

**1.0 INTRODUCTION**

Milltown Compost operates a composting site at Milltown Mor, Fethard, Co. Tipperary. Matrix Environmental were contracted to carry out a dust deposition survey in order to assess the dust contribution from on site activities in the area of the compost. To this end an Environmental consultant subsequently visited the site on the 17<sup>th</sup> of September 2008 to install the dust gauges and on the 15<sup>th</sup> October to collect the dust gauges.

This report presents details of both the methodologies employed and results obtained.

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**2.0 METHODOLOGIES**

**2.1 Dust Survey**

Dust monitoring was conducted using dust gauges conforming to the Standard Method VD12119 (Measurement of Dustfall, Determination of Dustfall using Bergerhoff Instrument (Standard Method) German Engineering Institute). Each dust-sampling bottle was securely capped after the recommended exposure period of between 28 and 31 days. The samples were then returned to the laboratory for gravimetric analysis. The collected sample material is rinsed into a pre weighed evaporating dish and evaporated down to dryness. The total dry residue, which comprises both insoluble and soluble dust, is then determined. Results are expressed in mg/m<sup>2</sup>/day.

The following is a detailed description of the dust monitoring points:

Measurement No.	Location
D1	On ditch south of the main processing area.
D2	At entrance to field to north of main processing area.
D3	On northeastern boundary of site.

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**3.0 RESULTS**

Tables 3.1 present the results of the dust deposition survey carried out at the Milltown Mor site during September / October 2008.

<b>TABLE 3.1: DUST MEASUREMENT RESULTS</b>			
<b>Location No.</b>	<b>Measurement Period (days)</b>	<b>Dust Deposition (mg/m<sup>2</sup>/day)</b>	<b>County Council Permit Limit (mg/m<sup>2</sup>/day)</b>
D1	28	88	350
D2	28	211	350
D3	28	170	350

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**4.0 DISCUSSION**

**Dust:**

The levels of dust deposition measured at all locations were within the County Council permit limit value of 350 mg/m<sup>2</sup>/day.

The maximum dust result for the survey period was 211 mg/m<sup>2</sup>/day at location D2 that is located at entrance to field to north of main processing area. This confirms the previous monitoring carried out in November 2008, which also resulted in the maximum result at location D3. The result at the northeastern boundary (location D3) was 170 mg/m<sup>2</sup>/day. The result for the ditch to the south of the main processing buildings (location D2) was 88 mg/m<sup>2</sup>/day; this result is similar to previous results for this location.

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Matrix Environmental

**Monitoring of Daytime  
Noise Levels at the  
Milltown Compost Site Milltown  
Mor, Fethard  
Co. Tipperary.  
October 2008**

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**For the Attention of:**

Mr Patrick Boardman  
CTO Greenclean  
Blakes Cross  
Lusk  
Co. Dublin

**Prepared by:**

Mr. Craig Mallinson  
Environmental Consultant

**Ref: Noise 2008**

**Date: November 2008**

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### Executive Summary

Matrix Environmental was contracted by Milltown Compost, to conduct the annual noise survey at the site in Milltown Mor in order to determine the noise levels at the facility. To this end an Environmental consultant subsequently visited the site on the 15<sup>th</sup> of October 2008 to carry out a day-time noise survey.

The results of the noise survey carried out on the 15<sup>th</sup> of October 2008 at the facility resulted in a  $L_{Aeq}$  result of 40 dB (A) 30-minutes, at a location approximately half way between the facility and the NSL. The site is therefore considered to be in compliance with the permit noise limit of limit of 55 dB (A) at a nearest sensitive receptor (NSL).

No nighttime monitoring was carried out at the facility as the site operating hours are from 08:00 to 18:00, these hours are outside the standard nighttime hours, also the results for the daytime monitoring of 38 dB (A) is within the typical nighttime limit of 45 dB (A).

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## 1.0 INTRODUCTION

Milltown Compost operates a composting site at Milltown Mor, Fethard, Co. Tipperary. Matrix Environmental were contracted to carry out a daytime noise survey in order to assess the noise contribution from on site activities in the area of the compost site and at the nearest sensitive receptor to the compost site. The site was subsequently visited on the 15<sup>th</sup> of October 2008 to undertake the noise survey. This report presents details of both the methodologies employed and results obtained.

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## 2.0 METHODOLOGIES

### 2.1 Measurement Parameters

#### 2.1.1 L<sub>AeqT</sub> Values

L<sub>AeqT</sub> 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.

#### 2.1.2 L<sub>AF Max</sub>

The maximum RMS, A-Weighted sound pressure level occurring within a specified time period.

#### 2.1.3 L<sub>90</sub> and L<sub>10</sub> Values

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

### 2.2 Standards and Guidance

The acoustic assessment and subsequent report are in accordance with International Standard Organisation (ISO) 1996 Acoustics – Description and Measurement of Environmental Noise Part 1, 2, and 3 in addition to the Environmental Protection Agency: Environmental Noise Survey – Guidance Document

### 2.3 Site information

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

2.3.2 The weather was dry and calm at the time of the assessment.

2.3.3 Table 2.2 describes the locations of the monitoring positions for the noise monitoring assessment.

#### 2.3.4 Monitoring Locations

The following is a detailed description of the noise monitoring points:

Measurement No.	Location
N1	On entrance road into facility app 250 m from processing building
N2	At entrance to field to north of main processing area (See map appendix 1)

### 3.0 INSTRUMENTATION EQUIPMENT USED

The following equipment was employed during the acoustic assessment on 15<sup>th</sup> of October 2008.

Bruel & Kjaer Real-Time Noise Analyzer Type 2260 Observer with Sound Analysis Software BZ 7210:

Model No: 2260

Date of Certificate and Calibration

4<sup>th</sup> November 2007

Microphone Type: B&K 4936

Tripod

#### On Site Calibration

The instrument was calibrated immediately before and after the measurement periods with no drift in calibration level noted.

#### 4.0 RESULTS

Tables 4.1 present the results of the noise monitoring survey carried out at the Milltown Mor site on the 15<sup>th</sup> of October 2008.

TABLE 4.1: NOISE MEASUREMENT RESULTS					
Location No.	Measurement Period (min)	L <sub>eq</sub> dB(A)	L <sub>10</sub> dB(A)	L <sub>90</sub> dB(A)	L <sub>F Max</sub> dB(A)
1	30	40	45	34	49
2	30	50	57	44	61

No night time monitoring was carried out at the facility

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## 5.0 DISCUSSION

### Noise.

**Location N1:** On roadway at entrance to the facility (App 250 meters from Buildings). This location is in the direct

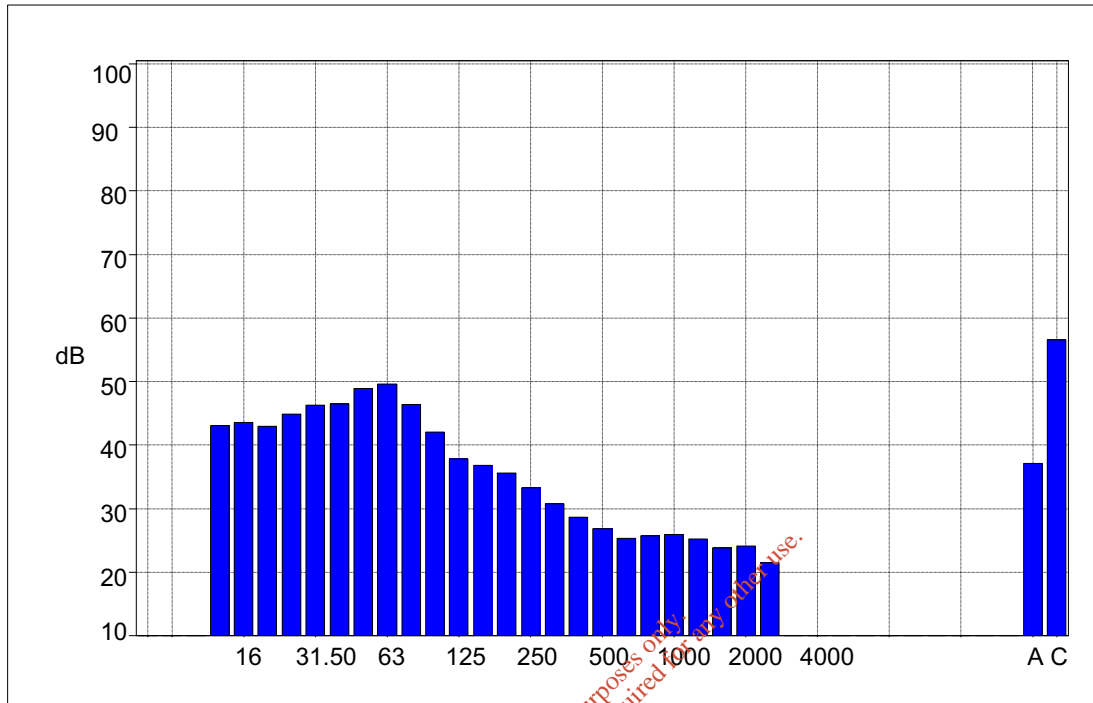
Throughout the monitoring period the composting operations were in progress. The  $L_{Aeq}$  result of 40dB is not considered significant and is well below the recognised daytime limit of 55 dB (A) for industrial units. The NSL is located a further 200 – 300 meters from this location and it can therefore be assumed that the noise from the facility will not impact on the NSL. No tonal noise observed (See Appendix 1 for tonal graph)

**Location N2:** At entrance to field to north of main processing area.

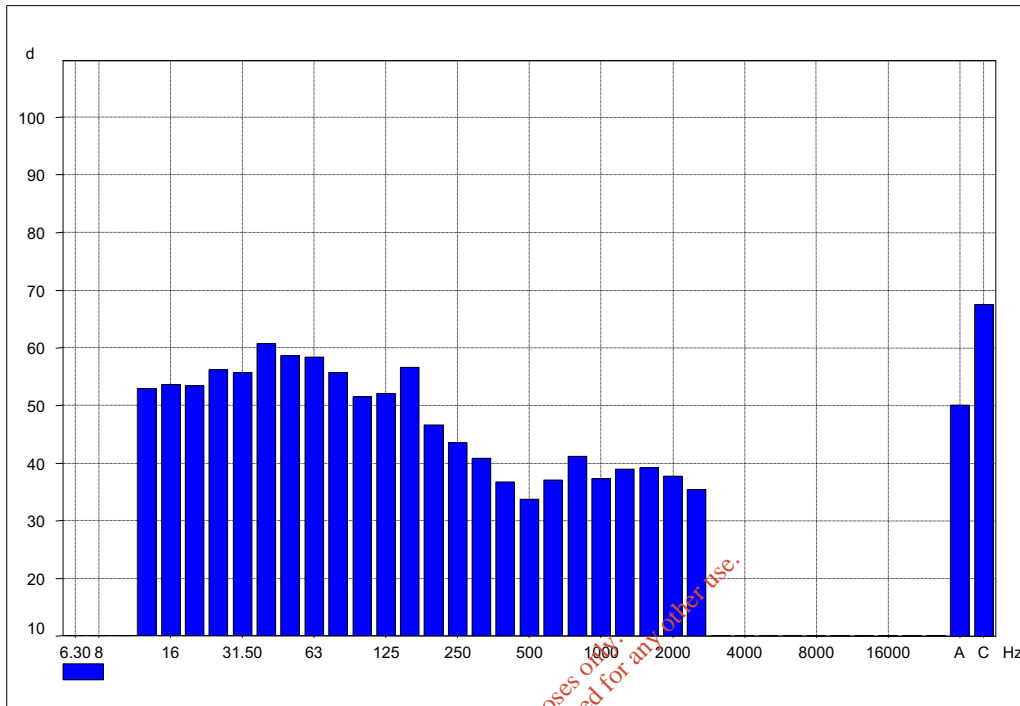
Throughout the monitoring period the composting operations were in progress. The  $L_{Aeq}$  result of 50dB is not considered significant and is well below the recognised daytime limit of 55 dB (A) for industrial units. The NSL is located a further 500 – 600 meters from this location and it can therefore be assumed that the noise from the facility will not impact on the NSL. No tonal noise observed (See Appendix 1 for tonal graph)

**Appendix 1**  
**Tonal Graph**

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**Sensitive Receptor N1 - Tonal Graph**



**N2 - Tonal Graph**

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## Appendix 2

### Monitoring Locations

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***ANNUAL BIOAEROSOL MONITORING***  
***AT THE***  
***MILLTOWN COMPOST SITE,***  
***MILLTOWN MOR, FETHARD,***  
***Co. TIPPERARY.***  
***OCTOBER 2008***

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**For the Attention of:**

Mr Patrick Boardman  
CTO Greenclean  
Blakes Cross  
Lusk  
Co. Dublin

**Prepared by:**

Mr. Craig Mallinson  
Environmental Consultant

**Ref: Bioaerosols Monitoring 2008**

**Executive Summary**

Matrix Environmental was contracted by Milltown Compost to undertake bioaerosol sampling and analysis at their facility at in Milltown Mor, County Tipperary, in order to assess current levels of bioaerosols (*Total Fungi/Bacteria* and *Aspergillus fumigatus*) at the facility. The site was subsequently visited by an Environmental Consultant on the 24<sup>th</sup> of October 2008 to conduct the monitoring event.

The bioaerosol sampling was undertaken at three locations in the vicinity of the facility (1) Nearest Sensitive Receptor, (2) 25 meters upwind of site boundary and (3) down wind of Site boundary. These locations were selected following a review of the prescribed sampling locations in the UK Composting Association's – *Standardized Protocol for the Sampling and Enumeration of Airborne Micro-organisms at Composting Facilities.1999*

The concentration of bioaerosols detected is low with the highest levels recorded at the downwind and sensitive receptor locations. No *Aspergillus fumigatus* was detected during the monitoring event.

The recorded levels reflect the on-site meteorological conditions during the sampling period.

This report is certified as accurate and representative of the sampling and associated analysis carried out.

## 1.0 INTRODUCTION

In compliance with the requirements of their waste permit Milltown Compost facility are required to carry out bioaerosol monitoring on an annual basis.

Matrix Environmental was commissioned to undertake the sampling and reporting. The site was visited by an environmental consultant on the 24<sup>th</sup> of October 2008.

This report presents details of the sampling and analytical methodology carried out together with a broad interpretation of the results.

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## 2.0 METHODOLOGY

Currently there is no specific methodology defined by the Environmental Protection Agency in Ireland for the sampling and analysis of Bioaerosols. In the absence of a specific methodology, Matrix Environmental utilized the UK Composting Association's – *Standardized Protocol for the Sampling and Enumeration of Airborne Micro-organisms at Composting Facilities*.

### 2.1 Bioaerosol Sampling

#### 2.1.1 Sampling Equipment

2 x Single Stage Biostage Samplers

2 x Vacuum Pumps

2 x Tripod

1 x Dry Gas Meter

18 x Agar Plates

Anemometer / Thermometer

Consumables – e.g. Ethanol, Indelible Pen.

#### 2.1.2 Sampling Procedure

Two samplers were erected at each sampling location (see table 2.1 below for description of sampling locations). Following cleaning of samplers using ethanol swabs, the agar plates were inserted into the Biostage sampler. Vacuum pumps were started in parallel and ran for the specified time period. Throughout the sampling period climatic data was recorded at 5 minute intervals. Following the completion of the specified time period, the pumps were turned off and the plates removed from the Biostage samplers and stored in sealed plastic bags prior to transportation to laboratory. This process was repeated at each location giving a total of 4 samples from each location. (2 for *Aspergillus fumigatus* and 2 for *Total Bacterial Count*). The sample flow rate for all samples was 28.3 l/min. A total of 3 blanks are required per monitoring event. Blank 1 are plates, which remain in a sealed bag throughout the day. Blank 2 is placed in the switched off sampling equipment for a period of 25 minutes while blank 3 is placed in the open air at the NSL for period of 25 min.

## 2.2 Monitoring Location

Table 2.1 describes the Bioaerosol sampling locations.

<b>TABLE 2.1: LOCATION OF BIOAEROSOL SAMPLING POSITIONS</b>		
<b>Sampling Station</b>	<b>Identity</b>	<b>Boundary Location</b>
Location 1	SR 1/2	Sensitive Receptor
Location 2	UW 1/2	Upwind boundary
Location 3	DW 1/2	Downwind location *

\* Typically the downwind location is located equal-distant from the site boundary as the nearest sensitive receptor is, however in this case the NSL is app 600 meters from the site boundary. On the day of sampling the wind was coming from a south-south westerly direction, to the north-northeast of the site is a large area of immature trees. In order to attain an accurate representation of the emissions from the facility the down wind samples were taken before the start of the wooded area, this will provide worst case results as the impact from the facility will be greater at such a reduced distance from the site boundary.

## 2.3 Sampling Time

A sampling period of 25 minutes was used as stipulated in UK Composting Association's – *Standardized Protocol for the Sampling and Enumeration of Airborne Micro-organisms at Composting Facilities*. 1999

## 2.4 Climatic Conditions

Weather conditions throughout the duration of the sampling period were generally dry and clear, the cloud cover was between 0% and 10% through out the sampling exercise. The relative humidity fluctuated between 54% and 87% averaging at 73% and wind speed ranged between 3 and 7 m/sec with wind direction steady from a south- southwesterly direction.

## 3.0 RESULTS

Tables 3.1 - 3.4 present the results of the Bioaerosol Monitoring

<b>TABLE 3.1: RESULTS OF TOTAL BACTERIA MONITORING</b>			
Sampling Location	Time	Total No. of Colonies	cfu/m <sup>3</sup>
SR1 B	08:20 – 08:45	40	57
SR2 B	08:48 – 09:13	34	48
UW1 B	09:23 – 09:48	46	65
UW2 B	09:53 – 10:18	22	31
DW1 B	10:30 – 10:55	102	144
DW2 B	11:00 – 11:25	54	76

<b>TABLE 3.2: RESULTS OF ASPERGILLUS MONITORING</b>			
Sampling Location	Time	Total No. of Colonies	Concentration cfu/m <sup>3</sup>
SR1 A	08:20 – 08:45	0	0
SR2 A	08:48 – 09:13	0	0
UW1 A	09:23 – 09:48	0	0
UW2 A	09:53 – 10:18	0	0
DW1 A	10:30 – 10:55	0	0
DW2 A	11:00 – 11:25	0	0

<b>TABLE 3.3: BLANK RESULTS – TOTAL BACTERIA</b>
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Sampling Location	Time	Total No. of Colonies	Concentration cfu/m <sup>3</sup>
Blank 1	25 min	0	N/A
Blank 2	25 min	7	N/A
Blank 3 (SR)	25 min	10	N/A

<b>TABLE 3.4: BLANK RESULTS – ASPERGILLUS</b>			
Sampling Location	Time	Total No. of Colonies	Concentration cfu/m <sup>3</sup>
Blank 1	25 min	0	N/A
Blank 2	25 min	0	N/A
Blank 3 (SR)	25 min	0	N/A

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#### 4.0 DISCUSSION

Bioaerosols are constantly present in the ambient atmosphere as a consequence of dust from soil and the natural breakdown of vegetation. Measured ambient levels of bacteria and fungi vary over a wide range. A recent review reported on a number of studies that highlighted airborne fungi levels of 0 to 94,000cfu/m<sup>3</sup> and airborne bacteria to range from 2 to 17,600cfu/m<sup>3</sup> (1).

The results for the 2008 monitoring event for the Milltown Compost site are detailed in tables 3.1, 3.2, 3.3 and 3.4. The concentration of bioaerosols is very low with a similar level of total bacteria recorded at both the upwind and downwind locations, the results obtained indicate that the compost facility is not impacting on the level of bioaerosols within the vicinity of the site.

The results obtained for the site reflect the conditions on the day of sampling and time of year and current site operations.

#### 6.0 REFERENCES

- (1) Swan et al. Occupational and Environmental exposure to bioaerosols from composts and potential health effects- A critical review of published data. Research report 130. 2003



***ANNUAL BIOFILTER MONITORING***  
***AT THE***  
***MILLTOWN COMPOST SITE,***  
***MILLTOWN MOR, FETHARD,***  
***CO. TIPPERARY.***  
***OCTOBER 2008***

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**For the Attention of:**

Mr Patrick Boardman  
CTO Greenclean  
Blakes Cross  
Lusk  
Co. Dublin

**Prepared by:**

Mr. Craig Mallinson  
Environmental Consultant

**Ref: Biofilter Monitoring October 2008**

**Executive Summary**

Milltown Compost facility commissioned Matrix Environmental to undertake inlet and outlet sampling and analysis of the biofilter at their facility at Milltown Mor, County Tipperary as per requirements of their waste permit. This included testing of the biofilter media for pH, %moisture and Total Viable Counts (TVC's) at two biofilter units. The site was subsequently visited by an Environmental Consultant on the 15<sup>th</sup> October 2008 to conduct the monitoring event.

The results of the biofilter media monitoring are outlined in section 4.0. The results of the emission monitoring are also given in section 4.0. The outlet emission levels were compared to the emission limit values as detailed in the waste permit for the facility. All results are within their associated limits.

This report is certified as accurate and representative of the sampling and associated analysis carried out.

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## 1.0 INTRODUCTION

In compliance with the requirements of their waste permit Milltown Compost compost facility are required to carry out monitoring of the inlet and outlet airstream of their bio filter and also the bio filter media itself.

Matrix Environmental was commissioned to undertake the sampling and reporting. An environmental consultant visited the site on the 15<sup>th</sup> October 2008.

This report presents details of the sampling and analytical methodology carried out together with a broad interpretation of the results.

## 2.0 SCOPE OF MONITORING

The monitoring scope is outlined in Tables 2.1 and 2.2 below.

<b>Table 2.1 Scope of Bed monitoring</b>	
<b>Parameters</b>	<b>Location</b>
pH, Moisture, TVC's, Ammonia	A composite sample will be made from a number of locations on the biofilter bed

<b>Table 2.2 Scope of inlet and outlet monitoring</b>	
<b>Parameters</b>	<b>Location</b>
Ammonia, Hydrogen Sulphide , Mercaptans	Biofilter inlet duct
Ammonia, Hydrogen Sulphide , Mercaptans	Biofilter surface

### 3.0 METHODOLOGY

#### 3.1 Biofilter bed sampling

Parameter	Method of Analysis	Volume Required	Sample Container
Moisture Content	P274	100 g	Plastic/Glass
pH <sub>w</sub> (soils)	P233	20g	Plastic/Glass
Ammonia	P236	100g	Plastic/Glass
TVC's @ 30°C	IML 11	250g	Sterile Container

#### 3.2 Biofilter emission sampling

Levels of the required parameters were determined calorimetrically using the appropriate Draeger tube and pump. Each analysis was carried out by placing the tube into the pump and pulling a known volume through the tube. The appearance of a discoloration indicates the presence of the species of interest. The results are expressed in ppm.

CTO site personnel confirmed that the biofilter was operating as normal on the day of sampling.

#### 4.0 RESULTS

Table 4.1 and 4.2 present the results of the Biofilter Media analysis

<b>Table 4.1 Monitoring results from the Biofilter 1 media</b>	
<b>Parameter</b>	<b>Result</b>
% Moisture	73.3
pH	4.7
Ammonia (mg/kg)	12.8
Total Viable Counts @ 30°C (Solid) cfu/g	2.84 x 10 <sup>6</sup>

<b>Table 4.2 Monitoring results from the Biofilter 2 media</b>	
<b>Parameter</b>	<b>Result</b>
% Moisture	74.5
pH	4.7
Ammonia (mg/kg)	105
Total Viable Counts @ 30°C (Solid) cfu/g	1.6 x 10 <sup>6</sup>

A composite sample of the biofilter media was taken from the surface of the biofilter. At four locations on the biofilter surface small pits were dug to a depth of 40 to 50cm. From these pits a sample was taken. All four samples were combined into a single sample on-site.

Table 4.3 presents the results of the inlet and outlet emission monitoring from Biofilter 1.

<b>Table 4.3 Biofilter 1 - Inlet and outlet emission levels of required parameters</b>		
<b>Parameter</b>	<b>Inlet Concentration (ppm)</b>	<b>Outlet Concentration (ppm)</b>
Hydrogen Sulphide	<0.2	<0.2
Ammonia	<5	<5
Mercaptan	0.5	<0.5

Table 4.4 presents the results of the inlet and outlet emission monitoring from Biofilter 2.

<b>Table 4.4 Biofilter 2 - Inlet and outlet emission levels of required parameters</b>		
<b>Parameter</b>	<b>Inlet Concentration (ppm)</b>	<b>Outlet Concentration (ppm)</b>
Hydrogen Sulphide	<0.2	<0.2
Ammonia	<5	<5
Mercaptan	0.5	<0.5

Monitoring was carried out at a fixed location on the inlet ducting and over a number of points on the surface of the biofilter (outlet).

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**5.0 COMMENT**

The limits associated with the sites waste permit are as follows:

- Ammonia – 50ppm
- Mercaptan – 5ppm
- Hydrogen Sulphide – 5ppm

The biofilter emission levels at the CTO facility are within these limit values.

The results obtained reflect the conditions on the day of sampling and current site operations.

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*ANALYSIS OF COMPOST FROM CTO  
GREENCLEAN  
SAMPLE X6*

**REPORT NO:** GW 080713

**ATTENTION:** Patrick Boardman,  
CTO GREENCLEAN,  
Blake's Cross  
Lusk,  
Co Dublin.

**PREPARED BY:** Dr Bill Carlile  
Chief Research Scientist,  
Bord na Móna.

Dearbháil Ní Chualáin,  
Scientist,  
Bord na Móna Ltd.

**DATE:** 15 August 2008

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*Results of Analysis* .....2

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## 1 Introduction

No details of this compost sample are known. No details of the composting process are known. Therefore no interpretation could be given.

This report outlines the parameters under which the analysis was carried out, and provides detailed results of the laboratory tests.

## 2 Results of Analysis

A sample was received from CTO Greenclean on the 25<sup>th</sup> July 08 (GW 080713). It was received in good condition. Analysis was carried out on these samples as requested by the client. No details of the matrix, or composting process of these samples are known. They were analysed as compost samples as requested by the client.

This sample was labelled as follows:

Table 1

Client Sample Code	BnM Sample Code
X6	GW080713

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# Compost Testing and Analysis Service

Report ref: GW 080713

**Sample reference:** see below**Sample matrix:** not known

Maturity Tests

Specific Oxygen Uptake Rate

Sample no	mmolO <sub>2</sub> /kg OS/h**
<b>GW 080713</b>	8.63

Self Heating Test

Sample no	Maximum temperature reached (°C)
<b>GW 080713</b>	45

Organic Matter Content

Total Plant Nutrients and Carbon Content (Dry Wt. Basis)

Sample no.	Organic Matter %	C %
<b>GW 080713</b>	42.4	23.6

Heavy Metals (Dry Wt. Basis)

Sample no.	Cd mg.kg <sup>-1</sup>	Cr mg.kg <sup>-1</sup>	Cu mg.kg <sup>-1</sup>	Pb mg.kg <sup>-1</sup>	Hg mg.kg <sup>-1</sup>	Ni mg.kg <sup>-1</sup>	Zn mg.kg <sup>-1</sup>
<b>GW 080713</b>	0.427	109	79.3	59.7	0.13	22.4	232

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## Oxygen Uptake Rate

Bord na Móna Maturity Indicator Values (OS = organic solids)

<b>mmolO<sub>2</sub>/kg OS/h**</b>	<b>Compost Process Stage</b>
>26	Very Unstable
16-25	Unstable
11-15	Moderately Stable
5-10	Stable
<5	Completely stable

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Costings

<b>Test</b>	<b>Cost per sample (€)</b>
<b>Maturity Analysis</b>	
Self heating test, Specific Oxygen Uptake Rate trace elements	
<b>Cost per sample ex VAT</b>	<b>€138.83</b>

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*ANALYSIS OF COMPOST FROM  
MILLTOWN COMPOSTING*

*Y17*

**REPORT NO:** GW 081107

**ATTENTION:** Patrick Boardman,  
CTO GREENCLEAN,  
Blake's Cross  
Lusk,  
Co Dublin.

**PREPARED BY:** Dr Bill Carlile  
Chief Research Scientist,  
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Dearbháil Ní Chualáin,  
Scientist,  
Bord na Móna ltd.

**DATE:** 22 December 2008

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## 1 Introduction

No details of this compost sample are known. No details of the composting process are known.

This report outlines the parameters under which the analysis was carried out, and provides detailed results of the laboratory tests. This sample was labelled 'Y17'

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## 2 Results of Analysis

# Compost Testing and Analysis Service

Report ref: GW 081107

**Sample reference:** GW 081107**Sample matrix:** not known

Maturity Tests

Oxygen Uptake Rate

Sample no	mmolO <sub>2</sub> /kg OS/h
GW 081107	15.43

Self Heating Test

Sample no	Maximum temperature reached (°C) (ambient 21°C)
GW 081107	28

Plant Nutrient and Organic Matter Content

Water Soluble Nutrients

pH	EC μS.cm <sup>-1</sup>	NH <sub>4</sub> -N mg.L <sup>-1</sup>	NO <sub>3</sub> -N mg.L <sup>-1</sup>	PO <sub>4</sub> -P mg.L <sup>-1</sup>	K mg.L <sup>-1</sup>
7.28	738	64	1	<0.01	248

Total Plant Nutrients and Carbon Content (Dry Wt. Basis)

N %	P %	K %	C %	C:N %
1.57	3.32	3.21	26.14	16.6

Heavy Metals (Dry Wt. Basis)

Cd mg.kg <sup>-1</sup>	Cr mg.kg <sup>-1</sup>	Cu mg.kg <sup>-1</sup>	Hg mg.kg <sup>-1</sup>	Ni mg.kg <sup>-1</sup>	Pb mg.kg <sup>-1</sup>	Zn mg.kg <sup>-1</sup>
0.527	101	91.5	0.13	24.6	86.5	288

Physical Analysis

H <sub>2</sub> O %	Bulk Density (as received) <sup>‡</sup> g.L <sup>-1</sup>
45.9	519.8

Particle Size Analysis (Dry Wt. Basis)

>31.5 mm %	16.5- 31.5mm %	8-16.5mm %	4-8mm %	2-4mm %	1-2mm %	<1mm %
0.09	0.09	4.38	36.12	20.92	17.60	20.80

**Contaminants (Dry Wt. Basis)**

Sieve size	Stones %	Metals %	Plastic %	Glass %	Other %
<1mm	n/d	n/d	n/d	n/d	n/d
1-2mm	n/d	n/d	n/d	n/d	n/d
2-4mm	0.44	<0.01	0.44	<0.01	<0.01
4-8mm	0.39	<0.01	0.39	<0.01	<0.01
8-16mm	0.12	<0.01	0.12	<0.01	<0.01
16-31.5mm	<0.01	<0.01	0.01	<0.01	<0.01
>31.5mm	<0.01	<0.01	<0.01	<0.01	<0.01

**Microbiological Analysis**

Faecal Coliforms (MPN/g)	Salmonella (sp/25g)
140	Not detected

**Note:****N/A NOT AVAILABLE**

Results given on a fresh weight basis except where indicated

Samples will be kept for three months

<sup>f</sup>Yield is expressed as % of control plants grown in 100% peat in relation to plants grown in 10%, 25%, 50% and 100% GW.

<sup>†</sup>DBD=Dry bulk density (after drying at 105°C for 12 hours)

<sup>‡</sup>MBD=Moist bulk density (sample as received)

CBW=Composted Biowaste

MP=Multipurpose Peat (fertilised peat)

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## Compost Testing and Analysis Service Interpretation of Results Sheet

Ref: IR-1

Below are detailed maximum values or desirable ranges of values for mature biowaste compost. Results are on a fresh wt. basis except where indicated.

### Plant Nutrient and Organic Matter Content

#### Exchangeable Nutrients

pH*	SC* μS.cm <sup>-1</sup>	NH <sub>4</sub> -N mg.L <sup>-1</sup>	NO <sub>3</sub> -N mg.L <sup>-1</sup>	P mg.L <sup>-1</sup>	K mg.L <sup>-1</sup>
6.9-8.3	2000-6000	<1-500	<1-240	50-120	620-2280

\*Water soluble

#### Total Plant Nutrients and Carbon Content (Dry wt. Basis)

N %	P %	K %	ASH %	C:N	Mg %	Ca %
0.8-1.9	0.4-1.1	0.6-1.7	24-51	≤25	0.18-0.78	1.57-5.07

#### Heavy Metals (Dry Wt. Basis)

Class	Cd mg.kg <sup>-1</sup>	Cr mg.kg <sup>-1</sup>	Cu mg.kg <sup>-1</sup>	Pb mg.kg <sup>-1</sup>	Hg mg.kg <sup>-1</sup>	Ni mg.kg <sup>-1</sup>	Zn mg.kg <sup>-1</sup>
I	0.7	100	100	100	0.5	50	200
II	1.5	150	150	150	1	175	400

#### Physical Analysis

H <sub>2</sub> O %	DBD** g.L <sup>-1</sup>	MBD g.L <sup>-1</sup>
55-76	120-369	500-820

#### Contaminants (Dry Wt. Basis)

vs.L <sup>-1</sup>	0.5.L <sup>-1</sup> Free	0.5-2.L <sup>-1</sup> Low	>2.L <sup>-1</sup> Significant
<b>Foreign Material (Metal, Glass, Plastic etc)</b>	<0.1% Free of foreign material	0.1-0.5 % Potentially free	>0.5% Marked quantity (Noticeable)
<b>Stones</b>	<5% Low	>5% Significant	>2% Significant quantity (distinct)

#### Microbiological Analysis

<b>Faecal Coliforms (MPN/g)</b>	<b>Salmonella (sp/25g)</b>
<1000	Absent in 25g

\*\*Denotes Bord na Móna suggested standard

#### Oxygen Uptake Rate

Bord na Móna Maturity Indicator Values (OS = organic solids)

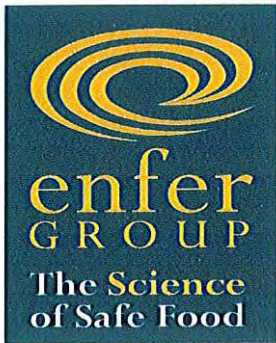
mmolO <sub>2</sub> /kg OS/h**	Compost Process Stage
>26	Very Unstable
16-25	Unstable
11-15	Moderately Stable
5-10	Stable
<5	Completely stable

---

Costings

<b>Test</b>	<b>Cost per sample (€)</b>
<b>Maturity Analysis</b>	
<b>Self heating test, Specific Oxygen Uptake Rate</b>	
<b>Chemical Analysis</b>	
<b>trace elements</b>	
<b>Physical Analysis</b>	
<b>Moisture, Foreign Material (gravel and stones)</b>	
<b>Microbiological analysis</b>	
<b>Salmonella</b>	
<b>Cost per sample ex VAT</b>	<b>€275.31</b>

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Enfer Micro Laboratories  
Carrigeen Business Park  
Clonmel, Co. Tipperary,  
Ireland.

Tel.: 353 52 78100  
Fax: 353 52 78133



Report No: MTCP-034111108

Document No: EF0011

### CERTIFICATE OF ANALYSIS

**Client** **Miltown Composting**  
Blakehouse  
Carrigtwohill  
Co.Cork

**Date Received** 11/11/2008  
**Date Tested** 11/11/2008  
**Date Reported** 17/11/2008  
**Order Number** N/A

**For the Attention** Neill Barry

**Sample Reception** 3 sample(s) received in good condition.

**Comments** N/A

**Note:** A # next to the result indicates that there was insufficient sample to carry out testing as per SOP.

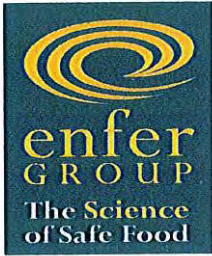
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Report Authorised by:

Keith McGrath PhD  
Technical Manager  
Enfer Micro Laboratories Ltd

**Conditions:**

1. Results in this report relate only to the items tested
2. Reports may not be reproduced except in full without the approval of Enfer Micro Laboratories Ltd
3. All queries regarding this report should be addressed to the Technical Manager at the above address
4. A \* next to a method reference signifies that Enfer Micro Laboratories Ltd are NOT INAB accredited for this method.
5. Results reported as CFU/cm<sup>2</sup> are calculated based on information supplied by customer regarding area swabbed
6. CFU indicates Colony Forming Units, MPN indicates Most Probable Number
7. This Certificate of Analysis is subject to Enfer Micro Laboratories Ltd terms and conditions which are available on request



Report No: MTCP-034111108

Document No: EF0011

**CERTIFICATE OF ANALYSIS**

**Date Received** 11/11/2008  
**Date Tested** 11/11/2008  
**Date Reported** 17/11/2008  
**Order Number** N/A

**Sample Type** Water  
**Client ID** 1. Groundwater  
**Enfer ID** 101369

<u>Test</u>	<u>Result</u>	<u>Unit</u>	<u>Method</u>
Faecal coliform bacteria	<1	MPN/100ml	SP 047 Based on ISO 9308-2 (1990)*
Coliform bacteria	12	CFU/100ml	SP 064 Based on ISO 9308-1(2000)

**Sample Type** Water  
**Client ID** 2. Groundwater  
**Enfer ID** 101370

<u>Test</u>	<u>Result</u>	<u>Unit</u>	<u>Method</u>
Coliform bacteria	39	CFU/100ml	SP 064 Based on ISO 9308-1(2000)
Faecal coliform bacteria	<1	MPN/100ml	SP 047 Based on ISO 9308-2 (1990)*

**Sample Type** Water  
**Client ID** 3. Groundwater  
**Enfer ID** 101371

<u>Test</u>	<u>Result</u>	<u>Unit</u>	<u>Method</u>
Coliform bacteria	41	CFU/100ml	SP 064 Based on ISO 9308-1(2000)
Faecal coliform bacteria	<1	MPN/100ml	SP 047 Based on ISO 9308-2 (1990)*

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Envirolab - Part of Independent Micro Lab Ltd.  
Christendom Enterprise Centre - Christendom -  
Ferrybank - Waterford - Co Waterford  
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Fax: +353 (0) 51 833 261  
E-mail: envirolab@esglabs.co.uk  
Website: www.IMLab.ie



An Independent Analytical Accredited Laboratory

# TEST CERTIFICATE

Mr Keith McGrath  
Enfer Micro Laboratories  
Carrigeen Industrial Estate  
Clonmel, Tipperary  
Ireland  
Fax: 052 78134

Page 1 of 1

Certificate Number: TWAT008462-1 Final

Order Number: 2836

Date Analysis Started: 21/11/2008

Date Reported: 04/12/2008

Lab Ref.	Sample Details	Method Number	Test	Result	Units	Flag
WAT18400	Desc: Groundwater No: 1. Order No: 2836 Date Received: 21/11/2008	P205	Chloride	31.3	mg / l Cl	
		P236	Ammonia	<0.03	mg / l N	
		P227	Conductivity	330	µS / cm	*
		P233	pH Value	6.6	Units	
WAT18401	Desc: Groundwater No: 2. Order No: 2836 Date Received: 21/11/2008	P205	Chloride	120.5	mg / l Cl	
		P236	Ammonia	<0.03	mg / l N	
		P227	Conductivity	735	µS / cm	*
		P233	pH Value	6.5	Units	
WAT18402	Desc: Groundwater No: 3. Order No: 2836 Date Received: 21/11/2008	P205	Chloride	82.5	mg / l Cl	
		P236	Ammonia	0.09	mg / l N	
		P227	Conductivity	601	µS / cm	*
		P233	pH Value	6.5	Units	

Denis M Kent  
Technical Manager

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### Disclaimers:

Unless otherwise stated, all results are expressed on an as received basis.  
Opinions and interpretations expressed herein are outside the scope of INAB accreditation.  
\* Indicates a test which is not included in the INAB accreditation schedule of this laboratory.



Customer ID: : CTO

MR STEPHEN GRIFFIN  
CTO GREENCLEAN ENV. SOLUTIONS LTD  
BLAKE HOUSE  
CARRIGTWOHILL  
CO. CORK

Report No : 1951R

Date of Receipt : 22/01/08

Delivery Mode : Hand

Date testing Initiated : 22/01/08

Date of Report : 06/02/08

Sample Cond. on Receipt : Satisfactory

No. Of Samples : 2

Sample Type : Water or Wastewater

Order Number : N/A

Page : 1 of 1

## TEST REPORT

Sample No : 1951R1

Customer Ref. : SAMPLE REF. NB 60

Test	Test Description	Test Result	Unit	Method
038	AMMONIA NITROGEN as N	0.8	mg/l	ET0383/MEWAM1981
066	BOD 5d with nitrificat'n inhib	2	mg/l	ET0662/APHA 98:5210:B
244	CHLORIDE (Cl)	22	mg/l	ET2443/APHA98 4500Cl:D
056	CONDUCTIVITY @ 25°C	394	µS/cm	ET0561/APHA1998:2510:B
124	pH VALUE	7.2		ET1242/APHA1998:4500 H:B
042	SUSPENDED SOLIDS	5	mg/l	ET 0422 (Based on APHA 2450:B)
C12	TOTAL COLIFORM COUNT- Colilert	58	MPN/100mls	MT C121
C13	E.COLI COUNT - Colilert	6	MPN/100mls	MT C121

Sample No : 1951R2

Customer Ref. : SAMPLE REF. NB 61

Test	Test Description	Test Result	Unit	Method
038	AMMONIA NITROGEN as N	3.1	mg/l	ET0383/MEWAM1981
066	BOD 5d with nitrificat'n inhib	<4	mg/l	ET0662/APHA 98:5210:B
244	CHLORIDE (Cl)	18	mg/l	ET2443/APHA98 4500Cl:D
056	CONDUCTIVITY @ 25°C	391	µS/cm	ET0561/APHA1998:2510:B
124	pH VALUE	7.5		ET1242/APHA1998:4500 H:B
042	SUSPENDED SOLIDS	<5	mg/l	ET 0422 (Based on APHA 2450:B)
C12	TOTAL COLIFORM COUNT- Colilert	517	MPN/100mls	MT C121
C13	E.COLI COUNT - Colilert	40	MPN/100mls	MT C121

Authorised By:

T. Twomey / P. Piggott

Env & Micro Division Managers



# **APPENDIX 4**

## Archaeological Assessment

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**Archaeological Damage Assessment  
For Application for Retention of  
Planning Permission at MilltownMore,  
Rosegreen, Cashel, Co. Tipperary.**

**Planning Authority: South Tipperary County Council**

**Planning Ref. No.: 08/834**

**Licensed Archaeologist: Anne-Marie Lennon**

**Client: Milltown Composting Systems Ltd, c/o NERGE Ltd, Mooresfort, Lattin,  
Co. Tipperary.**

08/834

## 1. INTRODUCTION

This Archaeological Damage Assessment is submitted in response to a Request for Further Information from South Tipperary County Council under Planning Application 08/834 for retention of demountable office, toilet, canteen, and changing room with septic tank, percolation area, 2 overhead water tanks, 1 underground collection tank, amendment store, transformer/switch gear structures, access roadway, weighbridge, change of the location and size of agricultural product store at Milltown More, Rosegreen, Cashel, Co. Tipperary (Fig.1 and appendix).

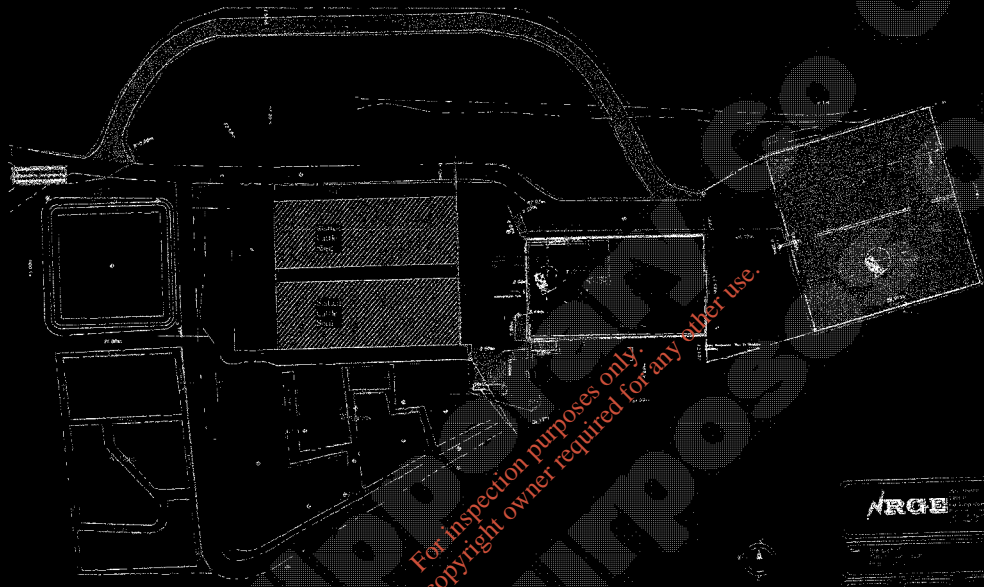


Fig.1: Site Plan, scale 1:1500 (approx)

08/834

## 2. SITING

The development is located in the townland of Milltown More, in the parish of Mora, in the barony of Middlethird in the county of Tipperary (Fig.2). It is sited on top of a hill c. 1Km to the south of the road from Rosegreen to Fethard. It is located within the zone of archaeological potential of R.M.P. sites TI069:059, ringfort, and TI069:082, road (Fig.3).

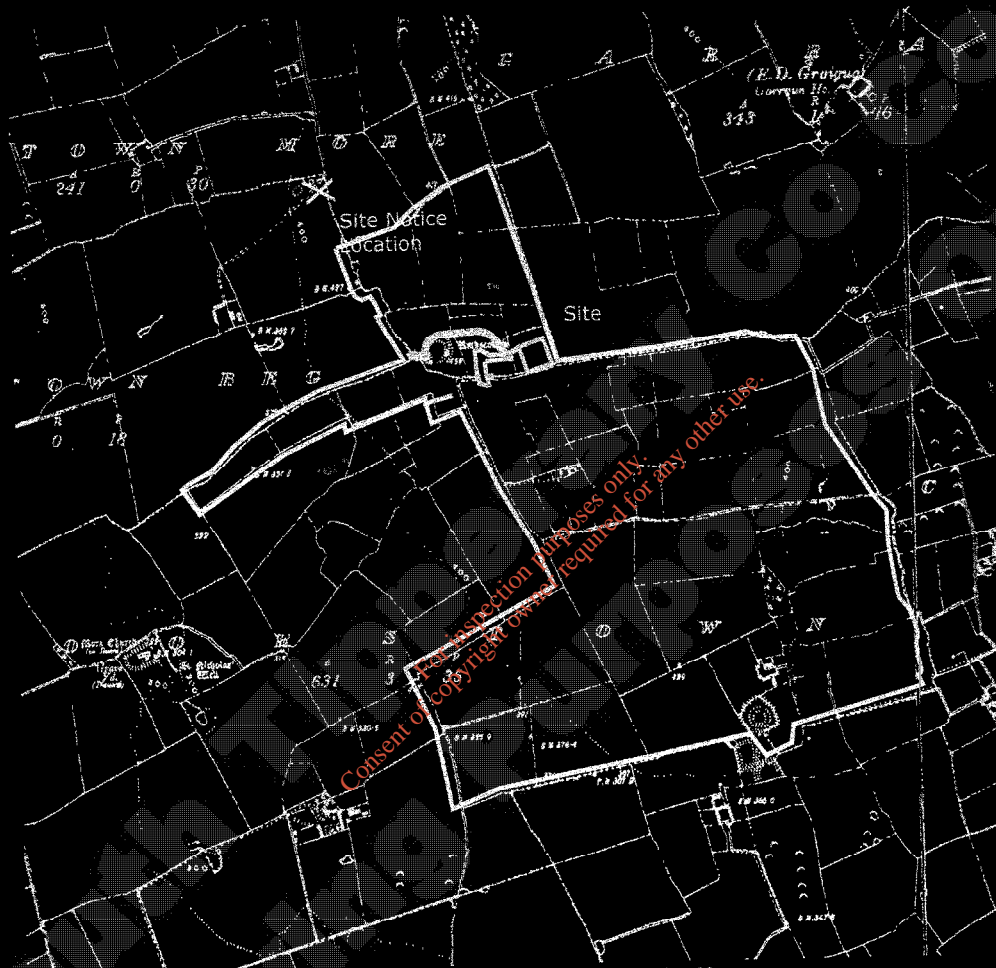


Fig.2: Site location, scale 1:10560

08/834

### 3. HISTORICAL AND ARCHAEOLOGICAL BACKGROUND

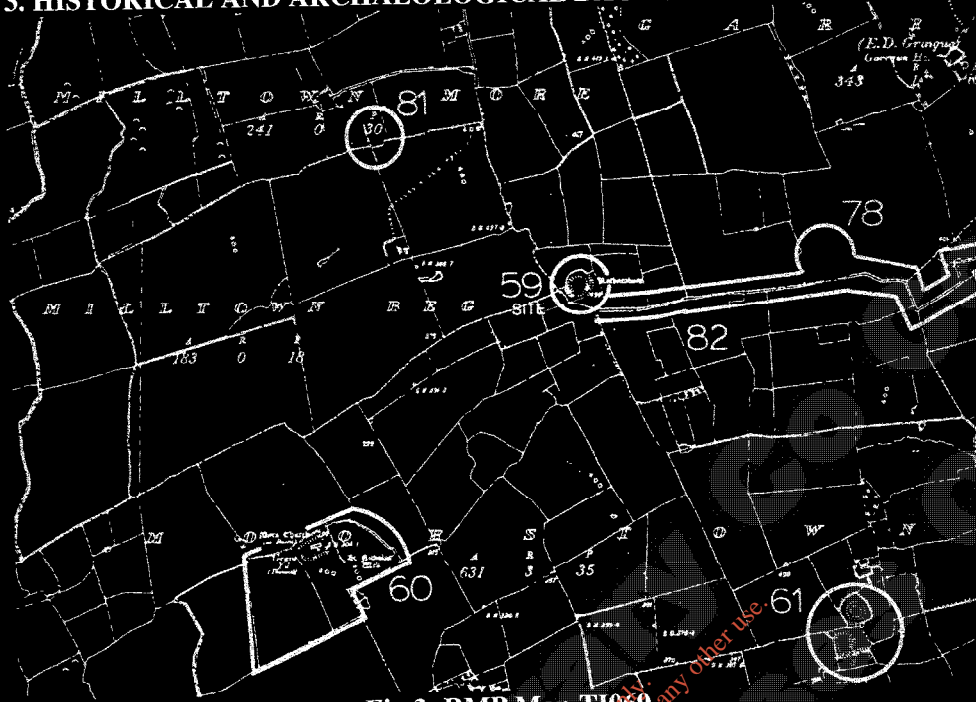


Fig.3: RMP Map TI069

The development site lies in rich farmland which has been exploited for at least since the Bronze Age. The ringfort density for the barony of Middlethird has been estimated at 1.02/Km<sup>2</sup>, indicating high levels of settlement during the early medieval period, and intense Anglo-Norman settlement in this part of Tipperary is evidenced by the number and concentration later medieval sites, as well as a high proportion of settlement townland names and nearby fortified towns (Cashel, Fethard and Clonmel).

The site lies within the zone of archaeological potential of R.M.P. sites TI069:059, ringfort, and TI069:082, road (Fig.3). Nearby sites include the parish church of Mora (TI069:060), 750m to the south-west, a possible enclosure 500m to the north-west (TI069:081), a complex of enclosures 1 Km south-east (TI069:061) and a possible enclosure 500m to the east (TI069:078). Tullamain Castle lies on the hill visible at c. 2Km to the north.

The ringfort within the development site was removed in the 1960/1970's when the farm complex was first developed. It was indicated as Rathcookera on the Ordnance Survey maps and, from its hilltop siting, may have been constructed or adapted as an Anglo-Norman ringwork. Its name has been translated by Power as The Cook's Rath, which he suggests derives from a personal name (Cooke), but may possibly be also associated with the production of pottery.

The road TI069:82 is first mentioned by Power (Place-Names of the Decies, 1906), described as "the by-road which now starts from the south-east angle of the townland (Garraun) and runs thence via Rathcookera is portion of the ancient road from New Inn and the west to Fethard through Red City". There appears to be no earlier reference to this road and Power may have been depending on local knowledge for his information.

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#### 4. ARCHAEOLOGICAL DAMAGE ASSESSMENT

The development site was first cleared in the late 1960's/early 1970's when the ringfort was removed at the entrance to the complex and the ground levelled to the east to accommodate the new buildings for the processing plant (Plate 1). Figure 4 shows the position of the ringfort projected on to a modern map from details on the R.M.P. map.

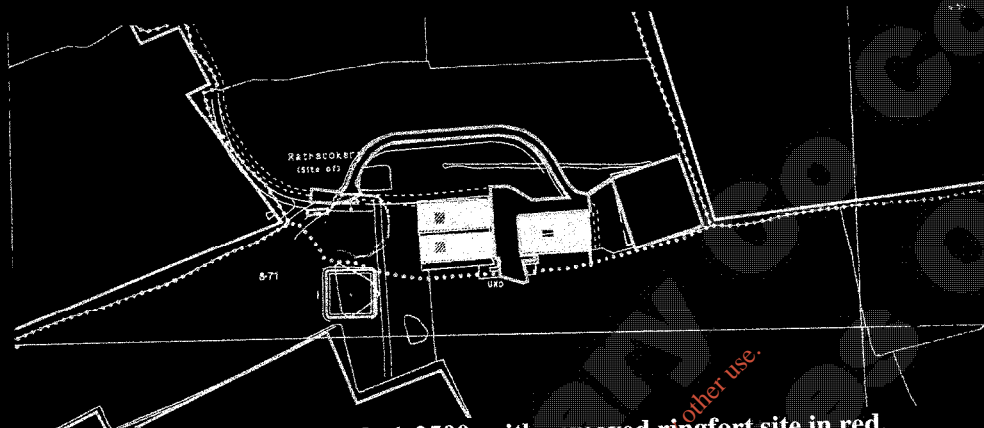


Fig.4: Site plan, scale 1:2500, with removed ringfort site in red.

Following the removal of the ringfort, access roads were laid to east, south and north, the land to the south developed for a drainage pond (subsequently not used) and the remaining land to the north landscaped. Close field inspection revealed no traces of the monument above ground in the verges and waste land either side of the roadways.

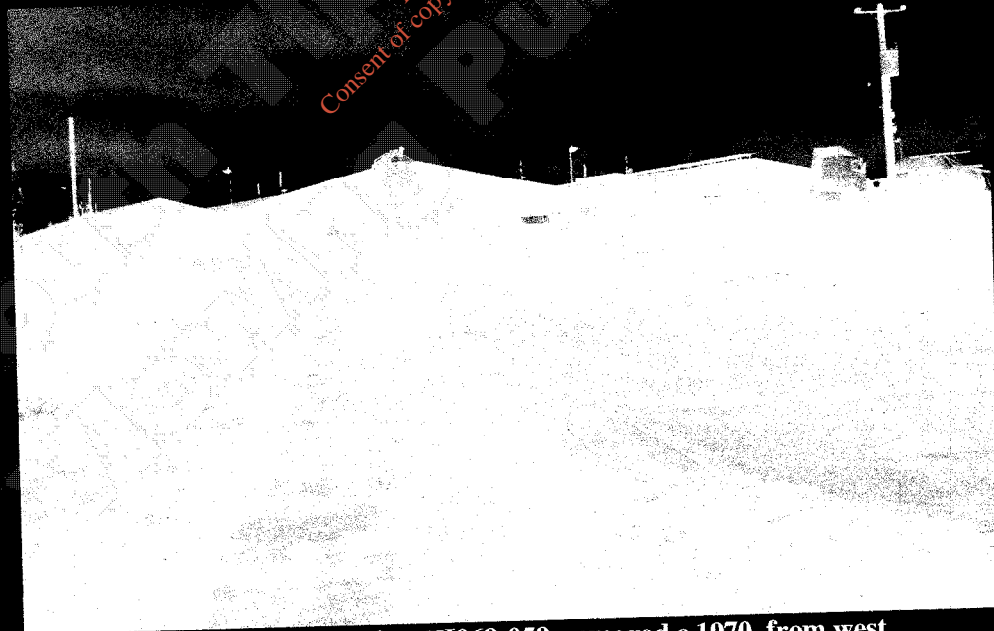


Plate 1: Site of ringfort TI069:059, removed c.1970, from west

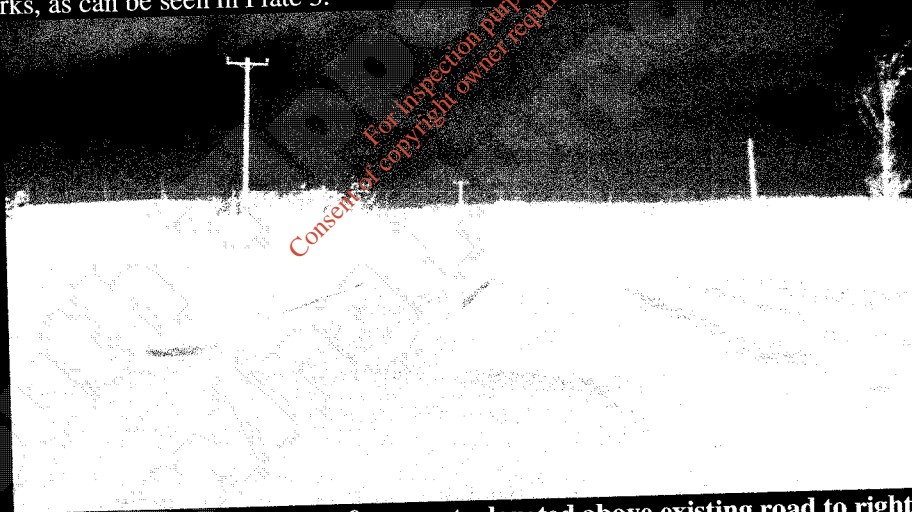
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Part of the works subject to this application for retention, viz. the weighbridge and the western end of the new road access to sheds 2 & 3 across the north of the site, are located either on or adjacent to the ringfort site. The north roadway (Plate 2) was laid originally during the first phase of works when the ringfort was removed and its subsequent re-surfacing for the new works therefore had no impact on any underlying archaeology.



**Plate 2: Northern access road (left) at north-east of ringfort site, from west**

The weighbridge, which was constructed recently, was built on eight, 1.2m<sup>2</sup>, 300mm deep pads which were set on the existing land surface requiring no excavation. The road accessing the weighbridge was then elevated slightly to accommodate the new works, as can be seen in Plate 3.



**Plate 3: New weighbridge, from east, elevated above existing road to right**

The second R.M.P. site affected by the development is the track proposed by Power as a medieval road, R.M.P. TI069:082, running through the site between the buildings and the wetland area to the south. Crossing the top of the hill, it is likely that any such road would have been directly associated with the enclosure Rathcookera. In common with other medieval tracks, this road may have varied in its precise location over time and have left very little trace of its origins or history in an archaeological context. However, from the line suggested in the Record of Monuments and Places for County Tipperary, its western extent within the site would appear to have been removed/covered over during the earlier works c. 1970.

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At the east of the site, the construction of the new building known as Sheds 2 & 3, in 2005, may have impacted on the line of the medieval road for a distance of c. 50m, but their re-alignment during construction (the original plans showed the sheds in line with the other main buildings) would appear to have reduced this impact by perhaps half, certainly on the track now visible, i.e. to the south-west corner only (Plate 4).

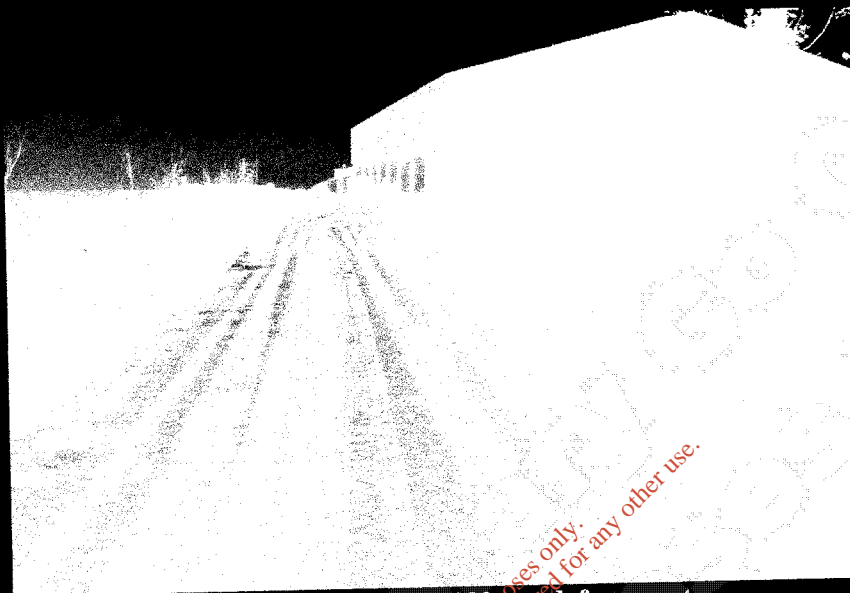


Plate 4: R.M.P TI069:082, road, from east

Ground works for the new sheds were not extensive, levelling and scraping an area previously stripped for outdoor storage and excavating 27 pads (three rows of nine E/W) of 1.2m<sup>2</sup> x up to 600mm deep. It is estimated that no more than five of these directly impacted on the road.

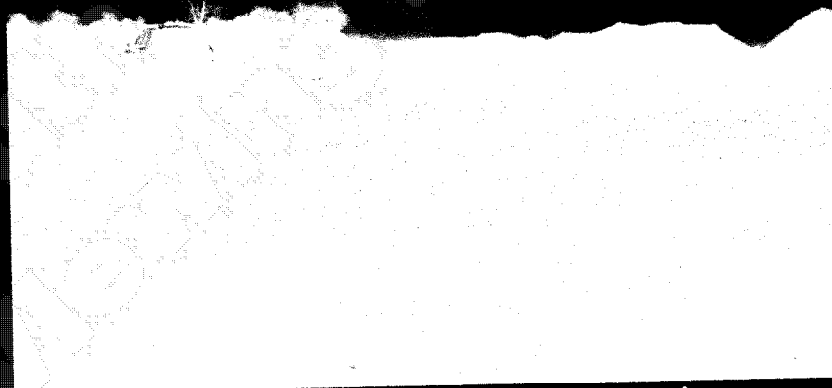


Plate 5: Site of sheds 2 & 3 prior to construction

All other works under this application have been located on ground previously disturbed during the original construction c. 1970, away from the ringfort site, and are considered to have had a minimal impact on any remaining archaeological deposits.

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## 5. SUMMARY

The development site is in an area of high archaeological potential which was largely destroyed about 40 years ago and of which no significant remains are visible above ground. The ringfort was, apparently, removed to a greater depth than would be usual in an agricultural context in order to lay a road suitable for carriage of heavy goods vehicles, although it is likely that sub-surface remains of the enclosing ditch may still survive.

Of the new works on the site, only the weighbridge is located within the immediate vicinity of the ringfort, and this was erected on pads laid on the existing ground surface with minimal ground disturbance. Field inspection found no evidence to contradict this.

The building at the east of the site, known as Sheds 2 & 3, impinged on the line of a medieval road postulated by Power in 1906. Their re-alignment on construction unwittingly mitigated their direct impact on the road but it is estimated that only perhaps five of the foundation pads directly impacted on the road line indicated by the RMP.

The other works which are the subject of this application for retention of planning permission have been constructed on ground previously disturbed in the building of the earlier complex.

While the precise effect of the recent works on the archaeological remains at this site cannot be assessed with any great degree of accuracy, significant physical damage (over and above that caused during initial works 40 years ago) is not considered likely from the evidence of the field inspection and documentary research. The visual impact of this development is restricted to its slight impact on the short stretch of the road affected by Sheds 2 & 3, which is considered minimal and some considerable distance from public view.

Test trenching of the site, as suggested in the further information request, is considered superfluous in the circumstances, as it would not mitigate any previous damage to the archaeology. However, it is strongly recommended that any further works on site which are subject to future planning applications are subject to a full archaeological assessment and/or archaeological monitoring.

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### Appendix

3. Please arrange to submit, for the consideration of the Planning Authority, details of traffic volumes generated by the use of the proposed Agricultural Product Store.
4. In the event that the proposed Agricultural Product Store is to be used for the purposes of storing composted material please arrange to submit, for the consideration of the Planning Authority, measures to control malodorous emissions from this building.
5. The applicant is advised that the existing Constructed Wetlands which facilitate the development on this site does not have planning permission. Accordingly the applicant is requested to regularise same through incorporation of same into the subject permission as significant further information.

The necessary details of the Constructed Wetland to be submitted to enable as assessment of the adequacy of same by the Planning Authority.

6. Please arrange to submit, for the consideration of the Planning Authority, details of surface water drainage and disposal network on the development site. Details to include final discharge point for surface waters.
7. Please arrange to submit, for the consideration of the Planning Authority, details for the collection, treatment and disposal of soiled waters generated by the development.
8. Please arrange to submit, for the consideration of the Planning Authority and Department of the Environment, Heritage & Local Government an Archaeological Damage Assessment of the development, as follows:

(i) The applicant is required to engage the services of a suitably qualified archaeologist to carry out an archaeological assessment of the development site. No further sub-surface work should be undertaken in the absence of the archaeologist without his/her express consent.

(ii) The archaeologist should carry out any relevant documentary research and inspect the site. Both the physical and visual impact of the development should be assessed. Test trenches shall be excavated at locations chosen by the archaeologist (licensed under the National Monuments Acts 1930-2004), having consulted the site drawings.

(iii) Having completed the work the archaeologist shall submit a written report to the Planning Authority and Heritage & Planning Division of the Department of the Environment, Heritage & Local Government.

All further information should be submitted in duplicate

Signed

*T. O'Dwyer*  
T. O'Dwyer  
Administrative Officer  
PLANNING

Date: *5th September* 2008

08/834

# **APPENDIX 5**

## Leachate Storage Tank Integrity Tests

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**INTEGRITY ASSESSMENT OF THE PRECAST CONCRETE TANKS**

**AT**

**Milltown Composting Systems**

**Milltownmore**

**Fethard**

**Co Tipperary**

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**NRGE LTD  
Mooresfort  
Lattin  
Co Tipperary**

**Tel 052 67151  
Email [nrge@iol.ie](mailto:nrge@iol.ie)**

**INTEGRITY ASSESSMENT OF THE PRECAST CONCRETE TANKS**  
**AT**

**Milltown Composting Systems**

**Milltownmore**

**Fethard**

**Co Tipperary**

**Co Tipperary**

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J McEniry

**NRGE LTD**  
**Mooresfort**  
**Lattin**  
**Co Tipperary**

**Tel 052 67151**  
**Email [nrge@iol.ie](mailto:nrge@iol.ie)**

Project 068-2  
Issue 002  
Date: 20<sup>th</sup> November 2007  
Prepared by : J McEniry BEng MIEI.

**1. Table of Contents.**

1. Table of Contents	1
2. Introduction	2
3. Description	2
4. Assessment of Tanks	2
5. Conclusions	3

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## 2. Introduction.

NRGE Ltd., on behalf of Milltown Composting Ltd., carried out an assessment of the integrity of the Leachate Storage Tanks and Septic Tank at the Composting Facility located at Milltownmore Fethard Co. Tipperary. The testing was conducted between the 8<sup>th</sup> and 14<sup>th</sup> November 2007.

## 3. Description.

Two precast round tanks (Tanks 1 and 2) were installed by the tank manufacturer to collect leachate from the facility. Tank 1 is located at Shed 1, at the front of the curing bays and collects leachate via grated channels and enclosed pipework. The second (Tank2) is located beside Sheds 2 & 3, and collects leachate also via grated channels and enclosed pipework. The septic tank is located at the south of the complex. It is a precast tank installed by the manufacturer.

## 4. Assessment of the Tanks.

The integrity tests were carried out in accordance with the methodology set out in BS 8007 Section 9, Testing for Liquid Tightness.

### 4.1 The Integrity of the Leachate Tank 1.

The methodology for establishing the water tightness of the tank was as follows:

- The tank was allowed to fill to a level of 1200mm with leachate,
- A physical level marker was placed on a dip rod in the tank in order to confirm the leachate level,
- The inflow pipe into the tank was then blocked to prevent ingress of leachate,
- The Indicator was inspected daily.

The level of the leachate in the tank remained at 1200mm for 4 days (8<sup>th</sup> to 11<sup>th</sup>). However it was not possible to continue to test for longer than 4 days because of the potential pollution risk from the build up of leachate within the curing bays.

In our opinion the water tightness of the tank complies with the test procedure set out in Section 9.2 of BS 8007.

#### 4.2 The Integrity of the Leachate Tank 2.

The methodology for establishing the water tightness of the tank was as follows:

- The tank was allowed to a level of 1040mm with leachate;
- A physical level indicator was placed on a dip rod in the tank in order to confirm the leachate level;
- The pipe into the Tank was then blocked to prevent further ingress of leachate;
- This Indicator was inspected daily.

The level of the leachate in the tank remained at 1040mm for 7 days (8<sup>th</sup> to 14<sup>th</sup>).

In our opinion the water tightness of tank 2 complies with the test procedure set out in Section 9.2 of BS 8007.

#### 4.3 The Integrity of the Septic Tank.

The methodology for establishing the water tightness of the tank was as follows:

- The tank was full to a level of 1030mm (the level of the outflow pipe);
- A physical level indicator was placed on a dip rod in the tank in order to confirm the manure level;
- The pipe into the Tank was then blocked to prevent ingress of sewage;
- This Indicator was inspected daily.

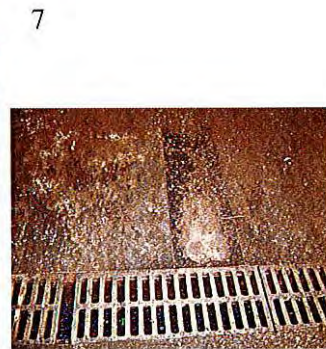
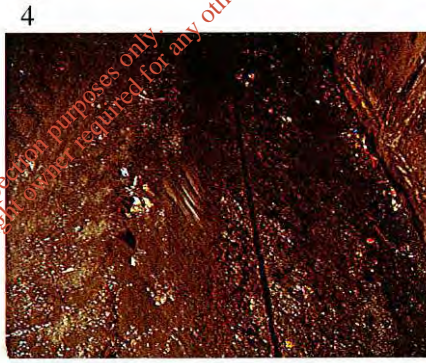
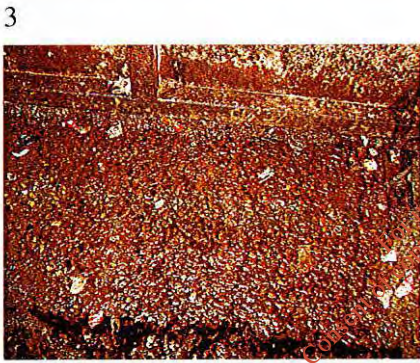
The level of the liquid in the tank remained at 1030mm for 7 days (8<sup>th</sup> to 14<sup>th</sup>). In our opinion the water tightness of the septic tank complies with the test procedure set out in Section 9.2 of BS 8007.

#### 5. Conclusions.

Based upon the above assessment and descriptions the structures are considered sound for the purpose of containment of leachate or sewage.



Appendix 1  
1



8



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# **APPENDIX 6**

## Proposed Sanitary Wastewater Treatment System

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Mr. Michael Mc Eniry  
NRGE  
Main St.  
Ballyporeen,  
Co. Tipperary

06/11/08

Dear Michael,

**Re: Provision of a new Sewerage Treatment System suitable for a four  
Population Office at Miltown Composting Ltd, Miltown, Fethard, Co Tipperary.**

We appreciate the opportunity to propose our standard onsite wastewater treatment system for the office at the above address.

Hydraulic load = 4 x 60L per person per day = 240 L per day

Organic load = 4 x 18g BOD per day = 72 g per day

We outline below our proposal for a complete installed and functioning onsite wastewater treatment system, including provision of all equipment, installation, commissioning and maintenance support.

- A. The Biogreen System that we are proposing for this project will cost € 1200-00 plus Vat;
- B. The Biogreen Treatment System will be able to treat a hydraulic flow well in excess 240 + liters/day:

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We will use the existing septic tank which has a capacity of 2700 litres as the first part of the treatment system. We will add to that a 1200 litre tank split in two chambers, one chamber will be use for aeration / treatment and the second as a final clarifier.

It will be able to treat well in excess 70g of influent BOD / day loading to effluent levels of 20mg/l of BOD5 and 30mg/l of TSS;

Once wastewater enters the Biogreen Treatment System all fluid transfers are accomplished by gravity flow to the final settlement chamber and from there it will flow gravity to the distribution box;

It will have a sludge return pipe from the final settlement chamber to the first chamber in the existing tank

The air pump will provide 40L of air per Min. at a water depth of 1.25m, require 40 watts of electricity and operate 24/7.

It will have an appropriate housing for outside use, have an isolation switch to which the costumers electrician will connect the power. It will be under continuing warranty as a part of the maintenance contract.

This proposal covers the Biogreen Treatment System & Distribution Box. It does not cover the collection/transport of wastewater from the house to the Treatment System.

This proposal includes the cost of the new tank referred to above and includes the cost of placing the tanks into an appropriately excavated area, but does not include the cost of the required excavation;

This proposal includes the cost of the electrical connections for the blower, which will be done by a Reci certified electrician, but does not include bringing the supply of electricity from the house to the isolation switch at the treatment unit which must be done by the costumers own electrician.

The cost of the excavation for the additional tank for the treatment system, the D-Box, and the trench to the D-Box will be the responsibility of the customer. Our role under this proposal is to install the additional tank, commission and maintain the Biogreen Treatment System and supply the D-Box

The percolation area / polishing filter must be carried out as shown at "5.0 Recommendation" on the SITE CHARACTERISATION FORM (2004) and as per EPA 2000

The cost of work carried out and materials used on the polishing filter are not covered by this contract;

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### Maintenance Contract

You will see from the maintenance contract included that your system is under guarantee for the first full year. At the end of the first year the system will be visited to ensure it is in perfect working order and you will be given the opportunity to sign up to a maintenance contract to for the following years  
The cost of the maintenance contract will be €100-00 plus vat.

### Payment Terms

A payment of €1200-00 plus Vat on delivery

### Time scale.

The system will be delivered promptly at a time to be agreed with the customer and / or digger operator.

Yours sincerely,

*Michael Slattery.*

*Biogreen Sewerage Solutions Ltd.*

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Biogreen Sewerage Solutions Ltd.  
Rosegreen Cashel Co. Tipperary.  
Vat No. IE9653832T

Phone 05235212

### Biogreen Maintenance Contract—Residential

This Maintenance Contract, between the management of Miltown Compositing Systems Miltown, Fethard, Co. Tipperary ("Client/Owner") and Biogreen Sewerage Solutions Ltd. of Rosegreen, Cashel, Co. Tipperary ("Service Provider") outlines the specific scope of inspection and maintenance services to be provided by Service Provider relating to the operation of the onsite wastewater treatment system installed at Miltown Compositing System at Miltown, Fethard, Co. Tipperary.

The Service Provider will provide operational and maintenance services to the Facility at the above address in accordance with good practice and local regulations.

#### Monitoring Schedule

FIRST YEAR: Initial site visit to be completed within 60 days of system installation, plus one site visit after 6 months in use.

SUBSEQUENT YEARS: Annual\*\* site inspections (1 site visit per year).

\*\*Where appropriate, visit scheduling will be based on seasonal occupancy. Client/Owner is responsible for notifying Service Provider of arrival date with a minimum of 3 weeks' notice after any absence of greater than 4 months.

#### Basic Operational Services

During scheduled maintenance visits the Service Provider shall perform visual inspections and services to the Facility as follows:

##### Treatment Tank:

- Verify that the liquid level is within normal operating range.
- Check aeration.
- Inspect treatment tank for odor and clarity.
- Verify blower operation.
- Check and clean (if necessary) blower air filter.

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Phone 05235212

Pump:

- Observe for proper functioning of the air pump.

Valves:

- Exercise all mechanical valves.

Test

- Field test effluent for odor and clarity.
- Measure level of dissolved oxygen in the treatment chamber.

Effluent Distribution System:

- Visual inspection of system for indications of system malfunction.

Parts Under Warranty:

- Treatment System is under full warranty including the air pump on an ongoing basis for as long as the maintenance contract is in place.

Miscellaneous:

- Review Maintenance Checklist to ensure all activities have been performed.
- Leave system in auto mode.

Emergency Response:

- The Service Provider will be available for onsite wastewater system emergencies (excluding internal plumbing defined to include plumbing in the house and also leading to the treatment tanks).

Reporting:

- Where required, inspection report to the local authority (with copies to Client/Owner) submitted within 30 days of inspection visits will contain:  
Service Provider's findings of inspections in the form of a completed Maintenance Checklist and records of any maintenance and/or emergency visits performed since the last inspection report.
- A copy of completed Maintenance Checklist will be left with Client/Owner at the time of inspection.
- Recommendations made to the owner for corrective actions not covered by warranty, if any, will be sent to the Client/Owner within 14 days of inspection.

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Biogreen Sewerage Solutions Ltd.  
Rosegreen Cashel Co. Tipperary.  
Vat No. IE9653832T

Phone 05235212

Record Keeping:

- The Service Provider shall keep a permanent log/file of:
  - all field notes relating to maintenance visits;
  - confirmation of correction of deficiencies and completion of repairs;

Client/Owner Responsibilities:

- A. Client/Owner shall promptly and continually maintain, in full force and effect and in accordance with their respective terms, all guarantees, warranties, easements, permits, licenses, and other similar regulatory approvals and consents necessary to operate and maintain the Facilities.
- B. Client/Owner shall be responsible for all capital expenditures for the improvement of the Facility or replacement or repair of any part of the System where damage is caused by misuse or abuse of the system.
- C. Client/Owner shall be responsible for loss or damage to the Facilities or components thereof caused by flood, fire, (except where it is caused by an electrical fault at the System side of the Isolation Switch at the unit) Acts of God, civil disturbance, or other force majeure event.
- D. Client/Owner shall be responsible for all fines and penalties imposed for process upsets and permit violations where permits are in operation.
- E. All present and/or future Client/Owners hereby hold the Service Provider, its officers, employees, agents, successors, and assigns harmless from any and all damages, legal fees or expenses, awards, demands, rights, causes of action, losses, or claims which may arise out of any failure of the Facility.
- F. The Client/Owner shall immediately notify the Service Provider of any periods longer than 2 weeks involving material change of use or circumstances (including but not limited to material change of flow, use of bactericidal substances, use chemo-therapy, anti-biotic's, chlorine, paint thinners, installation of water softeners, etc.).
- G. The Client/Owner shall immediately notify the Biogreen of any change of ownership of the Facilities.

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Additional Services:

Upon request from the Client/Owner the Service Provider will provide the following Additional Services:

- A. Site specific testing/sampling required by Local Authority and/or state regulator in addition to those detailed in Basic Operational Services.
- B. Requested or required meetings and/or additional site visits with the Client/Owner and any regulatory authorities in excess of those detailed in Basic Operational Services.
- C. Repair and replacement of components not covered by warranty, including management and coordination of hired contractors for maintenance, repairs, replacements, and any construction work required.
- D. Preparation of reports, data and plans in addition to those detailed in Basic Operational Services.

Biogreen Sewerage Solutions Ltd.  
Rosegreen Cashel Co. Tipperary.  
Vat No. IE9653832T

Phone 05235212

E. Other services requested by the Client/Owner and/or regulatory agencies in addition to those detailed in Basic Operational Services.

Period of Service:

This services contract agreement will cover the first year of operation. 30 days prior to the anniversary of installation the client/owner will receive written notification of the service provided over the past year and Maintenance Contract for the following year.

Transfer/Assignment of Agreement:

Assignment or transfer of this Agreement by the undersigned Client/Owner to a new Client/Owner during the year is effective upon a) execution of an assignment agreement and b) receipt of written acknowledgement of such transfer to Biogreen.

Fees for Services:

Basic Operational Services:

The cost of this service for the first year is free of charge. The cost of the service for the second year & subsequent years shall be €100-00 Plus vat. subject to adjustment for inflation. This includes full cover on the air pump after the manufactures warranty ends.

Additional Services:

- All Additional Services shall be billed on a call out charge of € 75 plus an hourly rate of €25/hour. 081834

Payment Conditions:

- The local authority requires that a maintenance contract must be put in place.
- The Client/Owner will be billed annually in advance, with payment due 30 days after date of invoice, for both Basic Operational Services and also for any Additional Services that are identifiable in advance.
- Other Additional Services will be billed separately as and when authorized.

Biogreen Sewerage Solutions Ltd.  
Rosegreen Cashel Co. Tipperary.  
Vat No. IE9653832T

Phone 05235212

Damage to System:

- ***In the event of the System being damaged by improper use eg. non-organic material being flushed into the tanks and causing the system to clog, or chemicals eg white spirits or other such products, or the overuse of other products harmful to bacteria being flushed into the system the cost of repair and or emptying the tanks will be born by the Client/Owner.***

Agreed on (date).

By,

\_\_\_\_\_  
Client/Owner

\_\_\_\_\_  
Biogreen Sewerage Solutions Ltd.

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# **APPENDIX 7**

## Potential Wastes for Acceptance

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PROPOSED WASTES FOR ACCEPTANCE AT MILTOWN COMPOSTING LTD

<b>02</b>	<b>Wastes from agriculture, horticulture, aquaculture, forestry, hunting and fishing, food preparation and processing</b>
<b>02 01</b>	<b>Waste from agriculture, horticulture, aquaculture, forestry, hunting and fishing</b>
02 01 01	Sludges from washing and cleaning
02 01 03	Plant-tissue waste
02 01 06	Animal faeces, urine and manure (including spoiled straw), effluent, collected separately and treated of site
02 01 07	Waste from forestry
02 01 99	Wastes not otherwise specified
<b>02 02</b>	<b>Wastes from the preparation and processing of meat, fish and other foods of animal origin</b>
02 02 01	Sludges from washing and cleaning
02 02 03	Materials unsuitable for consumption or processing
02 02 04	Sludges from on-site effluent treatment
02 02 99	Wastes not otherwise specified
<b>02 03</b>	<b>Wastes from fruit, vegetables, cereals, edible oils, cocoa, coffee, tea and tobacco preparation and processing; conserve production, yeast and yeast extract production, molasses preparation and</b>
02 03 01	Sludges from washing, cleaning, peeling, centrifuging and separation
02 03 04	Materials unsuitable for consumption or processing
02 03 05	Sludges from on-site effluent treatment
02 03 99	Wastes not otherwise specified
<b>02 04</b>	<b>Wastes from sugar processing</b>
02 04 03	Sludges from on-site effluent treatment
02 04 99	Wastes not otherwise specified
<b>02 05</b>	<b>Wastes from the dairy products industry</b>
02 05 01	Materials unsuitable for consumption or processing
02 05 02	Sludges from on-site effluent treatment
02 05 99	Wastes not otherwise specified
<b>02 06</b>	<b>Wastes from the baking and confectionery industry</b>
02 06 01	Materials unsuitable for consumption or processing

02 06 03	Sludges from on-site effluent treatment
02 06 99	Waste not otherwise specified
<b>02 07</b>	<b>Wastes from the production of alcoholic and non-alcohol beverages (except coffee, tea and cocoa)</b>
02 07 01	Wastes from washing, cleaning and mechanical reduction of raw materials
02 07 02	Wastes from spirits distillation
02 07 04	Materials unsuitable for consumption processing
02 07 05	Sludges from on-site effluent treatment
02 07 99	Waste not otherwise specified
<b>03</b>	<b>Wastes from wood processing and the production of panels and furniture, pulp, paper and cardboard</b>
<b>03 01</b>	<b>Wastes from pulp, paper and cardboard production and processing</b>
03 01 01	Waste bark and cork
03 01 05	Sawdust, shavings, cuttings, wood, particle board and veneer other than those mentioned in 03 01 04
<b>03 03</b>	<b>Wastes from pulp, paper and cardboard production and processing</b>
03 03 11	Sludges from on-site effluent treatment other than those mentioned in 03 03 10(EWC)
<b>15</b>	<b>Waste Packaging; absorbents, wiping cloths, filter materials and protective clothing not otherwise specified</b>
<b>15 02</b>	<b>Absorbents, filter materials, wiping cloths and protective clothing</b>
15 02 03	Absorbents, filter materials, wiping cloths and protective clothing other than those mentioned in 15 02 02
<b>17</b>	<b>Construction and demolition wastes (including excavated soil from contaminated sites)</b>
<b>17 02</b>	<b>Wood, glass and plastic</b>
17 02 01	Wood
<b>17 05</b>	<b>Soil (including excavated soil from contaminated sites), stones and dredging spoil</b>
17 05 06	Dredging spoil other than those mentioned in 17 05 05
<b>19 05</b>	<b>Wastes from aerobic treatment of solid wastes</b>
19 05 01	Non-composted fraction of municipal and similar wastes
19 05 02	Non-composted fraction of animal and vegetable waste
19 05 03	Off-specification compost
19 05 99	Wastes not otherwise specified
<b>19 06</b>	<b>Wastes from anaerobic treatment of waste</b>
19 06 03	Liquor from anaerobic treatment of municipal waste
19 06 04	Digestate from anaerobic treatment of municipal waste
19 06 05	Liquor from anaerobic treatment of animal and vegetable waste

19 06 06	Digestate from anaerobic treatment of animal and vegetable waste
19 06 99	Wastes not otherwise specified
<b>19 08</b>	<b>Wastes from waste water treatment plants not otherwise specified</b>
19 08 01	Screenings
19 08 02	Waste from desanding
19 08 05	Sludges from treatment of urban waste water
19 08 09	Grease and oil mixture from oil/water separation containing only edible oil and fat
19 08 12	Sludges from biological treatment of industrial waste water other than those mentioned in 19 08 11
19 08 14	Sludges from other treatment of industrial waste water other than those mentioned in 19 08 13
19 08 99	Wastes not otherwise specified
<b>19 09</b>	<b>Wastes from the preparation of water intended for human consumption or water for industrial use</b>
19 09 01	Solid waste from primary filtration and screenings
19 09 02	Sludge from water clarification
19 09 03	Sludge from decarbonation
19 09 04	Spent activated carbon
<b>19 12</b>	<b>Wastes from the mechanical treatment of waste (for example sorting, crushing, compacting, pelletising) not otherwise specified</b>
19 12 07	Wood other than that mentioned in 19 12 06
19 12 12	Other wastes (including mixtures of materials) from mechanical treatment of wastes other than those mentioned in 19 12 11
<b>19 13</b>	<b>Wastes from soil and groundwater remediation</b>
19 13 06	Sludges from groundwater remediation other than those mentioned in 19 13 05
19 13 08	Aqueous liquid wastes and aqueous concentrates from groundwater remediation other than those mentioned in 19 13 07
<b>20</b>	<b>Municipal wastes (household waste and similar commercial, industrial and institutional wastes) including separately collected fractions</b>
<b>20 01</b>	<b>Separately collected fractions</b>
20 01 01	Paper and cardboard
20 01 08	Biodegradable kitchen and canteen waste
20 01 25	Edible oil and fat
20 01 41	Wastes from chimney sweeping
<b>20 02</b>	<b>Garden and park wastes (including cemetery waste)</b>
20 02 01	Biodegradable waste
<b>20 03</b>	<b>Other municipal wastes</b>
20 03 01	Mixed municipal waste

20 03 02	Waste from markets
20 03 03	Street-cleaning residues
20 03 04	Septic tank sludge
20 03 06	Waste from sewage cleaning

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# **APPENDIX 8**

## Operational Procedures

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Miltown Composting Systems Ltd  
Miltownmore,  
Fethard,  
Co. Tipperary

Rev 1. 18/01/08

*Procedure for Leachate Collection and Recovery/Disposal*

**FAO: All Site Personnel**

**Purpose: To ensure that the correct procedure for leachate collection and recovery/disposal is adhered to**

**Scope: This procedure applies to all leachate collection and recovery/disposal on site**

1. (a) Pump leachate from both Tank A and Tank B back to the composting building and apply to the early stage barrier 1 material using a spraying apparatus.  
  
(b) Water from the water tank is used via the turner machine for wetting the Windrows.  
  
(c) Any leachate accumulating on the floor of the building to be absorbed by turning and mixing the material
2. All leachate collection channels must be kept clean of contamination and obstruction
3. Do a visual inspection of the leachate levels in Tank A & B.
  - a. Check tank A weekly with the use of a meter stick to ensure that the leachate is at least 10cm from the top of the tank
  - b. Check tank B weekly by visual inspection to ensure that the leachate is at least 10cm from the top of the tank
4. Do not discharge any leachate to surface waters or groundwater.
5. If it is necessary to remove surplus leachate from the facility, this shall only be done by a specialist waste contractor. The leachate shall be sent to an approved off-site wastewater treatment plant. South Tipperary County Council shall be informed of the details of the waste contractor and the wastewater treatment plant before the leachate is removed from the site.

Miltown Composting Systems Ltd  
Miltownmore,  
Fethard,  
Co. Tipperary

*Incident/Accident Response Procedure*

**FAO: All Site Personnel**

**Purpose: To ensure that corrective and preventative action is taken as soon as possible if any incident/accident occurs on site.**

**Scope: This procedure applies to any incident/accident or potential incident/accident**

1. If at any time you notice any incident or **potential incident/accident** in any part of the site **report** it at once to the **Site manager**.
2. The **Site manager** must **notify** or arrange to notify the appropriate body- **Local Authority** in the case of an incident or **Emergency services** in the case of an **emergency** ( see **Notification Procedure**)
3. If possible, **protect** the site **from further contamination** (barriers etc.) and start **corrective action** i.e. cleanup of the site (absorbent material etc.) and actions to **prevent the incident from recurring**.

An **incident** is:

An irregular process occurrence which causes

- Waste (liquid or solid) release to the environment
- An emission to atmosphere

An unscheduled release to the environment, inside or outside a building

- A spillage
- A leak (liquid or gas)

Any irregular

- Noise
- Malodour

A potential incident is any situation, which believe could cause an incident as defined above.



Matrix Environmental

***ANNUAL BIOAEROSOL MONITORING  
AT THE  
MILLTOWN COMPOST SITE,  
MILLTOWN MOR, FETHARD,  
CO. TIPPERARY.  
OCTOBER 2009***

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**For the Attention of:**

Mr David Ronan  
Milltown Compost  
Milltown Mor  
Fethard  
Co. Tipperary

**Prepared by:**

Mr. Craig Mallinson  
Environmental Consultant

**Ref: Bioaerosols Monitoring 2009**

UNIT 12, OLD CONNELL WEIR, NEWBRIDGE, CO KILDARE, IRELAND  
TELEPHONE: +353 45 436935, FAX: +353 45 431891  
VAT No: IE 6872328F

REGISTERED OFFICE: UNIT 12, OLD CONNELL WEIR, NEWBRIDGE, CO KILDARE; REGISTERED NO: 329285

**Executive Summary**

Matrix Environmental was contracted by Milltown Compost to undertake bioaerosol sampling and analysis at their facility at in Milltown Mor, County Tipperary, in order to assess current levels of bioaerosols (*Total Fungi/Bacteria* and *Aspergillus fumigatus*) at the facility. An Environmental Consultant subsequently visited the site on the 29<sup>th</sup> of September 2009 to conduct the monitoring event.

The bioaerosol sampling was undertaken at three locations in the vicinity of the facility (1) Nearest Sensitive Receptor, (2) 25 meters upwind of site boundary and (3) down wind of Site boundary. These locations were selected following a review of the prescribed sampling locations in the UK Composting Association's – *Standardized Protocol for the Sampling and Enumeration of Airborne Micro-organisms at Composting Facilities.1999*

The concentration of bioaerosols detected is low with the highest levels recorded at the upwind location, however levels at all locations are similar. No *Aspergillus fumigatus* was detected during the monitoring event.

The recorded levels reflect the on-site meteorological conditions during the sampling period.

This report is certified as accurate and representative of the sampling and associated analysis carried out.

## 1.0 INTRODUCTION

In compliance with the requirements of their waste permit Milltown Compost facility are required to carry out bioaerosol monitoring on an annual basis.

Matrix Environmental was commissioned to undertake the sampling and reporting. An Environmental Consultant visited the site on the 29<sup>th</sup> of September 2009.

This report presents details of the sampling and analytical methodology carried out together with a broad interpretation of the results.

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## 2.0 METHODOLOGY

Currently there is no specific methodology defined by the Environmental Protection Agency in Ireland for the sampling and analysis of Bioaerosols. In the absence of a specific methodology, Matrix Environmental utilized the UK Composting Association's – *Standardized Protocol for the Sampling and Enumeration of Airborne Micro-organisms at Composting Facilities*.

### 2.1 Bioaerosol Sampling

#### 2.1.1 Sampling Equipment

2 x Single Stage Biostage Samplers  
2 x Vacuum Pumps  
2 x Tripod  
1 x Dry Gas Meter  
18 x Agar Plates  
Anemometer / Thermometer  
Consumables – e.g. Ethanol, Indelible Pen.

#### 2.1.2 Sampling Procedure

Two samplers were erected at each sampling location (see table 2.1 below for description of sampling locations). Following cleaning of samplers using ethanol swabs, the agar plates were inserted into the Biostage sampler. Vacuum pumps were started in parallel and ran for the specified time period. Throughout the sampling period climatic data was recorded at 5 minute intervals. Following the completion of the specified time period, the pumps were turned off and the plates removed from the Biostage samplers and stored in sealed plastic bags prior to transportation to laboratory. This process was repeated at each location giving a total of 4 samples from each location. (2 for *Aspergillus fumigatus* and 2 for *Total Bacterial Count*). The sample flow rate for all samples was 28.3 l/min. A total of 3 blanks are required per monitoring event. Blanks 1 and 2 are plates, which remain in a sealed bag throughout the day. Blank 3 is placed in the switched off sampling equipment for a period of 25 minutes at the downwind location.

## 2.2 Monitoring Location

Table 2.1 describes the Bioaerosol sampling locations.

<b>TABLE 2.1: LOCATION OF BIOAEROSOL SAMPLING POSITIONS</b>		
<b>Sampling Station</b>	<b>Identity</b>	<b>Boundary Location</b>
Location 1	SR 1/2	Sensitive Receptor
Location 2	UW 1/2	Upwind boundary
Location 3	DW 1/2	Downwind location *

\* Typically the downwind location is located equal-distant from the site boundary, as the nearest sensitive receptor is, however in this case the Sensitive Receptor is app 600 meters from the site boundary. On the day of sampling the wind was coming from a west-north westerly direction, the downwind location was set up to the east-southeast of the site in a agricultural field. In order to attain an accurate representation of the emissions from the facility the downwind samples were 300meters from the site as opposed to 600meters (Hedges and a change to topography necessitated this change), this will provide worst case results as the impact from the facility will be greater at such a reduced distance from the site boundary.

## 2.3 Sampling Time

A sampling period of 25 minutes was used as stipulated in UK Composting Association's – *Standardized Protocol for the Sampling and Enumeration of Airborne Micro-organisms at Composting Facilities.1999*

## 2.4 Climatic Conditions

Weather conditions throughout the duration of the sampling period were generally dry and clear, the cloud cover was between 90% and 100% through out the sampling exercise. The relative humidity fluctuated between 82% and 100% averaging at 91% and wind speed ranged between 5 and 7 m/sec with wind direction steady from a west-north westerly direction.



### 3.0 RESULTS

Tables 3.1 - 3.4 present the results of the Bioaerosol Monitoring

<b>TABLE 3.1: RESULTS OF TOTAL BACTERIA MONITORING</b>			
Sampling Location	Time	Total No. of Colonies	cfu/m <sup>3</sup>
SR1 B	11:05 – 11:30	230	325
SR2 B	11:35 – 12:00	233	329
UW1 B	09:03 – 09:28	300	424
UW2 B	09:31 – 09:56	320	452
DW1 B	10:04 – 10:29	236	334
DW2 B	10:32 – 10:57	200	282

<b>TABLE 3.2: RESULTS OF ASPERGILLUS MONITORING</b>			
Sampling Location	Time	Total No. of Colonies	Concentration cfu/m <sup>3</sup>
SR1 A	11:05 – 11:30	0	0
SR2 A	11:35 – 12:00	0	0
UW1 A	09:03 – 09:28	0	0
UW2 A	09:31 – 09:56	0	0
DW1 A	10:04 – 10:29	0	0
DW2 A	10:32 – 10:57	0	0

<b>TABLE 3.3: BLANK RESULTS – TOTAL BACTERIA</b>			
Sampling Location	Time	Total No. of Colonies	Concentration cfu/m <sup>3</sup>
Blank 1	N/A	1	N/A
Blank 2	N/A	0	N/A
Blank 3 (DW)	25 min	28	N/A

<b>TABLE 3.4: BLANK RESULTS – ASPERGILLUS</b>			
Sampling Location	Time	Total No. of Colonies	Concentration cfu/m <sup>3</sup>
Blank 1	N/A	0	N/A
Blank 2	N/A	0	N/A
Blank 3 (DW)	25 min	0	N/A

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#### 4.0 DISCUSSION

Bioaerosols are constantly present in the ambient atmosphere as a consequence of dust from soil and the natural breakdown of vegetation. Measured ambient levels of bacteria and fungi vary over a wide range. A recent review reported on a number of studies that highlighted airborne fungi levels of 0 to 94,000cfu/m<sup>3</sup> and airborne bacteria to range from 2 to 17,600cfu/m<sup>3</sup> (1).

The results for the 2009 monitoring event for the Milltown compost site are detailed in tables 3.1, 3.2, 3.3 and 3.4. The concentration of bioaerosols is moderate with a similar level of total bacteria recorded at all locations, the results obtained indicate that the compost facility does not appear to be impacting on the level of bioaerosols within the vicinity of the site.

The results obtained for the site reflect the conditions on the day of sampling and time of year and current site operations.

#### 6.0 REFERENCES

- (1) Swan et al. Occupational and Environmental exposure to bioaerosols from composts and potential health effects- A critical review of published data. Research report 130. 2003



Matrix Environmental

***ANNUAL BIOFILTER MONITORING  
AT THE  
MILLTOWN COMPOST SITE,  
MILLTOWN MOR, FETHARD,  
CO. TIPPERARY.  
OCTOBER 2009***

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**For the Attention of:**

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Milltown Mor  
Fethard  
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**Prepared by:**

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**Ref: Biofilter Monitoring October 2009**

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**Executive Summary**

Milltown Compost facility commissioned Matrix Environmental to undertake inlet and outlet sampling and analysis of the biofilter at their facility at Milltown Mor, County Tipperary as per requirements of their waste permit. This included testing of the biofilter media for pH, Ammonia, Percent Moisture and Total Viable Counts (TVC's) and testing the inlet (two inlet pipes) and outlet gases from the production buildings for Ammonia, Hydrogen Sulphide and Mercaptans. An Environmental Consultant subsequently visited the site on the 29<sup>th</sup> September 2009 to undertake the biofilter media sampling and on the 15<sup>th</sup> October to conduct the gas analysis.

The results of the biofilter media monitoring are outlined in section 4.0. The results of the emission monitoring are also given in section 4.0. The outlet emission levels were compared to the emission limit values as detailed in the waste permit for the facility. All results are within their associated limits.

This report is certified as accurate and representative of the sampling and associated analysis carried out.

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**1.0 INTRODUCTION**

In compliance with the requirements of their waste permit Milltown Compost are required to carry out monitoring of the inlet and outlet airstream of their biofilter and also the biofilter media itself.

Matrix Environmental was commissioned to undertake the sampling and reporting. An environmental consultant visited the site on the 29<sup>th</sup> September and the 15<sup>th</sup> October 2009.

This report presents details of the sampling and analytical methodology carried out together with a broad interpretation of the results.

**2.0 SCOPE OF MONITORING**

The monitoring scope is outlined in Tables 2.1 and 2.2 below.

<b>Table 2.1 Scope of Bed monitoring</b>	
<b>Parameters</b>	<b>Location</b>
pH, Moisture, TVC's, Ammonia	A composite sample will be made from a number of locations on the biofilter bed

<b>Table 2.2 Scope of inlet and outlet monitoring</b>	
<b>Parameters</b>	<b>Location</b>
Ammonia, Mercaptans Hydrogen Sulphide,	Biofilter inlet duct x 2
Ammonia, Mercaptans Hydrogen Sulphide,	Biofilter surface

### 3.0 METHODOLOGY

#### 3.1 Biofilter bed sampling

<b>Table 3.1: Parameters and Limits of Detection</b>			
<b>Parameter</b>	<b>Method of Analysis</b>	<b>Volume Required</b>	<b>Sample Container</b>
Moisture Content	P274	100 g	Plastic/Glass
pH <sub>w</sub> (soils)	P233	20g	Plastic/Glass
Ammonia	P236	100g	Plastic/Glass
TVC's @ 30°C	IML 11	250g	Sterile Container

#### 3.2 Biofilter emission sampling

Levels of the required parameters were determined calorimetrically using the appropriate Draeger tube and pump. Each analysis was carried out by placing the tube into the pump and pulling a known volume through the tube. The appearance of a discoloration indicates the presence of the species of interest. The results are expressed in ppm.

CTO site personnel confirmed that the biofilter was operating as normal on the day of sampling.

#### 4.0 RESULTS

Table 4.1 presents the results of the Biofilter Media analysis

Parameter	Result
% Moisture	67.91
pH	6.7
Ammonia (mg/kg)	886
Total Viable Counts @ 30°C (Solid) cfu/g	>3 x 10 <sup>6</sup>

A composite sample of the biofilter media was taken from the surface of the biofilter. At four locations on the biofilter surface small pits were dug to a depth of 40 to 50cm. From these pits a sample was taken. All four samples were combined into a single sample on-site.

Table 4.2 presents the results of the inlet emission monitoring from Inlet 1 and 2.

Parameter	Inlet 1 Concentration (ppm)	Inlet 2 Concentration (ppm)
Hydrogen Sulphide	<0.2	<0.2
Ammonia	15	25
Mercaptans	0.5	<0.5

Table 4.3 presents the results of the emission monitoring from Biofilter Outlet

Parameter	Inlet Concentration (ppm)
Hydrogen Sulphide	<0.2
Ammonia	<5
Mercaptan	<0.5

Monitoring was carried out at a fixed location on the inlet ducting and over a number of points on the surface of the biofilter (outlet).



## 5.0 COMMENT

The limits associated with the sites waste permit are as follows:

- Ammonia – 50ppm
- Mercaptan – 5ppm
- Hydrogen Sulphide – 5ppm

The biofilter emission levels at the Milltown compost facility are within these limit values.

The results obtained reflect the conditions on the day of sampling and current site operations.

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Matrix Environmental

***ANNUAL DUST MONITORING  
AT THE  
MILLTOWN COMPOST SITE,  
MILLTOWN MOR, FETHARD,  
CO. TIPPERARY.  
SEPTEMBER 2009***

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**For the Attention of:**

Mr David Ronan  
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Milltown Mor  
Fethard  
Co. Tipperary

**Prepared by:**

Mr. Craig Mallinson  
Environmental Consultant

**Ref: Dust Monitoring 2008**

**Date: November 2008**

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- 1.0 INTRODUCTION
- 2.0 METHODOLOGY
- 3.0 RESULTS
- 4.0 DISCUSSION

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**Executive Summary**

Matrix Environmental was contracted by Milltown Compost to conduct a dust deposition survey of the site in Milltown Mor in order to determine the dust levels at the facility. To this end an Environmental consultant subsequently visited the site on the 1<sup>st</sup> of September 2009 to install the dust gauges and on the 29<sup>th</sup> September to collect the dust gauges.

Three locations were chosen to assess the level of dust from the facility. The maximum dust result for the survey period was 440 mg/m<sup>2</sup>/day at location D1 that is located on the ditch to the south of the main processing buildings (A new roadway was constructed during the monitoring period). The result at the northeastern boundary (location D3) was 11 mg/m<sup>2</sup>/day, while the result for the location D2 was 205 mg/m<sup>2</sup>/day. The results for D2 and D3 are within the permit limit value of 350 mg/m<sup>2</sup>/day.

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**1.0 INTRODUCTION**

Milltown Compost operates a composting site at Milltown Mor, Fethard, Co. Tipperary. Matrix Environmental were contracted to carry out a dust deposition survey in order to assess the dust contribution from on site activities in the area of the compost. To this end an Environmental consultant subsequently visited the site on the 1<sup>st</sup> of September 2009 to install the dust gauges and on the 29<sup>th</sup> September to collect the dust gauges.

This report presents details of both the methodologies employed and results obtained.

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**2.0 METHODOLOGIES**

**2.1 Dust Survey**

Dust monitoring was conducted using dust gauges conforming to the Standard Method VD12119 (Measurement of Dustfall, Determination of Dustfall using Bergerhoff Instrument (Standard Method) German Engineering Institute). Each dust-sampling bottle was securely capped after the recommended exposure period of between 28 and 31 days. The samples were then returned to the laboratory for gravimetric analysis. The collected sample material is rinsed into a pre weighed evaporating dish and evaporated down to dryness. The total dry residue, which comprises both insoluble and soluble dust, is then determined. Results are expressed in mg/m<sup>2</sup>/day.

The following is a detailed description of the dust monitoring points:

Measurement No.	Location
D1	On ditch south of the main processing area.
D2	At entrance to field to north of main processing area.
D3	On northeastern boundary of site.

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**3.0 RESULTS**

Tables 3.1 present the results of the dust deposition survey carried out at the Milltown Mor site during September 2009.

<b>TABLE 3.1: DUST MEASUREMENT RESULTS</b>			
<b>Location No.</b>	<b>Measurement Period (days)</b>	<b>Dust Deposition (mg/m<sup>2</sup>/day)</b>	<b>County Council Permit Limit (mg/m<sup>2</sup>/day)</b>
D1	28	440 *	350
D2	28	205	350
D3	28	11	350

\* - This result was significantly influenced by a new hardcore road, which was constructed during the period of the dust survey.

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**4.0 DISCUSSION**

**Dust:**

The levels of dust deposition measured at locations D2 and D3 were within the County Council permit limit value of 350 mg/m<sup>2</sup>/day. The level recorded at D1 was in excess of the County Council permit limit value of 350 mg/m<sup>2</sup>/day.

The maximum dust result for the survey period was 440 mg/m<sup>2</sup>/day at location D1 that is located on the ditch south of the main processing area. A new hardcore roadway associated with the adjoining farm was constructed during the period of the dust survey, this will have significantly influenced the dust levels recorded. Previous monitoring at this location has resulted in levels of dust of 88 mg/m<sup>2</sup>/day for the 2008 and 2007 monitoring events respectively.

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Matrix Environmental

**Monitoring of Daytime  
Noise Levels at the  
Milltown Compost Site Milltown  
Mor, Fethard  
Co. Tipperary.  
October 2009**

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**For the Attention of:**

Mr David Ronan  
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- 3.0 INSTRUMENTATION EQUIPMENT USED
- 4.0 RESULTS
- 5.0 DISCUSSION

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**Executive Summary**

Matrix Environmental was contracted by Milltown Compost, to conduct the annual noise survey at the site in Milltown Mor in order to determine the noise levels at the facility. To this end an Environmental consultant subsequently visited the site on the 14<sup>th</sup> of October 2009 to carry out a day-time noise survey.

The results of the noise survey carried out on the 14<sup>th</sup> of October 2009 at the facility resulted in a  $L_{Aeq}$  result of 52 dB (A) 30-minutes, at a location approximately half way between the facility and the NSL. The site is therefore considered to be in compliance with the permit noise limit of limit of 55 dB (A) at a nearest sensitive receptor (NSL).

No nighttime monitoring was carried out at the facility as the site operating hours are from 08:00 to 18:00, these hours are outside the standard nighttime hours.

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**1.0 INTRODUCTION**

Milltown Compost operates a composting site at Milltown Mor, Fethard, Co. Tipperary. Matrix Environmental were contracted to carry out a daytime noise survey in order to assess the noise contribution from on site activities in the area of the compost site and at the nearest sensitive receptor to the compost site. The site was subsequently visited on the 14<sup>th</sup> of October 2009 to undertake the noise survey. This report presents details of both the methodologies employed and results obtained.

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## 2.0 METHODOLOGIES

### 2.1 Measurement Parameters

#### 2.1.1 L<sub>AeqT</sub> Values

L<sub>AeqT</sub> 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.

#### 2.1.2 L<sub>AF Max</sub>

The maximum RMS, A-Weighted sound pressure level occurring within a specified time period.

#### 2.1.3 L<sub>90</sub> and L<sub>10</sub> Values

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

### 2.2 Standards and Guidance

The acoustic assessment and subsequent report are in accordance with International Standard Organisation (ISO) 1996 Acoustics – Description and Measurement of Environmental Noise Part 1, 2, and 3 in addition to the Environmental Protection Agency: Environmental Noise Survey – Guidance Document

### 2.3 Site information

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

2.3.2 The weather was dry and calm at the time of the assessment.

2.3.3 Table 2.2 describes the locations of the monitoring positions for the noise monitoring assessment.

2.3.4 Monitoring Locations

The following is a detailed description of the noise monitoring points:

Measurement No.	Location
N1	On entrance road into facility app 250 m from processing building
N2	On road to the north of main processing buildings (In vicinity of site office)

**3.0 INSTRUMENTATION EQUIPMENT USED**

The following equipment was employed during the acoustic assessment on 14<sup>th</sup> of October 2009.

Bruel & Kjaer Real-Time Noise Analyzer Type 2250 Observer with Sound Analysis Software BZ 7132:

Model No: 2250	Serial No. 2638881
Date of Certificate and Calibration	8 <sup>th</sup> July 2009
Microphone Type: B&K 4950	Serial No: 2626990
Tripod	

On Site Calibration

The instrument was calibrated immediately before and after the measurement periods with no drift in calibration level noted.

#### 4.0 RESULTS

Tables 4.1 present the results of the noise monitoring survey carried out at the Milltown Mor site on the 14<sup>th</sup> of October 2009.

TABLE 4.1: NOISE MEASUREMENT RESULTS					
Location No.	Measurement Period (min)	L <sub>eq</sub> dB(A)	L <sub>10</sub> dB(A)	L <sub>90</sub> dB(A)	L <sub>F</sub> Max dB(A)
1	30	52	47	34	86
2	30	60	60	59	63

No night time monitoring was carried out at the facility.

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## 5.0 DISCUSSION

### Noise.

**Location N1:** On roadway at entrance to the facility (App 250 meters from Buildings).

The  $L_{Aeq}$  recorded at this location of 52 dB (A) is within the day time limit of 55 dB (A) as stipulated in the waste permit. Tonal noise was observed at 63 Hz on the 1/3 Octave band analysis graph (See Appendix 1 for tonal graph). The source of this tonal noise was a tractor spreading slurry in an adjacent field. The  $L_{AFMax}$  was as a result of a tractor passing by the monitoring location. No compost site operations were audible during the monitoring period.

**Location N2:** At entrance to field to north of main processing area.

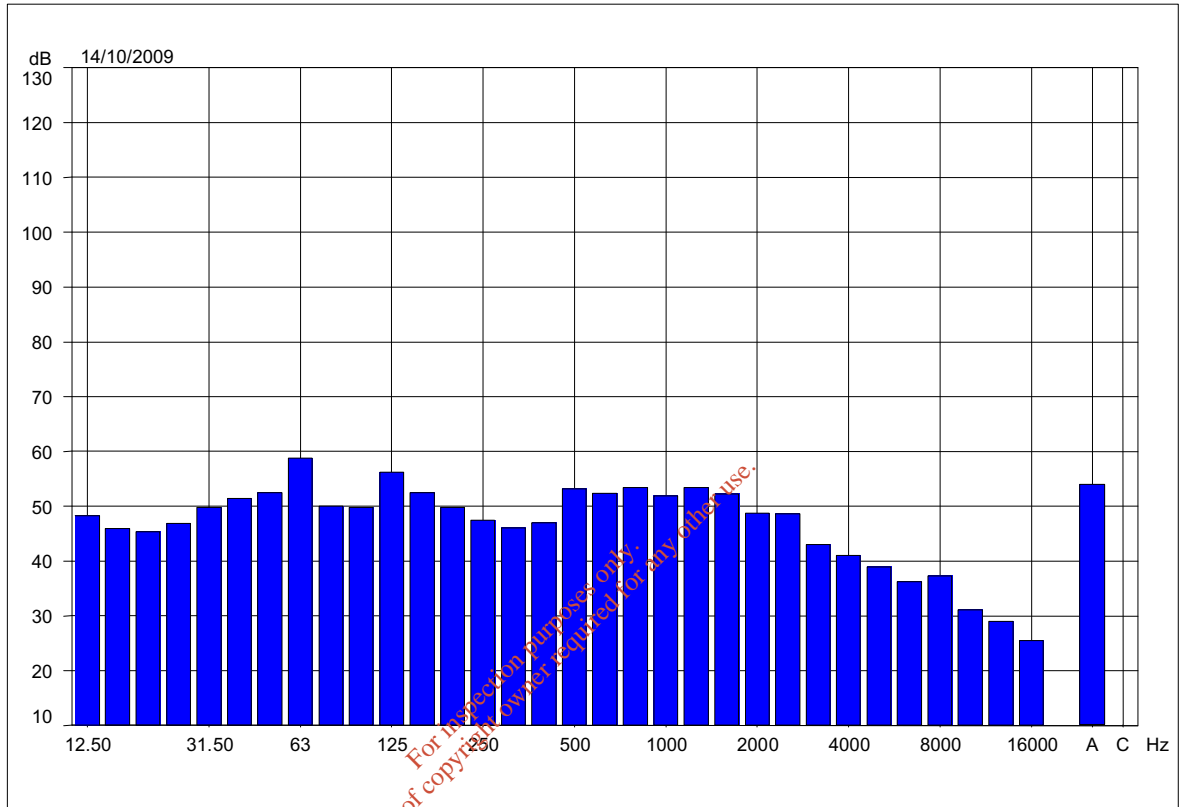
Throughout the monitoring period the composting operations were in progress. The  $L_{Aeq}$  result of 60dB is influenced by the fans located around the base of the processing buildings, the results for the  $L_{10}$  and  $L_{90}$  of 60 and 59 dB (A) indicate that the fans are the main noise contributors at this location. Tonal noise was observed at 200Hz on the 1/3 octave band analysis graph (See Appendix 1 for tonal graph)

**Comment** – The tonal noise recorded at each location was of a different frequency indicating that the tonal noise recorded at the NSL location was not influenced by the fans at the compost facility.

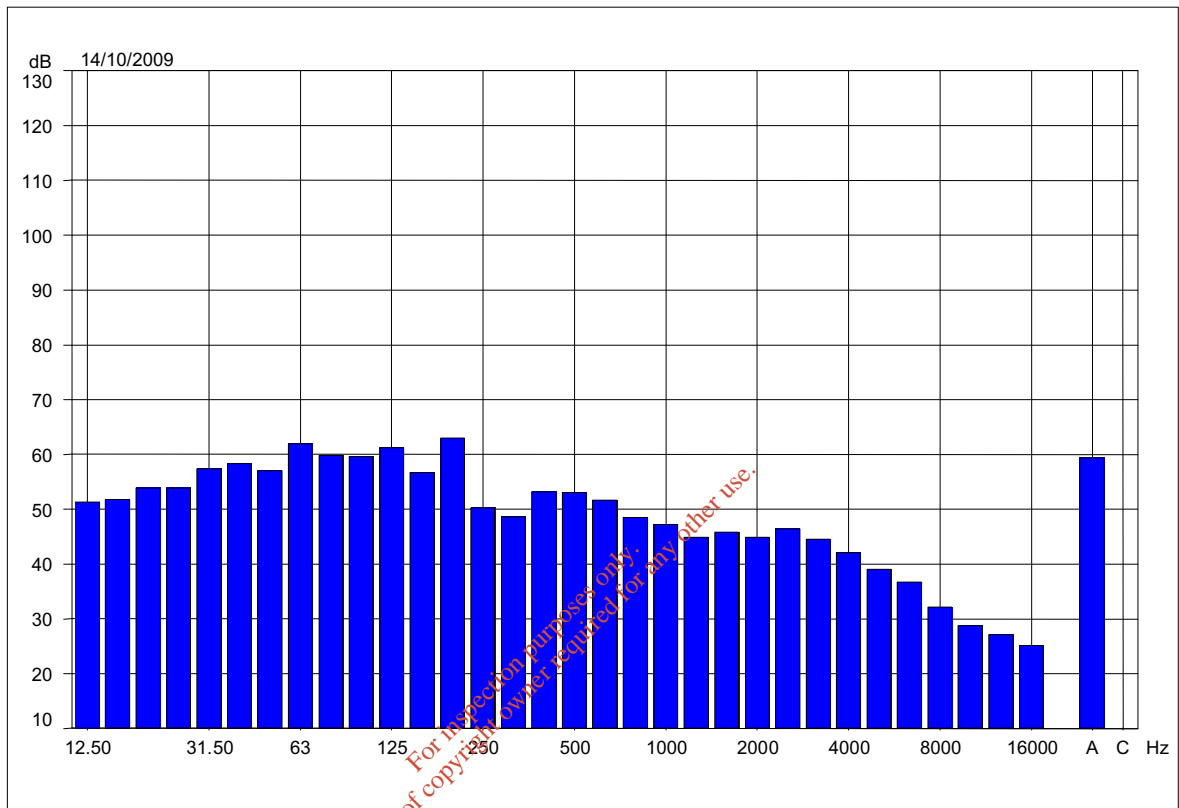


**Appendix 1**  
**Tonal Graph**

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Sensitive Receptor N1 - Tonal Graph

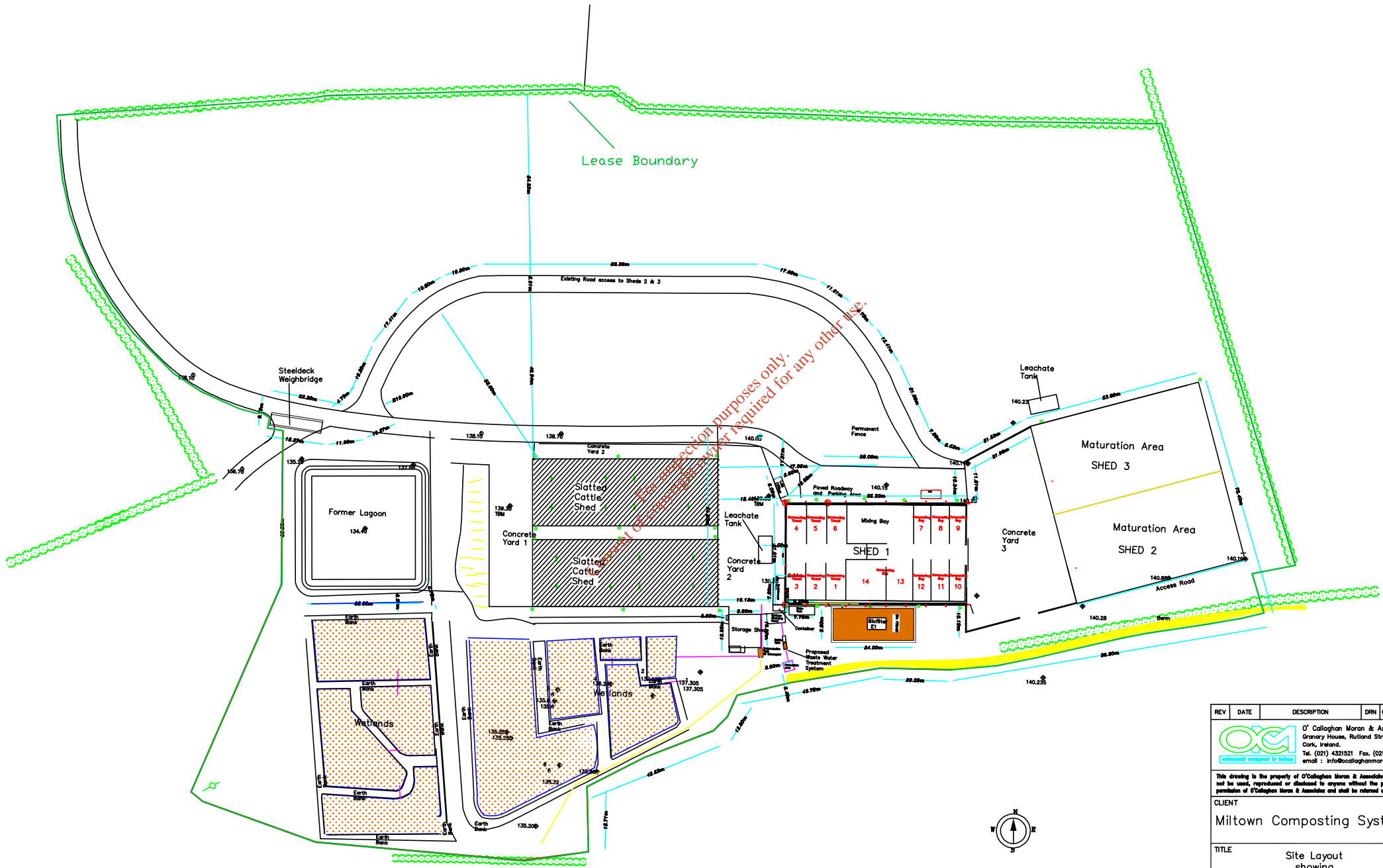


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### N2 - Tonal Graph


**Appendix 2**  
**Monitoring Locations**

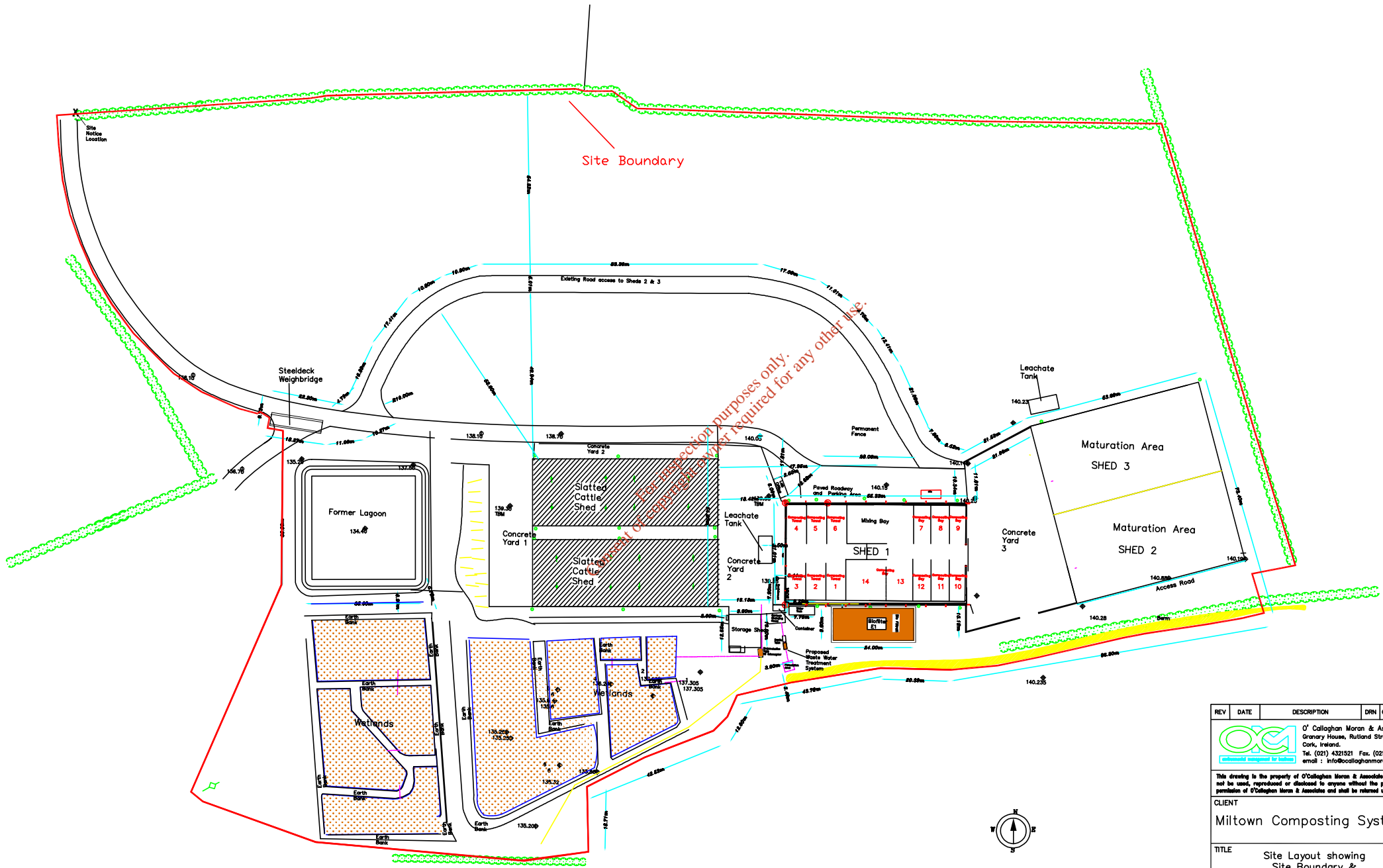
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TITLE					
Site Layout showing Site Boundary & Site Notice Location					
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