

6.0 NOISE AND VIBRATION

6.1 Methodology

A baseline noise survey was conducted at the site, between the 8th and the 12th of March 2004 and over a 24 hour period on the 31st of August 2004. The potential impacts of the development are examined to ensure that any adverse impacts are minimised and mitigation measures are proposed.

Monitoring and assessment was conducted in accordance with international noise standards in particular ISO 1996 1982: Acoustics Description and Measurement of Environmental Noise and BS 4142 1997 Method of Rating Industrial Noise affecting Mixed Residential and Industrial Areas. A complete report including measurement methodology and results is presented in Appendix 6 Noise Report and Monitoring Data.

Monitoring was conducted at two locations; Location 1 was situated within the site in a clear unobstructed area of an open field. Location 2 was at the nearest noise sensitive location (a dwelling house) approximately 180m west at the junction of the site access road and the R634 route (formerly the N25). These locations are illustrated in Figure 6.1 Noise Monitoring Locations.

Particular values recorded during the noise survey were the equivalent continuous sound level (L_{eq}), maximum noise level (L_{max}), the 10% (L_{10}), and 90% (L_{90}) percentile levels. These values represent the extremes of the range recorded over the monitoring period.

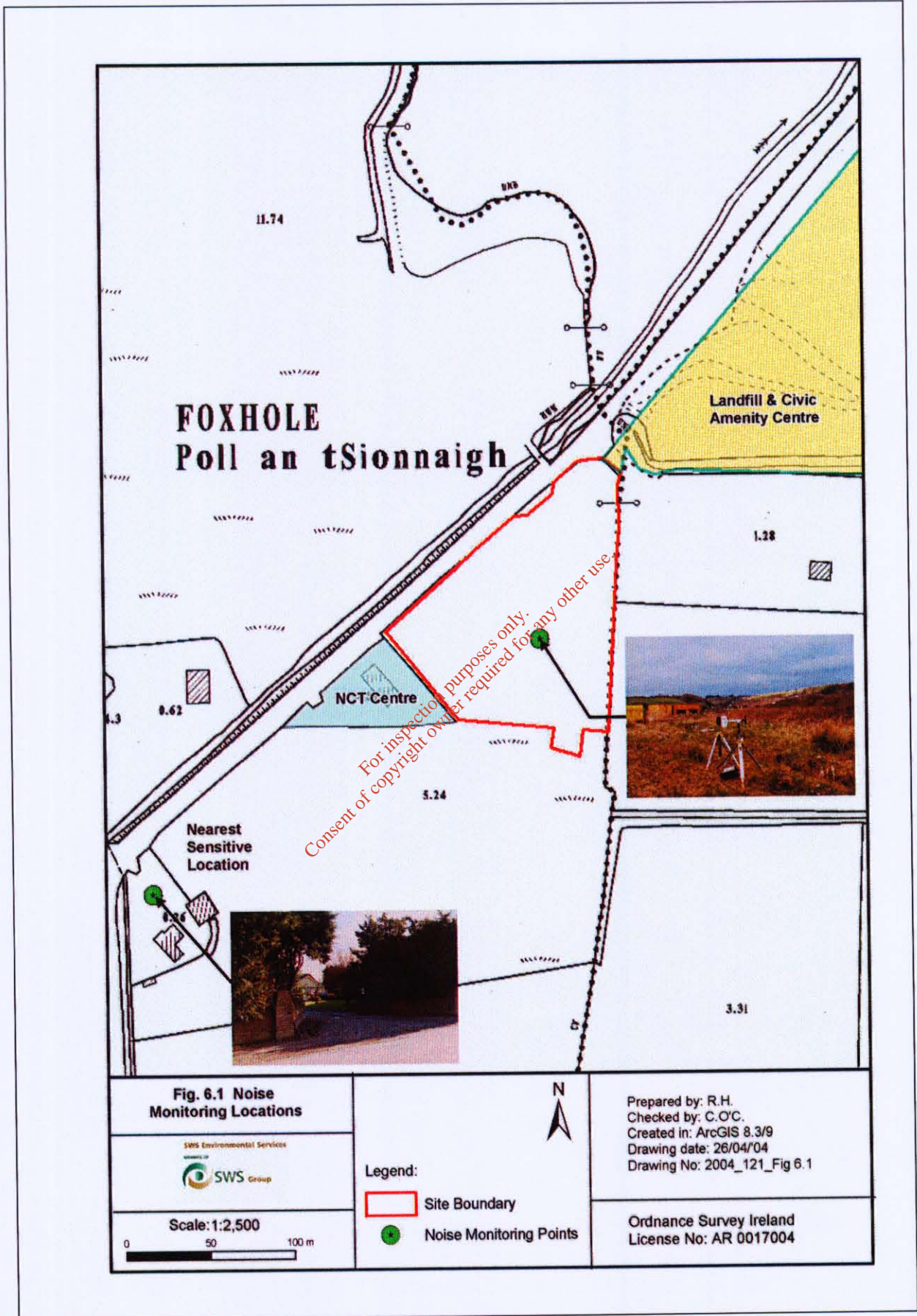


Figure 6.1 Noise Monitoring Locations

6.2 Existing Environment

The full set of the noise monitoring data is available in Appendix 6.

The primary noise sources in the area are mobile vehicles including haulage vehicles and private cars utilising the civic amenity site and NCT centre. The noise environment would be typical for locations situated near major transport routes.

At Location 2 the noise environment is largely dominated by road traffic noise. This is highlighted by the large difference between the L_{10} (69 dB(A)) which is traffic noise and the background noise L_{90} of 45dB(A). Traffic noise at this location is audible from the R634 route as well as vehicles entering the landfill site.

Traffic from the R634 is less audible at Location 1, however traffic noise entering and leaving the landfill is evident in the L_{10} and L_{90} monitoring results.

Overall, the average daytime L_{eq} of 54dB(A) measured onsite was lower than the average daytime L_{eq} of 66dB(A) measured at the nearest noise sensitive resident. This is due to traffic noise and the close proximity of Location 2 to the R634. During night time hours the noise levels at Location 2 are reduced, however levels are still quite elevated with an average L_{eq} of 50dB(A) due to traffic noise.

6.3 Impact Assessment

Characteristics of the Proposed Development

The examination of the proposed development is assessed during the Construction Phase and Operations Phase when considering the potential noise impacts of the activities at the site.

Recommendations from the Guidance Notes for Noise in Relation to Scheduled Activities, EPA, 1995 for the appropriate noise criteria relevant for a development of this type were used. This document specifies that to avoid disturbance at noise sensitive locations noise levels should be kept below 55dB $L_{Aeq,1hr}$ for daytime hours (08:00 – 22:00hrs) and below 45dB $L_{Aeq,1hr}$ for night time hours (22:00 – 08:00hrs).

Impact during the Construction Phase

Calculations of construction noise were made, following the procedures set out in BS 5228 Part 1:1997. The results are expressed as L_{Aeq} (12 hour) dB(A) equivalent continuous noise levels, which is a standard unit used to express construction noise.

The nearest dwelling (noise sensitive location) is over 180m from the site boundary. Noise levels at this distance were calculated from the sound power data assuming the plant would be operating at the nearest point of the boundary to the sensitive receivers. Construction equipment will not generally operate at the boundary of the site.

Typical noise levels from representative pieces of equipment and calculated noise levels at the nearest sensitive location are summarised in Appendix 6.

Impact of the Operation Phase

During the operation of the site there will be a number of distinct noise sources associated with proposed activity, these include:

- Waste Recovery and Transfer Building,
- Sludge Drying Building,
- Waste Water Treatment Plant,
- Vehicular Movements.

Waste Recovery and Transfer Building

Noise sources in this building will include both fixed equipment such as the picking station; overband magnet; conveyer belts and baler and mobile equipment such as the materials handling grab; tipper trucks; shredder and forklift. Typical noise levels associated with such equipment are given in Table 6.3 Noise Levels associated with Plant Items. Noise levels outside the building would be considerable lower.

Item	Noise Level dB
Baler	99
Forklift	104
Wood Shredder	100

Table 6.3 Noise Levels associated with Plant Items

The Waste Recovery and Transfer building will only operate between 8:00am and 9:00pm Mondays to Fridays, set-up and clean-up will take place between 7:00am and 8:00am and 9:00pm and 10:00pm Mondays to Fridays. On Saturdays operations will take place between 8:00am and 1:00pm, with set-up and clean-up between 7:00am and 8:00am and 1:00pm and 2:00pm.

Sludge Drying Facility

All electrical and mechanical equipment used in the operation of this facility will be housed in one building. Typical indoor noise levels measured at 1m from the actual dryer derived from site measurements at similar type facilities range from 89-92dB(A). Noise levels outside the building will be considerable lower. This facility will run on a 24 hour basis 7 days a week including holidays. It will be shut down for maintenance.

Waste Water Treatment Plant

The majority of this equipment will be housed individually. The noisiest piece of equipment in this area will be the aeration tank blower, typical noise levels of measured at similar type facilities produced a noise measurement of 75dB(A) at 1m.

Vehicular Movements

Vehicular movements associated with the site include staff car parking, service access traffic and loading activities.

In relation to surface car parking areas noise levels measured 10m beyond the boundary of a busy car park during peak periods is typically in the order of 48 dB $L_{Aeq,1hr}$. Taking into account the distance to the nearest noise sensitive location (180m), screening by the proposed development and the existing NCT centre noise levels will be well within daytime criterion of 55 dB $L_{Aeq,1hr}$ for any car parking activities.

It is estimated that the maximum delivery in/out movements per day (i.e. service access traffic) associated with the proposed Waste Recovery/Transfer and Sludge Drying Facility are 39 therefore there will not be any significant noise impact at the nearest noise sensitive location and again noise levels will be well within daytime criterion of 55 dB $L_{Aeq,1hr}$.

Noise associated with loading activities include reversing vehicular movements which produce tonal noises, idling vehicles which produce continuous noises and loading activities which generate impulsive noises. The guidelines (Guidance Notes for Noise in Relation to Scheduled Activities, EPA, 1995) recommend a daytime criterion of 55 dB $L_{Aeq,1hr}$.

Taking into account screening, attenuation due to the 180m distance, the existing NCT Test Centre even adding a 5dBA penalty for bangs, whistles and whines the proposed activities will be within this daytime criterion. Therefore there will not be any significant impact. Furthermore the majority of unloading activities will take place indoors e.g. the sludge reception building.

Combined Impact of the Operation

The noise contribution from the facility, at the nearest noise sensitive location can be obtained by summing the individual noise contributions from the above elements. The increase in noise

level from the facility at the nearest noise sensitive location is 31 dB(A) during daytime and 22dB(A) during night time (See Appendix 6).

The overall noise level, at the nearest noise sensitive location, can be predicted (BS 4142 1997 Method of Rating Industrial Noise affecting Mixed Residential and Industrial Areas) using the noise level contribution from the facility and the measured background noise levels at the nearest dwelling house.

Period	Background Noise Levels measured at the Nearest Noise Sensitive Location (dB(A))	Noise contribution associated with the facility activities (dB(A))	Difference
Daytime	66	31	-35
Night Time	50	22	-28

Table 6.4 Predicted overall noise levels at the Nearest Noise Sensitive Location

The noise generated by the proposed development at the nearest dwelling house is predicted to be more than 10dBA below the existing background noise levels; therefore there will not be any significant impact at the nearest noise sensitive location.

These calculations have only taken into account the reduction of noise breakout from the Kingspan or similar type building cladding material and the distance from the noise sources and the receiver. Further noise reduction will be attained by:

- The building layout, in the direct line of site, acting as noise barrier,
- The presence of a concrete block wall running adjacent to the Waste Recovery and Transfer building,
- A 2.5m high mass concrete wall in the tipping and storage area of the Waste Recovery and Transfer building,
- Ground attenuation,
- Atmospheric absorption,
- Meteorological effects,
- Landscaping.

6.4 Mitigation Measures

6.4.1 Construction Noise

The “best practical means” to minimise noise on site during the construction phase should be used and contractors should adopt the recommendations of BS 5228 Noise Control on Construction and Demolition Sites where practicable. In particular it is recommended that the following mitigation measures be implemented:

- Limiting and scheduling the hours of construction activity to avoid unsociable hours,
- Establishing communication links between the developer, contractor, Local Authority and local residents,
- Selecting plant and equipment with low inherent potential for generation of noise,
- Proper use and maintenance of plant and equipment,
- Locating pumps and generators in positions that cause the least noise disturbance.

6.4.2 Operational Noise

Noise mitigation measures are incorporated into the site design and layout in order to minimise the impact of noise on the surrounding environment. This includes the enclosure of all equipment in buildings as far as possible, good siting of the buildings, selection of plant and equipment with low inherent potential for generation of noise and the proper use and maintenance of all operational plant and equipment.

There will also be a concrete block wall running adjacent to the Waste Recovery and Transfer building and planting buffer zone approximately 2m wide surrounding the majority of the rest of the site acting as noise barriers.

Site personnel will be trained to use all equipment and plant on site so that noise is minimised.

Waste Recovery and Transfer Building

This building is fully enclosed and will be constructed using Kingspan cladding or equivalent. Loading and unloading doors are located on the northeast and south side of the building, facing away from the noise sensitive locations and away the prevailing wind. Silencers will be fitted to all air handling equipment. Splitter attenuators, acoustic louvers or similar will be installed in the ventilation system.

Facility operations will be limited to daytime hours and thus will avoid noise nuisance during night time hours.

Sludge Drying

The sludge drying and reception areas will be enclosed within a building constructed of adequate acoustic performance cladding e.g. Kingspan or similar. Silencers or similar will be fitted to all air handling equipment and splitter attenuators, acoustic louvers or similar will be installed in the ventilation systems.

Waste Water Treatment Plant

This facility is located at the furthest distance from the nearest noise sensitive location. Each piece of equipment that can generate significant noise will be covered to ensure that noise limits are met.

Vehicular Movements

Loading and unloading activities on site will be confined to the daytime operating period. When not in operation, vehicles will be switched off to prevent any unnecessary noise from idling vehicles. Reversing sirens on all vehicles, which are vital for safety, can generate significant noise. However, 'smart' reversing alarms, if available will be used, these can adjust the noise level volume in accordance with the background noise level of the site and or use movement sensors and lights.

Combined Impact of the Operation

Overall, the proposed development will have a marginal impact on the existing environment.

During construction phase there will be an increase in noise levels at the site. The impact of construction at the nearest noise sensitive location was evaluated and is not considered significant.

The noise generated by the proposed development at the nearest dwelling house is predicted to be more than 10dBA below the existing background noise levels; therefore there will not be any significantly impact at the nearest sensitive location.

6.5 VIBRATION

Some construction activities such as driving piles can give rise to considerable levels of ground vibration. However, at the proposed development flight augured piles will be used instead of driven piles. Therefore no adverse vibration effects are anticipated.

Plant and equipment is not expected to give rise to any vibration during the operations phase. Therefore it is not expected that vibration during the operations phase will impact on any adjacent building.

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