CMTP Branxholm Sawmills (Tas) Pty Ltd

Branxholm Sawmill environmental noise survey 2018

Report No. 5101_AC_R

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March 2018

Tarkarri Engineering

Air Quality • Acoustics • Environment • Vibration

DOCUMENT CONTROL

CMTP BRANXHOLM SAWMILLS (TAS) PTY LTD
BRANXHOLM SAWMILL
ENVIRONMENTAL NOISE SURVEY
2018

Report No.
5101_AC_R
Library Code
AC
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Revision History

Revision No.	Date Issued	Reason/Comments
0		

Distribution

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1	0	Project/Client File
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Keywords environmental noise, dBA, L_{Aeq}, ambient, tonal

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References

[1] Vipac Engineers and Scientist report 421243-01 CMTP Branxholm Sawmills - environmental noise assessment.

[2] Vipac Engineers and Scientist report 421243-03 CMTP Branxholm Sawmills - environmental noise survey 2014.

Executive Summary

Tarkarri Engineering was commissioned to conduct an environmental noise survey of the Branxholm Sawmill with assessment against condition N1 of the site's Environmental Protection Notice (EPN). Measurements were conducted on 20 February and 6 March 2018.

The $L_{Aeq,10min}$ levels observed at positions 1 and 4 during the day, when adjusted for intrusive characteristics, were above the day EPN noise emission limits. A potential breach was identified at position 1 with Chipper, Scragg Saw and sawdust extraction blower tones identified as the primary sources. Measured levels, adjusted, at position 2 and 3 were below the day noise emission limit of 50 dBA.

At night adjusted noise emission levels at positions 1 and 4 were below the night noise emission limit of 40 dBA. The sites Drying Kiln fans were a dominant source at position 4 and produced significantly tonal noise emissions.

Several narrow band tones emanating from the mill were measured during this survey, particularly at positions1, 3 and 4. The most notable were at 120 Hz (night only, from kiln fans) 125 Hz and 448 and are likely to be associated with the mills saw dust extraction blowers and/or Scragg Saw.

Recommendations for the control of noise emission are provided in section 7 of the report.

1 Introduction

Tarkarri Engineering was commissioned by CMTP Branxholm Sawmills (Tas) Pty Ltd to conduct an environmental noise survey of their Branxholm Sawmill with assessment against condition N1 of the site's Environmental Protection Notice (EPN), 7074/2(r1). This report presents the results of the survey conducted on 20 February and 6 March 2018.

2 Site description

The CMTP Branxholm Sawmill site is located approximately 400 m north of the centre of Branxholm along Warrentinna Rd. The site is bounded to the north, east and west by rural land with low density housing along Station Rd to the south-west and a sole property north-east of the site. The south is bounded by residential properties along Edwards Pl (approx. 80 m away).

The mill's main production involves the processing of softwood trees into sawn timber. Harvested logs are transported to site where they are debarked, sawn to relevant dimensions and air dried and/or fumigated. A gas fired kiln allows the drying process to be expedited.

The major existing noise sources identified at the site include the following: -

- Scragg Saw.
- Chipper.
- Saw dust extraction blowers.
- Narrowband and broadband forklift and front end loader (FEL) reversing alarms.
- Impacts noise from forklifts and transport of materials.
- Pneumatic nail gun.
- Drying Kiln fans.

Four observed measurement positions and on-site unobserved measurement position have previously been utilised for environmental noise surveys of the mill[1][2] and these have been utilised again here. Table 2-1 presents the position location information and figure 2-1 an aerial view of the mill and surrounds with the positions marked.

Environmental noise measurement positions		
Number	Location	Position (Eastings and Northings) (Datum: GDA94, Zone 55)
1	Southern Boundary	564921E / 5442636N
2	Pearce St	562164E / 5442422N
3	Station Rd	561543E / 5442682N
4	Northern boundary	561811E / 5443033N
5	Extended unobserved measurement	561933E / 5442717N

Table 2-1: Measurement locations.

Figure 2-1: Aerial view of Branxholm Sawmill site and surrounds with environmental noise survey positions marked.

3 EPN noise emission limits

The following is stated under condition N2 of EPN 7768/2(r1):-

1. Noise emissions from the activity when measured at any noise sensitive premises in other ownership and expressed as the equivalent A-weighted sound pressure level must not exceed:
    1.1 50 dB(A) between 0700 hours and 1800 hours (Day time); and
    1.2 40 dB(A) between 1800 hours and 0700 hours (Night time).
2. Where the combined level of noise from the activity and the normal ambient noise exceeds the noise levels stated above, this condition will not be considered to be breached unless the noise emissions from the activity are audible and exceed the ambient noise level by at least 5 dB(A).
3. The time interval over which noise levels are averaged must be 10 minutes or an alternative time specified in writing by the Director.
4. Measured noise levels must be adjusted for tonality, impulsiveness, modulation and low frequency in accordance with the Tasmanian Noise Measurement Procedures Manual.
5. All methods of measurement must be in accordance with the Tasmanian Noise Measurement Procedures Manual.

4 Instrumentation

The following instrumentation was used during the survey: -

- Environmental noise analyser Larson Davis 870B s/n 1189.
- Environmental noise analyser Larson Davis 831 s/n 1168.

- Spectrum analyser Larson Davis 831 s/n 1169.
- Acoustic Calibrator CA250 s/n 2706.

All instruments were field calibrated prior to use and wind socks were used on microphones for all measurements.

5 Noise measurements

Observed 10-minute measurements were obtained over a 30-minute period at each location during the day period and during the night at positions 1 and 4 (a single 10-minute interval was measured at position 1 during the night). This data has been summarised and average $L_{An,10min}$ measurements presented for each location. Relevant observations have also been noted. All 10-minute observed data is presented in Appendix 1.

An extended measurement was obtained at position 5 during the day on 20 February 2018 and a graph of the main 10-minute statistical data is provided as follows:-

- L_{Aeq}
- L_{A10}
- L_{A90}

For sake of clarity the other 5 data sets are not shown in this graph.

Spectral data was obtained at each observed measurement location and is shown graphically for each position in two data sets as follows:-

- 1/3-octave band spectra
- Narrow band data 0 to 1000 Hz (0.15625 Hz resolution)

Where appropriate, significant tones have been marked in these spectra and potential sources noted.

The following abbreviations are used in the data tables presented in the following subsections:-

- BS: Branxholm Sawmill
- LF: low frequency
- BB: Broadband
- NB: Narrowband
- BA: Backing alarm

5.1 Position 1 – Edwards Place

Position 1 is located to the south of the mill adjacent to a group of houses at the end of Edwards Place. This position has direct line of site to the south-east boundary of the Sawmill where the Scragg Saw and Chipper are located.

Noise emissions from the Branxholm site were dominant at this location during day period. Bird activity in nearby trees and occasional barking from dogs was also audible. A strong tone at 125 Hz from the mill was audible and clearly evident in the measured spectra. Scragg Saw noise, forklift operation, blower tones and the Chipper were the most notable emission sources from the mill at this location.

At night the fans from the Drying Kiln located at the northern end of the main mill building were audible at this location but, only faintly, with insect activity dominant.

Figure 5-1: Position 1.

1 – Edwards Place												
Period	Date	Time	LAeq	LAmax	LAmin	LA1	LA10	LA50	LA90	LA99	Weather	Audible sources
Day	20-Feb	9:20	52.7	67.6	46.3	59.0	54.3	51.5	49.5	48.0	Overcast light breeze S	External: Soft Voices Dogs Birds BS: Scragg saw Chipper BB BA Forklift activity Blower tones
Night	6-Mar	22:00	30.1	46.2	27.1	35.3	31.5	29.4	28.1	27.7	Clear calm	External: Insects Fauna Distant traffic BS: Kiln fans

Table 5-1: Position 1 Ln-statistics.

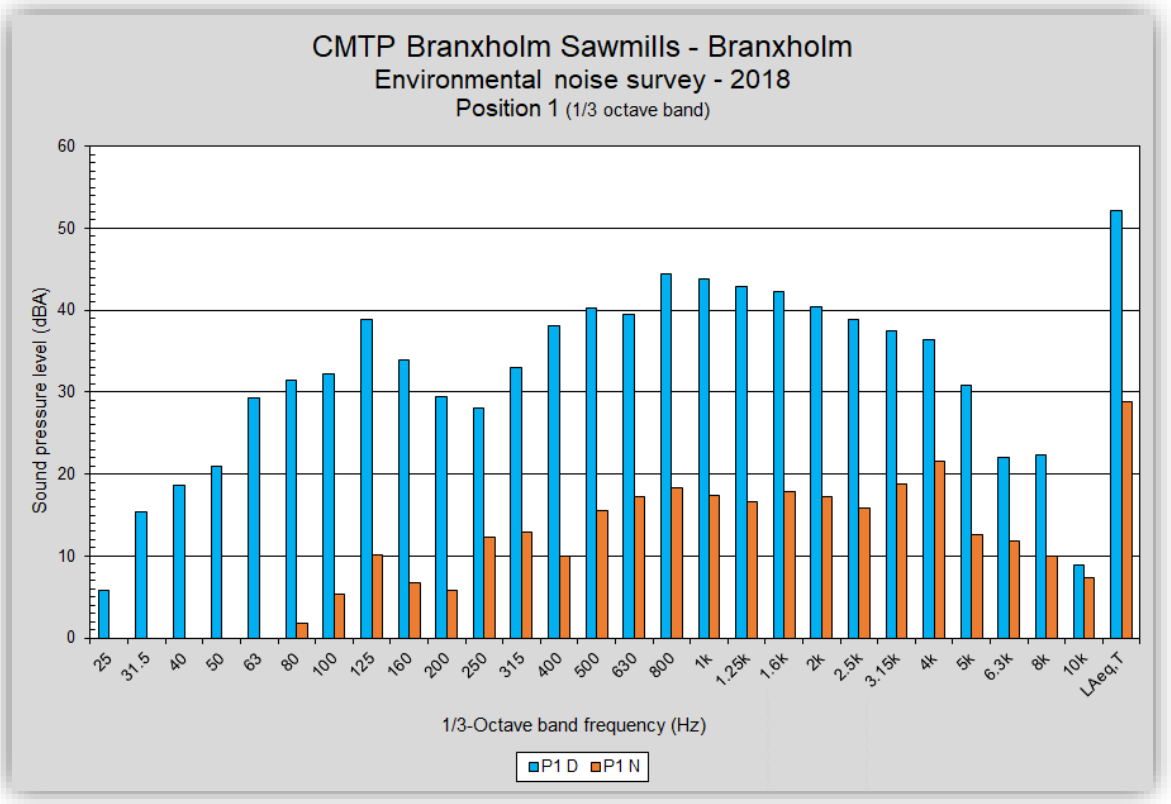

Figure 5-2: Position 1, 1/3-octave band spectrum.

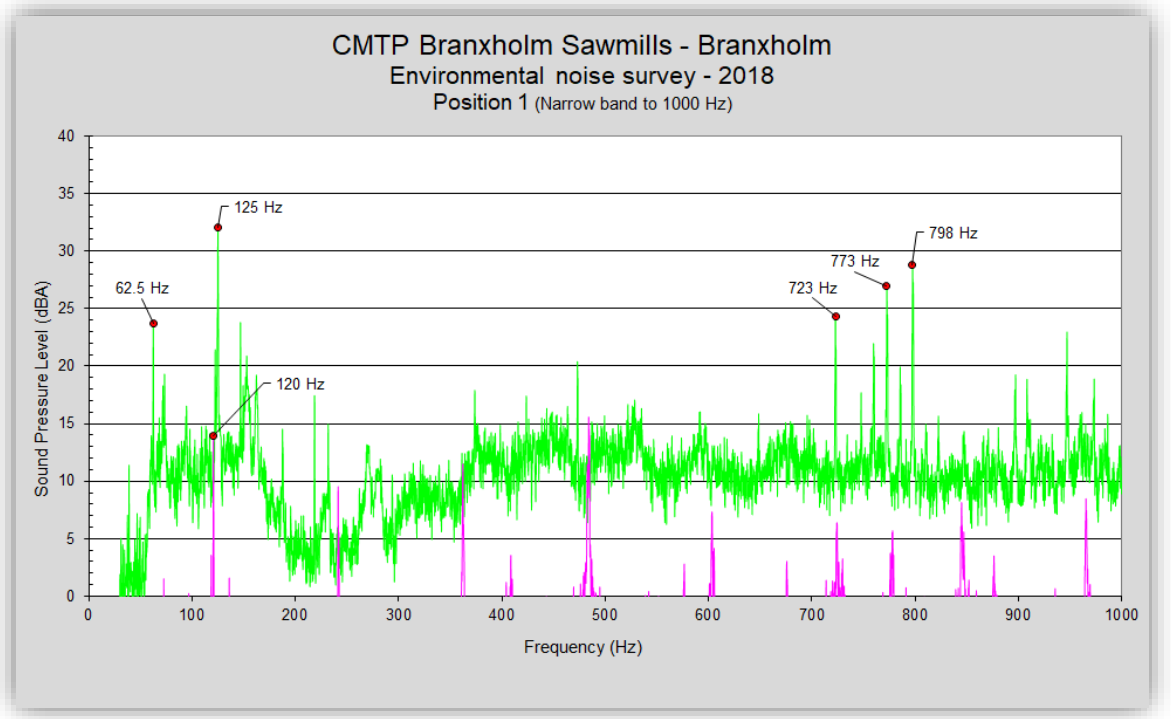

Figure 5-3: Position 1, narrow band spectrum 0 – 1000 Hz.

5.2 Position 2 – Pearce Street

Position 2 is located to the south-east of the mill adjacent to houses on Pearce St. This location is on elevated north-west facing topography with direct line of sight to the mill.

Measured L_{Aeq} levels at this location were elevated by traffic on Pearce St and the Tasman Hwy, occasional nearby leaf rustling and bird activity. Distant chainsaw usage, impact sounds and chipping in addition to elevated highway noise resulted in sawmill being inaudible for much of the observed period. When the mill was audible the Scragg Saw, BB RA's and occasional impacts were identifiable.

Figure 5-4: Position 2.

2 – Pearce Street												
Period	Date	Time	LAeq	LAmax	LAmin	LA1	LA10	LA50	LA90	LA99	Weather	Audible sources
Day	20-Feb	10:00	50.3	67.8	38.0	60.4	51.5	46.1	42.3	40.0	Overcast light breeze SSE	External: Local and highway traffic Birds Rustling leaves Chainsaw Chipping BS: BB BA noise Scragg Saw Impacts

Table 5-2: Position 2 Ln-statistics.

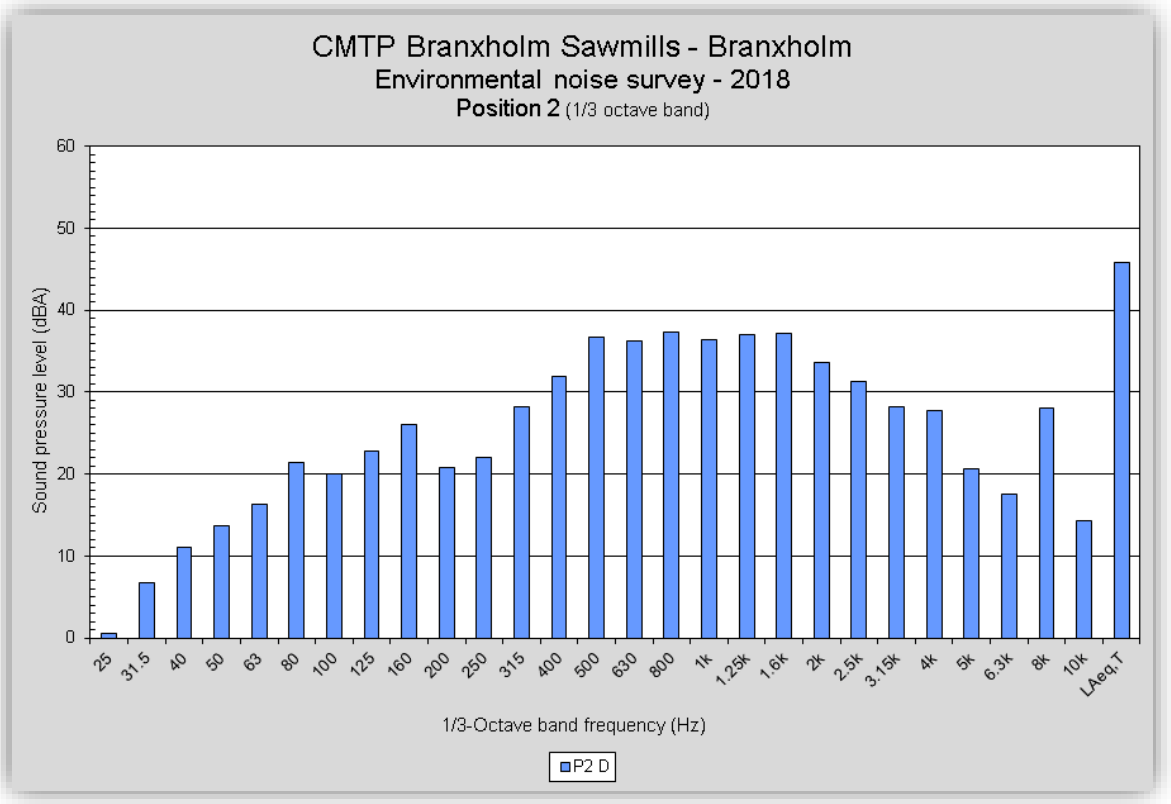

Figure 5-5: Position 2, 1/3-octave band spectrum.

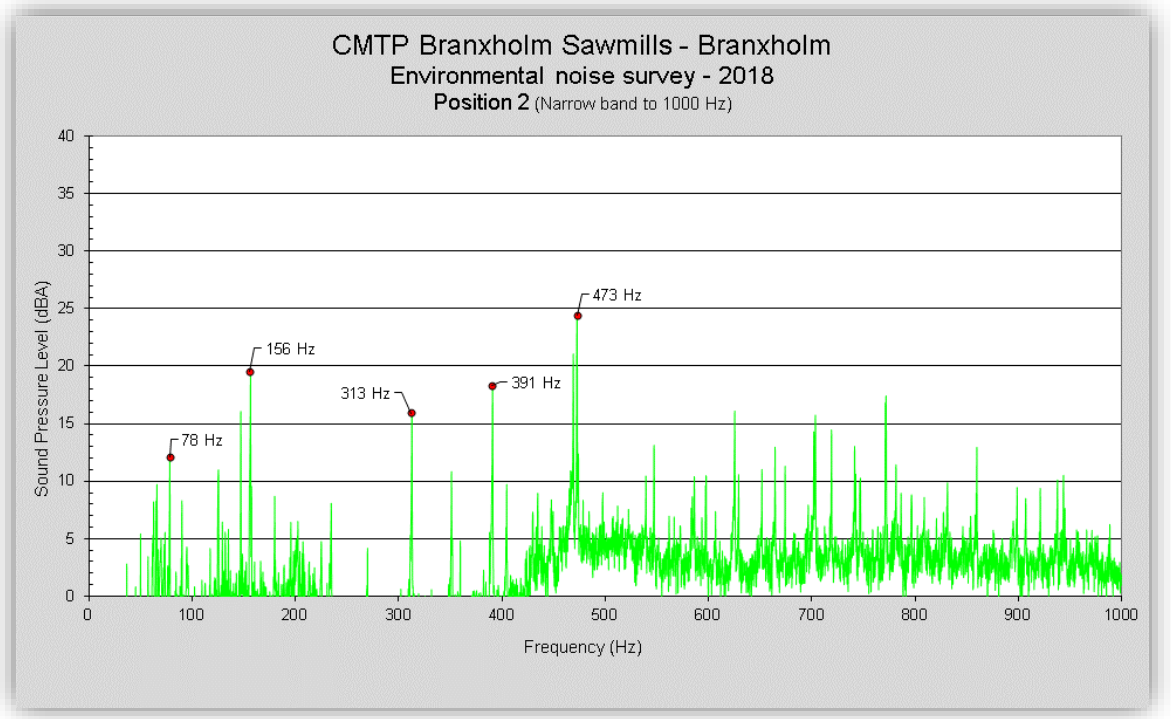

Figure 5-6: Position 2, narrow band spectrum 0 – 1000 Hz.

5.3 Position 3 – Station Road

Position three is located to the rear of properties that front onto Station St, west south-west of the mill.

Measured noise levels at this location were controlled by a combination of BB BA's and Scragg Saw operation. Traffic on the Tasman Highway and a truck passing on Red Hill Road elevated noise levels at this location for short periods. A significant blower tone at 448 Hz was audible between Scragg Saw operation.

Figure 5-7: Position 3.

3 – Station Road												
Period	Date	Time	LAeq	LAmax	LAmin	LA1	LA10	LA50	LA90	LA99	Weather	Audible sources
Day	20-Feb	10:40	47.3	58.9	39.2	53.7	49.8	46.2	43.1	40.9	Overcast breeze SSE	External: Hwy Traffic Local traffic Quiet voices Branch on tin roof Birds CB: Scragg Saw BB BA Chipper FEL Impacts Blower tones

Table 5-3: Position 3 Ln-statistics.

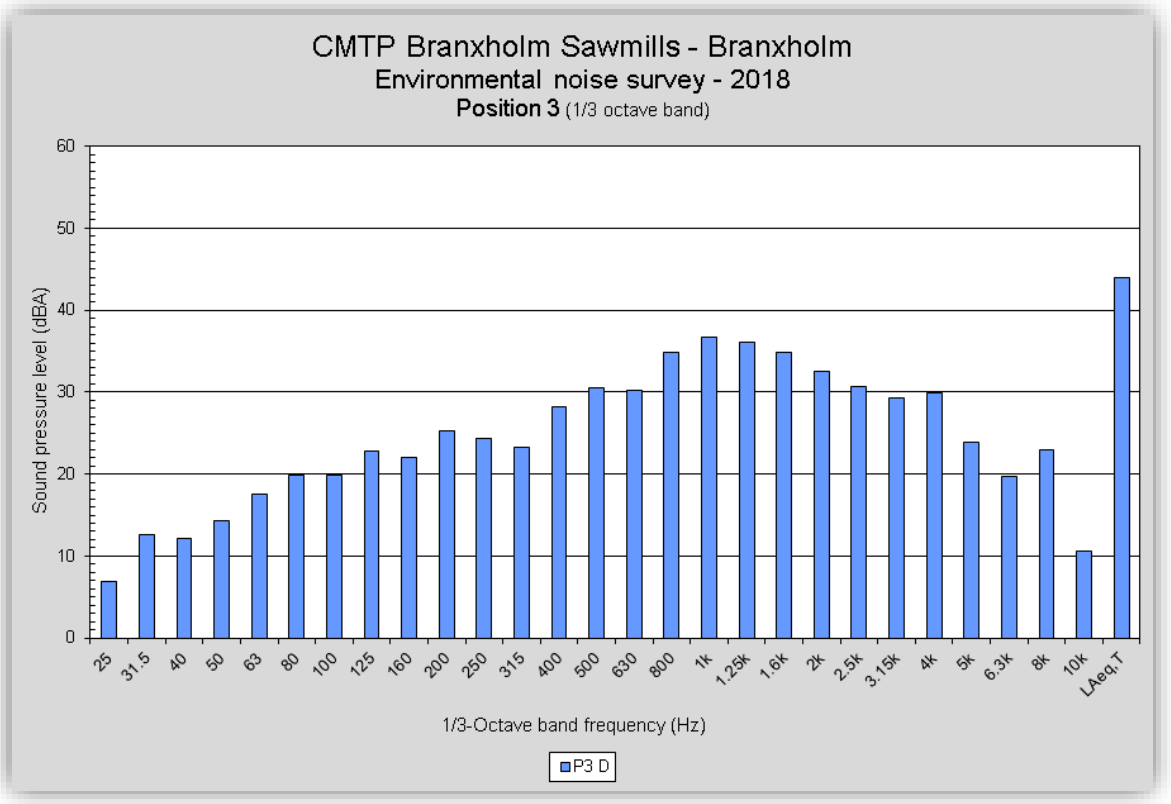

Figure 5-8: Position 3, 1/3-octave band spectrum.

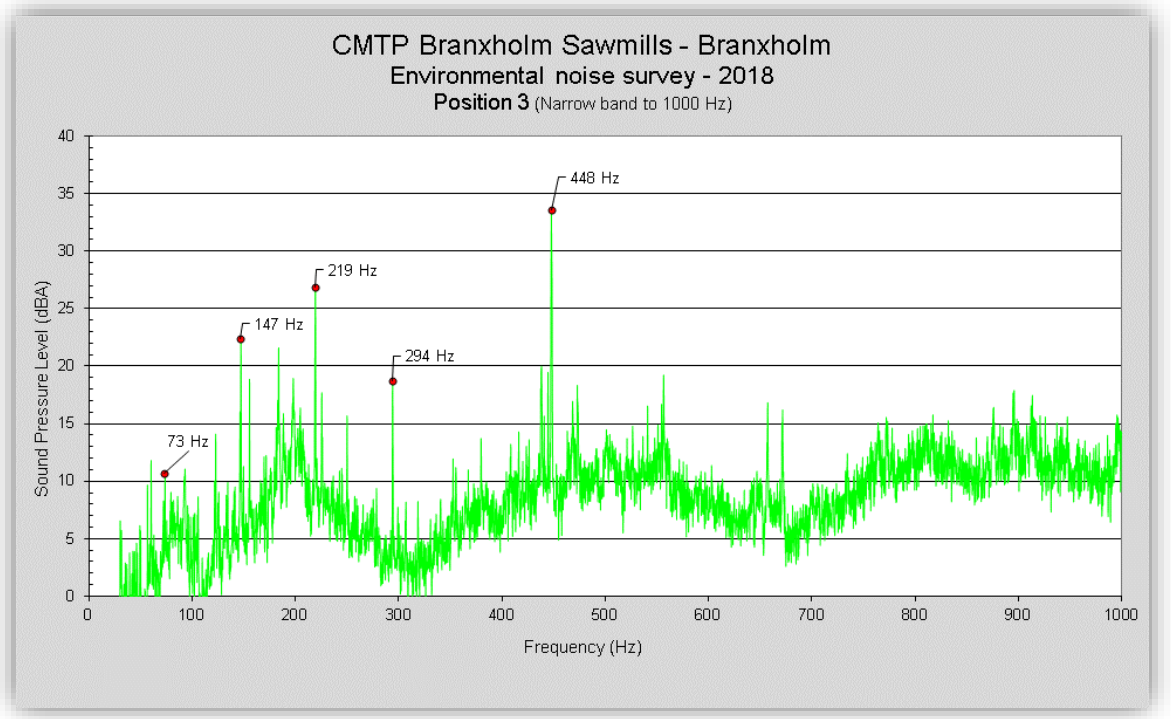

Figure 5-9: Position 3, narrow band spectrum 0 – 1000 Hz.

5.4 Position 4 – Northern boundary

Position four is located on the northern boundary of the site close to the northern site entrance

Rustling leaves, crickets and nearby birds contributed to the L_{Aeq} with audible sources from the sawmill including, Scragg Saw, BB and NB BA's, blower tones and pneumatic nail guns.

At night fans from the Drying Kiln located at the northern end of the main mill building were a dominant source along with local insect activity. Noise emissions from the kiln fans were audibly tonal producing strong acoustic energy at 120 Hz.

Figure 5-10: Position 4.

4 – Northern boundary												
Period	Date	Time	LAeq	LAmax	LAmin	LA1	LA10	LA50	LA90	LA99	Weather	Audible sources
Day	20-Feb	11:30	51.3	61.9	46.5	55.9	53.1	50.8	48.8	47.6	Partly cloudy mod breeze SSE	External: Birds Insects Leaf rustle BS: Scragg saw BB/NB BA Nail gun Blower tones Impacts
Night	6-Mar	22:00	38.0	47.8	34.3	42.9	39.4	37.4	36.1	35.3	Clear calm	External: Distant traffic Insects BS: Kiln fans

Table 5-4: Position 4 Ln-statistics.

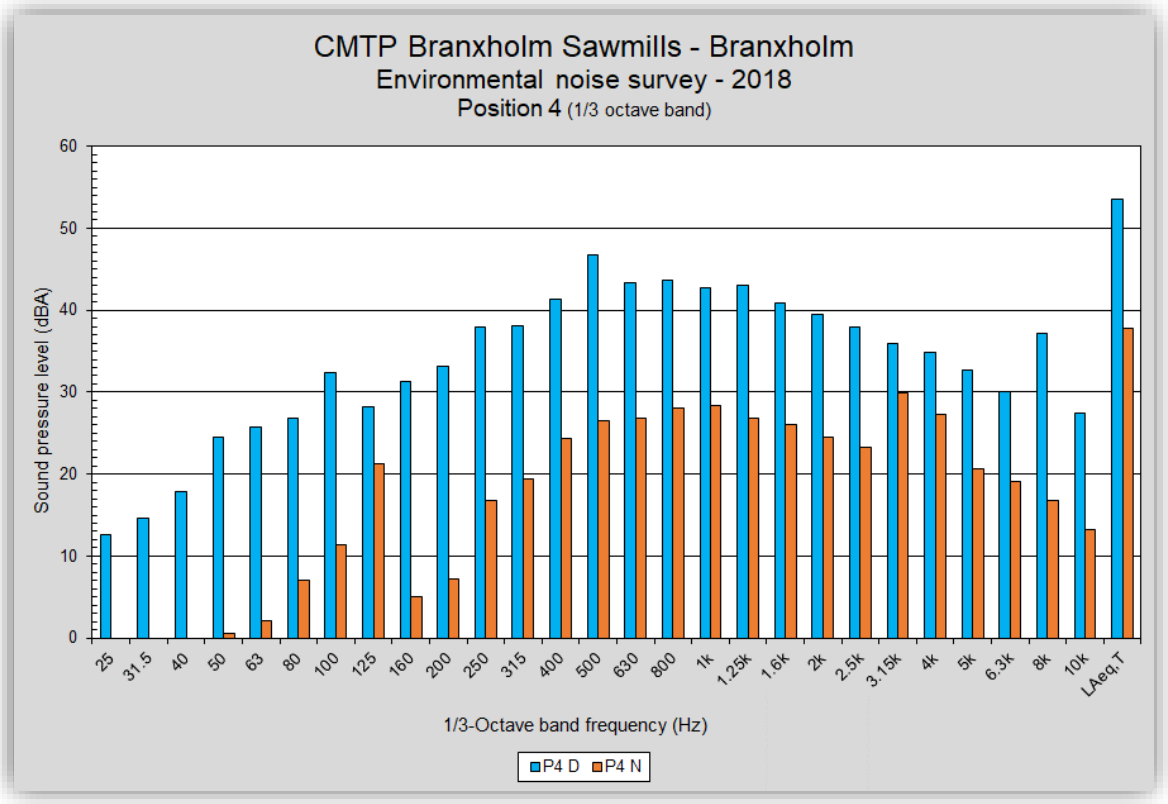

Figure 5-11: Position 4, 1/3-octave band spectrum.

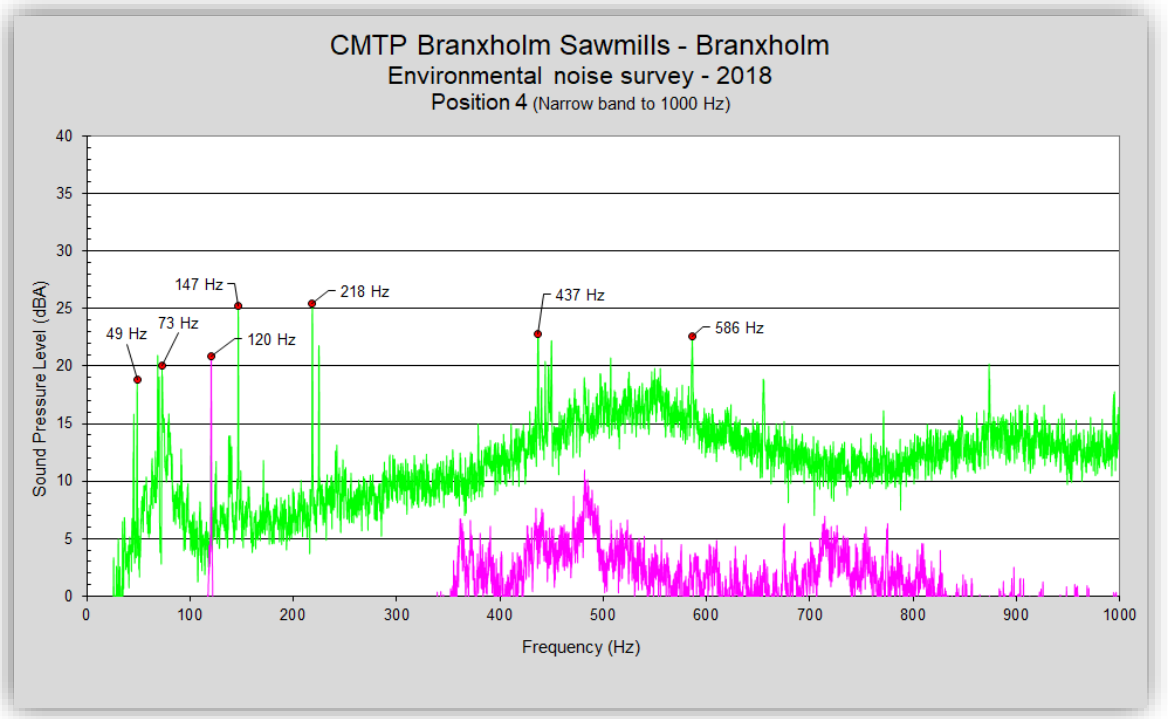

Figure 5-12: Position 4, narrow band spectrum 0 – 1000 Hz.

5.5 Position 5 – Site Extended Measurements

Position 5 is located on the Branxholm Sawmill site on the south-east boundary with clear view to the Chipper. Noise emission levels at this location were controlled by Chipper and Scragg Saw activity. Noise levels are typically stable with a process pause (morning break for personnel at the site) apparent at approx. 10:50 resulting in a drop in noise level. Day observed measurement periods at positions 1 to 4 are highlighted in yellow on the graph in figure 5-14.

Figure 5-13: Position 5.

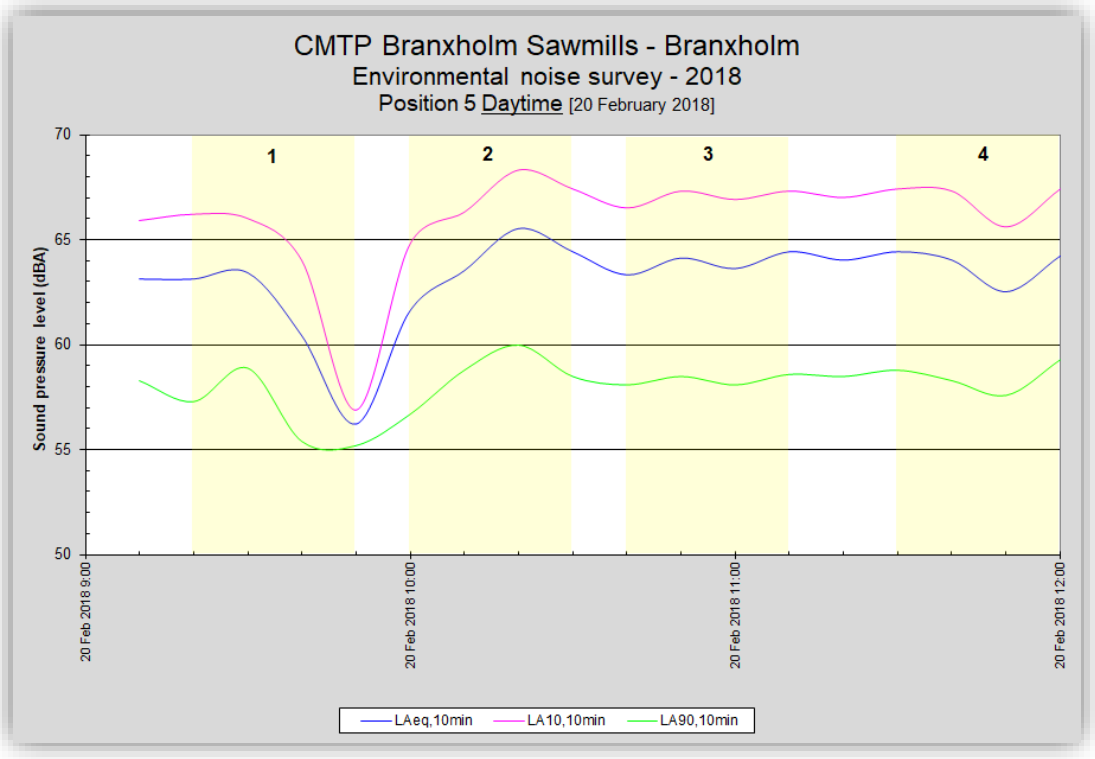

Figure 5-14: Position 5, extended daytime unobserved Ln-statistics.

6 Discussion of results

Table 6.1 presents a summary of measured levels in relation to EPN noise emission limits. Adjustments for tonality are considered and comments on the noise sources controlling the measured levels are also included. Impulsive and modulating noise emissions were not observed from the site and therefore adjustment for these characteristics are not considered. L_{Ceq} levels were < 15 dB higher than L_{Aeq} levels measured and therefore adjustments for excessive low frequency were not required.

Summary Results								
Position	Period	$L_{Aeq,10min}$ (dBA)	$L_{A90,10min}$ (dBA)	Tonal Adj (dB)	$L_{Aeq,10min,adj}$ (dBA)	EPN limits (dBA)	Potential Breach	Comment
1	Day	52.7	49.5	0.3	53.0	50	Yes	Branxholm site dominant and exceeds EPN noise emission limit.
	Night	30.1	28.1	0.2	30.3	40	No	Adjusted noise levels are below EPN noise emission limit.
2	Day	50.3	42.3	-	50.3	50	No	Adjusted noise levels are below EPN noise emission limit
3	Day	47.3	43.1	0.5	47.8	50	No	Adjusted noise levels are below EPN noise emission limit.
4	Day	51.3	48.8	1.3	52.6	50	No	Branxholm site and leaf rustle dominant. Exceedance not considered a breach.
	Night	38.0	36.1	0.4	38.4	40	No	Adjusted noise levels are below EPN noise emission limit.

Potential breach of EPN noise emission limits.

Table 6-1: Summary table of survey results.

7 Conclusions

- An environmental noise survey of the Branxholm Sawmill was conducted by Tarkarri Engineering on 20 February and 6 March 2018.
- The $L_{Aeq,10min}$ levels observed at positions 1 and 4 during the day, when adjusted for intrusive characteristics, were above the EPN noise emission limits.
- At position 1, $L_{Aeq,10min}$ immission levels were controlled by operation of the Scragg Saw and Chipper and blower tones from the sites sawdust extraction blowers. It is likely noise emission from the mill exceeded ambient $L_{Aeq,10min}$ noise levels ($L_{Aeq,10min}$ noise level in the absence of noise emissions from the mill) by 5 dB, therefore a potential breach of the EPN noise mission condition N1 occurred.
- $L_{Aeq,10min}$ immission levels at position 4 also exceeded the day noise emission limit of 50 dBA. While Scragg Saw, forklifts with NB BA, pneumatic nail gun and blower tones were audible at this location were clearly audible this not considered a potential breach of EPN noise mission condition N1. This is due to the prominence of noise generated by wind moving though nearby foliage such that ambient $L_{Aeq,10min}$ noise levels are unlikely to have been 5 dBA lower than measured during the survey.
- Measured levels, adjusted, at position 2 and 3 were below the day noise emission limit of 50 dBA.
- At night adjusted noise emission levels at positions 1 and 4 were below the night noise emission limit of 40 dBA. The sites Drying Kiln fans were a dominant source at position 4 and produced significantly tonal noise emissions.
- Several narrow band tones emanating from the mill were measured during this survey, particularly at positions1, 3 and 4. The most notable were at 120 Hz (night only, from kiln fans) 125 Hz and 448 and are likely to be associated with the mills saw dust extraction blowers and/or Scragg Saw.
- Recommendations for the control of noise emission from the Chipper, Scragg Saw and dust extraction blowers was provided in Vipac Engineers and Scientists report 421243-01[1]. These recommendations remain valid. While adjusted noise emission from the Drying Kiln fans didn't breach the site's night noise emission limit the emission were highly tonal. Control of such tonality would require silencing of the fan discharge points on the roof of the kiln with reactive type silencing.

8 Appendix

Observed environmental noise data.

Site	Period	Date	Time	Duration	$L_{Aeq,10min}$	$L_{Amax,10min}$	$L_{Amin,10min}$	$L_{A1,10min}$	$L_{A10,10min}$	$L_{A50,10min}$	$L_{A90,10min}$	$L_{A99,10min}$
1	Day	20-Feb-18	09:20	00:10:00	51.9	61.7	45.2	57.4	53.8	51.2	49.2	47.7
1	Day	20-Feb-18	09:30	00:10:00	53.9	76.5	47.1	59.0	55.2	52.4	50.5	48.7
1	Day	20-Feb-18	09:40	00:10:00	52.2	64.6	46.5	60.6	53.8	50.8	48.9	47.5
				Average	52.7	67.6	46.3	59.0	54.3	51.5	49.5	48.0
1	Night	06-Mar-18	22:00	00:10:00	30.1	46.2	27.1	35.3	31.5	29.4	28.1	27.7

Table A1 – Position 1 observed environmental noise measurements.

Site	Period	Date	Time	Duration	$L_{Aeq,10min}$	$L_{Amax,10min}$	$L_{Amin,10min}$	$L_{A1,10min}$	$L_{A10,10min}$	$L_{A50,10min}$	$L_{A90,10min}$	$L_{A99,10min}$
2	Day	20-Feb-18	10:00	0:10:00	49.0	70.1	36.7	59.5	49.7	45.4	41.6	39.6
2	Day	20-Feb-18	10:10	0:10:00	55.1	75.3	38.8	67.9	55.4	47.2	43.4	40.5
2	Day	20-Feb-18	10:20	0:10:00	46.7	58.0	38.6	53.9	49.4	45.7	41.9	40.0
				Average	50.3	67.8	38.0	60.4	51.5	46.1	42.3	40.0

Table A2 – Position 2 observed environmental noise measurements.

Site	Period	Date	Time	Duration	$L_{Aeq,10min}$	$L_{Amax,10min}$	$L_{Amin,10min}$	$L_{A1,10min}$	$L_{A10,10min}$	$L_{A50,10min}$	$L_{A90,10min}$	$L_{A99,10min}$
3	Day	20-Feb-18	10:40	0:10:00	48.5	60.4	39.8	55.7	51.5	47.1	43.7	41.1
3	Day	20-Feb-18	10:50	0:10:00	46.7	58.3	39.8	52.8	48.9	45.9	43.0	41.2
3	Day	20-Feb-18	11:00	0:10:00	46.6	58.0	38.0	52.5	49.1	45.7	42.6	40.3
				Average	47.3	58.9	39.2	53.7	49.8	46.2	43.1	40.9

Table A3 – Position 3 observed environmental noise measurements.

Site	Period	Date	Time	Duration	$L_{Aeq,10min}$	$L_{Amax,10min}$	$L_{Amin,10min}$	$L_{A1,10min}$	$L_{A10,10min}$	$L_{A50,10min}$	$L_{A90,10min}$	$L_{A99,10min}$
4	Day	20-Feb-18	11:30	0:10:00	51.5	60.8	46.7	56.5	53.4	50.9	49.0	47.8
4	Day	20-Feb-18	11:40	0:10:00	51.6	67.5	45.8	56.3	53.5	51.0	48.6	47.0
4	Day	20-Feb-18	11:50	0:10:00	50.8	57.5	47.1	54.9	52.5	50.4	48.8	48.0
				Average	51.3	61.9	46.5	55.9	53.1	50.8	48.8	47.6
4	Night	06-Mar-18	21:20	0:10:00	38.2	47.1	34.2	43.2	39.6	37.7	36.2	35.0
4	Night	06-Mar-18	21:30	0:10:00	38.0	48.9	34.6	42.6	39.1	37.4	36.2	35.6
4	Night	06-Mar-18	21:40	0:10:00	37.9	47.6	34.1	43.0	39.4	37.2	36.0	35.2
				Average	38.0	47.8	34.3	42.9	39.4	37.4	36.1	35.3

Table A4 – Position 4 observed environmental noise measurements.