OneSteel Recycling Pty Ltd
21-Dec-2016

# OneSteel Recycling Hexham Quarterly Noise Monitoring Report Q3 2016

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# Table of Contents

1.0 Introduction 1
1.1 Background 1
1.2 Site and monitoring locations 1
2.0 Noise limits 3
2.1 EPL Conditions 3
2.2 NSW Industrial Noise Policy 3
3.0 Attended Monitoring 4
3.1 Instrumentation 4
3.2 Weather Conditions 4
3.3 Site Operations 4
3.4 Results 5
4.0 Discussion 6
4.1 Influence of Extraneous Noise on Attended Measurements 6
4.2 Determination of Compliance 6
5.0 Conclusion 6

Appendix A
Glossary of acoustic terms A

# 1.0 Introduction

## 1.1 Background

OneSteel Recycling Hexham (OneSteel Recycling) has engaged AECOM Australia Pty Ltd to conduct noise monitoring at the location of the nearest residential receivers to the Hexham recycling plant. The noise survey was conducted at locations at Shamrock Street and St. Joseph's Retirement Village on 23 August 2016 as stated in OneSteel'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 site is located at 107 Sparke Street, Hexham, NSW. The site is bounded by vacant land and the South Channel 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
- 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 third quarter 2016 was conducted on 23 August 2016 at these two locations, with results detailed in **Table 1**.

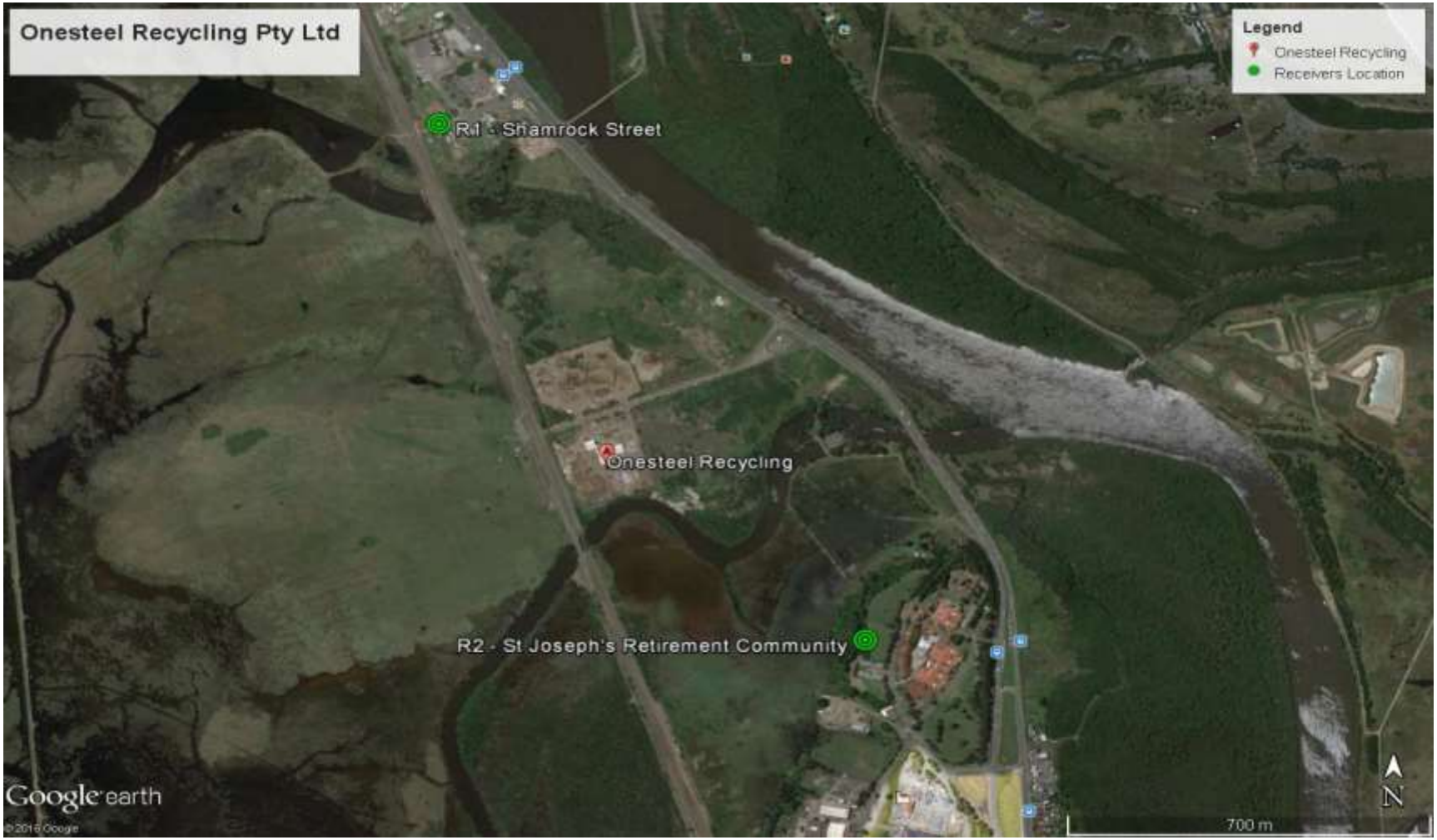


**Figure 1 OneSteel Site and Monitoring Locations**

# 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$^{o}$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 23 August 2016 at the two monitoring locations listed in **Section 1.2** during the daytime (0700 – 1800) and evening (1800 – 2200), 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 $L_{10}$, $L_{eq}$ and $L_{90}$ noise levels during each measurement period.

## 3.2 Weather Conditions

Weather conditions were within acceptable limits for noise monitoring during 23 August 2016. Skies were clear on the day and winds were calm, measuring at 1.5m/s during the monitoring period.

## 3.3 Site Operations

On the day of measurements the OneSteel Recycling site 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 both the daytime and evening periods, when the main noise sources on site were operational. These results are presented in **Table 1**. Monitoring during the night period was not performed on 23 August and when attempted towards the end of September unsuitable weather conditions prevented monitoring. As such there are no night period results included in this report.

**Table 1 Attended Daytime and evening Monitoring Results Summary, dB(A)**

| Location | Date / Time | EPL limit $L_{Aeq(15\ mins)}$ dB(A) | Measured noise level, dB(A) | | Description of noise environment |
|---|---|---|---|---|---|
| | | | $L_{Aeq}$ | $L_{A90}$ | |
| **Day and Evening*** | | | | | |
| R1 – 15 Shamrock Street, Hexham | 23/08/16 10:30 (Day) | 47 | 49 | 45 | OneSteel Recycling operations are indiscernible above ambient noise. Ambient noise was influenced by passing trains along Hunter Rail Line to the west, road traffic along Maitland Road to the west and trucks entering the carpark to the north of Shamrock Street. Noise from natural surrounds such as birds were also noted. |
| R1 – 15 Shamrock Street, Hexham | 23/08/16 20:15 (Evening) | 48 | 46 | 42 | |
| R2 – Calvary St Joseph's Retirement Community | 23/08/16 09:57 (Day) | 53 | 51 | 47 | OneSteel Recycling operations are audible but not dominant. Ambient noise is dominated by passing trains along the Hunter Rail Line to the west. Noise from natural surrounds, such as birds, was also noted. Traffic noise from Maitland road was audible. |
| R2 – Calvary St Joseph's Retirement Community | 23/08/16 19:40 (Evening) | 42 | 48 | 41 | |

The results in **Table 1** show that measured $L_{Aeq}$ noise levels at the majority of the locations are compliant with the EPL noise limits considering 2dB noise tolerances as per NSW industrial noise policy which is indicated in clause **2.2**. The noise level at R2 – Calvary St Joseph's Retirement Community exceeded the EPL noise limits during the evening period however it was noted that noise from OneSteel Recycling was barely audible over ambient noise and the dominant noise source was the road traffic at this location.

# 4.0 Discussion

## 4.1 Influence of Extraneous Noise on Attended Measurements

Measurement results show that measured noise levels at Calvary St Joseph's Retirement Community exceeded the EPL evening limit. This discrepancy is attributed to the large influence of road and rail traffic noise on the measured $L_{Aeq(15min)}$ levels at this location.

## 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 for R2 – Calvary St Joseph's Retirement Community during the evening period.

# 5.0 Conclusion

Attended noise compliance monitoring at designated sensitive receivers has taken place in general accordance with the requirements of OneSteel Hexham's EPL (EPL 5345). Monitoring during the night period was not performed on 23 August and when attempted towards the end of September unsuitable weather conditions prevented monitoring. As such there are no night period results included in this report.

According to NSW noise policy, a development will be deemed to be in non-compliance with 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.

As such, measured $L_{Aeq}$ noise levels were compliant with EPL noise limits at the majority of the designated receivers during the daytime and evening periods with the exception of one exceedance at R2 – Calvary St Joseph's Retirement Community. However, it was noted that extraneous noise sources, namely road traffic, contributed significantly to this exceedance.

Site noise from OneSteel recycling was indiscernible at Shamrock Street during the day and evening; however it was faintly audible at St Joseph's retirement village during day/evening due to proximity to the site. $L_{Aeq}$ levels were largely influenced by extraneous noise sources such as train and road traffic at both locations, whereas $L_{A90}$ levels were influenced by traffic on nearby roads.

Considering that results for three of the four monitoring periods presented in this report comply with the EPL criteria and observations at the time of monitoring indicate that the site was barely audible at these locations, it is likely that extraneous sources, predominantly road and rail noise, resulted in the single exceedance at the St Joseph's Retirement Village.

# Appendix A

## Glossary of acoustic terms

# Appendix A Glossary of acoustic terms

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

| | |
|---|---|
| *Sound power level* | The total sound emitted by a source |
| *Sound pressure level* | The amount of sound at a specified point |
| *Decibel [dB]* | The measurement unit of sound |
| *A Weighted decibels [dB(A])* | 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). |
| *Decibel scale* | 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: |
| | 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 |
| *Frequency [f]* | 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. |
| *Equivalent continuous sound level [$L_{eq}$]* | 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. |
| $L_{max}$ | The maximum sound pressure level measured over the measurement period |
| $L_{min}$ | The minimum sound pressure level measured over the measurement period |
| $L_{10}$ | The sound pressure level exceeded for 10% of the measurement period. For 10% of the measurement period it was louder than the $L_{10}$. |

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