

Kabeyun Limited
(W0121-01)
Gibralter
Castleshane
Co. Monaghan

Annual Environmental Report

2009

Prepared By: Donna Kelly
BSc Hons Environmental Science

CONTENTS

	Page No.
1.0 Reporting Period	3
2.0 Waste Activities	3
3.0 Decommissioning and Aftercare	3
4.0 Capacity of the Facility	4
5.0 Waste	4
5.1 Waste Received	4
5.2 Waste Recovered	4
5.3 Waste Disposed	4
6.0 Water Usage	4
7.0 Emissions	5
7.1 Water Monitoring	5
7.2 Airborne Micro-Organism Monitoring	5
7.3 Dust Monitoring	5
7.4 Noise Monitoring	5
8.0 Results and Interpretation	6
8.1 Water	6
8.2 Airborne Micro-Organisms	8
8.3 Dust	9
8.4 Noise	11
9.0 Resource and Energy Consumption	12
10.0 Environmental Objectives and Targets for 2009	13
11.0 Environmental Objectives and Targets for 2010	13
12.0 Complaints	16

13.0	Nuisance Controls	17
14.0	Costs	17
15.0	Staff Training	17

1.0 Reporting Period

For the Year 2009.

2.0 Waste Activities

Kabeyun Limited is licensed by the Environmental Protection Agency in accordance with the Fourth Schedule of the Waste Management Act 1996 to 2003 for

Recycling or reclamation of organic substances which are not used as solvents (including composting and other biological transformation processes):

Kabeyun Limited produces Phase II mushroom substrate at its facility.

3.0 Decommissioning and Aftercare

Section 2.5 of Kabeyun Ltd's Environmental Liabilities Risk Assessment, conducted by WYG Environmental in September 2007 outlines the *Provisions for Site Closure*, and is included below:

2.5 Provisions for Site Closure

Operations at the facility are ongoing with an open-ended lifespan. In the event of a decision to close the facility a closure plan will be developed. This plan will allow for removal of all raw materials, intermediate materials and compost from the site and cleaning of all surfaces where materials/compost were handled and/or stored. A monitoring programme will be carried out on environmental media including air and water to ensure that all emissions from the facility have ceased.

It is assumed that upon closure of the site, the premises will be suitable for industrial or other use and will have a re-sale value, which will cover the costs of removal of materials/compost, site cleaning and monitoring.

When operations cease at the site it is expected that the bulk of the site infrastructure will be sold on to a prospective buyer as an asset. This will include the site buildings, offices, compost tunnels, fencing, gates, lighting, fire alarms and drainage/sewage infrastructure. The potential buyer may also require other plant equipment. However, if not, these will be sold off to other potential buyers separately or dismantled and disposed off site at a licensed facility. Other plant equipment includes generator, site machinery, oil storage tanks and bunds.

When Operations cease at the site any residual compost/waste will be removed and disposed at relevant licensed recovery/disposal facilities. The entire site floors and walls will be power swept and washed to clear all debris and dust. Silt traps will be dislodged and interceptors cleaned out. The waste from the cleaning operations will be disposed to relevant licensed facilities. It is not anticipated that any specialist recovery or disposal will be required.

A monitoring programme of all potential emissions including surface water, foul waters and dust will be carried out after this process in order to ensure that emissions from the site have ceased. The monitoring programme will be designed to include at least two rounds of sampling carried out within two months of the decommissioning of the facility and within at least two weeks apart.

As stated above, operations at the facility are ongoing with an open-ended lifespan. To date, an aftercare management plan has not been developed. Potential nuisances at the site are limited to operational emissions such as odour, dust and noise. After closure and cleaning of the site as described above and when operations have ceased and assuming confirmation from the monitoring programme that all emissions have ceased, it is expected that there will be no requirement for long term aftercare management at the site.

For more details please refer to the ELRA submitted to the EPA on 1st October 2007.

4.0 Capacity of the Facility

In 2009 Kabeyun Compost Limited produced:

55, 645 Tonnes - Mushroom Substrate (Phase II)

5.0 Waste

5.1 Waste Received:

Table 5.1.1 Type and quantity of Waste received in Kabeyun Limited 2009

Waste Type	EWC Code	Quantity (Tonnes)
Chicken Manure	02 01 06	13, 548
Gypsum*	17 08 02	2, 118

*Although not classified as a waste, gypsum has been included in this section following request by the EPA

5.2 Waste Recovered:

See **Table 5.1.1** above.

5.3 Waste Disposed:

See 'Onsite treatment & offsite transfers of waste' in Appendix A.

6.0 Water Usage

Water is provided for Kabeyun Ltd by two groundwater wells on site. A total of 58,827 m³ of water was used in 2009 - an average of 4,902 m³ of water per month, or 1131 m³ per week. This equates to a 12% decrease in ground water usage from 2008 levels.

7.0 Emissions

7.1 Water monitoring:

Kabeyun Limited is required to monitor two types of water i.e. surface water and groundwater. Surface water sampling locations include SW1. Two groundwater monitoring locations exist; GW1 and GW2.

Monitoring was carried out: - on ground waters in February, May, August and November 2009. In December 2009 by the EPA.
- on SW1 in February 2009. On river water in December 2009 by the EPA.

7.2 Airborne Micro-Organism Monitoring:

Four Airborne Micro-Organism monitoring locations exist on the Kabeyun site; AB1, AB2, AB3 and AB4. During sampling all four locations were monitored: AB1, located upwind of the facility, with AB2, AB3 and AB4 situated downwind of the facility.

Monitoring was carried out: - July 2009.

7.3 Dust Monitoring:

Four dust monitoring locations exist on the Kabeyun site, D1, D2, D3 and D4. Time period required to complete dust monitoring is 30 (+/- 2) days.

Monitoring was carried out: - April/May 2009.
- August/September 2009.
- September/October 2009.

7.4 Noise Monitoring:

Monitoring was carried out: - May 2009.
- September 2009.

8.0 Results and Interpretation

8.1 Water

Table 8.1.1 Groundwater Monitoring Results for Kabeyun Limited 2009 – GW1

	GW1 (Top Well)				
	26.02.09	29.05.09	28.08.09	20.11.09	16.12.09
<i>pH</i>	7.31	7.01	7.20	7.42	7.60
<i>COD (mg/l O2)</i>	<10	2.4	4.1	<4	26
<i>Ammonia (mg/l) NH4-N</i>	0.347	0.391	0.328	0.307	0.370
<i>Nitrates (mg/l) NO3-N</i>	<0.5	1.97	0.14	0.16	<0.08
<i>Sulphate</i>	36	15	96	<5	21.3
<i>Total Coliforms (per 100ml)</i>	Absent	Absent	Absent	Absent	-
<i>E.Coli (per 100ml)</i>	Absent	Absent	Absent	Absent	-

Table 8.1.2 Groundwater Monitoring Results for Kabeyun Limited 2009 – GW2

	GW2 (Bottom Well)				
	26.02.09	29.05.09	28.08.09	20.11.09	16.12.09
<i>pH</i>	7.15	7.00	7.18	7.21	7.30
<i>COD (mg/l O2)</i>	<10	3.8	4.2	<4	24
<i>Ammonia (mg/l) NH4-N</i>	0.338	0.343	0.385	0.323	0.340
<i>Nitrates (mg/l) NO3-N</i>	1.00	1.75	0.31	0.2	<0.08
<i>Sulphate</i>	44	14	17	<5	23.9
<i>Total Coliforms (per 100ml)</i>	Absent	Absent	Absent	Absent	-
<i>E.Coli (per 100ml)</i>	Absent	Absent	Absent	Absent	-

Groundwater monitoring was conducted on five occasions during 2009 at Kabeyun Ltd – in February, May, August and November by Bio-labs, Monaghan and in December by the EPA, Monaghan. Results are displayed in **Tables 8.1.1 and 8.1.2** above. All samples were found to have satisfactory results; not exceeding specified limits.

Table 8.1.3 Surface water Monitoring Results for Kabeyun Limited 2009 – SW1 and Cor River

	SW1	Upstream	Downstream
	26.02.09	16.12.09	16.12.09
<i>Temperature</i>	-	5.4	5.3
<i>(% saturation)</i>	-	94	94
<i>COD (mg/l O2)</i>	<10	34	21
<i>pH</i>	6.68	7.6	7.8
<i>Ammonia (mg/l N)</i>	0.023	0.06	0.06
<i>TON (mg/l N)</i>	-	0.91	1.11
<i>Sulphate (mg/l SO4)</i>	42	11.2	13.1
<i>Total P (mg/l P)</i>	0.05	0.025	0.020
<i>BOD (mg/l O2)</i>	1.5	<1.5	<1.5
<i>Conductivity</i>	-	306	315
<i>Suspended Solids (mg/l)</i>	28	7	6

SW1; the surface water pipe entering the Cor River, upstream of the Kabeyun facility was sampled in February 2009. All results fell within specified limits. The EPA, Monaghan then carried out surface water monitoring on the Cor River in December 2009; all results displayed in **Table 8.1.3** above. The Cor River runs along the eastern perimeter of the Kabeyun facility, in a NE direction. The EPA found no results to be exceeding specified limits. Water quality downstream is consistent with water quality upstream indicating no adverse impact from the Kabeyun facility.

8.2 Airborne Micro-Organisms

Table 8.2.1 Airborne Micro-Organism Results for Kabeyun Limited 2009

Monitoring Location	Mesophilic Bacteria cfu/m ³		Aspergillus fumigatus cfu/m ³	
	Sample 1	Sample 2	Sample 1	Sample 2
AB1 u/w in field beside site	50	28	0	0
AB2 d/w near Phase 2 tunnels	686	912	0	21
AB3 d/w of goodie water tank	459	777	156	254
AB4 d/w at nearest receptor	64	28	0	0
Control Sample	0	-	0	-
Typical Reported Concentrations at Compost Facilities	10,000 - 10,000,000		0 - 10,000	

As per Schedule *E.3 Airborne Microbes* of our Waste Licence, Airborne Micro-Organism monitoring was conducted on 24.07.09 by QED Engineering Ltd. Results of which are displayed in **Table 8.2.1** above.

A South Westerly wind was evident on the day and four sampling locations were chosen accordingly, one upwind of the facility (AB1), and three downwind of the facility (AB2, AB3 and AB4). AB1 was at a distance of approx. 25m from the site. AB2 was located on site, downwind of the Phase 2 tunnels. AB3 was located at the site boundary, downwind of the goody water storage tank. AB4 was located 400m from the site, at the nearest sensitive receptor (house). At each sample location two samples for Mesophilic Bacteria analysis and two samples for Aspergillus fumigatus analysis were taken. At location AB2, a control sample was also taken.

A small concentration of Mesophilic Bacteria was recorded at AB1, upwind of the facility; Sample 1 - 50 cfu/m³ and Sample 2 – 28 cfu/m³. These results act as an indicator of the background levels of bio-aerosols present naturally in the environment. A higher concentration of Mesophilic Bacteria was recorded at AB2, with results of 686 cfu/m³ and 912 cfu/m³. This sampling location was downwind of the Phase 2 tunnels. A small concentration of Aspergillus fumigatus (21 cfu/m³) was also recorded at this location. Both Mesophilic Bacteria (459 cfu/m³ and 777 cfu/m³) and Aspergillus fumigatus (156 cfu/m³ and 254 cfu/m³) were recorded at AB3. At AB4, 400m from the site, a small concentration of Mesophilic Bacteria was

recorded in both samples; 64 cfu/m³ and 28 cfu/m³. As can be seen from Table **Table 8.2.1**, all concentrations present at Kabeyun Ltd are lower than typical levels recorded at compost facilities. Therefore it can be assumed that Kabeyun Ltd is not adversely impacting on the environment in relation to airborne micro-organisms. For more details please refer to monitoring report submitted to the EPA on 09 September 2009.

8.3 Dust

Table 8.3.1 Dust Monitoring Results Kabeyun Ltd – April/May 2009

Monitoring Location	Survey period 16/04/09 - 14/05/09	Dust Deposition (mg/m²/day)
D1	28 Days	74.6
D2		40.2
D3		114.8
D4		63.2

Table 8.3.2 Dust Monitoring Results Kabeyun Ltd – August/September 2009

Monitoring Location	Survey period 13/08/09 - 11/09/09	Dust Deposition (mg/m²/day)
D1	29 Days	77.6
D2		55.4
D3		33.3
D4		49.9

Table 8.3.3 Dust Monitoring Results Kabeyun Ltd – September/October 2009

Monitoring Location	Survey period 16/09/09 - 13/10/09	Dust Deposition (mg/m²/day)
D1	27 Days	190.5
D2		71.5
D3		29.8
D4		71.5

Tables 8.3.1, 8.3.2 and 8.3.3 above display dust deposition results from monitoring conducted at Kabeyun Ltd in April/May 2009, August/September 2009 and September/November 2009 by White Young & Green Environmental Ltd. All results fell within licence limits of 350 mg/m²/day. For more details please refer to the monitoring reports submitted to the EPA on 12 June 2009 and 06 November 2009.

8.4 Noise

Table 8.4.1 Day Time Noise Monitoring Results for Kabeyun Limited; 18th May 2009

Noise Monitoring Location	Survey Start Time	L(A) _{eq} dB	L(A) ₁₀ dB	L(A) ₉₀ dB	Main Noise Sources
NSL1 Day	16.42 - 17.12	56.4	48.2	40.8	Intermittent traffic from R213 and adjacent road. Factory noise included slightly audible constant noise (possibly compost machinery or fans) & site traffic.
NSL2 Day	17.21 - 17.51	50.9	54.6	39.1	Distant intermittent traffic and local wildlife (birdsong). Generally quiet. No audible noise from factory.

Table 8.4.2 Night Time Noise Monitoring Results for Kabeyun Limited; 18th May 2009

Noise Monitoring Location	Survey Start Time	L(A) _{eq} dB	L(A) ₁₀ dB	L(A) ₉₀ dB	Main Noise Sources
NSL1 Night	22.09 - 22.39	37.3	39.4	32.2	Intermittent traffic in the distance. Slightly audible noise from factory but insignificant.
NSL2 Night	22.46 - 23.16	46.1	50.3	31.9	Clearly hear intermittent traffic from main road, generally very quiet. No audible noise from factory.

Table 8.4.3 Day Time Noise Monitoring Results for Kabeyun Limited; 29th September 2009

Noise Monitoring Location	Survey Start Time	L(A) _{eq} dB	L(A) ₁₀ dB	L(A) ₉₀ dB	Main Noise Sources
NSL1 Day	15.30	53.9	49.5	44.6	Dominant noise from Kabeyun Ltd site and traffic from main road. Constant sound of conveyor and intermittent noise from site traffic. Reverse alarms etc. Background noise includes slight noise from trees rustling and four cars passing on the side road.
NSL2 Day	16.10	41.4	43.5	36.7	Dominant noise from traffic. Factory barely audible. Background noise included leaves rustling.

Table 8.4.4 Night Time Noise Monitoring Results for Kabeyun Limited; 29th September 2009

Noise Monitoring Location	Survey Start Time	L(A) _{eq} dB	L(A) ₁₀ dB	L(A) ₉₀ dB	Main Noise Sources
NSL1 Night	22.06	44.2	40.8	31.0	Dominant night time noise was from the Kabeyun site. No noise from site traffic. Constant engine noise. Full 30 minute monitoring period was not completed as there was a complaint lodged by a local resident - Ann & Emmet Rooney.
NSL2 Night	22.49	39.4	39.7	25.3	Dominant noise from traffic. Factory not audible. Background noise included leaves rustling.

Noise monitoring was carried out in May 2009, **Tables 8.4.1 and 8.4.2** and in September 2009, **Tables 8.4.3 and 8.4.4**, by White Young & Green Environmental Ltd. The L_{Aeq} results indicate the influence of non site related traffic on noise levels at NSL1 and NSL2. The L_{A90} is a good measure of background noise levels, without the influence of traffic. In May the day-time noise was measured at 40.8dB (NSL1) and 39.1 dB (NSL2); below the day-time limit of 55dB. The night-time noise was measured at 32.2dB (NSL1) and 31.9dB (NSL2); below the night-time limit of 45dB. In September the day-time noise was measured at 44.6dB (NSL1) and 36.7 (NSL2). The night-time noise was measured at 31.0dB (NSL1) and 25.3 (NSL2). On this occasion however, the residents at NSL1 complained during the night-time monitoring, stating that noise at the facility was lower at that time, compared to other occasions. Further noise monitoring will be conducted in 2010 as required.

9.0 Resource and Energy Consumption

Electricity consumption in 2009 was 2,520,498 kWh. This shows a decrease of 111,450 kWh in 2009 from the 2008 figure of 2,631,948 kWh (4.2% decrease).

Fuel consumption in 2009 was 2,957,018 kWh. There was a decrease of 389,370 kWh in 2009 from the 2008 figure of 3,346,388 kWh (11.6 % decrease).

Objective: Reduce odour generated from the site

EMP No: 3	Responsibility: Site Manager – Eoin McKenna	Start Date: March 2010
		Review Dates: September 2010

Target:
Cover all high odour sources – Phase I material and poultry manure
Monitor and analyse Hydrogen Sulphide and Dimethyl Sulphide levels

Indicator:
Phase I bunkers
Raw material storage hall
Sulphide monitoring record

Task No	Details	Due Date	By Whom	Status
1	Design and apply for planning permission for Phase I bunkers and poultry storage hall	July 06	SC	Complete
2	Design aeration system for goody water tank	December 06	SC/KC	Complete
3	Design screen for goody water tank	December 06	SC	Complete
4	Ensure poultry litter is covered	July 06	EMcK/PB	Continual
5	Construct building for poultry manure storage and bunkers for Phase I process	TBC	SC	
6	Install aeration system within tank	Sept 10	SC	Work in progress
7	Install screen at goody water tank	May 07	SC	Complete
8	Monitor and analyse Hydrogen Sulphide and Dimethyl Sulphide levels	July 07	EMcK/PB	Continual
9	Re-locate dunking tank to lagoon area	October 07	EMcK	Complete

Reviewed by: D.Kelly **Date:** 15.03.10

Objective: Reduce waste and handle waste responsibly				
EMP No: 4	Responsibility: Site Manager – Eoin McKenna	Start Date: March 2010		
		Review Dates: September 2010		
Target: Reduce volume waste to landfill – compare 2007/2008/2009 Adequate consignment notes for hazardous waste				
Indicator: Tonnage of waste to landfill in 2007, 2008 and 2009 Consignment notes for hazardous waste				
Task No	Details	Due Date	By Whom	Status
1	Identify reputable contractor to collect hazardous waste	October 06	EMcK	Complete
2	Request copies of all waste contractors WCP and Waste Licences	October 06	EMcK	Complete
3	Identify reputable contractor to collect recyclable wastes	November 06	EMcK	Complete
4	Provide leakproof containment for oil filters in the garage area	November 06	EMcK	Complete
5	Develop waste disposal procedure for hazardous and non-hazardous wastes	September 06	P Wilson	Complete
6	Maintain waste record	July 06	EMcK/PB/DK	Continual
7	Provide recycling bins in office and canteen areas	December 2009	EMcK/DK	Complete
Reviewed by: D.Kelly Date: 15.03.10				

12.0 Complaints

17 complaints relating to odour were received in 2009; **Table 12.1** below.

Table 12.1 Complaint details for Kabeyun Limited 2009

Complainant	No. of complaints received
Brendan & Ciara Hamilton	8
Brendan & Jean Mc Cleary	7
Kieran Sherry	2

13.0 Nuisance Controls

A pest control system is in place in Kabeyun Ltd, run by Ecolab. Ecolab conduct regular checks on the vermin controls on the site, and a maintenance record is updated accordingly.

All Vehicles entering and leaving the site are inspected to ensure that they are appropriately covered.

Other nuisances are assessed and recorded daily.

14.0 Costs

Costs for environmental reports and monitoring completed in 2009 was c. €25,000 +VAT.

15.0 Staff Training

Staff training is on-going. Training is conducted to maintain awareness with employees of our environmental objectives and targets and how they can be achieved. Posters and procedures have been erected in target areas.