Granary House
Rutland Street
Cork

Tel. [021]4321521
Fax. [021]4321522

Dr. Magnus Amajirionwu,
Office of Environmental Enforcement,
South East Region,
Environmental Protection Agency,
P.O. Box 3000,
Johnstown Caste Estate,
Co.Wexford.

22nd March 2010

RE: Annual Environmental Report – Greenking Composting Ltd. (Reg. No. W0218-01)

Dear Dr. Amajirionwu,

Please find enclosed an original and 2 no. copies of the 2009 Annual Environmental Report (AER) for the above referenced facility. The AER file has been uploaded to the EPA website and is a true copy of the original Annual Environmental Report. The AER/PRTR emissions data reporting workbook has also been uploaded to the EPA website.

If you have any queries, please call me.

Yours sincerely,

Michael Watson.

Michael Watson

0911701/MG/MS
Encl.
c.c. Mr. Ian Browne, Greenking Composting Ltd.,

Granary House
Rutland Street
Cork

Tel. [021] 4321521
Fax. [021] 4321522

environmental management for business

ANNUAL ENVIRONMENTAL REPORT

FOR GREENKING COMPOSTING LTD.

COOLBEG, COUNTY WICKLOW

LICENCE REG. NO. W0218-01

JANUARY 2009 – DECEMBER 2009

Prepared For: -

Greenking Composting Ltd.,
Coolbeg,
Co. Wicklow.

Prepared By: -

O' Callaghan Moran & Associates,
Granary House,
Rutland Street,
Cork.

22nd March 2010

Project	Annual Environmental Report 2009			
Client	GreenKing Composting Ltd. W0218-01			
Report No	Date	Status	Prepared By	Reviewed By
1170101	16/03/2010	Draft	Martina Gleeson PhD	Michael Watson MSc.
1170101	22/03/2010	Final Report	Martina Gleeson PhD	Michael Watson MSc.

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1. INTRODUCTION

This is the fourth Annual Environmental Report (AER) for Kings Tree Services Ltd, trading as Greenking Composting Ltd. (Greenking), composting facility at Coolbeg, County Wicklow. The facility's Waste Licence (Register No. W0218-01) was issued on the 20th October 2005 and it began accepting waste on the 6th June 2006. This AER covers the period from January 2009 to December 2009.

The content of the AER is based on Schedule G of the Waste Licence and the report format follows guidelines set in the "Draft Guidance on Environmental Management Systems and Reporting to the Agency".

2. SITE DESCRIPTION

2.1 Site Location and Layout

The site is located in the townland of Coolbeg approximately 4 km to the south west of Wicklow Town and 3 km to the south east of Glenealy, as shown on Figure 2.1. It encompasses approximately 2.5 ha. The land adjoining the western site boundary is occupied by a non-hazardous residual waste landfill.

The site layout includes the reception office (240 m^2), workshop (540 m^2) and weighbridge and parking areas, the waste reception area (c. 1250 m^2), windrows area (c. 9500 m^2), maturation area (700 m^2), finished product storage (c. 2375 m^2) and a leachate storage lagoon (1250 m^2).

2.2 Waste Types

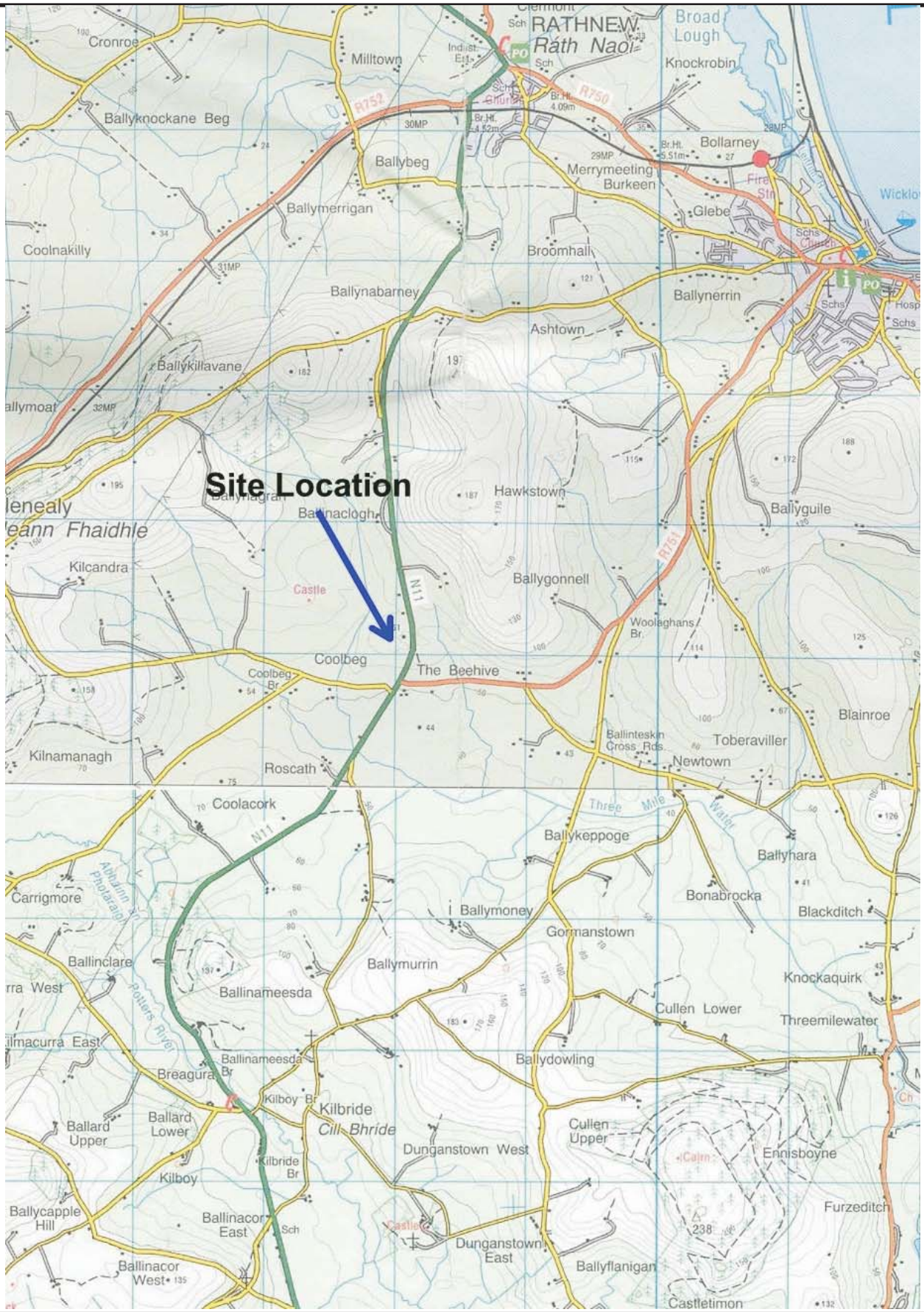
The facility is licensed to accept 40,000 tonnes of non-hazardous biodegradable green waste annually. The materials accepted includes wood wastes generated by the KTS tree surgery business, garden and park waste produced during improvement and maintenance works by landscape gardeners, grass and shrub trimmings produced by individual householders and timber and wood waste (non biocide treated) recovered during construction and demolition works.

The composting operation involves pre-treatment to shred and mix the green waste; composting in open windrows; maturation and post treatment to remove impurities. The finished product is suitable for horticultural and agricultural use.

The following plant is used on-site: -

- 1 No. Front Loading Shovel,
- 1 No. Mobile Wood Chipper/Shredder,
- 1 No. Hydraulic Excavator,
- 1 No. Mobile Star screener,
- 1 No. Leachate Tanker,
- 1 No. Tractor,
- 1 No. Teleporter

This provides for 100% duty and 50% standby for all key plant items. Additional supporting plant items are hired in for use on-site for short periods in the event of plant breakdown.



O' Callaghan Moran & Associates.
Granary House, Rutland Street,
Cork Ireland.
Tel. (021) 4321521 Fax. (021) 4321522
email : ocm@indigo.ie

CLIENT

Greenking Composting

TITLE

Site Location

Details

O.S. Licence Agreement Number AR 0038702

Ordnance Survey Ireland. Government of Ireland.

FIG. No

2.1

Scale

NTS

Rev.

A

3. EMISSION MONITORING

The monitoring programme specified in the Licence includes surface water, groundwater, dust, noise, odour and micro-organism monitoring. All of the monitoring locations, with the exception of odour and micro-organisms, are shown on Figure 3.1. The odour and micro-organism monitoring locations are shown on Figure 2.1 of the specialist subcontractors report in Appendix 1.

3.1 Surface Water Monitoring

Surface water monitoring is carried out biannually at one monitoring point (SW-1). The surface water monitoring was carried out in May and October 2009.

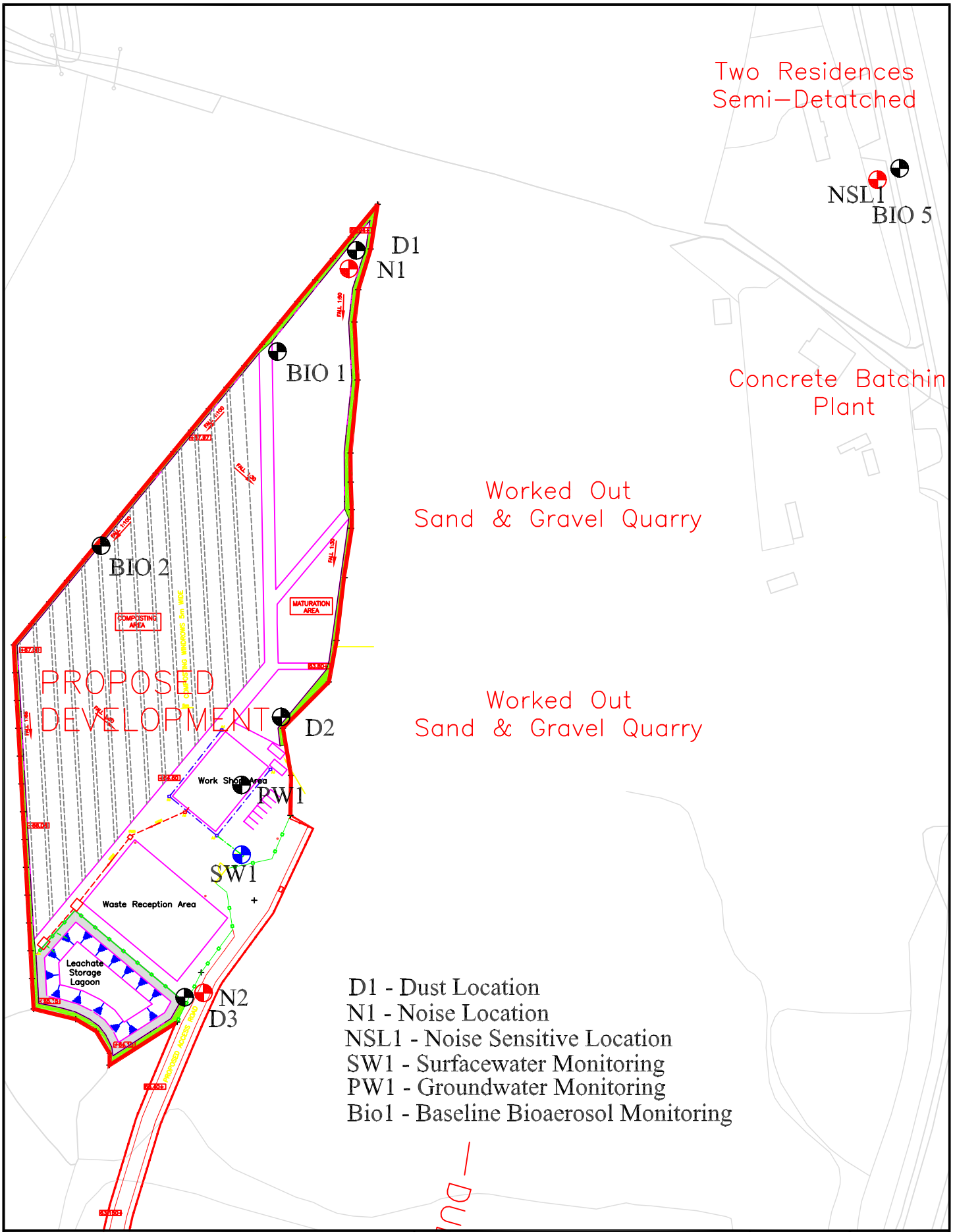
All run-off from non process paved areas and roof areas is collected and directed to a Class 1 oil-water interceptor and then to a soakway located along the access road to the south of the site. The surface water sample was collected at a manhole located between the oil interceptor and the soakway.

The range of analysis was as specified in Schedule C.2 of the Waste Licence and included pH, electrical conductivity, Biological Oxygen Demand (BOD), total suspended solids (TSS), ammoniacal nitrogen, faecal coliforms and total coliforms. The results are summarised in Table 3.1 and the full laboratory reports are included in Appendix 1.

Table 3.1 Surface Water Monitoring Results

Parameter	Units	May 2009	October 2009
pH	pH Units	8.25	7.81
Conductivity	mS/cm	0.318	0.26
BOD	mg/l	2.5	<2
TSS	mg/l	<10	5
Ammoniacal Nitrogen	mg/l	0.12	<1
Faecal Coliforms	cfu/100ml	>1000	0
Total Coliforms	cfu/100ml	>1000	98040

There are no trigger levels or emission limit values set in the Licence. The results indicate that the surface water discharge is of good chemical quality. The source of the coliforms is not known, but may be associated with animal activity in the vicinity of the facility and is not considered unusual.



O' Callaghan Moran & Associates.
Granary House, Rutland Street,
Cork, Ireland.
Tel. (021) 321521 Fax. (021) 321522
email : ocm@indigo.ie

CLIENT
GreenKing Composting

DETAILS

Figure
3.1

TITLE
MONITORING LOCATIONS

SCALE
NTS

REV.
A

3.2 Groundwater Monitoring

The Licence requires annual groundwater sampling at sampling location PW-1 shown on Figure 3.1. The groundwater sampling was undertaken in May 2009 and the range of analysis was as specified in Schedule C.2 of the Waste Licence. The parameters included pH, conductivity, ammoniacal nitrogen, chloride, arsenic, boron, cadmium, chromium, copper, lead, selenium, zinc, faecal coliforms and total coliforms. The results are summarised in Table 3.2 and the full laboratory report is included in Appendix 1.

There are no groundwater trigger levels or emission limit values in the Licence. Therefore the table also includes the Interim Guideline Values (IGVs) for groundwater quality published by the Agency. The IGVs are not statutory limit values, but have been prepared to assist in the assessment of impacts on groundwater quality.

Table 3.2 Groundwater Monitoring Results

Parameter	Units	PW-1	IGV
pH	pH Units	8.22	6.5 – 9.5
Conductivity	mS/cm	0.267	1.000
Chloride	mg/l	22.1	30
Ammoniacal Nitrogen	mg/l	0.10	0.15
Mercury	mg/l	<0.0006	0.001
Arsenic	mg/l	<0.0025	0.01
Boron	mg/l	0.017	1
Cadmium	mg/l	<0.0005	0.005
Chromium	mg/l	<0.0015	0.03
Copper	mg/l	0.033	0.03
Lead	mg/l	<0.005	0.01
Nickel	mg/l	<0.002	0.02
Zinc	mg/l	0.027	0.1
Total Coliforms	cfu/100mls	180	0
Faecal Coliforms	cfu/100mls	0	0

IGV – Interim Guideline Value - EPA

With the exception of copper and total coliforms, all parameters were below their respective IGVs. The reason for the slightly elevated copper and coliform levels is unknown but at this level neither are considered significant and are likely naturally occurring.

3.3 Noise Monitoring

As part of the Agency's audit report Reference (W0218-01)sm05djm, the Agency agreed to reduce the frequency of noise monitoring carried out at the facility to biennial (once every two years). Noise monitoring was carried out in 2008 and will be carried out again in 2010.

3.4 Dust Monitoring

The Licence requires dust monitoring be carried out quarterly. Dust monitoring was carried out in February, April, July and October at three on-site locations (D-1, D-2 and D-3). The results are summarised in Table 3.3 and are included in Appendix 1.

Table 3.3 Dust Monitoring Results

Monitoring Location	Units	February	April	July	October	Deposition Limit Value
D1	$mg/m^2/day$	32	124	66	146	350
D2	$mg/m^2/day$	*	134	34	**	350
D3	$mg/m^2/day$	*	199	80	158	350

* - Dust gauge was broken in transit to the laboratory
** - Dust gauge contaminated

The dust gauges at D2 and D3 in February were broken in transit to the laboratory and therefore analysis was not possible. The dust gauge located at D2 in October was contaminated with bird excrement and was therefore not suitable for analysis. The dust deposition limit (350 $mg/m^2/day$) was not exceeded at any of the remaining monitoring locations.

3.5 Bioaerosol Monitoring

Bioaerosol monitoring is carried out annually. Bioaerosol sampling including Aspergillus *fumigatus* and Total Mesophillic bacteria was carried out on the 20th November 2009 at three monitoring locations as shown on Figure 2.1 in the report which is included in Appendix 1. The results are presented on Table 3.4 and summarised below.

The Aspergillus *fumigatus* concentrations were low and at expected ambient concentration levels for the time of year. Total mesophillic bacteria concentration levels at Green 2 were elevated but dissipated rapidly with distance to monitoring location Green 3 (approx 50 m downwind).

The monitoring found that there were no significant bioaerosol impacts in the vicinity of the facility, with all reported bioaerosol ambient air concentrations within the lower range of the assessment criterion.

Table 3.4 Bioaerosols Concentration Levels

Location ID	Average Aspergillus *fumigatus* concentration (CFU m^{-3})[1]	Average Mesophillic bacteria concentration (CFU m^{-3})[1]	Sample count[2]
Green 1	2	18	3
Green 2	43	884	3
Green 3	13	46	3

Note: [1] denote a total of 6 blanks (3 plate and 3 impactor blanks) were incorporated into the sampling exercise. All blanks were negative CFU m^{-3}

[2] denote total number of sample counts for each parameter monitored at each location

3.6 Odour Monitoring

Odour monitoring was carried out on the 20th November 2009 in accordance with Schedule C of the Waste Licence. The results are summarised on Table 3.5 and the full report is included in Appendix 1. The monitoring was conducted at 8 locations shown on Figure 2.1 in the report.

All sampling and analysis was performed in accordance with EN13725:2003. No elevated concentrations of odour or hydrogen sulphide were detected during the survey. All Hydrogen Sulphide concentrations were less than 3 parts per billion (ppb) in ambient air.

Table 3.5 Odour Threshold Concentration and Hydrogen Sulphide Results

Sample Number	Odour threshold conc. (OuE m^{-3})[1]	H_2S (ppb)	Comment
Green 1.1	45	<3	No distinct odour
Green 1.2	57	<3	No distinct odour
Green 2.1	39	<3	No distinct odour
Green 2.2	42	<3	No distinct odour
Green 3.1	39	<3	No distinct odour
Green 3.2	39	<3	No distinct odour
Green 4	-	<3	No distinct odour
Green 5	-	<3	No distinct odour
Green 6	-	<3	No distinct odour
Green 7	-	<3	No distinct odour
Green 8	-	<3	No distinct odour

4. SITE DEVELOPMENT WORKS

4.1 Engineering Works

No engineering works have been carried out in 2009 and it is not envisaged that any works will be carried out in 2010. The Agency will be notified of all future engineering works as per Condition 3.2 of the Licence.

4.2 Energy Efficiency

An energy efficiency report was submitted as part of the AER for 2006. One of the main recommendations of this report was to install a thermostat in the office building. This recommendation has been implemented and currently each radiator is fitted with an individual manually adjusted thermostat, which turns the radiators on and off as required to maintain a comfortable working environment. There are only two members of staff at the facility full-time and so the energy consumption at the facility is very low. The main users of electricity are the office equipment, i.e. computers, fax, photocopier and printer.

Table 4.1 presents an estimate of the resources used on-site from January to December 2009. The water supply for the facility comes from an on-site groundwater well and this is not metered. The water is used solely for sanitary and kitchen purposes. The current carbon footprint is 39 tonnes, mostly based on the diesel usage, which is considered negligible in context of national emissions.

Table 4.1 Estimate of Resources Used On-Site

Energy Stream	Annual Quantity	Units	Period
Electricity	9,935	kWh	January – December 2009
Heating Oil	1,506	Litres	January – December 2009
Hydraulic & Engine Oil	100	Litres	January – December 2009
Diesel	10,689	Litres	January – December 2009

5. WASTE RECEIVED AND CONSIGNED FROM THE FACILITY

Table 5.1 shows the total quantities of waste received at the facility in 2009. A breakdown of the waste types is provided in accordance with the European Waste Catalogue and Hazardous Waste list. The total quantity of green waste received from January to December 2009 was 2,351 tonnes. Table 5.2 shows the quantities of waste received in the previous years. The facility is licensed to accept 40,000 tonnes of green waste annually.

All incoming waste is fully recovered during the composting process. Any erratics are removed and sent for disposal/recovery at a licensed facility. In 2009 a 20 cubic yard skip was placed on site by Greenstar Ltd for the removal of erratics. The skip was not filled in 2009 and therefore no erratics were removed off site. The total quantity of compost consigned was 1,508 tonnes. The compost has been tested to ensure that it meets the standards set in Schedule F of the Waste Licence. The compost testing reports which are included in Appendix 2 show that the compost meets the standards set in the Licence. Greenking's customers include landscape gardeners, Golf Clubs and Dun Laoghaire Rathdown County Council among others.

Table 5.1 Waste Received 2009

EWC	Description	Waste In
20 02 01	Green Waste	2,351
	Total Received	**2,351**

Table 5.2 Waste Received during period 2006 to 2008

EWC	Description	2008	2007	2006
20 02 01	Green Waste	3,377	4,062	1,179
	Total Received	**3,377**	**4,062**	**1,179**

6. ENVIRONMENTAL INCIDENTS AND COMPLAINTS

6.1 Incidents

There were no incidents during the reporting period.

6.2 Register of Complaints

Greenking maintains a register of complaints received in accordance with Condition 11.9 of the waste licence. No complaints were received during the reporting period.

7. ENVIRONMENTAL DEVELOPMENT & CONTROL

7.1 Environmental Management Programme Report

Greenking has developed an Environmental Management System (EMS) for the facility. The O&T for 2008 and the proposed schedule of objectives and targets for 2009 are outlined below.

7.1.1 Site Management Structure

Management and Staffing structure: -

Name: Ian Browne

Responsibility: Facility Manager, overall responsibility for the day to day running of the facility.

Experience: Has completed the relevant modules of the FÁS Waste Management course.

Name: Ann Keogh

Responsibility: Facility Administrator.

Experience: Has completed the relevant modules of the FÁS Waste Management course.

7.1.2 Staff Training

No training was carried out in 2009.

7.2 Environmental Management Programme

7.2.1 Schedule of Objectives 2009

The Schedule of Objectives for 2009 and the progress made are summarised in Table 7.1 below.

7.2.2 Schedule of Objectives 2010

A schedule of targets and objectives for 2010 has been set by the management of the facility. These objectives are outlined in Table 7.2.

7.3 Communications Programme

Records available for public inspection on-site include:-

- Waste Licence,
- Licence Application and Review documentation,
- Monitoring Records,
- Complaints File,
- EPA Correspondence File.

Visits to the site should be arranged in advance by ringing the Facility Manager at 040 – 462422.

7.4 Nuisance Controls

Nuisance controls employed at the facility include daily inspections of the facility for vermin, litter, and dust.

Table 7.1 Objectives and Targets for 2009

No	Objective	Target	Update
1	Reduce the energy/fuel usage at the facility.	Monitor diesel and electricity usage at least annually	Diesel usage reduced
2	Control litter, dust, odour, and noise nuisances.	Continue daily Facility Inspection Form to ensure any nuisances are identified and managed on a daily basis.	Ongoing
3	Maintain Environmental Management System	Maintain documentation for EMS and implement on site.	Ongoing
		Review the EMP in accordance with the Licence	Done
4	Maintain Regular Schedule of Environmental Training	Carry out Training on Environmental Awareness, Emergency Response, Waste Licence W0218-01 for all staff.	Ongoing
5	Identify measures to improve efficiency and minimise waste	Continue to identify measures to reduce waste and use of water.	Ongoing

Table 7.2 Objectives and Targets for 2010

No	Objective	Target	Timescale
1	Reduce the energy/fuel usage at the facility.	Monitor diesel and electricity usage at least annually	Q4 2010
2	Control litter, dust, odour, and noise nuisances.	Continue daily Facility Inspection Form to ensure any nuisances are identified and managed on a daily basis.	Ongoing
3	Maintain Environmental Management System	Maintain documentation for EMS and implement on site.	Ongoing
		Review the EMP in accordance with the Licence	Q4 2010
4	Maintain Regular Schedule of Environmental Training	Carry out Training on Environmental Awareness, Emergency Response, Waste Licence W0218-01 for all staff.	Ongoing
5	Identify measures to improve efficiency and minimise waste	Continue to identify measures to reduce waste and use of water.	Ongoing

7.5 Tank and Pipeline Testing

Condition 3.17.5 of the Waste Licence requires that the integrity and water tightness of all bunded structures be tested by the licensee at least once every three years. The tank and pipeline testing was carried out in 2008 and passed and is not due to be carried out again until 2011.

7.6 Statement of Environmental Liabilities Measures

The facility has an Environmental Management Programme (EMP) in place. The EMP serves as a guidance document for facility staff and describes operational control and management practices that are applied at the facility. The EMP is also the core element of the Environmental Management System (EMS) for the facility and is designed to ensure that management of site activities complies with regulatory requirements and best practice. The EMS includes a detailed Emergency Response Procedure which sets out the steps to be taken in the event of an incident at the facility with the potential to cause environmental damage. Greenking also implements a comprehensive monitoring programme which will highlight any potential environmental incidents with the potential to cause environmental damage.

Greenking have financial provisions in place to address any environmental liability including insurance cover to the sum of €6,500,000 for any one occurrence at the facility. The possible costs of remediation are shown on Table 7.3.

Table 7.3 Risk Classification Table

Risk	Category	Description	Cost of Remediation (€)
1	Very Low	No damage or negligible change to the environment	€0 - 10,000
2	Low	Minor/localised impact or nuisance	€10,000 - 100k
3	Medium	Moderate damage to the environment	€100k – 1m
4	High	Severe damage to the environment	€1m – 5m
5	Very High	Massive damage to a large area, irreversible in the medium term	>€5 million

7.7 European Pollutant Release and Transfer Register Regulation

Under the European Pollutant Release and Transfer Register Regulation (EC) No. 166/2006 Greenking are required to submit information annually to the Agency. A copy of the information submitted to the Agency via the web-based data reporting system is included in Appendix 4.

8. OTHER REPORTS

8.1 Waste Recovery Report

National and regional policy on waste management is based on the Department of the Environment and Local Government's policy statement of September 1998, "Changing Our Ways", in which the Government affirmed its commitment to the EU hierarchy of waste management. In order of preference this is: -

- Prevention,
- Minimisation,
- Reuse,
- Recycling,
- Energy Recovery,
- Disposal.

The policy statement was based on, and is supported by, EU legislation (Landfill Directive 99/339/EC) that requires the diversion of organic wastes, including green waste, from landfill to alternative waste treatment facilities.

The Greenking facility, which is designed to increase the recycling of biodegradable materials and reduce the volume of waste disposed to landfill, meets the needs identified in EU and national waste policy statements and contributed to the achievement of these goals as it accepted for recovery 2,351 tonnes of waste in 2009.

APPENDIX 1

Environmental Monitoring Reports

Surface Water & Ground Water Reports

Jones Environmental Forensics Ltd

Unit 3 Deeside Point
Zone 3
Deeside Industrial Park
Deeside
CH5 2UA

Tel: +44 (0) 1244 833780
Fax: +44 (0) 1244 833781

O'Callaghan Moran & Associates
Granary House
Rutland Street
Cork

UKAS TESTING
No.4225

Attention: Martina Gleeson

Date:	15th May 2009
Your reference:	09-117-01
Our reference :	Test Report 09/1172
Location :	
Date samples received:	7th May 2009
Status:	Final Report
Issue:	1

Two water samples were received for analysis on 7th May 2009 which was completed on 15th May 2009. Please find attached our Test Report which should include all sections if reproduced. All interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Signed

J W Farrell- Jones CChem FRSC
Chartered Chemist

Jones Environmental Laboratory

Client Name:	O'Callaghan Moran & Associates
Reference:	09-117-01
Location:	
Contact:	Martina Gleeson
JE Job No.:	09/1172

Report- liquids

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle

H=H_2SO_4, Z=ZnAc, N=NaOH, HN=$HN0_3$

J E Sample No.	1-2	3-5									**LOD**	**Units**	**Method No.**
Sample ID	SW1	PW1											
Depth													
Containers	H, P	H, P, P											
Sample Date													
Sample Type	Water	Water											
Batch Number	1	1											
Date of Receipt	07/05/09	07/05/09											
pH#	8.25	8.22									<0.01	pH units	TM19/PM11
Electrical Conductivity# @25°C	318	267									<100	µS/cm	TM28/PM11
Ammoniacal Nitrogen as N low#	0.12	0.10									<0.01	mg/l	TM038W
Total Suspended Solids	<10	~									<10	mg/l	TM037W
Chloride#	~	22.1									<0.3	mg/l	TM038W
Arsenic - dissolved #	~	<2.5									<2.5	µg/l	TM 030W
Boron - dissolved	~	17									<12	µg/l	TM 030W
Cadmium - dissolved #	~	<0.5									<0.5	µg/l	TM 030W
Chromium - dissolved #	~	<1.5									<1.5	µg/l	TM 030W
Mercury - dissolved #	~	<0.6									<0.6	µg/l	TM 030W
Nickel - dissolved #	~	<2									<2	µg/l	TM 030W
Lead - dissolved #	~	<5									<5	µg/l	TM 030W
Selenium - dissolved #	~	<3									<3	µg/l	TM 030W
Zinc - dissolved #	~	27									<3	µg/l	TM 030W
Copper - dissolved #	~	33									<7	µg/l	TM 030W

SS Calibrated against single substa

** Subcontracted

M MCERTS Accredited

UKAS Accredited

Please include all sections of this report if it is reproduced

All solid results are expressed on a dry weight basis unless stated otherwise.

Oldcastle Laboratories Ltd.

Cogan St., Oldcastle, Co. Meath. Ireland.
Tel: (049) 8541160/8541406, Fax (049) 8541755
EMail: info@oldcastlelabs.ie
Website address:www.oldcastlelabs.ie

CERTIFICATE OF ANALYSIS

Lab Ref No:	181798
Date Received:	5th May 2009
Commencement Date:	5th May 2009
Certificate Date:	7th May 2009
Sender:	Martina Gleeson, OCM, Granary Hse, Rutland St, Cork, Co Cork
Senders Reference:	Water Sample Ref S W 1 09-117-01
Type of Test:	Bacti

BACTERIOLOGY OF WATER

Total Coliform Count in 100 mls	**Positive >1000**	(@ 37°C)
Faecal Coliform Count in 100 mls	**Positive >1000**	(@ 44°C)

The presence of Faecal Coliforms indicate contamination with excreta of animal or human origin.
A Positive result indicates the presence of Coliforms.
A Negative result indicates no Coliforms present.

Coliforms other than Faecal Coliforms may arise due to contamination from organic matter, soil, decaying vegetation etc.

The European Communities (Drinking Water) Regulations, 2007 specify that water for human consumption should not contain Total Coliforms or Faecal Coliforms.

Signed: Martin Fulton
Analyst

Above Results Relate Only To Sample Submitted. The results outlined on this certificate cover only the parameters analysed and all other water quality parameters should be analysed separately.

Oldcastle Laboratories Ltd. perform all tests in accordance with an ISO 9001 Quality Management System.

Oldcastle Laboratories Ltd.

Cogan St., Oldcastle, Co. Meath. Ireland.
Tel: (049) 8541160/8541406, Fax (049) 8541755
Email: info@oldcastlelabs.ie
Website address:www.oldcastlelabs.ie

CERTIFICATE OF ANALYSIS

Lab Ref No: 181799

Date Received: 5th May 2009

Commencement Date: 5th May 2009

Certificate Date: 12th May 2009

Sender: Martina Gleeson, OCM, Granary Hse, Rutland St, Cork, Co Cork

Senders Reference: Water Sample Ref S W 1 09-117-01

Chemical Analysis Of Effluent

Parameter	Units	Laboratory Result
BOD	$BOD^{20}{}_{5}$ mg/l	2.5

Notes: PV are as per European Communities 2007 regulations on drinking water quality.
Nitrates result is nitrates expressed as N (PV 11.3mg/l N = 50mg/l NO_3) and nitrites result is nitrites expressed as N (PV 0.03mg/l N = 0.1mg/l NO_2).
Excessive iron when present can lead to staining while excessive hardness may lead to deposits on pipes.
Microbiological analysis is reported separately where applicable.

Signed: Martin Fulton
Analyst

Above Results Relate Only To Sample Submitted.

Oldcastle Laboratories Ltd. perform all tests in accordance with an ISO 9001 Quality Management System.

Oldcastle Laboratories Ltd.

Cogan St., Oldcastle, Co. Meath. Ireland.
Tel: (049) 8541160/8541406, Fax (049) 8541755
EMail: info@oldcastlelabs.ie
Website address:www.oldcastlelabs.ie

CERTIFICATE OF ANALYSIS

Lab Ref No:	181797
Date Received:	5th May 2009
Commencement Date:	5th May 2009
Certificate Date:	7th May 2009
Sender:	Martina Gleeson, OCM, Granary Hse, Rutland St, Cork, Co Cork
Senders Reference:	Water Sample Ref P W 1
Type of Test:	Bacti

BACTERIOLOGY OF WATER

Total Coliform Count in 100 mls	**Positive 180**	(@ 37°C)
Faecal Coliform Count in 100 mls	Negative	(@ 44°C)

The presence of Faecal Coliforms indicate contamination with excreta of animal or human origin.
A Positive result indicates the presence of Coliforms.
A Negative result indicates no Coliforms present.

Coliforms other than Faecal Coliforms may arise due to contamination from organic matter, soil, decaying vegetation etc.

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Signed: Martin Fulton
Analyst

Above Results Relate Only To Sample Submitted. The results outlined on this certificate cover only the parameters analysed and all other water quality parameters should be analysed separately.

Oldcastle Laboratories Ltd. perform all tests in accordance with an ISO 9001 Quality Management System.

City Analysts Limited
Environmental Laboratories

City Analysts Limited,
Pigeon House Road,
Ringsend,
Dublin 4.

Tel: (01) 613 6003 /6 /9
Fax: (01) 613 6008
Email:info@cityanalysts.ie
www.cityanalysts.ie

Customer: O'Callaghan Moran

Customer Address: Granary house,
Rutland st,
cork
Ireland

Customer Contact: Martina Gleeson

Report Reference: 09-03864-OCM

Report Date: 28/10/2009

Customer PO No.:
Chain of Custody No.: 10654

Certificate Of Analysis

Analysis of 1 sample(s) submitted on 21/10/2009 is now complete.
We have the pleasure of enclosing your certificate of analysis.
Should you have any queries regarding the report or require any further services, we would be happy to discuss your requirements. For additional information about the company please log-on to our web site at the above address.

Thank you for choosing City Analysts Limited. We look forward to assisting you again.

Authorised By: Niamh McIntyre **Date:** 28/10/09.

Authorised Signatories:
Dublin : Miriam Byrne, Niamh McIntyre, Jenny Pender, Adriana Przekazinska
Limerick: Hugh O'Donnell. Eimear Carney, Colleen O'Hara, Maurice Daffy, Sylwia Wojtowicz.
Note: Information on methods of analysis and performance characteristics is available on request.

Directors: Miriam Byrne, Ireland John Rahill, Ireland Alan Shattock, Ireland.
VAT Number IE 8265424H Registered in Ireland

City Analysts Limited,
Pigeon House Road,
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Dublin 4.

Tel: (01) 613 6003 /6 /9
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www.cityanalysts.ie

City Analysts Limited

Environmental Laboratories

Certificate of Analysis

Customer: O'Callaghan Moran

Customer Address: Granary house,
Rutland st,
cork
Ireland

Report Reference: 09-03864-OCM
Date Received: 21/10/2009

Customer Contact: Martina Gleeson

Sample Description: SW-1
Sample Type: Effluent
Date Sampled: 21/10/2009
Lab Reference Number: 70944

Site/Method Ref.	Analysis Start Date	Parameter	Result	Units	PV Value	Accreditation Status
D/3000	22/10/2009	Ammonia as N	<1	mg/l	-	INAB
D/1003	22/10/2009	CBOD5	<2	mg/l	-	INAB
D/1201	21/10/2009	Coliforms	98040.0	MPN/100ml	-	INAB
D/3011	21/10/2009	Conductivity	260	µs/cm at 20°C	-	NON
D/3221	21/10/2009	Faecal Coliforms	0	cfu/100ml	-	INAB
D/1041	21/10/2009	pH	7.81	pH Units	-	INAB
D/1049	22/10/2009	TSS	5	mg/l	-	INAB

Note:
NAC & ATC - No abnormal change and acceptable to customers.
PV Value is the parametric value, taken from European Communities, (Drinking Water) (No. 2) Regulations, 2007. S.I. No. 278 of 2007, and relates only to drinking water samples.
Site D = Analysed at City Analysts Dublin. Site L = Analysed at City Analysts Limerick

Template 1146
Revision 009

Dust Reports

Oldcastle Laboratories Ltd.

Cogan St., Oldcastle, Co. Meath. Ireland.
Tel: (049) 8541160/8541406, Fax (049) 8541755
Email: info@oldcastlelabs.ie
Website address:www.oldcastlelabs.ie

CERTIFICATE OF ANALYSIS

Lab Ref No: 181800 - 181802

Date Received: 5th May 2009

Commencement Date: 5th May 2009

Certificate Date: 14th May 2009

Sender: Martina Gleeson, c/o OCM, Granary Hse., Rutland St., Cork, Co. Cork

Sample Type: **Bergerhoff Dust Gauges - Job number 09-117-01 - 29 Days.**

Your Ref.	Total Solids mg/m2/day	Organic Particles mg/m2/day	Inorganic Particles mg/m2/day
D1	124	43	81
D2	134	70	64
D3	199	69	130

Comment:

Signed: Lizanne Farrelly
Analyst

Above Results Relate Only To Sample Submitted.
Oldcastle Laboratories Ltd. perform all tests in accordance with an ISO 9001 Quality Management System.

southern scientific
services ltd.

OUR REF: RP 2009 / OCM / 08

ANALYSIS REPORT

CUSTOMER:	O' CALLAGHAN MORAN & ASSOCIATES	SAMPLE TYPE:	BERGERHOFF DUST GAUGE
ADDRESS:	Granary House, Rutland Street, Cork	CONDITION OF SAMPLE ON RECEIPT:	Satisfactory
		DATE SAMPLED:	28 Days
REPORT TO:	MARTINA GLEESON	DATE RECEIVED:	13 March 2009
SAMPLED BY:	O' Callaghan Moran & Associates	DATE ANALYSED:	16 - 23 March 2009
SAMPLING PT:	KTS	DATE REPORTED:	23 March 2009
ORDER NO:	09-117-01	WORK NO.:	21382 C

TABLE OF RESULTS

Method:	LAB REF:	YOUR REF:	TOTAL PARTICULATES $mg/m^2/Day$	ORGANIC PARTICULATES $mg/m^2/Day$	INORGANIC PARTICULATES $mg/m^2/Day$
TA Luft VDI 2119	C09-Mar 314	D1	32	24	<10
TA Luft VDI 2119	"	D2	*	*	*
TA Luft VDI 2119	"	D3	*	*	*

* Collector gauge broken during transit to laboratory.

Jennifer Keane

Jennifer Keane
Chemistry Laboratory

- **The results relate only to the items tested.**
- **The analysis report shall not be reproduced except in full without written approval of the laboratory.**

Customer:	O'Callaghan Moran
Customer Address:	Granary house, Rutland st, cork Ireland
Customer Contact:	Michael Watson
Report Reference:	09-04007-OCMR
Report Date:	30/11/2009
Customer PO No.:	0911701
Chain of Custody No.:	10622

Reissued Certificate Of Analysis

Reason for report re-issue: To amend reporting of units to mg/(m2/d)

Analysis of 3 sample(s) submitted on 03/11/2009 is now complete.
We have the pleasure of enclosing your certificate of analysis.

Should you have any queries regarding the report or require any further services, we would be happy to discuss your requirements. For additional information about the company please log-on to our web site at the above address.

Thank you for choosing City Analysts Limited. We look forward to assisting you again.

Authorised By: _____ **Date:** _____

Authorised Signatories:
Dublin : Miriam Byrne, Niamh McIntyre, Jenny Pender, Adriana Przekazinska
Limerick: Hugh O'Donnell. Eimear Carney, Colleen O'Hara, Maurice Daffy, Sylwia Wojtowicz.
Note: Information on methods of analysis and performance characteristics is available on request.

Certificate of Analysis

Customer: O'Callaghan Moran

Report Reference: 09-04007-OCM

Date Received: 03/11/2009

Customer Address: Granary house,
Rutland st,
cork
Ireland

Customer Contact: Michael Watson

Sample Description: D1
Sample Type: Dust
Date Sampled: 03/11/2009
Lab Reference Number: 71478

Site/Method Ref.	Analysis Start Date	Parameter	Result	Units	PV Value	Accreditation Status
D/3119	13/11/2009	Total Dust	33.2	mg/container	-	NON

Analysts Comments:

Result = 146.5 mg/(m2d)

Note:

NAC & ATC - No abnormal change and acceptable to customers.
PV Value is the parametric value, taken from European Communities, (Drinking Water) (No. 2) Regulations, 2007. S.I. No. 278 of 2007, and relates only to drinking water samples.
Site D = Analysed at City Analysts Dublin. Site L = Analysed at City Analysts Limerick

Certificate of Analysis

Customer: O'Callaghan Moran

Report Reference: 09-04007-OCM

Date Received: 03/11/2009

Customer Address: Granary house,
Rutland st,
cork
Ireland

Customer Contact: Michael Watson

Sample Description: D2
Sample Type: Dust
Date Sampled: 03/11/2009
Lab Reference Number: 71479

Site/Method Ref.	Analysis Start Date	Parameter	Result	Units	PV Value	Accreditation Status
D/3119	13/11/2009	Total Dust	195.7	mg/container	-	NON

Analysts Comments:

Result = 863.7 mg/(m2d)

Note:

NAC & ATC - No abnormal change and acceptable to customers.
PV Value is the parametric value, taken from European Communities, (Drinking Water) (No. 2) Regulations, 2007. S.I. No. 278 of 2007, and relates only to drinking water samples.
Site D = Analysed at City Analysts Dublin. Site L = Analysed at City Analysts Limerick

Certificate of Analysis

Customer: O'Callaghan Moran

Report Reference: 09-04007-OCM

Date Received: 03/11/2009

Customer Address: Granary house,
Rutland st,
cork
Ireland

Customer Contact: Michael Watson

Sample Description: D3
Sample Type: Dust
Date Sampled: 03/11/2009
Lab Reference Number: 71480

Site/Method Ref.	Analysis Start Date	Parameter	Result	Units	PV Value	Accreditation Status
D/3119	13/11/2009	Total Dust	35.8	mg/container	-	NON

Analysts Comments:

Result = 158 mg/(m2d)

Note:

NAC & ATC - No abnormal change and acceptable to customers.
PV Value is the parametric value, taken from European Communities, (Drinking Water) (No. 2) Regulations, 2007. S.I. No. 278 of 2007, and relates only to drinking water samples.
Site D = Analysed at City Analysts Dublin. Site L = Analysed at City Analysts Limerick

Oldcastle Laboratories Ltd.

Cogan St., Oldcastle, Co. Meath. Ireland.
Tel: (049) 8541160/8541406, Fax (049) 8541755
Email: info@oldcastlelabs.ie
Website address:www.oldcastlelabs.ie

CERTIFICATE OF ANALYSIS

Lab Ref No: 185368 - 185370

Date Received: 5th August 2009

Commencement Date: 5th August 2009

Certificate Date: 12th August 2009

Sender: Michael Watson, OCM, Granary Hse., Rutland St., Cork, Co. Cork

Sample Reference: **Bergerhoff Dust Gauges - Dust Job No. 09-117-01 - KTS - 28 Days Sampled 05/08/09**

Sample Reference	Total Dust mg/m²/day	Inorganic Dust mg/m²/day	Organic Dust mg/m²/day
D1	66	29	37
D2	34	24	10
D3	80	50	30

Comment:

Signed: Lizanne Farrelly
Analyst

Above Results Relate Only To Sample Submitted.

Oldcastle Laboratories Ltd. perform all tests in accordance with an ISO 9001 Quality Management System.

Odour & Bioaerosol Report

ODOUR & ENVIRONMENTAL ENGINEERING CONSULTANTS

Unit 32 De Granville Court, Dublin Rd, Trim, Co. Meath

Tel: +353 46 9437922
Mobile: +353 86 8550401
E-mail: info@odourireland.com
www.odourireland.com

BIOAEROSOL, ODOUR AND HYDROGEN SULPHIDE IMPACT ASSESSMENT AT GREEN KING COMPOSTING LTD, COOLBEG, CO. WICKLOW

PREPARED BY:	Dr. Brian Sheridan
ATTENTION:	Dr. Martina Gleeson(OCM)
DATE:	04th January 2010
REPORT NUMBER:	2010A2 (1)
DOCUMENT VERSION:	Version 1
REVIEWERS:	Dr. Martina Gleeson

TABLE OF CONTENTS

Document Amendment Record

Client: ***Green King Composting Ltd***

Title: Bioaerosol, Odour and H_2S Impact Assessment at Green King Composting Ltd, Coolbeg, Co. Wicklow

Project Number: 2010A2(1)			**Document Reference:** Bioaerosol, Odour and H_2S Impact Assessment at Green King Composting Ltd, Coolbeg, Co. Wicklow		
2010A2(1)	Document for review	B.A.S.	JMC	B.A.S	04/01/2010
2010A2(2)	Minor Edits	M.G			04/01/2010
Revision	**Purpose/Description**	**Originated**	**Checked**	**Authorised**	**Date**

1. Introduction

Odour Monitoring Ireland was commissioned to perform a bioaerosol, odour and hydrogen sulphide (H_2S) assessment in the vicinity of Green King Composting Ltd, Coolbeg, Co. Wicklow. The bioaerosol assessment was carried out in accordance with the guidance document established by the UK Composting Association "Standardised protocol for the testing and enumeration of micro organisms". Total Mesophillic bacteria and Aspergillus *fumigatus* sampling was performed using equivalent Andersen single stage impactors. Triplicate sampling was performed at each of the three identified sampling locations within and in the vicinity of Green King Composting facility located at Coolbeg, Co. Wicklow.

The odour assessment was carried out in accordance with EN 13725:2003. Hydrogen sulphide (H_2S) sampling and analysis was carried out using a Gold leaf Jerome ppb analyser.

The bioaerosol concentration levels were determined at each sampling location in triplicate. Three sampling locations were chosen including Green 1, 2 and 3. Currently, there are no significant bioaerosol impacts in the vicinity of Green King Composting facility located at Coolbeg, Co. Wicklow with all reported bioaerosol ambient air concentrations within the range of the assessment criterion. All odour sampling and analysis was performed in accordance with EN13725:2003. All ambient odour threshold concentrations were less than 57 Ou_E m^{-3}. Hydrogen sulphide concentrations recorded at each monitoring location were less than the lower level of detection of 3 ppb in ambient air.

1.1 Aims of the study

The main aims of the study were:

- To enumerate the ambient air concentration of two bioaerosols groups namely: Aspergillus *fumigatus* and Total Mesophillic bacteria during operation of the composting facility at Coolbeg, Co. Wicklow. These are the two most frequently requested bioaerosols to be monitored for composting plants.
- To ascertain ambient odour and H_2S concentrations levels in the vicinity of the composting facility.

2. Materials and methods

This section describes in detail the materials and methods used throughout the study period.

2.1 Sampling locations and residential locations

Figure 2.1 and *Table 2.1* illustrates the location of the facility in relation to local residents.

Table 2.1. Monitoring locations and parameters monitored.

Location ID	Parameter monitored	Location details
Green 1	Total Mesophillic bacteria and Aspergillus fumigatus, Odour[1], H_2S	Upwind of site
Green 2	Total Mesophillic bacteria and Aspergillus fumigatus, Odour[1], H_2S	Beside green waste
Green 3	Total Mesophillic bacteria and Aspergillus fumigatus, Odour[1], H_2S	Downwind of site
Green 4	H_2S, Odour[1]	At entrance to site downwind
Green 5	H_2S	Upwind of site
Green 6	H_2S, Odour[1]	Upwind of site
Green 7	H_2S	Downwind of site
Green 8	H_2S Odour[1]	At entrance to site downwind

Notes: [1] denotes duplicate odour samples taken

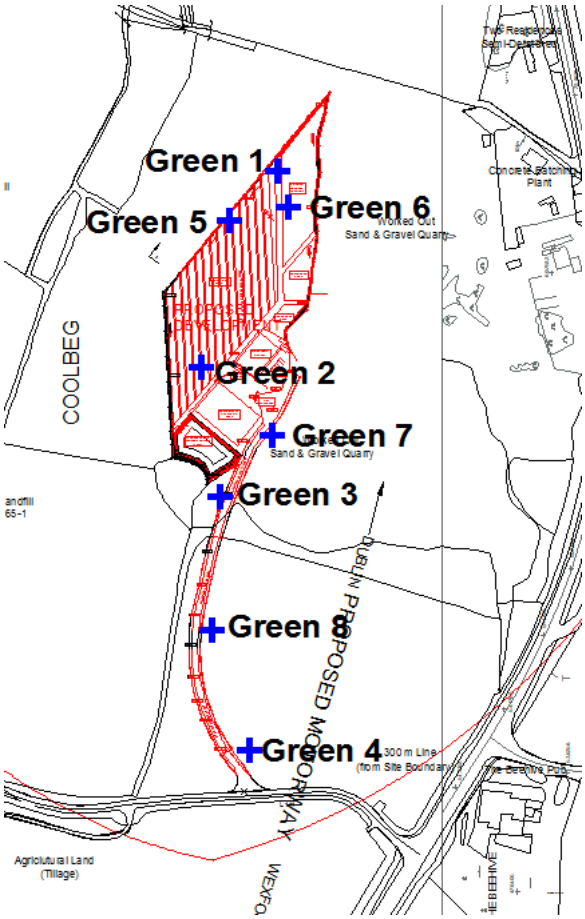

Figure 2.1. Schematic overview of Bioaerosol, Odour and H_2S monitoring locations.

2.2 Meteorological data

Table 2.2 illustrates the average wind direction during the one-day monitoring period. Average wind speed was low breeze to breezy during all day. Cloud cover was high with an octave rating of 3 to 5 (i.e. on an 8 point scale). Barometric pressure was approximately 1008 to 1010 mbar. Relative humidity was high with a range of readings from 65 to 75% while temperature was low from 10 to 12 degrees Celsius. This would be typical for this time period of the year in Southern Ireland.

Table 2.2 Meteorological conditions during the one-day monitoring period.

Parameter	Day 1-Nov 20th 2009
Wind direction (From)	320 to 350
Wind speed (m s^{-1})	3 to 4
Barometric pressure	998 to 1003
Temperature (^{0}C)	10.5 to 11.3
Relative humidity (%)	65 to 75

2.3 Bioaerosols monitoring

Monitoring of bioaerosols was performed in strict accordance with available information and advice including the sources:

1. Standardised Protocol for the Sampling and Enumeration of Airborne Micro-organisms at Composting Facilities. (1999). The UK Composting Association.
2. Macher, J. (1999). Bioaerosol assessment and control. American Conference of Government Industrial Hygienists, Kemper Woods Centre, 1330 Kemper Meadow Drive, Cincinnati, OH.

3. Direct Laboratories, (formerly ADAS), Woodthorne, Wergs Road, Wolverhampton, WV6 8QT.
4. SKC Inc, 863 Valley View Road, Eighty-four, PA, 15330.

Impactor plate sampling was carried out in accordance with the document "Sampling Protocol for the Sampling and Enumeration of Airborne Micro-organisms at Composting facilities", The Composting Association, UK.

One sampling technique was employed namely:

- Biostage single stage 400 hole impactor (SKC Inc, PA)- This is directly equivalent to the Andersen N6 single stage impactor and meets the requirements of NIOSH 0800 and NIOSH 0801 biological sampling standards (i.e. this impactor is a direct copy of the Andersen N6 impactor with added benefits including the Surelok system which prevents any air leakages. This was an inherent problem of the Andersen N6 single stage impactor).

Generally, sampling times of 10 to 15 minutes were used to assess ambient background levels using the impactor plates as longer sampling times can lead to desiccation of the plate and impacted microbes. Sampling times of 10 minutes were used for the duration of this study.

The Biostage (i.e. Andersen N 6 equivalent impactor) was calibrated using a Bios Primary flow calibrator to a volumetric flow rate of 28.3 *litres* min^{-1} and Hi Flow 30 battery operated automatically timed pumps were used for suction airflow.

The Biostage impactors were fixed to tripods ensuring an adjustable sampling height of between 0.40 to 1.90 metres. The sampling height was fixed at 1.50 metres. Two Biostage impactors were used throughout the study period. The use of correctly designed sampling equipment ensured correct operation at all times throughout the study period.

The Irish Equine Centre (ISO 17025 accredited) tested two medias including Malt Extract Agar media (MEA) for Aspergillus *fumigatus*, and standard plate count agar (TVC) for total Mesophillic bacteria. MEA media facilitates the sporulation of Aspergillus *fumigatus*, which is used to identify the species. Sterile fresh 90mm plates were supplied by Cruinn Diagnostics accredited laboratory services and placed in sealed coolers. Fresh plates were used to eliminate the formation of a skin upon the plate upper surface (i.e. develops with age). It was thought that this may cause problems while using an impaction method (i.e. particle bounce off).

2.4. Transport of bioaerosol samples

All sampling plates during monitoring were allowed to equilibrate to ambient temperature before sampling. This allowed for the development of less harsh conditions upon impacted bioaerosols. It was also noticed that cooled plates (approximately 5^0C) formed an outer "skin" which could facilitate particle bounce. Following equilibration, it was apparent from observation, better "knitting" of impactor plates occurred. Before each sampling event, the Biostage impactors were sterilised using cotton wool and 70% iso-proponal. The impactors were autoclaved for complete sterilisation before sampling. Once sampled, all agar plates were inverted, sealed with parafilm, placed within a flexible plastic container, and neatly stacked within a mobile cooler for delivery to Irish Equine Centre laboratory located in Kill, Co. Kildare. Once received, they were incubated at the appropriate temperatures of 30^0C for Total viable counts (i.e. Mesophillic bacteria) and 37^0C for Aspergillus *fumigatus* by the laboratory technician. Results were received within 10 to 15 days following sampling.

2.5. Odour sampling

In order to obtain air samples for odour assessment, a static sampling method was used where air samples were collected in 60 litre pre-conditioned Nalophan^{NA} bags using a vacuum sampling device over a ten to twenty minute period. The sampler operates on the 'lung principle', whereby the air is removed from a rigid container around the bag by a battery powered SKC vacuum pump at a rate of 3 to 5 *l* min^{-1}. This caused the bag to fill through a stainless steel and PTFE tube whose inlet is placed in ambient air, with the volume of sample equal to the volume of air evacuated from the rigid container. All odour-sampling bags were pre-conditioned and flushed with odourless lab air to remove any interference from the sample material.

2.6. Olfactometry

Olfactometry using the human sense of smell is the most valid means of measuring odour (Dravniek et al, 1986) and at present is the most commonly used method to measure the concentration of odour in air (Hobbs et al, 1996). Olfactometry is carried out using an instrument called an olfactometer. Three different types of dynamic dilution olfactometers exist:

- Yes/No Olfactometer
- Forced Choice Olfactometer
- Triangular Forced Choice Olfactometer.

In the dynamic dilution olfactometer, the odour is first diluted and is then presented to a panel of screened panellists of no less than four (CEN, 2003) Panellists are previously screened to ensure that they have a normal sense of smell (Casey et al., 2003). According to the CEN standard this screening must be performed using a certified reference gas *n*-butanol. This screening is applied to eliminate anosmia (low sensitivity) and super-noses (high sensitivity). The odour analysis has to be undertaken in a low odour environment such as an air-conditioned odour free laboratory. Analysis should be performed preferably within 8 to 12 hours of sampling.

2.7. Odour measurement in accordance with EN13725:2003

An ECOMA TO8 dynamic yes/no olfactometer was used throughout the measurement period to determine the odour threshold concentration of the sample air. The odour threshold concentration is defined as the dilution factor at which 50% of the panel can just detect the odour. Only those panel members who pass screening tests with n-butanol (certified reference gas, CAS 72-36-3) and who adhered to the code of behaviour were selected as panellists for olfactometry measurements (CEN, 2003). Odour measurement was carried out in an odour free laboratory in accordance with EN13725:2003.

2.7.1 What is an odour unit?

The odour concentration of a gaseous sample of odourant is determined by presenting a panel of selected screened human panellists with a sample of odourous air and varying the concentration by diluting with odourless gas, in order to determine the dilution factor at the 50% detection threshold. The Z_{50} value (threshold concentration) is expressed in odour units (Ou_E m^{-3}).

The European odour unit is that amount of odourant(s) that, when evaporated into one cubic metre of neutral gas (nitrogen), at standard conditions elicits a physiological response from a panel (detection threshold) equivalent to that elicited by one European Reference Odour Mass (EROM) evaporated in one cubic meter of neutral gas at standard conditions. One EROM is that mass of a substance (n-butanol) that will elicit the Z_{50} physiological response assessed by an odour panel in accordance with this standard. *n*-Butanol is one such reference standard and is equivalent to 123µg of n-butanol evaporated in one cubic meter of neutral gas at standard conditions (CEN, 2003).

2.8. H_2S measurement

A Jerome real time data-logging H_2S gold leaf analyser (measurement range 3 ppb to 50ppm) was also used for the measurement of ambient hydrogen sulphide levels in order to ascertain any elevations in ambient H_2S concentrations. This was used, as H_2S is commonly associated with composting operations and is a good indicator gas for the assessment of significant odour nuisance in the vicinity of compost facilities.

2.9 Bioaerosol assessment criteria

Table 2.2 illustrates the assessment criterion which is used for comparison of results during operation to ascertain ambient bioaerosol air quality in the vicinity of the Green King Composting facility located at Coolbeg, Co. Wicklow.

Table 2.2. Assessment criteria for the ambient bioaerosol air quality in the vicinity of Green King Composting facility Coolbeg, Co. Wicklow.

Assessment criteria	Reference concentration range	Notes	Reference
Total fungi (includes Aspergillus *fumigatus*)[1]	1000 to 5,000 CFU m^{-3}	Environment Agency proposed concentration level, Reported concentration range in Swan, 2003 & Sheridan et al., 2004	McNeel et al., 1999 Wheeler et al., 2001, Swan et al., 2003 Sheridan et al., 2004
Mesophillic bacteria[1]	5,000 to 10,000 CFU m^{-3}	Environment Agency proposed concentration level, Reported concentration range in Swan, 2003 and Sheridan et al., 2004	Gorny and Dutkiewicz (2002) Wheeler et al., 2001 Swan et al., 2003 Dutch Occupational Health Association NWA 1989. Sheridan et al., 2004

Notes: [1] denotes the values of CFU m^{-3} refers to Colony Forming Unit per cubic metre of air sampled.

2.10 Ambient Bioaerosol air quality

Table 2.3 illustrates the results from bioaerosol air quality monitoring. Both Aspergillus *fumigatus* and Total Mesophillic bacteria were assessed on the day of sampling in 20th November 2009.

Table 2.3. Bioaerosols concentration levels within and in the vicinity of the recycling facility in 20th November 2009.

Location ID	Average Aspergillus *fumigatus* concentration (CFU m^{-3})[1]	Average Mesophillic bacteria concentration (CFU m^{-3})[1]	Sample count[2]
Green 1	2	18	3
Green 2	43	884	3
Green 3	13	46	3

Note: [1] denotes a total of 6 blanks (3 plate and 3 impactor blanks for the monitored bioaerosol) were incorporated into the sampling exercise. All blanks were negative CFU m^{-3}.
[2] denote total number of sample counts for each parameter monitored at each location.

Table 2.3 illustrates the ambient bioaerosol air quality within and in the vicinity of the Green waste composting facility. As can be observed, Aspergillus *fumigatus* concentrations are low and at expected ambient concentration levels. Total mesophillic bacteria concentration levels at monitored location Green 2 were elevated but dissipated rapidly with distance to monitoring location Green 3 (approx. 50m downwind). The dissipation in concentrations of total mesophillic bacteria from Green 2 to Green 3 would be indicative of results obtained from international literature where bioaerosol concentrations greatly dissipate with distance from the source (i.e. within 80 to 200 metres).

Following a review of literature, it is reported that concentration levels of bioaerosols in ambient environment range from 0 to 400 CFU m^{-3} for Aspergillus *fumigatus*, 0 to 15,673 CFU m^{-3} for Total fungi and 79 to 3204 CFU m^{-3} for Total bacteria. The data set measured is within the lower end of this range.

In accordance with the assessment criteria reported in *Table 2.2*, bioaerosol concentrations within lower range for Aspergillus fumigatus and in the mid range for total Mesophillic bacteria.

2.11. Odour and H_2S results

Table 2.4 and 2.5 illustrates the odour threshold concentration and hydrogen sulphide results obtained during the monitoring period. All sampling and analysis for odour was performed in accordance with EN13725:2003. No elevated concentrations of odour or hydrogen sulphide were detected during the survey.

Table 2.4. Odour threshold concentration and Hydrogen sulphide results following monitoring of Green King Composting Ltd, Coolbeg, Co. Wicklow.

Date/Time	Location	Odour threshold conc. (OuE m^{-3})	H_2S (ppb)	Comment
Nov 2009	Green 1	45	<3	No distinct odour
Nov 2009	Green 2	57	<3	No distinct odour
Nov 2009	Green 3	39	<3	No distinct odour
Nov 2009	Green 4	42	<3	No distinct odour
Nov 2009	Green 6	39	<3	No distinct odour
Nov 2009	Green 8	39	<3	No distinct odour
Nov 2009	Green 5	-	<3	No distinct odour
Nov 2009	Green 7	-	<3	No distinct odour

3. Conclusions

The following conclusions may be drawn from the study;

1. The bioaerosol concentration levels were determined at each sampling location in triplicate. Three sampling locations were chosen including Green 1, 2, 3. Currently, there are no significant bioaerosol impacts in the vicinity of Green King Composting facility located at Coolbeg, Co. Wicklow with all reported bioaerosol ambient air concentrations within the range of the proposed assessment criterion.
2. All odour sampling and analysis was performed in accordance with EN13725:2003.
3. All ambient odour threshold concentrations were less than 57 Ou_E m^{-3}, therefore causing no significant impact with respect to odour.
4. All Hydrogen sulphide concentrations recorded at each monitoring location were less than 3ppb in ambient air.

APPENDIX 2

Compost Testing Results

BORD NA MÓNA

BORD NA MÓNA HORTICULTURE LIMITED

ANALYSIS GREENWASTE FROM GREENKING

REPORT NO: **GW 090302**

ATTENTION:

Ian Browne,
GREENKING,
COOLBEG,
WICKLOW,

PREPARED BY:

Dr. Bill Carlile
Chief Research Scientist,
Bord na Móna.

Dearbháil Ní Chualáin,
Scientist,
Bord na Móna ltd.

DATE: 14th April 2009

Table of Contents

1 Introduction

No details are known of this sample, or composting process

2 Applied Standards

The analysis carried out on the samples of compost from Greenking was as requested by the client

Results of Analysis

A sample was received from Greenking on the 6th March 2009 (GW 090302). It was received in good condition. Analysis was carried out on this sample as requested by the client.

This sample was not labelled.

Compost Testing and Analysis Service

Report ref: GW 090302

Sample reference: GW 090302
Sample matrix: Composted greenwaste

Maturity Tests

Oxygen Uptake Rate

Sample no	$mmolO_2/kg$ OS/h
GW 090302	3.27

Self Heating Test

Sample no	Maximum temperature reached (°C)
GW 090302	19

Cress Germination Test

Sample no	% germination compared to control
GW 090302 100%	80
GW 090302 50:50	100
GW 090302 70:30	100

Plant Nutrient and Organic Matter Content

Water Soluble Nutrients

pH	EC $\mu S.cm^{-1}$	NH_4-N $mg.L^{-1}$	NO_3-N $mg.L^{-1}$	PO_4-P $mg.L^{-1}$	K $mg.L^{-1}$
8.18	713	5	3	2	847

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

N %	P %	K %	C %	C:N %
1.05	2.16	1.05	20	18.7

Heavy Metals (Dry Wt. Basis)

Cd $mg.kg^{-1}$	Cr $mg.kg^{-1}$	Cu $mg.kg^{-1}$	Hg $mg.kg^{-1}$	Ni $mg.kg^{-1}$	Pb $mg.kg^{-1}$	Zn $mg.kg^{-1}$
1.1	66.1	45.2	0.11	31.7	64.8	133

Physical Analysis

H_20 %
49

Particle Size Analysis (Dry Wt. Basis)

>31.5 mm %	16.5-31.5mm %	8-16.5mm %	4-8mm %	2-4mm %	1-2mm %	<1mm %
23	26	24	22	6	<0.01	<0.01

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	<0.01	<0.01	<0.01	<0.01	<0.01
4-8mm	1.27	<0.01	0.06	<0.01	<0.01
8-16mm	<0.01	<0.01	<0.01	<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)
<10	Not detected

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* $\mu S.cm^{-1}$	NH4-N $mg.L^{-1}$	NO3-N $mg.L^{-1}$	P $mg.L^{-1}$	K $mg.L^{-1}$
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-1	Cr mg.kg-1	Cu mg.kg-1	Pb mg.kg-1	Hg mg.kg $^{-1}$	Ni mg.kg-1	Zn mg.kg-1
I	**0.7**	**100**	**100**	**100**	**0.5**	**50**	**200**
II	**1.5**	**150**	**150**	**150**	**1**	**175**	**400**

Physical Analysis

H_20 %	DBD** $g.L^{-1}$	MBD $g.L^{-1}$
55-76	**120-369**	**500-820**

Contaminants (Dry Wt. Basis)

vs.L-1	0.5.L^{-1} Free	0.5-2.L^{-1} Low	>2.L^{-1} Significant	
Foreign Material (Metal, Glass, Plastic etc)	**<0.1%** Free of foreign material	**0.1-0.5 %** Potentially free	**>0.5%** Marked quantity (Noticeable)	**>2%** Significant quantity (distinct)

Stones	**<5%** Low	**>5%** Significant

Microbiological Analysis

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

**Denotes Bord na Móna suggested standard

Oxygen Uptake Rate

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

mmolO_2/kg OS/h**	**Compost Process Stage**
>26	Very Unstable
16-25	Unstable
11-15	Moderately Stable
5-10	Stable
<5	Completely stable

Costings

Cost (€) per sample ex VAT

Cost (€)
289.08

BORD NA MÓNA

BORD NA MÓNA HORTICULTURE LIMITED

ANALYSIS OF GREENWASTE FROM GREENKING

REPORT NO: **GW 091105**

ATTENTION:

Ian Browne,
GREENKING,
COOLBEG,
WICKLOW,

PREPARED BY:

Dr. Bill Carlile
Chief Research Scientist,
Bord na Móna.

Dearbháil Ní Chualáin,
Scientist,
Bord na Móna ltd.

DATE: 15th December 2009

Table of Contents

1 Introduction

No details are known of this sample, or composting process

2 Applied Standards

The analysis carried out on the samples of compost from Greenking was as requested by the client

Results of Analysis

A sample was received from Greenking on the 9th November 2009 (GW 091105). It was received in good condition. Analysis was carried out on this sample as requested by the client.

This sample was not labelled.

Compost Testing and Analysis Service

Report ref: GW 091105

Sample reference: GW 091105
Sample matrix: Composted greenwaste

Maturity Tests

Oxygen Uptake Rate

Sample no	$mmolO_2/kg$ OS/h
GW 091105	4.82

Self Heating Test

Sample no	Maximum temperature reached (°C)
GW 091105	21

Cress Test

% of sample mixed with peat	% germination compared to control
100%	93

Plant Nutrient and Organic Matter Content

Water Soluble Nutrients

pH	**EC** $\mu S.cm^{-1}$	**NH_4-N** $mg.L^{-1}$	**NO_3-N** $mg.L^{-1}$	**PO_4-P** $mg.L^{-1}$	**K** $mg.L^{-1}$
8.94	408	4	3	6	743

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

N %	**P** %	**K** %	**C** %	**C:N** %
1.59	0.30	0.86	28.76	18.1

Heavy Metals (Dry Wt. Basis)

Cd $mg.kg^{-1}$	**Cr** $mg.kg^{-1}$	**Cu** $mg.kg^{-1}$	**Hg** $mg.kg^{-1}$	**Ni** $mg.kg^{-1}$	**Pb** $mg.kg^{-1}$	**Zn** $mg.kg^{-1}$	**Se**	**Mo**	**As**
0.862	66.2	64.6	0.100	24.5	108	362	0.600	5.66	7.21

Physical Analysis

H_20 %
55.1

Particle Size Analysis (Dry Wt. Basis)

>31.5 mm %	**16.5-31.5mm %**	**8-16.5mm %**	**4-8mm %**	**2-4mm %**	**1-2mm %**	**<1mm %**
28	22	19	18	13	<0.01	<0.01

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	1.16	<0.01	0.05		<0.01
4-8mm	2.90	<0.01	<0.01	<0.01	<0.01
8-16mm	<0.01	<0.01	<0.01	<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)
10	Not detected

Note:

N/A NOT AVAILABLE

Results given on a fresh weight basis except where indicated

Samples will be kept for three months

[/]Yield is expressed as % of control plants grown in 100% peat in relation to plants grown in 10%, 25%, 50% and 100% GW.

[†]DBD=Dry bulk density (after drying at 105°C for 12 hours)

[‡]MBD=Moist bulk density (sample as received)

CBW=Composted Biowaste

MP=Multipurpose Peat (fertilised peat)

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*** $\mu S.cm^{-1}$	**NH4-N mg.L^{-1}**	**NO3-N** mg.L^{-1}	**P** mg.L^{-1}	**K** mg.L^{-1}
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-1	**Cr** mg.kg-1	**Cu** mg.kg-1	**Pb** mg.kg-1	**Hg** mg.kg^{-1}	**Ni** mg.kg-1	**Zn** mg.kg-1
I	**0.7**	**100**	**100**	**100**	**0.5**	**50**	**200**
II	**1.5**	**150**	**150**	**150**	**1**	**175**	**400**

Physical Analysis

H_20 %	**DBD**** g.L^{-1}	**MBD** g.L^{-1}
55-76	**120-369**	**500-820**

Contaminants (Dry Wt. Basis)

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

Microbiological Analysis

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

**Denotes Bord na Móna suggested standard

Oxygen Uptake Rate

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

mmolO_2/kg OS/h**	**Compost Process Stage**
>26	Very Unstable
16-25	Unstable
11-15	Moderately Stable
5-10	Stable
<5	Completely stable

APPENDIX 3

European Pollutant Release and Transfer Register

| PRTR# : W0218 | Facility Name : Kings Trees Services Composting Facility | Filename : W0218_2009.xls | Return Year : 2009 |

Environmental Protection Agency

AER Returns Worksheet

Version 1.1.10

REFERENCE YEAR	2009

1. FACILITY IDENTIFICATION

Parent Company Name	Kings Tree Services Limited
Facility Name	Kings Trees Services Composting Facility
PRTR Identification Number	W0218
Licence Number	W0218-01

Waste or IPPC Classes of Activity

No.	class_name
4.2	Recycling or reclamation of organic substances which are not used as solvents (including composting and other biological transformation processes).
4.13	Storage of waste intended for submission to any activity referred to in a preceding paragraph of this Schedule, other than temporary storage, pending collection, on the premises where such waste is produced.

Address 1	Coolbeg
Address 2	Co Wicklow
Address 3	
Address 4	
Country	Ireland
Coordinates of Location	-6.09863 52.9559
River Basin District	IEEA
NACE Code	3832
Main Economic Activity	Recovery of sorted materials
AER Returns Contact Name	Ian Browne
AER Returns Contact Email Address	ian@greenking.ie
AER Returns Contact Position	Facility Manager
AER Returns Contact Telephone Number	0404 62422
AER Returns Contact Mobile Phone Number	086 8382004
AER Returns Contact Fax Number	040468846
Production Volume	0.0
Production Volume Units	
Number of Installations	0
Number of Operating Hours in Year	0
Number of Employees	0
User Feedback/Comments	
Web Address	

2. PRTR CLASS ACTIVITIES

Activity Number	Activity Name
50.1	General
50.1	General

3. SOLVENTS REGULATIONS (S.I. No. 543 of 2002)

Is it applicable?	No
Have you been granted an exemption ?	
If applicable which activity class applies (as per Schedule 2 of the regulations) ?	
Is the reduction scheme compliance route being used ?	

4.1 RELEASES TO AIR

SECTION A : SECTOR SPECIFIC PRTR POLLUTANTS

RELEASES TO AIR								
POLLUTANT		METHOD				QUANTITY		
			Method Used					
No. Annex II	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
					0.0	0.0	0.0	0.0

* Select a row by double-clicking on the Pollutant Name (Column B) then click the delete button

SECTION B : REMAINING PRTR POLLUTANTS

RELEASES TO AIR								
POLLUTANT		METHOD				QUANTITY		
			Method Used					
No. Annex II	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
					0.0	0.0	0.0	0.0

* Select a row by double-clicking on the Pollutant Name (Column B) then click the delete button

SECTION C : REMAINING POLLUTANT EMISSIONS (As required in your Licence)

RELEASES TO AIR								
POLLUTANT		METHOD				QUANTITY		
			Method Used					
Pollutant No.	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
					0.0	0.0	0.0	0.0

* Select a row by double-clicking on the Pollutant Name (Column B) then click the delete button

Additional Data Requested from Landfill operators

For the purposes of the National Inventory on Greenhouse Gases, landfill operators are requested to provide summary data on landfill gas (Methane) flared or utilised on their facilities to accompany the figures for total methane generated. Operators should only report their Net methane (CH4) emission to the environment under T(total) KG/yr for Section A: Sector specific PRTR pollutants above. Please complete the table below:

Landfill: Kings Trees Services Composting Facility

Please enter summary data on the quantities of methane flared and / or utilised	**T (Total) kg/Year**	**M/C/E**	**Method Used**		**Facility Total Capacity m3 per hour**	
			Method Code	**Designation or Description**		
Total estimated methane generation (as per site model)	0.0				N/A	
Methane flared	0.0				0.0	(Total Flaring Capacity)
Methane utilised in engine/s	0.0				0.0	(Total Utilising Capacity)
Net methane emission (as reported in Section A above)	0.0				N/A	

4.2 RELEASES TO WATERS

SECTION A : SECTOR SPECIFIC PRTR POLLUTANTS

Data on ambient monitoring of storm/surface water or groundwater, conducted as part of your licence requirements, should NOT be submitted under AER / PRTR Reporting as this

RELEASES TO WATERS								
POLLUTANT					QUANTITY			
			Method Used					
No. Annex II	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
					0.0	0.0	0.0	0.0

* Select a row by double-clicking on the Pollutant Name (Column B) then click the delete button

SECTION B : REMAINING PRTR POLLUTANTS

RELEASES TO WATERS								
POLLUTANT					QUANTITY			
			Method Used					
No. Annex II	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
					0.0	0.0	0.0	0.0

* Select a row by double-clicking on the Pollutant Name (Column B) then click the delete button

SECTION C : REMAINING POLLUTANT EMISSIONS (as required in your Licence)

RELEASES TO WATERS								
POLLUTANT					QUANTITY			
			Method Used		SW-1			
Pollutant No.	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
303	BOD	E	EN ISO 17025	Flow was estimated based on rainfall amount over the year and the area of the facility. The analysis was ISO accredited	3.90065	3.90065	0.0	0.0
240	Suspended Solids	E	EN ISO 17025	Flow was estimated based on rainfall amount over the year and the area of the facility. The analysis was ISO accredited	7.8013	7.8013	0.0	0.0
238	Ammonia (as N)	E	EN ISO 17025	Flow was estimated based on rainfall amount over the year and the area of the facility. The analysis was ISO accredited	0.187231	0.187231	0.0	0.0

* Select a row by double-clicking on the Pollutant Name (Column B) then click the delete button

4.3 RELEASES TO WASTEWATER OR SEWER

SECTION A : PRTR POLLUTANTS

OFFSITE TRANSFER OF POLLUTANTS DESTINED FOR WASTE-WATER TREATMENT OR SEWER								
POLLUTANT		METHOD			QUANTITY			
			Method Used					
No. Annex II	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
					0.0	0.0	0.0	0.0

* Select a row by double-clicking on the Pollutant Name (Column B) then click the delete button

SECTION B : REMAINING POLLUTANT EMISSIONS (as required in your Licence)

OFFSITE TRANSFER OF POLLUTANTS DESTINED FOR WASTE-WATER TREATMENT OR SEWER								
POLLUTANT		METHOD			QUANTITY			
			Method Used					
Pollutant No.	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
					0.0	0.0	0.0	0.0

* Select a row by double-clicking on the Pollutant Name (Column B) then click the delete button

4.4 RELEASES TO LAND

SECTION A : PRTR POLLUTANTS

RELEASES TO LAND							
POLLUTANT		METHOD			QUANTITY		
			Method Used				
No. Annex II	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year
					0.0	0.0	0.0

* Select a row by double-clicking on the Pollutant Name (Column B) then click the delete button

SECTION B : REMAINING POLLUTANT EMISSIONS (as required in your Licence)

RELEASES TO LAND							
POLLUTANT		METHOD			QUANTITY		
			Method Used				
Pollutant No.	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year
					0.0	0.0	0.0

* Select a row by double-clicking on the Pollutant Name (Column B) then click the delete button

5. ONSITE TREATMENT & OFFSITE TRANSFERS OF WASTE

| PRTR# : W0218 | Facility Name : Kings Trees Services Composting Facility | Filename : W0218_2009.xls | Return Year : 2009 | 19/03/2010 12:13

3

Transfer Destination	European Waste Code	Hazardous	Quantity (Tonnes per Year)	Description of Waste	Waste Treatment Operation	Method Used		Location of Treatment	Haz Waste : Name and Licence/Permit No of Next Destination Facility Non Haz Waste: Name and Licence/Permit No of Recover/Disposer	Haz Waste : Address of Next Destination Facility Non Haz Waste: Address of Recover/Disposer	Name and License / Permit No. and Address of Final Recoverer / Disposer (HAZARDOUS WASTE ONLY)	Actual Address of Final Destination i.e. Final Recovery / Disposal Site (HAZARDOUS WASTE ONLY)
						M/C/E	Method Used					
Within the Country	20 02 01	No	2351.0	Green Waste	R3	M	Weighed	Onsite in Ireland	King Tree Services,W0218-01	Coolbeg,Co. Wicklow,.,.,Ireland		

* Select a row by double-clicking the Description of Waste then click the delete button