SECTION 8: NOISE AND VIBRATION

8.1 INTRODUCTION

This EIS section, prepared by John Barnett and Associates, addresses the noise and vibration aspects of the backfilling and restoration scheme at a former sand and gravel quarry operated by Behan's Land Restoration Ltd. at Blackhall, Co. Kildare. The restoration scheme essentially provides for the importation and placement of inert soils, stones and construction materials (principally block, brick, concrete, paving stones, granular fill, ceramics etc) within the existing void space. It also provides for processing and recovery of inert construction materials for re-use as secondary aggregate wither on-site, as part of the restoration scheme, or off-site.

The report will discuss the levels of both noise and vibration associated with existing activities at the site under review, and assess the increase in these levels, if any, generated by continuation of these works in future years.

Baseline studies and subsequent impact assessment were undertaken by

- Ann Clancy BSc. (Hons) (Environmental Management)
- Lorraine Holland BSc. (Hons) (Environmental Management)
- Sinead McDonnell BSc. (Hons) (Environmental Management)

8.2 RECEIVING ENVIRONMENT

8.2.1 Outline of the Baseline Study

The noise impact of the proposed restoration 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 were undertaken on the 5 April 2007 and the 10 October 2007. Noise measurements were obtained using Larson Davis 824 and 812 Model Sound Level Meters, which were calibrated using a Larson Davis Calibrator CAL 200. Noise monitoring was carried out at three separate locations around the applications site, designated N1 to N3. The monitoring locations are described below and shown in Figure 8.1.

N1 - at the western boundary of the site,
N2 - at the southern boundary of the site,
N3 - at the north eastern boundary of the site.

Station	Date	Monitoring Period	$L_{Aeq(1hr)}$	$L_{A10(1hr)}$	$L_{A90(1hr)}$
N1	05/04/2007	12:06 – 13:06	48.7	51.8	36.2
N2	05/04/2007	12:17 – 13:17	46.6	47.5	36.9
N3	05/04/2007	10:50 – 11:50	49.3	52.1	36.2
N1	10/10/2007	11:45 – 12:45	61.7	63.7	57.1
N2	10/10/2007	13:05 – 14:10	49.4	50.6	38.9
N3	10/10/2007	14:20 – 15:20	43.7	46.9	35.6

Table 8.1 Baseline Noise Monitoring Survey (2007)

8.2.3 Results of Baseline Monitoring

05 April 2007 *Weather Conditions: Bright and Sunny, 16^{0}C, Wind Speed 0.6 – 1.5 m/s*

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,
- loud music coming from the residence beside the monitoring location,
- noise coming from across the road from the monitoring location, possibly tree cutting.

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

- traffic movements along the adjacent road,
- sounds from birds and sheep,
- helicopters flying overhead.

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

- bird song,
- a lawnmower working intermittently at the house closest to the monitoring location

10 October 2007 : *Weather Conditions: Sunny, 50% Cloud, 18^{0}C, Wind Speed 1.2 m/s*

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,
- sounds from dogs barking throughout the monitoring period,
- helicopters flying overhead.

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

- traffic movements along the adjacent road,

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

- animal sounds coming from close to the monitoring location,
- a car horn beeping during the monitoring.

Intermittent activity occurred at the application site throughout the noise monitoring periods, principally traffic (HGV) movements in and around the site and end tipping. The recorded averaged ambient noise levels typically range between 45 dBA L_{Aeq} and 50 dBA L_{Aeq} and are consistent with daytime levels in rural areas in and around the Greater Dublin Area.

8.3 IMPACT OF RESTORATION WORKS

8.3.1 Short Term Impacts

During the site restoration period, the principal sources of additional noise around the application site will be from bulldozers and dump truck movements. To determine the impact of the proposed backfilling activities at the site, John Barnett and Associates carried out a noise prediction assessment, whereby the levels of noise were calculated at the nearest noise sensitive receptors (residences) shown on Figure 8.1.

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 screening has been adopted, and -5 dB(A) for partial screening. Monitoring of the effects of actual full screening berms indicates that a reduction of -15 to -20 dB(A) is more realistic. In addition, in this 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 pit operation:

- Bulldozer
- Dump truck

The worst case scenario in relation to the above noise sources occurs when the activity takes place closest to the sensitive receptor. This arises when soil placement and compaction takes place at the shortest distance to the receptors, refer to Figure 8.1.

A detailed noise assessment is provided in Appendix 8.1. This assessment indicates that the cumulative noise levels arising from the backfilling / concrete plant operations at the nearest noise sensitive receptors will, in the worst case scenario, be:

R1: 66 dB(A)

R2: 51 dB(A)

R3: 60 dB(A)

A bulldozer will be used to spread the imported inert natural materials to backfill and restore the void. HGV trucks will be used to transport the material on to and around the site.

In relation to noise thresholds – projections show that 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 Receptor 2 (R2), on the southern boundary of the site.

Due to their proximity to the activity, the predicted average ambient noise levels for Receptor 1 and Receptor 3 (R1 and R3) are higher, at 66 dB(A) at R1 and 60dB(A) at R3 without implementation of mitigation measures. 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 noise levels would be expected to be significantly below those predicted.

Notwithstanding this, while there could be a significant short-term noise impact during working hours when restoration works are ongoing at the site boundary adjoining these residences, it will be of relatively limited duration (period of weeks).

8.3.2 Long-Term Impacts

The nature of the proposed remediation scheme and are such that there will be no long-term impacts in relation to noise. Once remediation works are complete, there will be no operational or traffic noise generated at the site. The reduction in traffic levels along the local road, coupled with the reduction in activity at the application site should lead to reduction in average ambient noise levels, which will have a minor positive impact.

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 site activities near residences at the north-eastern and south-western boundaries. Should these 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 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 will screen site activities from view and reduce the projection of noise beyond the site boundary.

While the noise levels experienced at R1 and R3 will be above existing levels, any impact will be short-term in nature, of the order of a few weeks. This impact is considered acceptable in view of the overall environmental improvement that the site restoration works will effect.

It is currently envisaged that noise monitoring during the site restoration works will be undertaken at the three monitoring locations identified above on a quarterly basis.

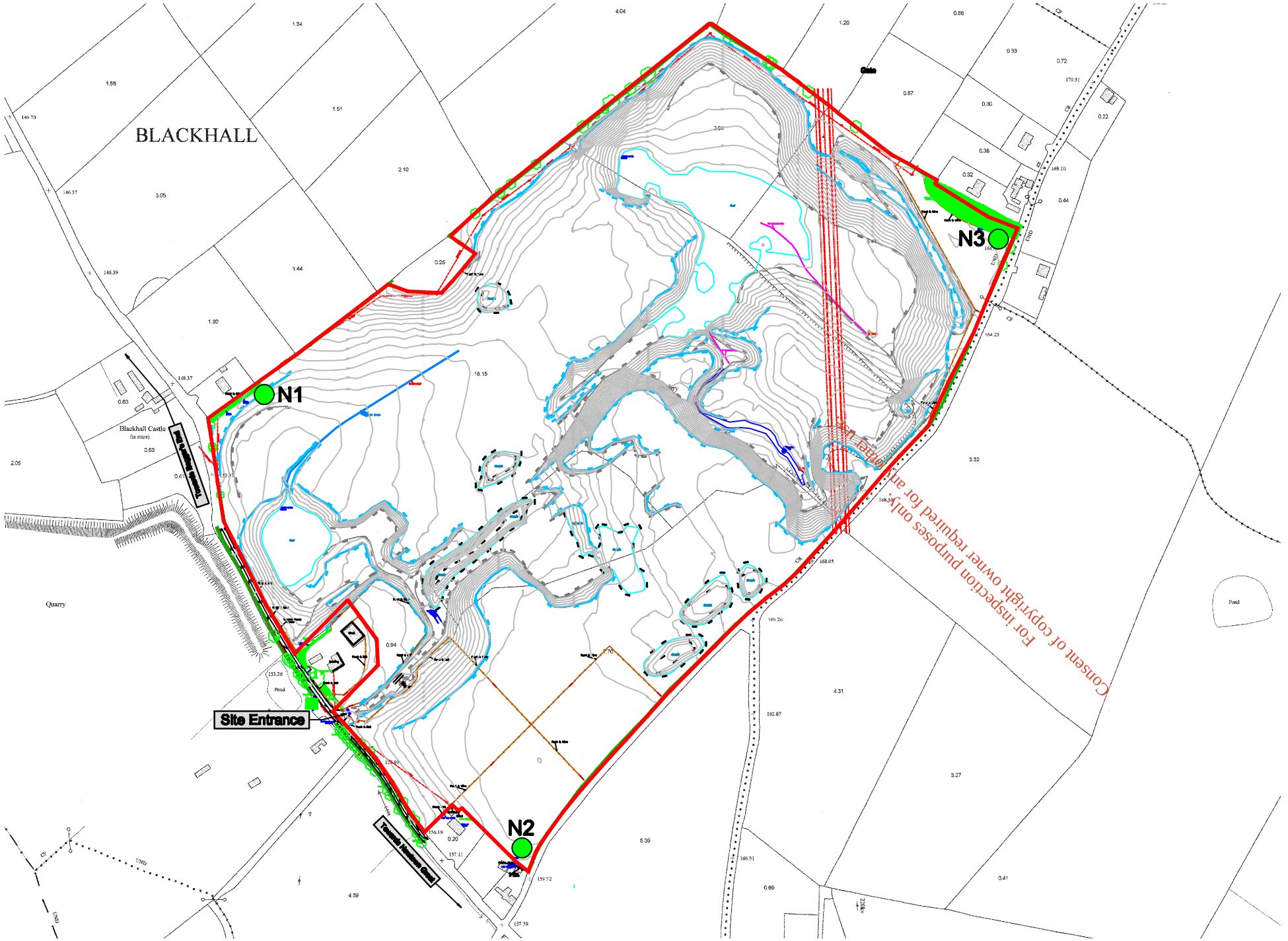
REFERENCES

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



Legend

- Application Site
- Gateway
- Deciduous Tree
- Sewer Manhole and details
- Fence
- Building
- ESB/Eircom Pole and Cable
- Embankment
- Wall
- Trees
- Ditchline
- N3 Noise Monitoring Locations

BEHAN'S LAND RESTORATION LTD.
BLACKHALL, PUNCHESTOWN
NAAS, CO. KILDARE

JOHN BARNETT & ASSOCIATES
7 DUNDRUM BUSINESS PARK
WINDY ARBOUR
DUBLIN 14

LEGEND AND NOTES:

Rev.	Date	By	Description
1	FEB 08	MK	
0	FEB 08	LMC	

Site:	LANDS AT BLACKHALL, CO. KILDARE	
Project:	RESTORATION OF FORMER GRAVEL PIT	
Title:	NOISE MONITORING LOCATIONS	
Drawn: MK	Scale: 1:5000	**FIGURE 8.1**
Job. No: 3746	Date: March 2008	

APPENDIX 8.1

DETAILED NOISE ASSESSMENT

Detailed Noise Assessment

Restoration of the Site (refer to Figure 8.1) : Worst Case Scenario

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
Bulldozer	73	-10	-5	-10	+3	25	250	50	-8	-28	-14	58	43	52
HGV / Dumper Truck	80	-10	-5	-10	+3	25	250	50	-8	-28	-14	65	50	59

Combined Noise Level at R1 = **66dB L_{Aeq}**

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

Combined Noise Level at R3 = **60dB L_{Aeq}**