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Tata Steel UK – Port Talbot Steel Works

Document Reference: Noise assessment for scrap processing and storage
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1. Noise sources

The main sources of noise arising from the activities in this area are:

- Delivery of scrap steel from the mills
- Segregating scrap into appropriate bays
- Cutting up large pieces of scrap, such as complete coils
- Loading scrap into lorries to be transported for recovery off-site

Initial observations determined that the last step, loading scrap into lorries using a magnet crane, generated the highest noise levels and hence further detailed analysis has focussed on these operations.

2. Noise measurements

Measurements were undertaken across a range of frequencies using a sound level meter, which was calibrated before each use. Safety considerations around moving vehicles and crane operations precluded taking readings at multiple locations around the activity so the measurements were taken at a single location in each case and the distance from the sound level meter to the noise source was also recorded. The loading of five different types of steel scrap (shown in Figures 1a to 1e) was observed.

Table 1 shows the sound power level (L_w) at different frequencies for loading each type of scrap. L_w was calculated from the measured sound pressure levels (SPL) and the distance (r) from the source to the meter, assuming that the sound propagated evenly around a hemispherical surface:

$$L_w = SPL + 10 \log_{10}(A)$$

where A = area of surface = ½ x (4 π r²) for a hemisphere

$$\therefore L_w \approx SPL + 20 \log_{10}(r) + 8$$

	Sound power (dB) by frequency								
Scrap type	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHx	Total
Mill scale	103.1	103.2	104.3	100.9	100.8	101.4	98.8	93.3	110.6
Light gauge	106.0	103.2	104.7	107.1	102.8	101.8	100.5	94.9	112.8
Slab ends	118.6	112.8	110.9	104.9	99.9	95.8	92.0	86.7	120.4
Plates	112.8	110.4	109.9	108.4	106.3	101.6	95.3	88.0	117.2
Crop ends	111.8	105.7	108.5	108.8	108.6	103.4	95.3	84.1	116.4

Table 1: Estimated sound power for loading different types of scrap

Figure 1a – mill scale

L_w = 111 dB

Figure 1b – light gauge scrap

L_w = 113 dB

Figure 1c – slab ends

L_w = 120 dB

Figure 1d – plate

L_w = 117 dB

Figure 1e – crop ends

L_w = 116 dB

Loading of different types of steel scrap

Estimated sound power (L_w) also shown for each type

3. Sound pressure levels in the community

A sound propagation calculator, following the ISO 9613-2:2024 standard, has been used to estimate the noise attenuation attributable to the distance from the scrap loading activities to the nearest sensitive receptors and the effect of the barrier provided by the Cold Mill building. For this model, a worst-case assumption has been made that there is no absorption of sound by the ground or other surfaces.

The receptors considered were at Abbots Close, 1050 metres from the proposed location for the scrap processing and storage activity (see Figure 2). Two different receptor heights were used in the model – 1.5 metres, representing exposure outside the properties, for instance in the garden, and 4 metres, representing the height of an upper floor window, for instance a bedroom.

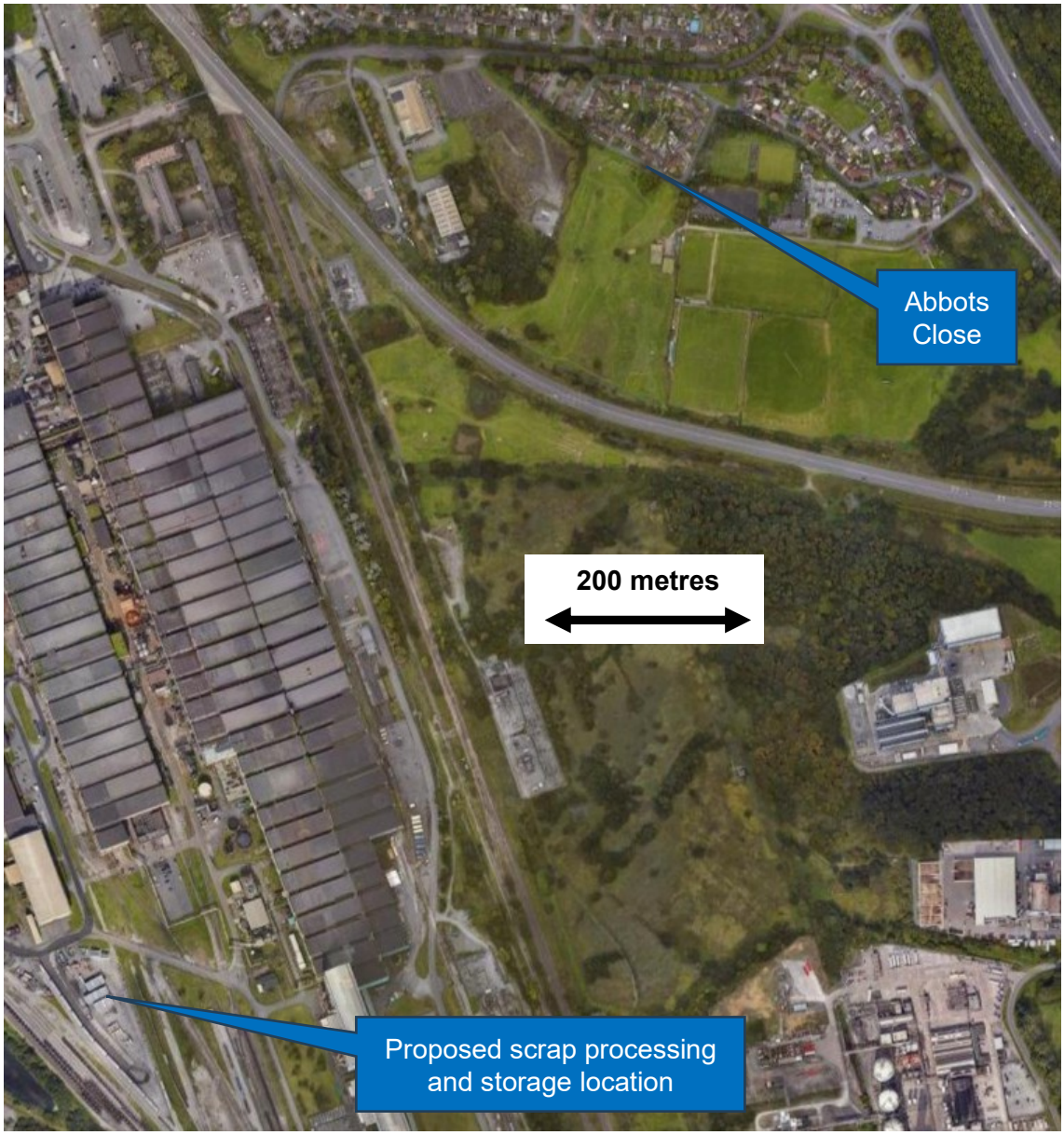


Figure 2: Proposed location of scrap loading and closest noise receptors

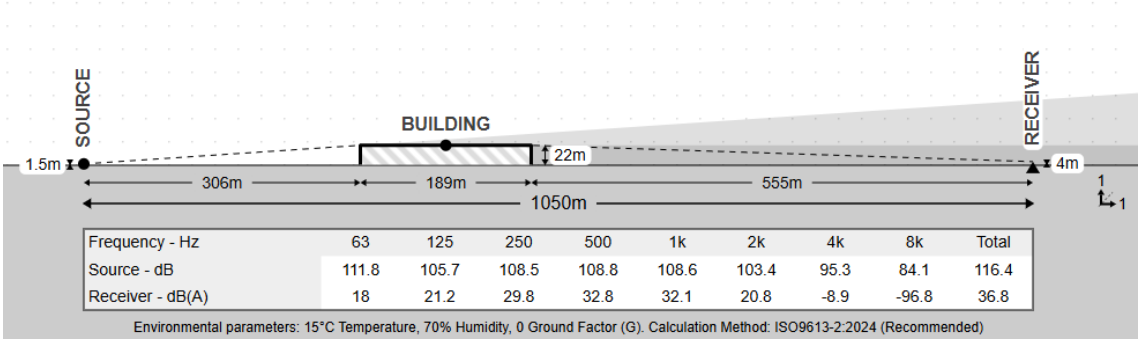
Table 2 shows the calculated sound pressure levels at Abbots Close when loading different types of scrap steel.

Scrap type	Sound power of source, dB	Sound pressure level, dB (A)	
		Receptor height = 1.5 metres	Receptor height = 4 metres
Mill scale	111	30	31
Light gauge	113	33	34
Slab ends	120	35	36
Plates	117	36	37
Crop ends	116	36	37

Table 2: Calculated sound pressure levels at Abbots Close

It should be noted that the sound pressure level at the receiver depends on both the sound power of the source and the frequency distribution of the sound. Hence the loading of slab ends (L_w = 120 dB) has less impact at Abbots Close than does loading of plates and crop ends (L_w = 117 or 116 dB) because the noise from the slab ends is skewed more to lower frequencies, which are attenuated to a greater degree when converted to an A weighted sound pressure level to reflect the human perception of sound.

Figure 3 shows the calculated values for the case giving the highest community impact (loading crop ends, receptor height 4 metres).



Sound propagation calculator from www.noisetools.net

Figure 3: Results from sound propagation calculator

4. Ambient noise levels

Ambient noise has been measured at Abbots Close on several previous occasions and the lowest recorded levels were L_{Aeq} = 51 dB during the day (1 hour reference period) and L_{Aeq} = 46 dB at night (15-minute reference period).

5. Overall noise impact assessment

The calculated sound pressure levels at Abbots Close attributable to loading of scrap are at least 9 dB below the measured ambient levels previously measured at that location and therefore it would not be expected that any impact would be perceptible, even at night-time.