

OneSteel Recycling Hexham Quarterly Noise Monitoring Report_Q4 2016



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OneSteel Recycling Hexham Quarterly Noise Monitoring Report_Q4 2016

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12-Jan-2017

Job No.: 60493017

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Quality Information

Document OneSteel Recycling Hexham Quarterly Noise Monitoring Report_Q4 2016

Ref 60493017

Date 12-Jan-2017

Prepared by Farshid Deilamy

Reviewed by Chad Whitburn

Revision History


Rev	Revision Date	Details	Authorised	
			Name/Position	Signature
A	12-January-2017	Final Report	Chad Whitburn Air Quality Team Leader	

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1.0 Introduction

1.1 Background

OneSteel Hexham has engaged AECOM Australia Pty Ltd to conduct noise monitoring at the location of the nearest residential receivers from the Hexham recycling plant. The noise survey was conducted on Shamrock Street and St. Joseph's Retirement Village on 22 November 2016 as stated in OneSteel Hexham's environment protection licence (EPL) No: 5345.

Acoustic terminology used in this report is defined in **Appendix A**.

1.2 Site and Monitoring Locations

The OneSteel Recycling centre site is located at 107 Sparke Street, Hexham, NSW. The site is bounded by vacant land of the Hunter River to the north and east, with Maitland Road located between the site and the river. To the south is Ironbark Creek with the Hunter Rail line to the west.

Site noise is generally characterised as heavy vehicle traffic due to delivery trucks visiting the site as well as the industrial shredder and associated site operations (handling scrap metal, heavy machinery etc).

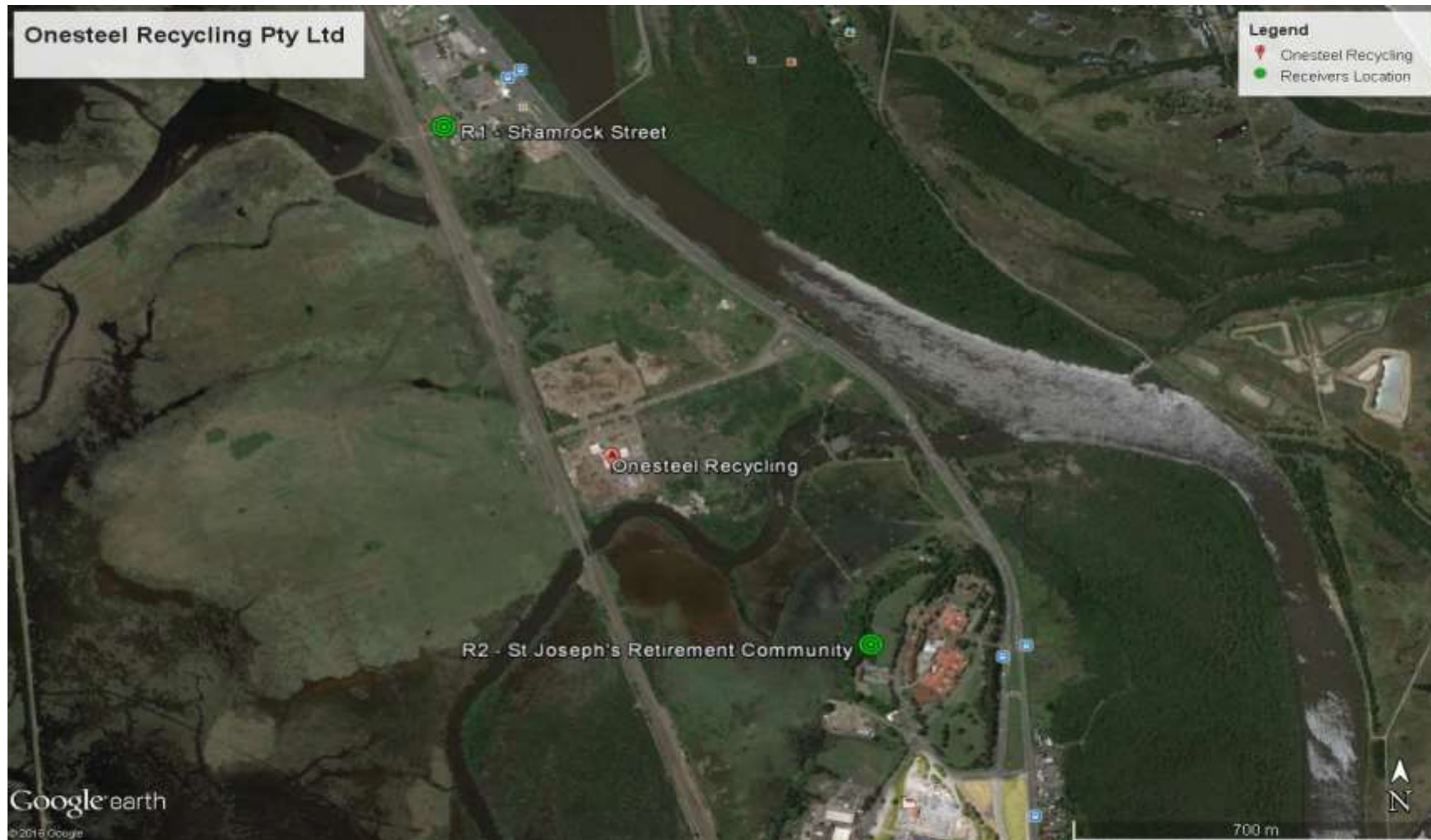
The site is open from 6:00 am to 6:00 pm from Monday to Saturday, however delivery trucks and the mill area (which contains the shredder operations) operates between 7:00 am and 6:00 pm Monday to Saturday, in accordance with EPL condition L5.1. The site does not operate on Sunday.

The two EPL monitoring locations are:

- R1 – Empty lot at 15 Shamrock Street, Hexham; and
- R2 – Calvary St Joseph's Retirement Community - 240 Maitland Rd, Sandgate

These EPL locations were selected as the nearest residential receptors to the north and south of the site. The monitoring locations are shown in **Figure 1**. The monitoring for the fourth quarter 2016 was conducted on 22 November 2016 at these two locations, with results detailed in **Table 1**.

Figure 1 OneSteel Site and Receiver Locations



2.0 Noise Limits

2.1 EPL Conditions

EPL Condition L4 – Noise Limits are reproduced below:

L4.1 Noise from the premises must not exceed the limits specified in the table below:

Location	Noise Limit dB(A)			
	Day	Evening	Night	
	L _{Aeq} (15min)	L _{Aeq} (15min)	L _{Aeq} (15min)	L _{A1} (1min)
Any residence in Shamrock Street, Hexham, affected by noise from the premises	47	48	45	55
St Joseph's Retirement Village and any associated residence in Old Maitland Road, Hexham, affected by noise from the premises	53	42	41	56
Any operating industrial premises affected by noise from the premises	70	70	70	N/A

L4.2 The noise limits above comply when measured or computed at any point within one metre of the boundary of any affected residential premises.

L4.2 The noise limits above comply when measured or computed at any point within one metre of the boundary of any affected residential premises.

5dB(A) must be added to the measured level if the noise is substantially tonal or impulsive in character.

L4.3 Day is defined as the period from 7am to 6pm Monday to Saturday and 8am to 6pm Sundays and Public Holidays.

Evening is defined as the period from 6pm to 10pm.

Night is defined as the period from 10pm to 7am Monday to Saturday and 10pm to 8am Sundays and Public Holidays.

L4.4 The noise emission limits identified in Condition L4.1 apply under the following meteorological conditions;

- a) Wind speeds up to 3m/s at 10 metres above ground level; and*
- b) Temperature inversion conditions of up to 3°C/100m.*

2.2 NSW Industrial Noise Policy

In reference to determining compliance with noise conditions, the Industrial Noise Policy (INP) states the following:

When is a development in non-compliance with a noise condition?

A development will be deemed to be in non-compliance with a noise consent or licence condition if the monitored noise level is more than 2 dB above the statutory noise limit specified in the consent or licence condition. This may occur for two reasons:

- The noise from the development is excessive, in which case the development is truly not complying with its consent or licence condition.*
- The noise was increased by extreme, non-standard weather effects—in which case the development is not considered to be in non-compliance with its consent or licence*

condition. Non-standard weather effects can be considered to be present during monitoring if the cloud cover is less than 40 per cent and the wind speed (at 10 m height) is less than 1.0 m/s (represents an extremely adverse weather condition for noise)—during the period from 6 pm to 7 am in non-arid areas (see Section 9.2).

In this latter case, further monitoring at a later date is required to determine compliance under the meteorological conditions specified in the consent/licence condition.

3.0 Attended Monitoring

Attended measurements were conducted on 22 November 2016 at the two monitoring locations listed in **Section 1.2** during the daytime (0700 – 1800), evening (1800 – 2200) and night time (2200-0700). It should be noted that this is in line with the site operating hours. Measurements were conducted at a height of 1.5m.

3.1 Instrumentation

Attended measurements were conducted using a Larson Davis SoundTrack LxT. This instrument has Class 1 characteristics as defined in AS IEC 61672.1-2004 “Electroacoustics - Sound Level Meters”. Measurements were conducted over 15-minute intervals.

Calibration of the instrument was confirmed with a Larson Davis CAL150 Sound Level Calibrator prior to, and at the completion of monitoring with a drift in calibration not exceeding ± 0.5 dB.

All equipment used for this assessment has current calibration certificates (i.e. calibrated in the last two years).

The sound level meter was set to ‘fast’ time weighting and programmed to store $L_{10(15 \text{ min})}$, $L_{Aeq(15 \text{ min})}$ and $L_{A90(15 \text{ min})}$ noise levels during each measurement period.

3.2 Weather Conditions

Weather conditions were within acceptable limits for noise monitoring during 22 November 2016. Skies were clear on the day and winds were calm.

3.3 Site Operations

On the days of measurements the OneSteel Recycling was operating under normal conditions. Noise emission characteristics of the site are outlined in **Section 1.2**.

3.4 Results

Noise monitoring was conducted during the daytime, evening and night time periods, when the main noise sources on site were operational.

The results from the attended noise monitoring carried out on 22 November 2016 during those periods are presented in **Table 1**.

Table 1 November 2016 - Attended Noise Monitoring Results Summary, dB(A)

Location	Date / Time	EPL limits $L_{Aeq(15 \text{ mins})}$ dB(A)	Measured Noise Level, dB(A)		Description of Noise Environment
			$L_{Aeq(15 \text{ min})}$	$L_{A90(15 \text{ min})}$	
Day, Evening and Night					
R1 – 15 Shamrock Street, Hexham	22/11/16 13:45 (Day)	47	56	49	- Freight train noise - Extraneous noise as a result of heavy trucks trafficking - Traffic noise from the Maitland road
R1 – 15 Shamrock Street, Hexham	22/11/16 20:20 (Evening)	48	64	59	- Extraneous noise due to the heavy trucks trafficking - Traffic noise from the Maitland road
R1 – 15 Shamrock Street, Hexham	22/11/16 23:40 (Night)	45	49	44	- Extraneous noise due to the heavy trucks trafficking - Traffic noise from the Maitland road
R2 – Calvary St Joseph's Retirement Community	22/11/16 13:00 (Day)	53	49	45	- Birds chirping background noise - Cricket chirping ambient noise - Traffic noise from the Maitland road - Freight train noise
R2 – Calvary St Joseph's Retirement Community	22/11/16 19:55 (Evening)	42	58	54	- Birds chirping background noise - Frogs and crickets noise in the background - Freight train noise
R2 – Calvary St Joseph's Retirement Community	22/11/16 23:00 (Night)	41	46	43	- Frogs and crickets noise in the background

The results in **Table 1** show that measured $L_{Aeq(15 \text{ min})}$ noise level measured at R2 – Calvary St Joseph's Retirement Community is compliant with development EPL noise limits during the day-time period. Measured $L_{Aeq(15 \text{ min})}$ levels at this location and R1 – 15 Shamrock Street exceeded EPL criterion for all other periods, however it was noted that noise from OneSteel Recycling was barely audible over ambient noise and the dominant noise was the road and train traffic at this location.

4.0 Discussion

4.1 Influence of Extraneous Noise on Attended Measurements

Measurement results show that majority of measured noise levels at Shamrock Street and Calvary St Joseph's Retirement Community exceed EPL limits. These exceedances are attributed to the large influence of road and rail traffic noise on the measured $L_{Aeq(15\text{ min})}$ levels at both locations.

4.2 Determination of Compliance

The influence of extraneous noise, i.e. road and rail traffic, makes it difficult to determine the noise contribution from the site in isolation, and therefore difficult to determine compliance with EPL limits.

5.0 Conclusion

Attended noise compliance monitoring at designated noise sensitive receivers has taken place in accordance with the requirements of OneSteel Hexham EPL (EPL 5345).

$L_{Aeq(15\text{ min})}$ noise levels higher than the project EPL noise limits were measured at the majority of the designated receivers during the daytime, evening and night time periods. $L_{Aeq(15\text{ min})}$ noise level measured at R2 – Calvary St Joseph's Retirement Community was compliant with development EPL noise limits during the day-time period. However it was noted that extraneous noise sources, namely road and rail traffic, contributed significantly to these noise levels.

Site noise from OneSteel recycling was indiscernible at Shamrock Street during the day, evening and night; however it was faintly audible at St Joseph's retirement village during day and evening due to proximity to the site and site activity during the day. $L_{Aeq(15\text{ min})}$ levels were largely influenced by extraneous noise sources such as train and road traffic at both locations, whereas $L_{A90(15\text{ min})}$ levels were influenced by traffic on nearby roads. Definitive compliance with EPL noise limits was, however, difficult to determine through direct measurement due to the influence of extraneous noise sources during the day, evening and night time.



Appendix A

Glossary of Acoustic Terms

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The following is a brief description of acoustic terminology used in this report:

<i>Sound power level</i>	The total sound emitted by a source																						
<i>Sound pressure level</i>	The amount of sound at a specified point																						
<i>Decibel [dB]</i>	The measurement unit of sound																						
<i>A Weighted decibels [dB(A)]</i>	The A weighting is a frequency filter applied to measured noise levels to represent how humans hear sounds. The A-weighting filter emphasises frequencies in the speech range (between 1kHz and 4 kHz) which the human ear is most sensitive to, and places less emphasis on low frequencies at which the human ear is not so sensitive. When an overall sound level is A-weighted it is expressed in units of dB (A).																						
	The decibel scale is logarithmic in order to produce a better representation of the response of the human ear. A 3 dB increase in the sound pressure level corresponds to a doubling in the sound energy. A 10 dB increase in the sound pressure level corresponds to a perceived doubling in volume. Examples of decibel levels of common sounds are as follows:																						
<i>Decibel scale</i>	<table> <tr> <td>0dB(A)</td> <td>Threshold of human hearing</td> </tr> <tr> <td>30dB(A)</td> <td>A quiet country park</td> </tr> <tr> <td>40dB(A)</td> <td>Whisper in a library</td> </tr> <tr> <td>50dB(A)</td> <td>Open office space</td> </tr> <tr> <td>70dB(A)</td> <td>Inside a car on a freeway</td> </tr> <tr> <td>80dB(A)</td> <td>Outboard motor</td> </tr> <tr> <td>90dB(A)</td> <td>Heavy truck pass-by</td> </tr> <tr> <td>100dB(A)</td> <td>Jackhammer/Subway train</td> </tr> <tr> <td>110 dB(A)</td> <td>Rock Concert</td> </tr> <tr> <td>115dB(A)</td> <td>Limit of sound permitted in industry</td> </tr> <tr> <td>120dB(A)</td> <td>747 take off at 250 metres</td> </tr> </table>	0dB(A)	Threshold of human hearing	30dB(A)	A quiet country park	40dB(A)	Whisper in a library	50dB(A)	Open office space	70dB(A)	Inside a car on a freeway	80dB(A)	Outboard motor	90dB(A)	Heavy truck pass-by	100dB(A)	Jackhammer/Subway train	110 dB(A)	Rock Concert	115dB(A)	Limit of sound permitted in industry	120dB(A)	747 take off at 250 metres
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<i>Frequency [f]</i>	The repetition rate of the cycle measured in Hertz (Hz). The frequency corresponds to the pitch of the sound. A high frequency corresponds to a high pitched sound and a low frequency to a low pitched sound.																						
<i>Equivalent continuous sound level [L_{Aeq}]</i>	The constant sound level which, when occurring over the same period of time, would result in the receiver experiencing the same amount of sound energy.																						
<i>L_{max}</i>	The maximum sound pressure level measured over the measurement period																						
<i>L_{min}</i>	The minimum sound pressure level measured over the measurement period																						
<i>L₁₀</i>	The sound pressure level exceeded for 10% of the measurement period. For 10% of the measurement period it was louder than the L ₁₀ .																						

<i>L_{A90(15 min)}</i>	The sound pressure level exceeded for 90% of the measurement period. For 90% of the measurement period it was louder than the <i>L_{A90 (15 min)}</i> .
<i>Ambient noise</i>	The all-encompassing noise at a point composed of sound from all sources near and far.
<i>Background noise</i>	The underlying level of noise present in the ambient noise when extraneous noise (such as transient traffic and dogs barking) is removed. The <i>L_{A90 (15 min)}</i> sound pressure level is used to quantify background noise.
<i>Traffic noise</i>	The total noise resulting from road traffic. The <i>L_{eq}</i> sound pressure level is used to quantify traffic noise.
<i>Day</i>	The period from 0700 to 1800 h Monday to Saturday and 0800 to 1800 h Sundays and Public Holidays.
<i>Evening</i>	The period from 1800 to 2200 h Monday to Sunday and Public Holidays.
<i>Night</i>	The period from 2200 to 0700 h Monday to Saturday and 2200 to 0800 h Sundays and Public Holidays.
<i>Assessment background level [ABL]</i>	The overall background level for each day, evening and night period for each day of the noise monitoring.
<i>Rating background level [RBL]</i>	The overall background level for each day, evening and night period for the entire length of noise monitoring.

*Definitions of a number of terms have been adapted from Australian Standard AS1633:1985 "Acoustics – Glossary of terms and related symbols", the EPA's NSW Industrial Noise Policy and the EPA's NSW Road Noise Policy.