Appendix 7.1 Noise Study IPC Licence Application, 1999

BORD NA MÓNA

BORD NA MÓNA ENVIRONMENTAL LIMITED

AN ASSESSMENT OF THE NOISE EMISSIONS FROM PRE-SELECTED LOCATIONS IN COMPLIANCE WITH THE REQUIREMENTS OF BORD NA MÓNA'S INTEGRATED POLLUTION CONTROL LICENCE APPLICATION

REPORT NO: K960-N

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1.0 INTRODUCTION

As part of the requirements of their Integrated Pollution Control Licence applications Bord na Mona Energy Limited are required to assess each site in relation to its noise output. Due to the expansive mass of the sites and their similarity in terms of production activity it was proposed to choose two sites as a basis for a preliminary noise assessment, namely, the Allen Group and the Boora Group.

Perimeter and noise sensitive measurements (day and night) were taken at both an active production area and an area proposed for production. Subsequent additional noise assessments will be undertaken on commencement of peat harvesting activities.

At all locations rail movement was considered the most dominant noise source. Noise levels were monitored at the source and a prediction of the projected noise level at the nearest sensitive location is given. In all cases background measurements were determined. The sites were subsequently visited by Bord na Móna Environmental Consultants on the 5th , 8th and 19th of May 1999.

This report presents the results of the assessment together with details of the methodologies employed. A broad interpretation of the results is also included.

2.0 METHODOLOGY

Noise measurements were conducted using a Cirrus Noise Sound Level Meter type 703A. the following parameters were applied to the measurements:

Time Weighting	Fast
Frequency Weighting	A
Field	Frontal
Range	31.1 - 143.2

2.1 Sample Locations

2.1.1 All measurements were taken at 1.5 m height above local ground level and 1-2 m away from reflective surfaces.

The sample locations and grid references are detailed in Table 2.1 below.

TABLE 2.1. SAMPLE LOCATIONS		
ALLEN GROUP		
Reference ID	**Grid Reference**	**Description of Location**
N1	E250660, N222170	Perimeter of Ballykeane Bog
N2	E250930, N222225	Noise sensitive at Ballykeane Bog
N3	E271300, N227625	Perimeter of Killinagh bog
N4	E271430, N227650	Noise sensitive at Killinagh bog
N5	E253700, N225925	Bridge over the railway track at Ballycon Workshop
BOORA GROUP		
N6	E220225, N223800	Level crossing near Pollagh Bog

A map outlining the locations is given in Appendix 1

2.2 Measurement Parameters

2.2.1 L_{eq} Values

L_{eq} (t) values represent the continuous equivalent sound level over a specified time (t). This value expresses the average levels over time and is a linear integral.

2.2.2 Max P Values

The Max P value represents the maximum sound pressure level produced by a source during the monitoring period.

2.2.3. L_{90} and L_{10} Values

The L_{90} and L_{10} values represent the sound levels exceeded for a percentage of the instrument measuring time. L_{10} indicates that for 10% of the monitoring period, the sound levels were greater than the quoted value. L_{10} is a good statistical parameter for expressing event noise such as passing traffic. The L_{90} represents post event sound levels and is a good indicator of background noise levels.

2.2.4 Source Noise Predictions

Rail movement was considered the most likely noise source to generate noise outside the site boundary. It was therefore necessary to predict the contribution of this noise source to the noise levels at the nearest noise sensitive. These predictions have been done in all cases using the inverse square law, which is a "rule-of-thumb" used to calculate the expected reduction in noise levels as one moves away from the source. Generally, as one doubles the distance from the source, a reduction of 6 dB is expected. Within a confined space, however, this rule is generally broken due to reflection, where a diffuse field is set up at a level higher than that expected from this law.

The Inverse Square law is defined as.

$$Lp_2 = Lp_1 - 20 \text{ Log } (R2/R1) \quad \text{where}$$

Lp_2 is the calculated sound pressure level at R2 meters from the source

Lp_1 is the measured reference sound pressure level at Rl meters from the source

3.0 CALIBRATION

The noise level meter was calibrated before and after all measurements. Calibration and equipment details are presented below:

Noise Meter Serial No. 024818
Calibrator Cert No. 101114
Set Level 94.0dB(A)

4.0 RESULTS

4.1 Climatic Conditions

5/5/99 Dry and breezy (wind speed <5m/s) with average temperatures of 10°-12°.

8/5/99 Dry and breezy (wind speed <5m/s) with average temperatures of 10°-12°.

19/5/99 Dry and calm with average temperatures of 8°-11°.

4.2 Noise Measurements

TABLE 4.1.1: RESULTS OF BACKGROUND NOISE MEASUREMENTS AT BALLYKEANE BOG ON 5/5/99 (DAY-TIME)

Ref. No.	Period (mins)	Start Time	L_{eq} dB(A)	L_{10} dB(A)	L_{90} dB(A)	Max P. dB(A)
N1	5	10:00	41.1	42.1	32.0	58.7
N2	5	10:22	45.2	46.6	32.8	64.2

TABLE 4.1.2: RESULTS OF NOISE MEASUREMENTS AT BALLYKEANE BOG DURING MILLING OPERATIONS ON 5/5/99 (DAY-TIME)

Ref No.	Period (mins)	Start Time	L_{eq} dB(A)	L_{10} dB(A)	L_{90} dB(A)	Max P. dB(A)
N1-1[1]	5	10:58	60.5	61.9	40.7	80.4
N1-2[1]	5	11:06	46.9	48.0	40.2	61.1
N2	5	10:42	45.0	45.2	33.0	63.2

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TABLE 4.1.3: RESULTS OF BACKGROUND NOISE MEASUREMENTS AT BALLYKEANE BOG ON 19/5/99 (NIGHT-TIME)

Ref. No.	Period (mins)	Start Time	L_{eq} dB(A)	L_{10} dB(A)	L_{90} dB(A)	Max P. dB(A)
N1	5	22:30	31.7	31.9	31.1	50.0
N2-1[1]	5	22:46	56.9	36.1	31.1	83.0
N2-2[1]	5	22:53	49.4	37.1	31.1	72.6

Notes: 1. Duplicate Measurements

2. Milling operations at Ballykeane bog only occur during daytime hours. In addition, no rail movement occurs near N1 or N2.

TABLE 4.2.1: RESULTS OF BACKGROUND NOISE MEASUREMENTS AT KILLINAGH BOG ON 5/5/99 (DAY-TIME)						
Ref. No.	Period (mins)	Start Time	L_{eq} dB(A)	L_{10} dB(A)	L_{90} dB(A)	Max P. dB(A)
N3	5	12:30	42.8	45.3	38.1	56.4
N4	5	12:41	42.0	44.4	35.1	59.3

TABLE 4.2.2: RESULTS OF BACKGROUND NOISE MEASUREMENTS AT KILLINAGH BOG ON 8/5/99 (NIGHT-TIME)						
Ref. No.	Period (mins)	Start Time	L_{eq} dB(A)	L_{10} dB(A)	L_{90} dB(A)	Max P. dB(A)
N3	5		31.9	32.4	31.2	43.7
N4	5		32.4	32.0	31.2	51.7

Note: There was no production at Killinagh bog during the noise assessment

TABLE 4.3.1: RESULTS OF BACKGROUND NOISE MEASUREMENTS AT RAIL LOCATIONS (DAY-TIME)						
Ref. No.	Period (mins)	Start Time	L_{eq} dB(A)	L_{10} dB(A)	L_{90} dB(A)	Max P. dB(A)
N5	5	13:37	50.9	51.2	42.8	70.9
N6	5	15:51	59.2	55.8	48.2	80.1

TABLE 4.3.2: RESULTS OF NOISE MEASUREMENTS DURING RAIL MOVEMENT (DAY-TIME)						
Ref. No.	Period (mins)	Start Time	L_{eq} dB(A)	L_{10} dB(A)	L_{90} dB(A)	Max P. dB(A)
N5	5	13:25	76.7	79.8	46.9	100.6
N6-1	5	15:57	65.3	68.5	55.2	91.2
N6-2	5	15:44	62.1	63.6	47.8	80.0

TABLE 4.3.3: PREDICTED NOISE LEVELS AT THE NEAREST NOISE SENSITIVE LOCATIONS			
Ref. No.	Distance from source to the actual L_{eq} dB(A) measurement (m)	Distance from source to the nearest noise sensitive location (m)	Predicted L_{eq} dB(A) at the nearest noise sensitive location
N5	2	400	30.7
N6-1	30	50	60.9
N6-2	30	50	57.7

5.0 DISCUSSION

Ballykeane Bog - During milling operations

Tables 4.1.1 to 4.1.3 above present the results of the noise monitoring assessment undertaken at Ballykeane Bog, Allen Group. Background measurements were taken during daytime and night-time hours (Tables 4.1.1 and 4.1.2). At the noise sensitive location, N2, which is located approximately 150m from the perimeter, both of the elevated background levels recorded at night were attributable to the passing of cars on the road adjacent to the house and the noise emanating from a gun that was discharged nearby. A more representative indication of noise levels are the L_{90} Values both recorded at 31.1dB(A). These values are typical of the background noise without the noise emanating from the aforementioned sources. During the day the main contributor to the noise level at N2 was a tractor in operation nearby.

Two measurements were taken at the perimeter of the bog during milling operations (Table 4.1.3) as follows:

- N1-1 Three milling units in operation at the perimeter of the bog.
- N1-2 Three milling units at various locations on the bog.

The measurement at N1-1 depicts the worst case scenario and results in a L_{eq} of 60.5dB(A). However at the noise sensitive location no noise attributable to the bog was audible. Furthermore an L_{eq} of 45dB(A) was recorded at N2 which is below the recommended daytime guideline of 55dB(A).

Killinagh bog- Background

This bog was chosen as the rear of the nearest residence is located less than 50m from the perimeter of the bog. Although this bog was inactive during the monitoring period, preliminary measurements were taken to assess the background levels in the area. It is proposed to monitor noise levels at this location as soon as production commences. At this residence both the daytime and night-time background measurements were significantly below the recommended guidelines of 45dB(A) at night and 55dB(A) during the day.

Noise Source Predictions

Predictions of the contribution of the locomotive noise source to the noise levels at the nearest noise sensitive locations are presented in table 4.3.3.

Location N5, Allen Group:

During the day of monitoring milled peat produced from the Esker bog was transported via rail to the one of the Bord na Móna Briquette Factories. Typically, milled peat trains operate in pairs. Therefore, to assess the maximum noise source level a measurement was taken at the bridge beside Ballycon workshop as two locomotives were passing. This bridge (N5) is located approximately 400metres from the nearest residence. The result of the predicted noise level at this location (30.7dB(A))is significantly below the BATNEEC guidance level of 55dB(A).

Location N6, Boora Group : Pollagh

At Pollagh bog the nearest residence is located approximately 50metres from the level crossing. Measurements were taken at approx. 30metres from this crossing as follows:

1. Background - in the absence of rail movement
2. During transport operations - two milled peat trains
3. During transport operations - a mobile rail fuelling/service unit

During all measurements work was being carried out by a private peat operatior on a section of the bog adjacent to the level crossing. This activity accounted for the elevated background measurement at this location. The maximum predicted noise level at the nearest residence is 60.9dB(A) which exceeds the recommended guideline of 55dB(A). However, it should be noted that the background level recorded was 59.2dB(A) which is also in exceedence of same.

Appendix 1

LOCATION OF NOISE MONITORING LOCATIONS - ALLEN GROUP

BORD NA MÓNA
ENVIRONMENTAL LIMITED
NEWBRIDGE, CO. KILDARE

Project:
BORD NA MONA ENERGY LIMITED
IPC LICENCE APPLICATION

Title: ALLEN GROUP
NOISE EMISSIONS

SCALE: 1 – 50000

Drawn:	Checked:
Date: May '99	Drg. No.12.1

BORD NA MÓNA
ENVIRONMENTAL LIMITED
NEWBRIDGE, CO. KILDARE

Project:
BORD NA MONA ENERGY LIMITED
IPC LICENCE APPLICATION

Title: BOORA GROUP
NOISE EMISSIONS

SCALE: 1 – 50000

Drawn:	Checked:
Date: May '99	Drg. No.12.1