SECTION 8: NOISE AND VIBRATION

8.1 INTRODUCTION

This Environmental Impact Statement (EIS) provides supporting information to accompany a Waste Licence Application (WLA) to the Environmental Protection Agency (EPA) by Roadstone Dublin Limited for continued operation of its existing construction and demolition (C&D) waste recovery facility at Fassaroe, Bray, Co. Wicklow and proposed backfilling of the adjoining, worked out quarry void using imported and site-won inert soils.

This Chapter of the EIS, prepared by SLR Consulting Ireland, addresses the potential impact of additional noise and vibration emissions associated with the continued operation and further development of waste recovery facilities at the Fassaore site.

In essence, waste recovery operations will comprise

- importation of inert soils and C&D waste from external sources
- stockpiling, placement and compaction of inert soil
- processing of C&D waste
- stockpiling of recycled C&D waste and
- off-site export of recycled C&D waste

The principal noise impact associated with the continued operation of the existing waste recovery facility and the future recovery of inert soils through deposition, is increased noise nuisance. An increase in noise levels is likely to arise on account of:

- Increased traffic levels along the existing access road to the facility and internally across Roadstone Dublin's landholding
- End-tipping of inert soil or C&D waste
- Operation of additional plant and equipment within the application site (bulldozers, crushing and screening plant).

With respect to the potential for noise impacts, the key objective at the application site is to manage activities in order to ensure that any discernable increase in noise levels is prevented and the effect of any increase in noise emissions is minimised.

A description of the receiving environment around the waste recovery facility, where noise nuisance could potentially arise is provided in Section 8.2. The potential impacts of noise emissions on sensitive locations around the facility have been assessed and are presented and discussed in Section 8.3. The following issues are addressed separately for the potential impacts:

- methodology used to assess the potential impacts of activities at the facility on noise and vibration levels at local properties;
- baseline conditions pertaining to measured (or estimated) existing noise and vibration levels around the facility;
- evaluation criteria;
- prediction of the potential impacts;
- evaluation of these impacts;
- description of mitigation measures which will be incorporated into the design and operation of the facility to eliminate or reduce the potential for noise (or vibration) impacts;
- summary of any residual impacts and reinstatement;
- monitoring proposals.

Baseline studies and subsequent impact assessment were undertaken by:

• Aldona Binchy	MSc.Eng.(Environmental Engineering)	SLR Consulting Ireland
• Colin Doyle	Environmental Technician	Roadstone Dublin Limited

8.2 RECEIVING ENVIRONMENT

8.2.1 Outline of the Baseline Study

The noise impact arising from the continued operation of the C&D waste recovery facility and the proposed quarry backfilling scheme is assessed by comparing predicted noise levels from proposed activities with existing levels of noise in the environment. The existing background noise environment is characterised by undertaking a baseline noise measurement survey at a number of locations around the application site. The objectives of the baseline study are to:

- determine existing noise levels on site
- identify sources of noise
- determine the current impact on the nearest noise sensitive receptors / residents
- use the data collected to predict noise levels associated with future activity at the site
- identify suitable and effective mitigation measures

8.2.2 Baseline Study Methodology

Noise surveys at the Fassaroe site were undertaken on 12 November 2008 and 10 December 2008. Noise measurements were obtained using Norsonic Nor 118 Model Sound Level Meters, which were calibrated using a Norsonic Calibrator 1443. Noise monitoring was carried out at four separate locations around the site within the Roadstone landholding at Fassaroe, designated N1 to N4. The monitoring locations are described below and shown in Figure 8.1.

N1 - at the southern boundary of the site;
N2 - at the south-western boundary of the site;
N3 - at the northern boundary of the site;
N4 - at the eastern boundary of the site.

Station	Date	Monitoring Period	$L_{Aeq(1hr)}$	$L_{A10(1hr)}$	$L_{A90(1hr)}$
N1	12/11/08	8:53 - 9:53	56.4	58.8	48.7
N2	12/11/08	9:57 - 10:57	44.2	45.3	41.3
N3	12/11/08	11:05 - 12:05	56.1	59.0	49.3
N4	12/11/08	12:13 - 13:13	43.3	51.5	46.2
N1	10/12/08	9:30 -10:30	54.6	56.9	44.6
N2	10/12/08	10:33 - 11:33	43.4	44.4	41.4
N3	10/12/08	11:39 - 12:39	42.5	45.2	37.9
N4	10/12/08	12:44 – 13:44	62.4	52.4	46.5

Table 8.1 Baseline Noise Monitoring Survey (2008)

8.2.3 Results of Baseline Monitoring

12 November 2008 : *Weather Conditions: Cloudy, Cold and Calm.*

Location N1
At the time of the baseline survey, noise levels at this location (N1) were predominantly influenced by

- traffic movements along the adjacent road,
- vibrator on the aggregate intake bin

Location N2
At the time of the baseline survey, noise levels at this location (N2) were predominantly influenced by

- vibrator on the aggregate intake bin

Location N3
At the time of the baseline survey, noise levels at this location (N3) were predominantly influenced by

- a loading shovel and truck movements
- a loading shovel working at the aggregate processing plant

Location N4
At the time of the baseline survey, noise levels at this location (N4) were predominantly influenced by

- the aggregate screening plant

10 December 2008 : *Weather Conditions: Sunny, Cold and Calm*

Location N1
At the time of the baseline survey, noise levels at this location (N1) were predominantly influenced by

- traffic movements along the adjacent road,

Location N2
At the time of the baseline survey, noise levels at this location (N2) were predominantly influenced by

- concrete plant
- loading shovel

Location N3
At the time of the baseline survey, there were no discernible extraneous noise sources at this location (N3).

Location N4
At the time of the baseline survey, noise levels at this location (N4) were predominantly influenced by

- traffic movements

Intermittent activity occurred within Roadstone Dublin's landholding throughout the noise monitoring periods, principally traffic (HGV) movements across the site, end tipping of materials and also aggregate processing / screening activities. The recorded averaged ambient noise levels typically range between 43 dBA L_{Aeq} and 55 dBA L_{Aeq} and are consistent with daytime levels around the Greater Dublin Area.

8.3 IMPACT OF RESTORATION WORKS

8.3.1 Short Term Impacts

When the waste recovery facility is operational, the principal sources of additional noise emanating from the application site will be from bulldozer activity and truck movements at the former quarry, as well as intermittent crushing / screening of C&D waste. To determine the noise impact at the site, SLR Consulting carried out a noise prediction assessment, whereby the levels of noise were calculated at the nearest noise sensitive receptors (residences) shown on Figure 8.2.

The noise assessment methodology used was based on BS5228: Part 1 (1997) "Noise and vibration control on construction and open sites – Code of Practice for Basic Information and Procedure for Noise Control".

For the purposes of this assessment, a reduction of -10 to -15dB(A) for full noise screening by berms has been adopted. A reduction of -5 dB(A) has been adopted for partial noise screening. Monitoring of the effects of actual full noise screening by berms indicates that a reduction of -15 to -20 dB(A) is often more realistic. In addition, for the purposes of this noise assessment it is assumed that all of the noise sources are active for a 100% of the time, at the distances stated

during the working hours of the development. On this basis it is considered that the noise assessment is very conservative and represents a worst case scenario.

The following noise sources have been considered in the noise assessment for the facility operation:

- Bulldozer
- HGV truck
- Concrete crusher and associated plant

For the purposes of the noise assessment, it is assumed that a bulldozer will be used to spread the imported inert natural materials when backfilling and restoring the void. HGV trucks will be used to transport the material onto and around the site. A mobile crusher / screener will be used for processing and recovery of inert construction materials for re-use as secondary aggregates.

A noise prediction assessment has been undertaken, whereby the levels of noise arising from the development were calculated at the nearest sensitive receptors R1, R2 and R3 shown on Figure 8.2. Detailed noise assessment calculations are provided in Appendix 8.1

The worst case scenario in relation to the above noise sources occurs when quarry backfilling activity takes place closest to each sensitive receptor, when spreading and compaction plant and HGV trucks are at the shortest distance, refer to Figure 8.2

The noise assessment indicates that the cumulative noise levels arising from the backfilling activities and operation of the crushing/ screening plant at the nearest noise sensitive receptors will, in the worst case scenario, be as follows :

a) Soil placement and compaction at the Northern Boundary Worst Case I (Phase 1) (Refer to Appendix 8.1 – Table (i)):

1 No. Stationary Crusher / Screener, 1 No. Bulldozer and HGV Truck

Combined Noise Level at R1 = **59 dB L_{Aeq}**

Combined Noise Level at R2 = **49 dB L_{Aeq}**

Combined Noise Level at R3 = **49 dB L_{Aeq}**

b) Soil placement and compaction at the Eastern Boundary Worst Case II (Phase 4) (Refer to Appendix 8.1– Table (ii)):

1 No. Stationary Crusher / Screener, 1 No. Bulldozer and HGV Truck

Combined Noise Level at R1 = **56 dB L_{Aeq}**

Combined Noise Level at R2 = **53 dB L_{Aeq}**

Combined Noise Level at R3 = **52 dB L_{Aeq}**

c) Soil placement and compaction at the Southern Boundary Worst Case III (Phase 3) (Refer to Appendix 8.1 – A Table (iii)):

1 No. Stationary Crusher / Screener, 1 No. Bulldozer and Dumper Truck

Combined Noise Level at R1 = **56 dB L_{Aeq}**

Combined Noise Level at R2 = **51 dB L_{Aeq}**

Combined Noise Level at R3 = **53 dB L_{Aeq}**

In relation to noise thresholds, projections show that even in a worst case scenario, the proposed remediation works can progress *without* exceeding the recognised threshold average ambient

noise level of 55dBA L_{Aeq} recommended in the EPA (2006) Environmental Management Guidelines for the Extractive Sector at both Receptor 2 (R2) and Receptor 3 (R3), on the eastern and southern boundaries of the site respectively.

In view of its close proximity to the proposed waste recovery activities and in the absence of appropriate mitigation measures, predicted average ambient noise levels at Receptor 1 (R1) would however be expected to exceed threshold limits for all three scenarios outlined above. This is very much a worst case scenario, as it assumes plant and machinery will be running for 100% of the time, rather than intermittently. In reality this will not occur and average ambient noise levels would be expected to be significantly below those predicted.

Notwithstanding this, it should be noted that the predicted noise levels are only slightly elevated above those recorded at this receptor in the course of the recent baseline noise survey.

8.3.2 Long-Term Impacts

The nature of the proposed backfilling and restoration scheme is such that there will be no long-term impacts in relation to noise. Once quarry backfilling works are complete, there is likely to be significantly less operational and/or traffic noise generated across the application site. Some noise would continue to be generated by C&D waste recovery operations. The reduction in traffic levels along the internal haul roads and over public roads, coupled with the reduction in waste activities at the application site should result in average ambient noise levels falling back to existing levels, with negligible long-term impact on the local environment.

8.3.3 Interaction with other Environmental Receptors

There are no interactions of the identified impacts with other environmental receptors.

8.4 MITIGATION MEASURES

A number of mitigation measures will be put in place to aid noise reduction, at each of the noise sensitive receptors.

It is proposed to monitor average ambient noise levels as backfilling works at the quarry proceed close to residences at the northern, southern and eastern boundaries of the application site (proposed noise monitoring locations N1, N3, N4 and N5 are shown on Figure 8.1).

Should noise monitoring at these locations indicate that threshold average ambient noise limits are exceeded (or likely to be exceeded), provision will be made for a combination of one or more of the following mitigation measures in order to reduce noise levels below threshold limits :

(i) construction of a temporary screening embankment,
(ii) installation of a temporary noise barrier between noise source and receptor(s)
(iii) reduction of noise emissions at source
(iv) management of activities to minimise vehicular movements and/or duration of activities in the vicinity of affected residences.

A screening embankment (or noise barrier), should it be required, will serve to reduce the projection of noise beyond the site boundary as well as screen site activities from view.

Providing mitigation measures outlined above are implemented, predicted residual noise levels experienced at receptor R1 arising from site activities will be maintained at or lower than the noise threshold level of 55dBA. This impact is considered acceptable in view of the overall environmental improvement that the quarry backfilling works will effect.

It is currently envisaged that noise monitoring will be undertaken at the four monitoring locations identified above on a quarterly basis while waste recovery activities are ongoing. This monitoring regime is in line with standard conditions attaching to EPA licences for waste facilities.

REFERENCES

British Standards Institute (1997) : *British Standard 5228 : Noise and Vibration Control on Construction and Open Sites*

Environmental Protection Agency (EPA) (1995) *Integrated Pollution Control Licensing – Guidance Notes for Noise in Relation to Scheduled Activities*

Department of Environment (UK) (1993) *Minerals Planning Guidance : The Control of Noise at Surface Mineral Workings (MPG)*

FIGURES

N3

N5 (PROPOSED)

N2

N4

N1

SILT POND / CLOSED DEPRESSION

EXISTING POND

SILT AREA

EXISTING POND

0 50 100 150 200m 300 400 500

Metres
1:5000

0059.00017.18.FIG 8.1.0.NOISE MONITORING LOCATIONS

N

W E

S

NOTES

1. Based on OSi 6inch sheet no. 21

2. Ordnance Survey Ireland Licence no. SU 0000709 (c) Ordnance Survey of Ireland & Government of Ireland

LEGEND

Applicant's Land Interest (c. 65.1 ha)

Waste Licence Application Area (c. 21.4 ha)

N1 *Noise Monitoring Locations*

R *Location of Residences*

Building

roadstone

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FORTUNESTOWN
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DUBLIN 24

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WASTE LICENCE APPLICATION

FASSAROE WASTE RECOVERY FACILITY
FASSAROE, BRAY, CO.WICKLOW

NOISE MONITORING LOCATIONS

FIGURE 8.1

Scale
1:5,000 @ A3

Date
APRIL 2009

N
W E
S

Stationary Screener/Crusher
Compacting Plant
PHASE 1
EXISTING POND
PHASE 2
SILT AREA
PHASE 3
SILT AREA
PHASE 4
EXISTING POND
Compacting Plant
Compacting Plant
SILT POND / CLOSED DEPRESSION
R1
R2
R3
230
135
100
430
510
570
620
260
360
620
280
295

0 50 100 150 200m 300 400 500
Metres
1:5000

0059.00017.18.FIG 8.2.0.NOISE ASSESSMENT

NOTES

1. Based on OSi 6inch sheet no. 21

2. Ordnance Survey Ireland Licence no. SU 0000709
(c) Ordnance Survey of Ireland & Government of Ireland

LEGEND

- Applicant's Land Interest (c. 65.1 ha)
- Waste Licence Application Area (c. 21.4 ha)
- R1 — Noise Receptor Locations
- R — Location of Residences
- Building
- 420 — Distances (in metres)
- Phase Sections

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WASTE LICENCE APPLICATION

FASSAROE WASTE RECOVERY FACILITY
FASSAROE, BRAY, CO.WICKLOW

NOISE ASSESSMENT

FIGURE 8.2

Scale: 1:5,000 @ A3

Date: APRIL 2009

APPENDIX 8.1

DETAILED NOISE ASSESSMENT

Appendix 8.1 – Noise Assessment (Refer to Figure 8.2)

Table (i) Soil placement and compaction at the Northern Boundary Worst Case I

Plant Type	Average L_{Aeq} at 10m (dB(A))	Screening (dB(A))			Reflection (dB(A))			Activity Distance (m)			Attenuation with Distance (dB(A))			Activity L_{Aeq} (dB(A))		
		R1	R2	R3	R1	R2	R3	R1	R2	R3	R1	R2	R3	R1	R2	R3
Bulldozer	73	-5	-5	-5	+3	+3	+3	135	510	625	22	34	35	49	37	36
HGV Truck	80	-5	-5	-5	+3	+3	+3	135	510	625	22	34	35	56	44	43
Screener	85	-5	-5	-5	+3	+3	+3	230	570	620	27	35	35	56	48	48

Combined Noise Level at R1 = **59 dB L_{Aeq}**

Combined Noise Level at R2 = **49 dB L_{Aeq}**

Combined Noise Level at R3 = **49 dB L_{Aeq}**

Table (ii) Soil placement and compaction at the Eastern Boundary Worst Case II

Plant Type	Average L_{Aeq} at 10m (dB(A))	Screening (dB(A))			Reflection (dB(A))			Activity Distance (m)			Attenuation with Distance (dB(A))			Activity L_{Aeq} (dB(A))		
		R1	R2	R3	R1	R2	R3	R1	R2	R3	R1	R2	R3	R1	R2	R3
Bulldozer	73	-5	-5	-5	+3	+3	+3	400	260	295	32	28	29	39	43	42
HGV Truck	80	-5	-5	-5	+3	+3	+3	400	260	295	32	28	29	46	50	49
Screener	85	-5	-5	-5	+3	+3	+3	230	570	620	27	35	35	56	48	48

Combined Noise Level at R1 = **56 dB L_{Aeq}**

Combined Noise Level at R2 = **53 dB L_{Aeq}**

Combined Noise Level at R3 = **52 dB L_{Aeq}**

Table (iii) Soil placement and compaction at the Southern Boundary Worst Case III

Plant Type	Average L_{Aeq} at 10m (dB(A))	Screening (dB(A))			Reflection (dB(A))			Activity Distance (m)			Attenuation with Distance (dB(A))			Activity L_{Aeq} (dB(A))		
		R1	R2	R3	R1	R2	R3	R1	R2	R3	R1	R2	R3	R1	R2	R3
Bulldozer	73	-5	-5	-5	+3	+3	+3	430	360	280	32	31	28	39	40	43
HGV Truck	80	-5	-5	-5	+3	+3	+3	430	360	280	32	31	28	46	47	50
Screener	85	-5	-5	-5	+3	+3	+3	230	570	620	27	35	35	56	48	48

Combined Noise Level at R1 = **56 dB L_{Aeq}**

Combined Noise Level at R2 = **51 dB L_{Aeq}**

Combined Noise Level at R3 = **53 dB L_{Aeq}**