.1	82.0	82.0
50%:	81.9	81.9	81.9	81.8	81.8	81.7	81.7	81.6	81.6	81.6
60%:	81.5	81.5	81.4	81.4	81.3	81.3	81.2	81.1	81.0	80.9
70%:	80.8	80.6	80.4	80.2	80.0	79.8	79.4	79.1	78.7	78.1
80%:	77.5	77.0	76.6	76.3	75.9	75.5	75.1	74.8	74.5	74.2
90%:	73.7	73.3	73.0	72.7	72.4	72.1	71.8	71.3	70.9	70.6

.	0%	1%	2%	3%	4%	5%	6%	%7	%8	%9
100%:	69.6									

Session Report

11/8/2017

Information Panel

Name	S171
Start Time	8/11/2017 8:30:33 AM
Stop Time	8/11/2017 8:45:34 AM
Device Name	BIAA0001X
Model Type	SoundPro SE
Device Firmware Rev	R.13B
Comments	
Company Name	Waterway Constructions
Description	Background monitoring NO construction
Run Time	00:15:01
Serial Number	BIAA0001X
User Name	Gareth Daran
Location	HMAS Vampire

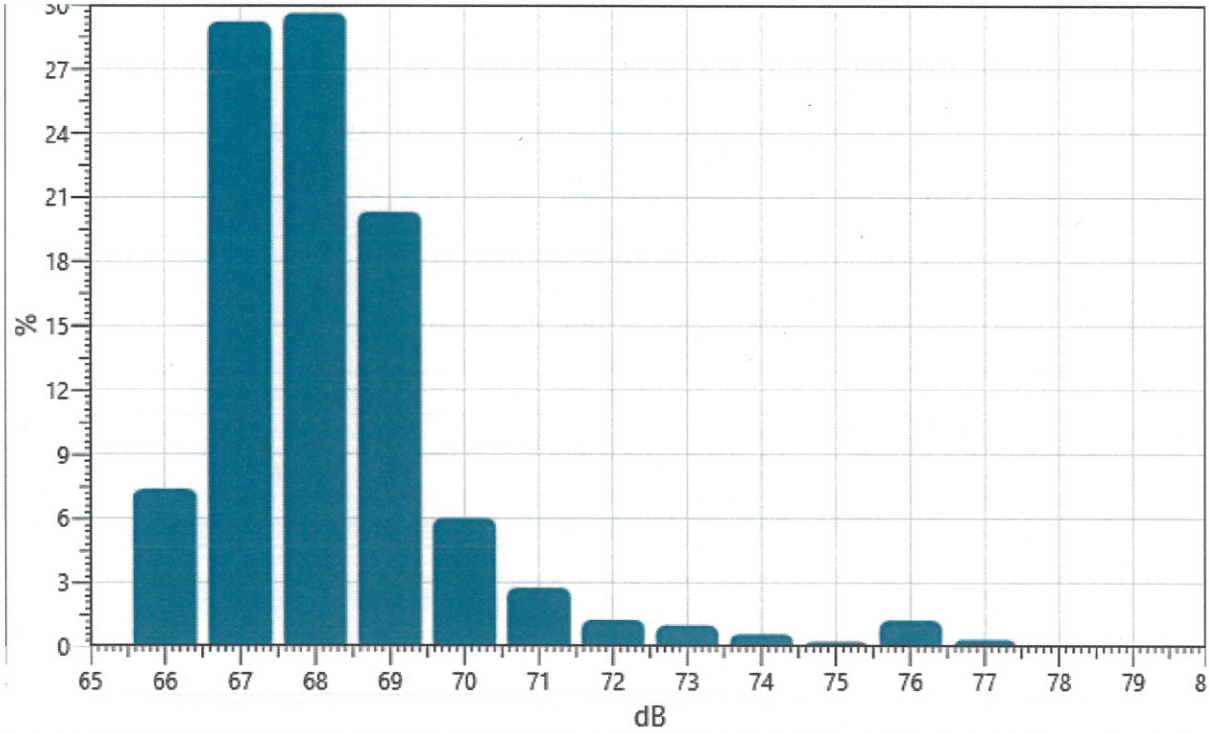
Summary Data Panel

Description	Meter	Value	Description	Meter	Value
Leq	1	69.1 dB	L90	1	67 dB
L50	1	68.3 dB	L10	1	70.3 dB
Lmax	1	78.1 dB	Lmin	1	65.9 dB
Lpk	1	98.3 dB			
Exchange Rate	1	3 dB	Weighting	1	C
Response	1	SLOW	Bandwidth	1	OFF
Leq	2	72 dB	Lmax	2	87.9 dB
Lmin	2	66.4 dB	Lpk	2	98.3 dB
Exchange Rate	2	3 dB	Weighting	2	C
Response	2	IMPULSE			

WATERWAY

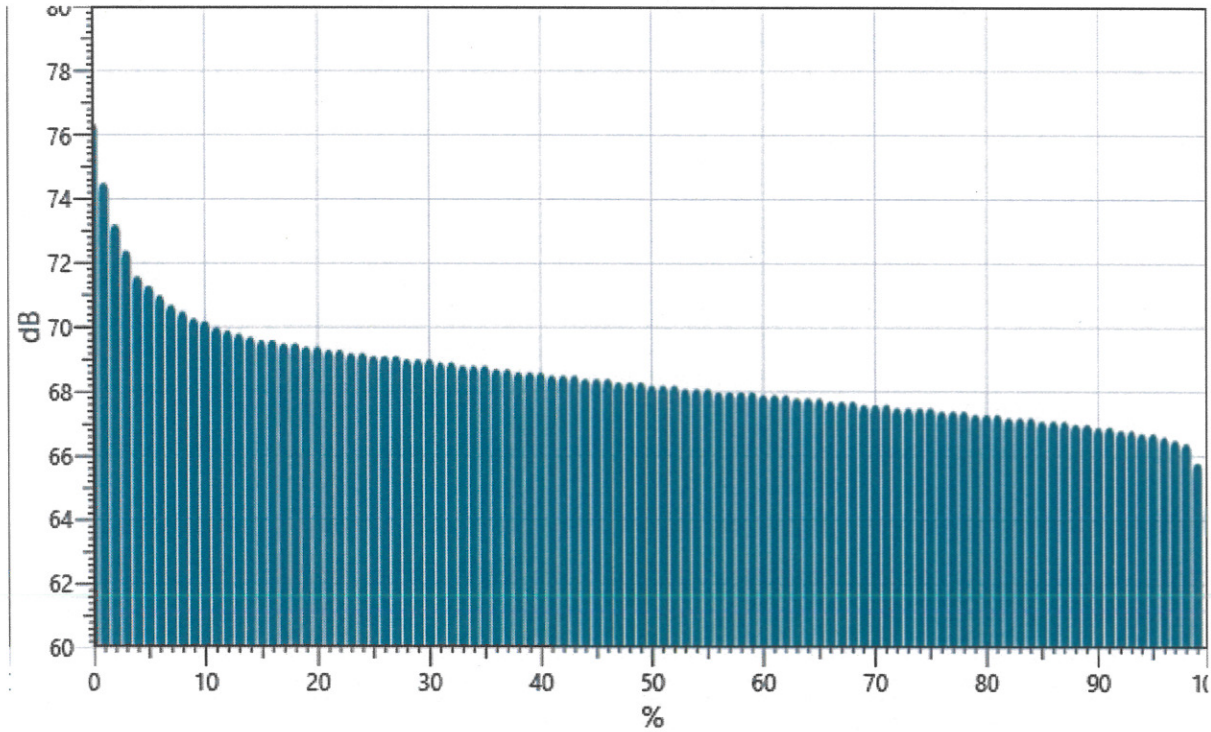
Statistics Chart

S171: Statistics Chart



Exceedance Chart

S171: Exceedance Chart



Statistics Table

dB:	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
65:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
66:	0.04	0.06	0.06	0.10	0.36	0.72	1.08	1.39	1.85	1.71	7.37
67:	1.98	2.38	2.52	2.97	3.38	3.39	3.35	3.09	2.90	3.25	29.22
68:	3.26	3.24	3.06	3.12	3.26	3.05	2.83	2.84	2.71	2.25	29.62
69:	2.60	3.00	2.23	2.38	2.37	2.11	1.70	1.59	1.16	1.16	20.32
70:	0.81	0.68	0.63	0.70	0.68	0.65	0.49	0.49	0.43	0.46	6.01
71:	0.39	0.33	0.35	0.31	0.34	0.31	0.29	0.22	0.11	0.11	2.75
72:	0.15	0.17	0.11	0.07	0.12	0.13	0.14	0.11	0.12	0.14	1.25
73:	0.16	0.16	0.13	0.14	0.09	0.13	0.06	0.05	0.04	0.04	1.01
74:	0.06	0.06	0.05	0.08	0.08	0.07	0.07	0.07	0.05	0.03	0.61
75:	0.03	0.04	0.06	0.02	0.03	0.01	0.01	0.02	0.02	0.02	0.24
76:	0.03	0.08	0.10	0.10	0.09	0.25	0.14	0.12	0.13	0.20	1.24
77:	0.16	0.11	0.01	0.01	0.01	0.00	0.00	0.01	0.01	0.01	0.33
78:	0.01	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02

Exceedance Table

.	0%	1%	2%	3%	4%	5%	6%	%7	%8	%9
0%:		76.4	74.5	73.2	72.4	71.6	71.3	71.0	70.7	70.5
10%:	70.3	70.2	70.0	69.9	69.8	69.7	69.6	69.6	69.5	69.5
20%:	69.4	69.4	69.3	69.3	69.2	69.2	69.1	69.1	69.1	69.0
30%:	69.0	69.0	68.9	68.9	68.8	68.8	68.8	68.7	68.7	68.6
40%:	68.6	68.6	68.5	68.5	68.5	68.4	68.4	68.4	68.3	68.3
50%:	68.3	68.2	68.2	68.2	68.1	68.1	68.1	68.0	68.0	68.0
60%:	68.0	67.9	67.9	67.9	67.8	67.8	67.8	67.7	67.7	67.7
70%:	67.6	67.6	67.6	67.5	67.5	67.5	67.5	67.4	67.4	67.4
80%:	67.3	67.3	67.3	67.2	67.2	67.2	67.1	67.1	67.1	67.0
90%:	67.0	66.9	66.9	66.8	66.8	66.7	66.7	66.6	66.5	66.4
100%:	65.8									

Session Report

11/8/2017

Information Panel

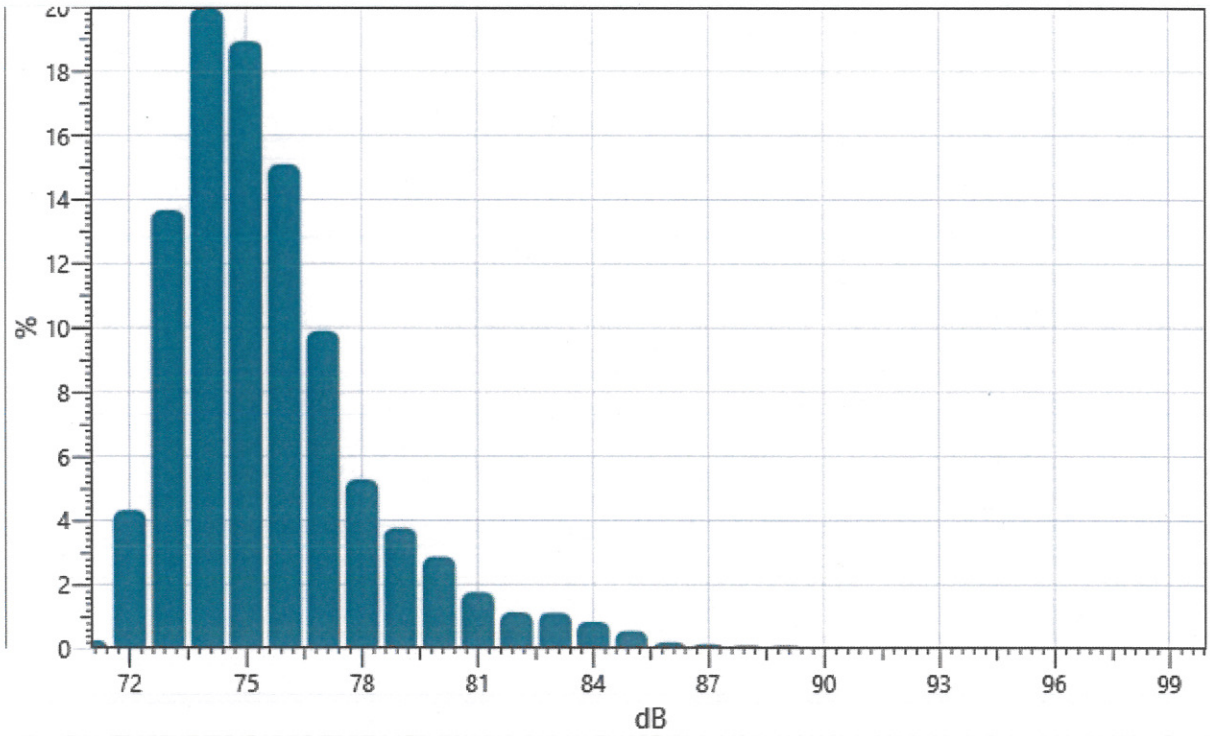
Name	S172
Start Time	8/11/2017 8:51:27 AM
Stop Time	8/11/2017 9:06:29 AM
Device Name	BIAA0001X
Model Type	SoundPro SE
Device Firmware Rev	R.13B
Company Name	Waterway Constructions
Description	Background monitoring No Construction
Location	Harbourside Shopping Cetre
Run Time	00:15:02
Serial Number	BIAA0001X
User Name	Gareth Doran

Summary Data Panel

Description	Meter	Value	Description	Meter	Value
Leq	1	77.2 dB	L50	1	75.4 dB
L90	1	73.4 dB	L10	1	79.5 dB
Lmax	1	90.6 dB	Lmin	1	71.7 dB
Lpk	1	118.4 dB			
Exchange Rate	1	3 dB	Weighting	1	C
Response	1	SLOW	Bandwidth	1	OFF
Leq	2	82.1 dB	Lmax	2	101.1 dB
Lmin	2	72.1 dB	Lpk	2	118.4 dB
Exchange Rate	2	3 dB	Weighting	2	C
Response	2	IMPULSE			

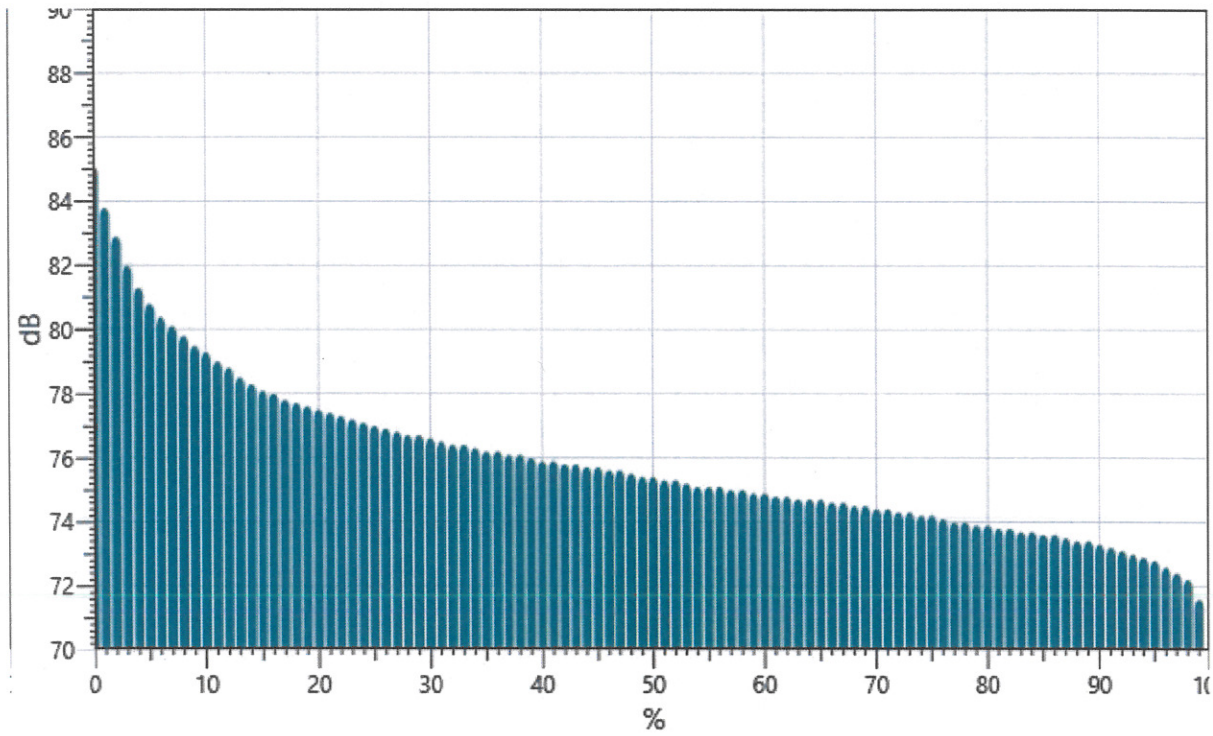
Statistics Chart

S172: Statistics Chart



Exceedance Chart

S172: Exceedance Chart



WATERWAY

Statistics Table

dB:	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
71:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.06	0.19	0.25
72:	0.21	0.24	0.21	0.15	0.42	0.61	0.65	0.58	0.52	0.73	4.32
73:	0.95	1.08	1.19	1.11	1.01	1.44	1.47	1.85	1.69	1.89	13.67
74:	1.87	2.12	1.68	1.67	1.91	1.88	2.06	2.31	2.28	2.18	19.96
75:	2.31	2.43	2.31	1.49	1.74	1.71	1.75	1.77	1.81	1.60	18.93
76:	1.94	1.88	1.71	1.45	1.57	1.41	1.26	1.41	1.24	1.22	15.10
77:	1.28	1.04	1.11	1.11	1.06	0.92	0.79	0.78	0.83	0.98	9.89
78:	0.83	0.74	0.70	0.41	0.47	0.48	0.42	0.37	0.43	0.42	5.27
79:	0.39	0.42	0.41	0.36	0.32	0.39	0.36	0.36	0.33	0.43	3.76
80:	0.40	0.35	0.32	0.31	0.28	0.25	0.24	0.25	0.24	0.22	2.87
81:	0.24	0.23	0.23	0.18	0.19	0.14	0.14	0.13	0.14	0.15	1.76
82:	0.17	0.16	0.16	0.14	0.09	0.09	0.08	0.07	0.08	0.08	1.13
83:	0.10	0.10	0.10	0.11	0.13	0.13	0.10	0.11	0.13	0.11	1.11
84:	0.09	0.09	0.11	0.05	0.07	0.08	0.06	0.09	0.09	0.09	0.84
85:	0.05	0.05	0.04	0.07	0.08	0.06	0.05	0.07	0.05	0.04	0.56
86:	0.03	0.01	0.02	0.01	0.02	0.02	0.02	0.02	0.02	0.03	0.19
87:	0.02	0.02	0.02	0.01	0.01	0.01	0.02	0.01	0.01	0.02	0.14
88:	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.11
89:	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.10
90:	0.00	0.00	0.01	0.01	0.01	0.00	0.01	0.00	0.00	0.00	0.04

Exceedance Table

.	0%	1%	2%	3%	4%	5%	6%	%7	%8	%9
0%:		85.1	83.8	82.9	82.0	81.3	80.8	80.4	80.1	79.8
10%:	79.5	79.3	79.0	78.8	78.5	78.3	78.1	78.0	77.8	77.7
20%:	77.6	77.5	77.4	77.3	77.2	77.1	77.0	76.9	76.8	76.7
30%:	76.7	76.6	76.5	76.4	76.4	76.3	76.2	76.2	76.1	76.1
40%:	76.0	75.9	75.9	75.8	75.8	75.7	75.7	75.6	75.6	75.5
50%:	75.4	75.4	75.3	75.3	75.2	75.1	75.1	75.1	75.0	75.0
60%:	74.9	74.9	74.8	74.8	74.7	74.7	74.7	74.6	74.6	74.5
70%:	74.5	74.4	74.4	74.3	74.3	74.2	74.2	74.1	74.0	74.0
80%:	73.9	73.9	73.8	73.8	73.7	73.7	73.6	73.6	73.5	73.4
90%:	73.4	73.3	73.2	73.1	73.0	72.9	72.8	72.6	72.4	72.2
100%:	71.6									