NOISE ANALYSIS OF A REFERENCE PLANT IN THE UK

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Noise Analysis of a Reference Plant

To enable an assessment of the potential noise levels that will be produced by the proposed new Ballymount MRF equipment a comprehensive noise analysis study has been undertaken at a comparable reference facility. This facility contains equipment supplied by the same manufacturers and is handling input material of a similar percentage breakdown. The results of this analysis have been sampled for certain areas of the facility as shown below.

The Reference Plant

Norfolk Environmental Waste Solutions (NEWS), located in Norwich, Norfolk, England

The weather conditions during this noise analysis were:

Weather type: light showers
Temperature: 13 ^{o}C
Wind: northerly (12 mph)
Visibility: Moderate
Pressure: 1015 mb
Relative humidity: 93

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The plant was running under normal operating conditions of 15 tonnes per hour of dry recyclable material (paper, card, film, steel, aluminium and plastic bottles). There were continuous vehicle movements within and around the facility that included front-end shovels, folk lift trucks and vehicles delivery and collecting material.

This noise analysis study was carried out using a 1351 Sound Level Meter (calibrated using a 1356 sound level calibrator on 29th November 2005).

Results

All results taken were averaged from readings taken at each reference point over a two minute period to calculate an accurate average sound level reading. The ambient sound level value is 58.5 dB(A).

Inside MRF Building

The average sound level within a sorting cabin (the location of all sorting operatives within the facility) is 78.5 dB(A).

The average sound level immediately in front of a CP separator screen is 92.1 dB(A). This is the loudest position within the facility.

The average sound level immediately in front of an MSS high ejection separator unit is 88.6 dB(A).

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The average sound level on the floor around the processing equipment (not immediately adjacent to any piece of equipment) is 78.1 dB(A).

The average sound level on the floor in the storage areas of the facility is 75.3 dB(A).

The average sound level on the floor around baling equipment is (the location of all other operatives within the facility) 87.7 dB(A).

The average sound level in the office block immediately adjacent (and connected) to the processing equipment hall is 42.9 dB(A). There were no personnel in this office during the test and no MRF noise from the MRF could be heard within the office block.

It is recommended that all personnel that will be working not within a cabin wear ear protection with an attenuation value of 15dB.

Outside MRF Building

Noise readings were take at 1m, 5m and 10m away from the outside of the building.

A section of the drawing including the sound level values taken on the outside of the building where there are no vehicle access doors (i.e. a solid side of a building with 3 personnel fire exit doors that were all closed) that enclose the processing equipment can be seen below.

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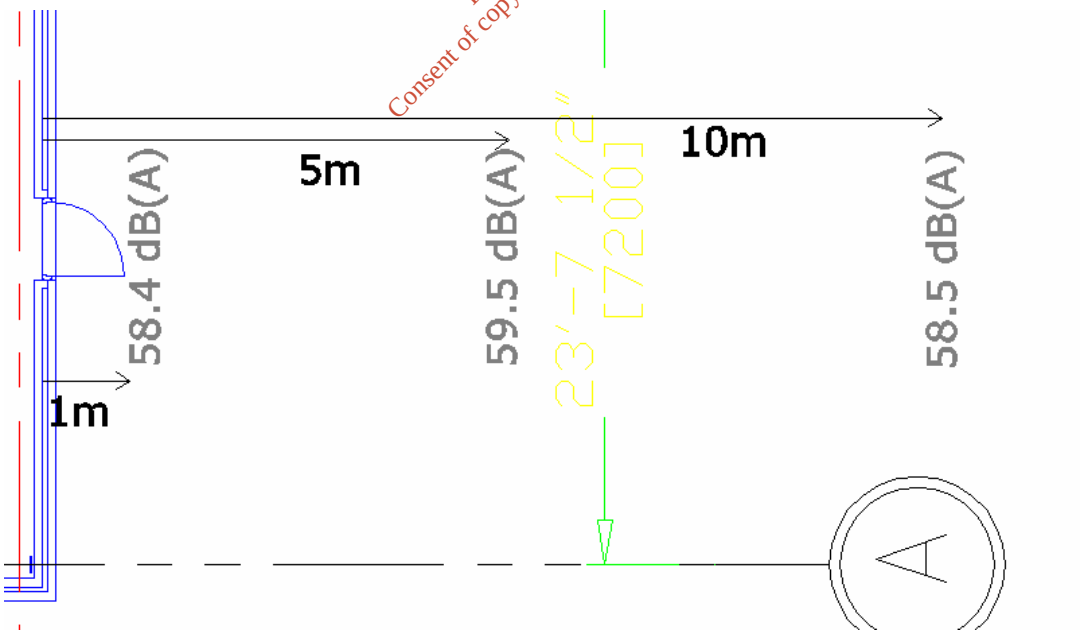

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As the intensity of the sound level is LA = 10log10(I/Io). Where I is the intensity of the sound and Io is the reference intensity sound. Then as the sound intensity is halved the sound pressure level will reduce by 3dB as the dissipation value of the sound is on a logarithmic scale.

As you double the distance from the point source the intensity of the sound should halve (as explained above). The value taken at 5m from the building was 59.5 dB(A). If the MRF processing building is the primary sound intensity producer the value at 10m should be 3dB(A) less and therefore a value of 56.5 dB(A) should be observed.

As can be seen in the above picture, this is not the case. An observation made during the recording of the sound levels was that, the major contributor to the noise on the outside of the building was from a road that was positioned approximately 100m away from the building.

Therefore due to the absorption and reflection factor of the fabric of the building, there is an insignificant amount of noise radiated by the MRF processing equipment outside of the building.

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