Annual Environmental Report 2015

Licence Registration No.:	W0198-01
Licencee:	Bord na Móna Plc.
Location of Activity:	Kilberry, Athy, Co. Kildare.
Attention:	Office of Environmental Enforcement Environmental Protection Agency P.O. Box 3000 Johnstown Castle Co. Wexford

BORD NA MÓNA

BORD NA MÓNA HORTICULTURE LIMITED

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SECTION 1

INTRODUCTION

1.1 INTRODUCTION

The following document represents the Annual Environmental Report (AER) for Bord na Móna Kilberry Compost facility for the period January 2015 - December 2015. Detailed within this report is a summary of all monitoring, and any activities and on-going improvements at the facility during this period that has had an influence on the environmental performance of the company.

Through the continued compliance with the conditions of their Waste licence register No. W0198-01, Bord na Móna continues to express their commitment of environmental improvement through out the site.

An Environmental and Quality Management System is established at the facility, which incorporates procedures of operational activities on site, emergency preparedness and response, reporting, dealing with unacceptable wastes and an public access to the site and site's environmental performance. Through the on-going achievement and reviewing of the objectives and targets, Bord na Móna facilitate on-going environmental improvements.

Bord na Móna's commitment is expressed in the company's Environmental Management policy, as given overleaf.

1.1.2 – Environmental Policy

BORD NA MÓNA

Environmental Policy

BORD NA MÓNA

Introduction

A licence from the Environmental Protection Agency (W0198-1) was granted on the 16th of December 2004. This licence is for the construction and operation of a Composting Facility at Kilberry, Athy, Co. Kildare. The quantity of waste to be accepted is 50,000 tonnes in the first year rising to 96,000 tonnes by the 5th year. Non-hazardous biodegradable wastes (Shredded Green waste, Brewery By-Product, Sawdust, Bark and Cocoa Husk) will be accepted at this facility.

The process leading to the production of usable, composted material will require the completion of a series of stages as follows, acceptance procedures and tipping, mixing and formulation of windrows, turning / composting, screening of stabilised material and shredding and re-use of oversize material. The wastes are combined together to form windrows for composting. The average composting period will be 12-16 weeks during which time the composting process will stabilise a range of organic waste materials / by-products which will then be incorporated into horticultural growing media produced on the adjoining site.

Policy

Environmental care is a Bord na Móna core value. BnM seeks to be recognised in the compost supply business as a leader in terms of environmental care. Bord na Móna's environmental programmes shall be an integrated approach focused on continuous improvement. The environmental programmes in Bord na Móna will seek to achieve the following:

- Ensure compliance with the requirements of the EPA Waste Licence and National/European legislation.
- Review Environmental performance and establish environmental objectives and targets on an annual basis to improve the environmental performance of our composting facility
- Minimise potential negative environmental impacts through activities that are designed for the prevention of pollution
- Encourage the involvement of employees through training and awareness programmes to promote and ensure an environmentally friendly workplace.
- Audit practices and programmes to help ensure continuous improvement

The company values and promotes environmental leadership, responsibility and innovation in the management of all company facilities and operations. Management team are expected to provide sound environmental leadership, to maintain appropriate records and demonstrate compliance with programmes and practices.

Authorised as of March 29th 2012

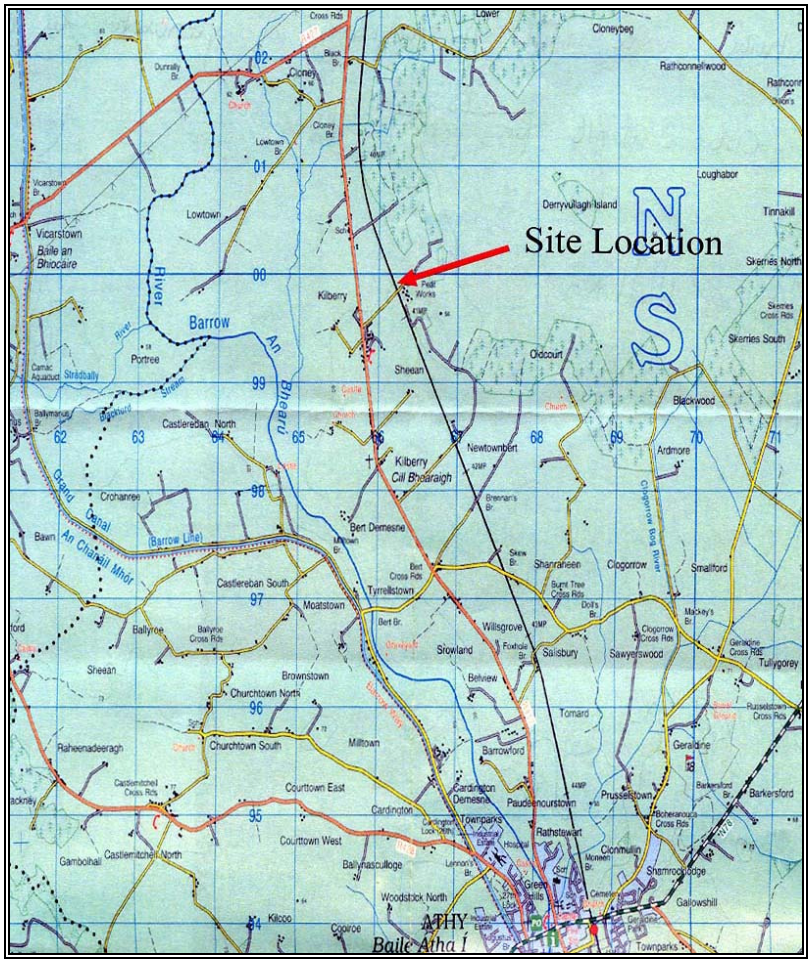
Ray Lenehan
General Manager

Attachment# 1 to EMSKIL-001 / rev 1

1.2 SITE DESCRIPTION

1.2.1 Site Location

The proposed development is located on the eastern portion of Kilberry townland, approximately 4 km north of Athy, Co. Kildare. It is located along the R417 between Athy and Monasterevin.



Regional Location of Bord na Mona Kilberry Compost Site

The total area the site occupies is ca. 2.5 hectares. The topography of the area is flat peat land and agricultural land with a gradual rise to the north. The land on the site is relatively level with a fall of 1:200 over the total site from south to north. The surrounding land is a mixture of agricultural, forestry and peat land with the southern boundary adjoining the Bord na Móna Moss Peat production site.

1.2.1 General

A licence from the Environmental Protection Agency (W0198-01) was granted on the 16th of December 2004. This licence was for the construction and operation of a Composting Facility at Kilberry, Athy, Co. Kildare. The quantity of waste to be accepted was 50,000 tonnes in the first year rising to 96,000 tonnes by the 5th year. Non-hazardous biodegradable wastes (Shredded Green waste, Brewery By-Product, Sawdust, Bark and Cocoa Husk) were the initial waste types accepted at this facility. In the intervening years a number of additional waste streams have been identified and added to the waste licence with agreement from the EPA. The current waste list is as follows:

Shredded / Unshredded Green Waste
Brewery By-Product
Sawdust
Bark
Cocoa Husk
Spent Mushroom Compost
Christmas Trees
Wood Pulp Sludge
Fruit and Vegetables
Dairy Products Sludge

1.2.2 Method of Working

1.2.2.1 Composting Process

The process leading to the production of usable, composted material requires the completion of a series of stages as follows:

1. Acceptance procedures and tipping
2. Mixing and formulation of windrows
3. Turning / Composting
4. Screening of stabilised material
5. Shredding and re-use of oversize material

1. Acceptance Procedures:

All vehicles entering the site firstly report to compost coordinator. A delivery note will accompany each vehicle detailing:

- Vehicle registration number
- Driver / Company
- Material type and origin
- Quantity of waste

These details will be entered on to the Bord na Móna MRP system along with the recorded weight of the vehicle. A hard copy of this information will be issued to the driver as a POD (Proof of Delivery).

2. Discharge/Mixing and formation of windrows.

On completion of acceptance procedures vehicles will be directed to a specific tipping area in the composting facility. Where they will tip the feedstock in such a fashion as to provide a linier strip of material. Unshredded material is directed to the shredder in phase 2.

3. Turning / Composting

The current average composting period is 12 weeks, during which time the piles are turned approximately 20 times as follows:

Week 1 - 2	4 times per week
Week 3 – 6	2 times per week
Week 7-10	1 turn per week

A series of parameters are monitored during the composting cycle as follows:

- Temperature (using deep probes)
- CO_2 evolution (an index of microbial activity)
- Moisture content

The results of ongoing monitoring can trigger a number of interactions such as:

- Increased turning frequency

- Addition of water. Lagoon water is used as the source of this water.

4. Screening

Following the completion of composting the material is transported from the stockpile to the screening area, which is located in Phase 2 using the Volvo loader.

The composted material is screened, material below 10mm will be stockpiled for use in growing media plants, whilst material over this size will be set aside for shredding and composting.

5. Shredding:

Oversized material is collected at the screening plant and is reincorporated into the new windrows.

Working Hours

Composting activities (Turning / Screening) will normally be undertaken during the hours of 08:00 and 18:00; Monday to Friday inclusive.

Delivery hours are confined to the hours of 08:00 to 18:00; Monday to Friday inclusive.

Reduced site activities such as maintenance and cleaning proceed until 22:00 Monday to Friday inclusive.

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SECTION 2

DATA

2.1 SUMMARY DATA

2.1.1 Waste Recovery Data:

Waste Type	EWC Code	Annual Intake (Tonnes)
Greenwaste	20 02 01	17941
Bark	03 03 01	1915
Brewery by-Product	02 07 01	19184
Dairy Sludge	02 05 02	1852
Brewery Sludge	02 07 05	553

2.1.2 Wastes produced on site

Waste Type	EWC Code	Annual Output (Tonnes)
Uncomposted Fraction – Plastics etc	19 05 01	30

2.1.3 Summary Report on Emissions:

There are no emission points within the facility.

2.1.3 Summary Reports on Environmental Monitoring:

2.1.3 (A) Surface Water Analysis Results – Tables A.1 – A.4 below show results of 2015 Surface water analysis. The results are very similar to previous years.

Table A.1 - Surface Water Q1 2nd April 2015					
Parameter	**SW1**	**SW2**	**SW3**	**SW4**	**SW5**
pH	7.6	7.6	7.7	7.7	6.5
Suspended Solids (mg/l)	8	16	25	16	118
BOD (mg/l)	<2	<2	<2	<2	<2
DRO (mg/l)	<10	<10	<10	<10	<10
Mineral Oil (mg/l)	<10	<10	<10	<10	<10

Table A.1 - Surface Water Q2 17th June 2015					
Parameter	**SW1**	**SW2**	**SW3**	**SW4**	**SW5**
pH	7.5	7.7	7.7	7.6	8
Suspended Solids (mg/l)	8	27	<5	10	27
BOD (mg/l)	<2	<2	<2	<2	<2
DRO (mg/l)	<10	<10	<10	<10	<10
Mineral Oil (mg/l)	<10	<10	<10	<10	<10

Table A.3 - Surface Water Q3 23rd Sept 2015					
Parameter	**SW1**	**SW2**	**SW3**	**SW4**	**SW5**
pH	7.2	7.4	7.3	7.4	8.0
Suspended Solids (mg/l)	27	19	11	10	<5
DRO (mg/l)	<10	<10	<10	<10	<10
Mineral Oil (mg/l)	<10	<10	<10	<10	<10

Table A.4 - Surface Water Q4 15th December 2015					
Parameter	**SW1**	**SW2**	**SW3**	**SW4**	**SW5**
pH	7.2	7.3	7.2	7.3	7.6
Suspended Solids (mg/l)	<5	<5	6	<5	8
BOD (mg/l)	<2	<2	<2	<2	3
DRO (mg/l)	<10	<10	<10	<10	<10
Mineral Oil (mg/l)	<10	<10	<10	<10	<10

2.1.3 (B) Ground Water Analysis Results

Groundwater results are elevated for a number of parameters most notably Ammonia – these results are consistent with previous years and MW 1,2,3 are in line with results from the EIS. MW 4,5 are both hydraulically up gradient of the site. The trends with regards to the elevated parameters will continue to be assessed during 2016.

Groundwater Results Q1 2nd April 2015					
Laboratory ID.	**MW1**	**MW2**	**MW3**	**MW4**	**MW5**
pH	7.5	7.3	7.3	8.1	6.8
Conductivity µS/cm	614	560	638	689	2922
Ammonia as N mg/l	1.9	6.6	5.8	22	28
Chloride mg/l	23	18	18	40	116
Sulphate mg/l	17	1.4	0.92	1.6	0.96
Nickel ug/l	9	6	<2	24	7
Manganese ug/l	406	81	120	865	1636

Groundwater Results Q2 17th June 2015					
Laboratory ID.	**MW1**	**MW2**	**MW3**	**MW4**	**MW5**
pH	7.5	7.4	7.3	7.1	7.2
Conductivity µS/cm l	656	596	681	1825	1146
Ammonia as N mg/l	1.6	6.8	5.8	23	12
Chloride mg/l	27	21	21	48	32
Sulphate mg/l	24	4.1	1.5	3.6	1.7
Nickel ug/l	8	4	3	32	61
Manganese ug/l	412	104	267	998	3345

Groundwater Results Q3 23rd and 30th Sept 2015					
Laboratory ID.	**MW1**	**MW2**	**MW3**	**MW4**	**MW5**
pH	7.4	7.2	7.0	6.5	6.8
Conductivity µS/cm l	518	567	729	1696	909
Ammonia as N mg/l	1.9	6.7	6.2	21	8.9
Chloride mg/l	22	16	19	46	21
Sulphate mg/l	7.4	25	0.77	1.8	0.6
Nickel ug/l	3	3	<2	26	9
Manganese ug/l	<2	89	410	777	31

Groundwater Q4 15th Dec 2015					
Parameter	**MW-01**	**MW-02**	**MW-03**	**MW-04**	**MW-05**
pH	7.7	7.4	7.4	7.2	7.2
Conductivity uS/cm	471	492	535	772	842
Ammonia as N mg/l	1.8	7.1	5.7	8.1	11
Chloride mg/l	24	17	19	34	29
Sulphate mg/l	7.6	46	0.72	5.6	1.9
Nitrate mg/l	<0.04	<0.04	<0.04	<0.04	<0.04
Phosphate	<0.16	<0.16	<0.16	<0.16	<0.16
Boron µg/l	12	11	8	16	12
Antimony µg/l	<2	<2	<2	<2	<2
Arsenic µg/l	4	18	14	<2	20
Aluminium µg/l	<2	<2	<2	<2	<2
Berylium µg/l	<2	<2	<2	<2	<2
Barium µg/l	390	295	320	140	116
Chromium µg/l	<2	<2	2	<2	<2
Cadmium µg/l	<2	<2	<2	<2	<2
Cobalt µg/l	<2	<2	<2	<2	<2
Copper µg/l	<2	<2	<2	<2	<2
Iron mg/l	<0.1	<0.1	<0.1	<0.1	<0.1
Potassium mg/l	1.3	1.6	1.4	4	55
Sodium mg/l	8.8	9.6	6.8	11	14
Calcium mg/l	31	87	30	44	80
Manganese µg/l	25	18	<2	6	334
Silver µg/l	<2	<2	<2	<2	<2
Nickel µg/l	6	5	6	9	15
Lead µg/l	<2	<2	<2	<2	<2
Selenium µg/l	5	9	15	6	9
Tin µg/l	<2	<2	<2	<2	<2
Zinc µg/l	<2	<2	<2	<2	2
Mercury µg/l	<1	<1	<1	<1	<1
E.Coli cfu/100mls	19	7	<1	2	34
Total Coliforms cfu/100mls	19	7	<1	152	40

Groundwater Q4 2015-*VOC Analysis*					
VOC's (µg/l)	**MW-01**	**MW-02**	**MW-03**	**MW-04**	**MW-05**
Dichlorodifluoromethane	<1	<1	<1	<1	<1
Chloromethane	<1	<1	<1	<1	<1
Vinyl chloride	<1	<1	<1	<1	<1
Bromomethane	<1	<1	<1	<1	<1
Chloroethane	<1	<1	<1	<1	<1
Trichlorofluoromethane	<1	<1	<1	<1	<1
1,1-Dichloroethene	<1	<1	<1	<1	<1
Dichloromethane	<3	<3	<3	<3	<3
trans-1,2-Dichloroethene	<1	<1	<1	<1	<1
1,1-Dichloroethane	<1	<1	<1	<1	<1
2,2-Dichloropropane	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene	<1	<1	<1	<1	<1
Bromochloromethane	<1	<1	<1	<1	<1
Chloroform	<1	<1	<1	<1	<1
1,1,1-Trichloroethane	<1	<1	<1	<1	<1
Carbon Tetrachloride	<1	<1	<1	<1	<1
1,1-Dichloropropene	<1	<1	<1	<1	<1
Benzene	<1	<1	<1	<1	<1
1,2-Dichloroethane	<1	<1	<1	<1	<1
Trichloroethene	<1	<1	<1	<1	<1
1,2-Dichloropropane	<1	<1	<1	<1	<1
Dibromomethane	<1	<1	<1	<1	<1
Bromodichloromethane	<1	<1	<1	<1	<1
Toluene	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	<1	<1	<1	<1	<1
1,1,1,2-Tetrachloroethane	<1	<1	<1	<1	<1
m,p-Xylene	<1	<1	<1	<1	<1
Styrene	<1	<1	<1	<1	<1
Isopropylbenzene	<1	<1	<1	<1	<1
n-propylbenzene	<1	<1	<1	<1	<1

Groundwater Q4 2015 - *Cont'd VOC Analysis*					
VOC's (µg/l)	**MW-01**	**MW-02**	**MW-03**	**MW-04**	**MW-05**
2-Chlorotoluene	<1	<1	<1	<1	<1
4-Chlorotoluene	<1	<1	<1	<1	<1
1,2,4-Trimethylbenzene	<1	<1	<1	<1	<1
4-Isopropyltoluene	<1	<1	<1	<1	<1
1,4-Dichlorobenzene	<1	<1	<1	<1	<1
1,2-Dichlorobenzene	<1	<1	<1	<1	<1
Naphthalene	<1	<1	<1	<1	<1
1,3-Dichloropropane	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	<1	<1	<1	<1	<1
Dibromochloromethane	<1	<1	<1	<1	<1
Chlorobenzene	<1	<1	<1	<1	<1
Ethyl Benzene	<1	<1	<1	<1	<1
o-Xylene	<1	<1	<1	<1	<1
Bromoform	<1	<1	<1	<1	<1
1,2,3-Trichloropropane	<1	<1	<1	<1	<1
Bromobenzene	<1	<1	<1	<1	<1
Tert-Butylbenzene	<1	<1	<1	<1	<1
Sec-Butylbenzene	<1	<1	<1	<1	<1
1,3,5-Trimethylbenzene	<1	<1	<1	<1	<1
1,2- Dibromo-3-chloropropane	<1	<1	<1	<1	<1
Hexachlorobutadiene	<1	<1	<1	<1	<1
1,2,3-Trichlorobenzene	<1	<1	<1	<1	<1
1,3-Dichlorobenzene	<1	<1	<1	<1	<1
Tetrachloroethene	<1	<1	<1	<1	<1
n-butylbenzene	<1	<1	<1	<1	<1
1,2,4-Trichlorobenzene	<1	<1	<1	<1	<1
MTBE	<1	<1	<1	<1	<1

Groundwater Q4 2015 – *SVOC Analysis*					
SVOC's (µg/l)	**MW-01**	**MW-02**	**MW-03**	**MW-04**	**MW-05**
Phenol	<1	<1	<1	<1	<1
2-Chlorophenol	<1	<1	<1	<1	<1
2-Methylphenol	<1	<1	<1	<1	<1
4-Methylphenol	<1	<1	<1	<1	<1
2-Nitrophenol	<1	<1	<1	<1	<1
4-Nitrophenol	<1	<1	<1	<1	<1
2,4-Dichlorophenol	<1	<1	<1	<1	<1
2,4-Dimethylphenol	<1	<1	<1	<1	<1
4-Chloro-3-methylphenol	<1	<1	<1	<1	<1
2,4,6-Trichlorophenol	<1	<1	<1	<1	<1
2,4,5-Trichlorophenol	<1	<1	<1	<1	<1
Pentachlorophenol	<1	<1	<1	<1	<1
1,3-Dichlorobenzene	<1	<1	<1	<1	<1
1,4-Dichlorobenzene	<1	<1	<1	<1	<1
1,2-Dichlorobenzene	<1	<1	<1	<1	<1
1,2,4-Trichlorobenzene	<1	<1	<1	<1	<1
Nitrobenzene	<1	<1	<1	<1	<1
Azobenzene	<1	<1	<1	<1	<1
Hexachlorobenzene	<1	<1	<1	<1	<1
Naphthalene	<1	<1	<1	<1	<1
Acenaphthalene	<1	<1	<1	<1	<1
Acenaphthene	<1	<1	<1	<1	<1
Flourene	<1	<1	<1	<1	<1
Phenanthrene	<1	<1	<1	<1	<1
Anthracene	<1	<1	<1	<1	<1
Fluoranthrene	<1	<1	<1	<1	<1
Pyrene	<1	<1	<1	<1	<1
Benzo(a)anthracene	<1	<1	<1	<1	<1
Chrysene	<1	<1	<1	<1	<1

Groundwater Q4 2015 - *Cont'd SVOC Analysis*					
SVOC's (µg/l)	**MW1**	**MW2**	**MW3**	**MW4**	**MW-05**
Benzo(a)pyrene	<1	<1	<1	<1	<1
Indenol(1,2,3-cd)pyrene	<1	<1	<1	<1	<1
Dibenzo(a,h)anthracene	<1	<1	<1	<1	<1
Benzo(ghi)perylene	<1	<1	<1	<1	<1
2-Chloronaphthalene	<1	<1	<1	<1	<1
Carbazole	<1	<1	<1	<1	<1
2-Methylnaphthalene	<1	<1	<1	<1	<1
Isophorone	<1	<1	<1	<1	<1
Dibenzofuran	<1	<1	<1	<1	<1
Dimethyl phthalate	<1	<1	<1	<1	<1
Diethyl phthalate	<1	<1	<1	<1	<1
Di-butylphthalete	<1	<1	<1	<1	<1
Di-octylphthalate	<1	<1	<1	<1	<1
Bis(2-ethylhexyl)phthalate	<1	<1	<1	<1	<1
Butylbenzylphthalate	<1	<1	<1	<1	<1
4-Chloroaniline	<1	<1	<1	<1	<1
2-Nitroaniline	<1	<1	<1	<1	<1
3-Nitroaniline	<1	<1	<1	<1	<1
4-Nitroaniline	<1	<1	<1	<1	<1
2,4-Dinitroaniline	<1	<1	<1	<1	<1
2,6-Dinitroaniline	<1	<1	<1	<1	<1
Bis(2-Chloroethyl)ether	<1	<1	<1	<1	<1
4-Bromophenylphenylether	<1	<1	<1	<1	<1
4-Chlorophenylphenylether	<1	<1	<1	<1	<1
Hexachloroethane	<1	<1	<1	<1	<1
Hexachlorobutadiene	<1	<1	<1	<1	<1
Hexachlorocyclopentadiene	<1	<1	<1	<1	<1
Bis(2-chloroethoxy)methane	<1	<1	<1	<1	<1
N-nitrosodi-n-propylamine	<1	<1	<1	<1	<1

Groundwater Q4 2015 – *Pesticide Suite*					
Pesticides (µg/l)	**MW-01**	**MW-02**	**MW-03**	**MW-04**	**MW-05**
Dichlorvos	<0.01	<0.01	<0.01	<0.01	<0.01
Mevinphos	<0.01	<0.01	<0.01	<0.01	<0.01
Alpha - HCH	<0.01	<0.01	<0.01	<0.01	<0.01
Diazinon	<0.01	<0.01	<0.01	<0.01	<0.01
Gamma - HCH	<0.01	<0.01	<0.01	<0.01	<0.01
Beta - HCH	<0.01	<0.01	<0.01	<0.01	<0.01
Methyl Parathion	<0.01	<0.01	<0.01	<0.01	<0.01
Malathion	<0.01	<0.01	<0.01	<0.01	<0.01
Heptachlor	<0.01	<0.01	<0.01	<0.01	<0.01
Heptachlor Epoxide	<0.01	<0.01	<0.01	<0.01	<0.01
Aldrin	<0.01	<0.01	<0.01	<0.01	<0.01
Fenitrothion	<0.01	<0.01	<0.01	<0.01	<0.01
Heptachlor Epoxide	<0.01	<0.01	<0.01	<0.01	<0.01
Endosulphan I	<0.01	<0.01	<0.01	<0.01	<0.01
Parathion	<0.01	<0.01	<0.01	<0.01	<0.01
p,p - DDE	<0.01	<0.01	<0.01	<0.01	<0.01
o,p - DDE	<0.01	<0.01	<0.01	<0.01	<0.01
Endosulphan II	<0.01	<0.01	<0.01	<0.01	<0.01
Azinphos Methyl	<0.01	<0.01	<0.01	<0.01	<0.01
Ethion	<0.01	<0.01	<0.01	<0.01	<0.01
Endrin	<0.01	<0.01	<0.01	<0.01	<0.01
Endosulfan Sulphate	<0.01	<0.01	<0.01	<0.01	<0.01
p,p - DDT	<0.01	<0.01	<0.01	<0.01	<0.01
o,p - DDT	<0.01	<0.01	<0.01	<0.01	<0.01
p,p – TDE	<0.01	<0.01	<0.01	<0.01	<0.01
o,p – TDE	<0.01	<0.01	<0.01	<0.01	<0.01
p,p - Methoxychlor	<0.01	<0.01	<0.01	<0.01	<0.01
o,p - Methoxychlor	<0.01	<0.01	<0.01	<0.01	<0.01

2.1.3 (C) Dust Analysis Results

The 2015 results are typically within the licence limit with the exception of one occasion in Q3 AM01 which were attributed to external influences. The wetting of roadways during dry periods has reduced overall dust levels on site.

2015 Dust Results				
Location	**Q1 Dust ($mg/m^2/day$)**	**Q2 Dust ($mg/m^2/day$)**	**Q3 Dust ($mg/m^2/day$)**	**Q4 Dust ($mg/m^2/day$)**
AM-01	77	241	455	77
AM-02	136	335	306	118
AM-03	230	229	No Sample	57
AM-04	No Sample	229	261	44

2.1.3 (D) Odour Analysis Results 2015 – See Appendix 1 for Sample location maps

The Odour results for 2015 are typical of an open windrow compost facility.

METEOROLOGICAL CONDITIONS Q1 - 10TH FEB 2015			
Parameter		**Parameter**	
Weather	Dry with light breeze	**Wind speed**	1.47 m/sec (average)
Temp	3.1	**Wind Direction**	light breeze from NE
General Air Quality	Good	**Bar Pressure**	1020.9 mbar

Odour Sampling Results Q1 - 10TH FEB 2015		
Locations	**On site observations**	**Results**
OD 1 (Upwind)	Intermittent composting odour detected	27 ou_E/m^3
OD 2 (Downwind / Sensitive Receptor)	Intermittent composting odour detected	27 ou_E/m^3
OD 3 (Downwind / Sensitive Receptor)	Intermittent composting odour detected	23 ou_E/m^3

METEOROLOGICAL CONDITIONS Q2 - 17TH JUNE 2015			
Parameter		**Parameter**	
Weather	Dry with very light breeze.	**Wind speed**	2.29 m/sec (average)
Temp	19°C	**Wind Direction**	Gentle breeze from north west
General Air Quality	Good	**Bar Pressure**	1025 mbar

Odour Sampling Results Q2 – 17TH JUNE 2015		
Locations	**On site observations**	**Results**
OD 1 (Upwind / Sensitive Receptor)	Chimney smoke odour from nearest dwelling & composting odour detected	91 ou_E/m^3
OD 2 (Upwind / Sensitive Receptor)	Diesel fumes from passing truck & composting odour detected	114 ou_E/m^3
OD 3 (Downwind)	Moderate Composting odour	166 ou_E/m^3

METEOROLOGICAL CONDITIONS Q3 – 28TH JULY 2015			
Parameter		**Parameter**	
Weather	Dry with gentle breeze	**Wind speed**	1.37 m/sec (average)
Temp	14.9 °C	**Wind Direction**	Very light breeze from NW
General Air Quality	Good	**Bar Pressure**	1016 mbar

Odour Sampling Results Q3 – 28TH JULY 2015		
Locations	**On site observations**	**Results**
OD 1 (Upwind / Sensitive Receptor)	Faint bark mulch odour	54 ou_E/m^3
OD 2 (Downwind)	Typical odour associate4d with composting	32 ou_E/m^3
OD 3 (Downwind)	Typical odour associate4d with composting	23 ou_E/m^3

METEOROLOGICAL CONDITIONS Q4 – 14TH DECEMBER 2015			
Parameter		**Parameter**	
Weather	Dry with very light breeze	**Wind speed**	1.14 m/sec (average)
Temp	13°C	**Wind Direction**	Very light breeze from SW
General Air Quality	Good	**Bar Pressure**	1010 mbar

Odour Sampling Results Q4 – 14th December 2015		
Locations	**On site observations**	**Results**
OD 1 (Upwind / Sensitive Receptor)	Very faint bark odour	64 ou_E/m^3
OD 2 (Downwind)	Faint typical odour associated with compost	140 ou_E/m^3
OD 3 (Upwind)	Faint typical odour associated with compost	41 ou_E/m^3

2.1.4 (E) Air Emissions Results

Air Analysis Q1 2015				
Location	Amines (ppm)	Ammonia (ppm)	Hydrogen Sulphide (ppm)	Mercaptens (ppm)
Downwind on north eastern boundary next to lagoon	<3.99	<5	<0.2	<0.5

Air Analysis Q2 2015				
Location	Amines (ppm)	Ammonia (ppm)	Hydrogen Sulphide (ppm)	Mercaptens (ppm)
Downwind on north eastern boundary next to lagoon	<4.22	<5	<0.2	<0.5

Air Analysis Q3 2015				
Location	Amines (ppm)	Ammonia (ppm)	Hydrogen Sulphide (ppm)	Mercaptens (ppm)
Downwind on north eastern boundary next to lagoon	<4.18	<5	<0.2	<0.5

2.3.1 (E) Noise Emissions

Noise:

The annual noise-monitoring programme was carried out on the 20th 23rd and 25th February 2015. The results of same are presented in Table E.1 and E.2.

TABLE E.1: NOISE MEASUREMENT RESULTS (DAYTIME) 15th and 22th May 2015

Location No.	Duration (minutes)	Date	Start Time	L_{eq} dB(A)	L_{10} dB(A)	L_{90} dB(A)	L_{AFMax} dB(A)
N1	30	20/02/15	08:52	64	68	51	80
	30	20/02/15	13:46	66	67	52	86
	30	23/02/15	09:52	61	65	52	81
N2	30	20/02/15	09:28	47	49	42	77
	30	20/02/15	14:19	51	48	42	77
	30	23/02/15	10:26	50	53	32	71
N3	30	20/02/15	10:01	63	59	44	85
	30	20/02/15	15:00	66	69	49	89
	30	25/02/15	11:52	64	67	48	82
N4	30	20/02/15	10:36	54	55	49	82
	30	20/02/15	15:35	49	53	40	67
	30	25/02/15	12:25	55	57	51	76
NSL 1	30	20/02/15	08:20	58	61	49	78
	30	20/02/15	13:14	62	64	48	89
	30	20/02/15	16:09	62	61	49	94

2.1.4 Environmental Incidents & Complaints

All environmental incidents and complaints are recorded and actioned upon in accordance with the specific procedures as outlined in the Bord na Móna Kilberry Compost facility documented environmental management system.

Environmental Complaints	Number of complaints
Complaints received	One
Complaints requiring corrective action	None
Categories of complaint	
Odour	One
Noise	
Water	
Air	
Procedural	
Miscellaneous	

Environmental Incidents	Number of Incidents
Incidents during 2015	One
Incidents requiring corrective action	None
Categories of Incidents	
Odour	One
Noise	
Water	
Air	Cat 1 - Dust ELV breached
Procedural	
Miscellaneous	

2.1.5 Environmental Spending

The itemised spend on environmental issues at Bord na Móna Kilberry are listed below.

January 2015 to December 2015		
		€
EPA Fees		8000
Consultancy & Monitoring		30,000
Training		6,500
Env Equipment		6,000
	Total Cost	**50,500**

2.1.6 Resource and Energy Consumption

Fuel Usage 2015 – See table below

Machine Type	**Engine Type**	**Total (L)**
Komptech Topturn X67 Turner	Cat C9	102408.25
Komptech Crambo 6000 Shredder	Cat C16	
Komptech L3 Multistar Screen	Dieselelectric 44KVA	
L110E Volvo Front Loader	Volvo D7D LB E2	
L110E Volvo Front Loader 2	Volvo D7D LB E2	

Electricity Usage 2015 – recorded at compost site metre.

63,623 KwHr

SECTION 3

ENVIRONMENTAL MANAGEMENT

BORD NA MÓNA KILBERRY COMPOST FACILITY ENVIRONMENTAL OBJECTIVES AND TARGETS 2016

Item No	Objective	Target	Responsible Function
1	Meet Operating Capacity Requirements.	• Increase tonnage entering site – investigate new waste types. • Implement new marketing strategies to increase customer base.	Horticulture (Newbridge)
2	Training / EMS	• Carry out one spill drill. • All staff members to receive Environmental training. • Carry out annual review of all EMS procedures	Environmental (Kilberry)
3	Once off Projects	• Investigate site expansion to increase the overall footprint of the site. • Assess new conditions of the IED licence and implement any changes.	Environmental (Kilberry)
4	Carry out monitoring as per Licence 198-1	• Noise – Once per annum • Bioaerosols – Once per annum • Dust – four times per annum • SW - Quarterly • GW – Quarterly	Environmental (Newbridge / Kilberry)

3.1 Environmental Management Programme for 2016.

Review of Objectives and Targets for the period January to December 2015

Tables EMP 1.1 to 1.5 reviews the Objectives and Targets set for 2015. A number of the listed Objectives and their subsequent targets are cyclical as the company attempts to achieve continuous environmental improvement.

Tables EMP 2.1 to 2.5 set out the Objectives and Targets for 2016. A number of the listed Objectives and their subsequent targets are cyclical as the company attempts to achieve continuous environmental improvement.

Site Infrastructure EOT 1.1

Objective	Target	Target Date	2015 Review	Dept Responsible
Meet Operating Capacity Requirements.	Increase tonnage entering site – investigate new waste types.	2015	No new waste types added during 2015	Kilberry (Environmental)
	Implement new marketing strategies to increase customer base	2015	Continuous 2015	Horticulture (Newbridge)

Training EOT 1.2

Objective	Target	Target Date	2015 Review	Dept Responsible
Training / EMS	Carry out one spill drill.	2015	Complete	Environmental (Kilberry)
	All staff members to receive Environmental training.	2015	Complete	Environmental (Kilberry)
	Carry out annual review of all EMS procedures.	Q2 2015	Complete April 2015	Environmental (Kilberry)

Once off Projects EOT 1.3

Objective	Target	Target Date	2015 Review	Dept Responsible
Once off projects	Liaise with EPA Re the article 27 notification	Q2 2015	Complete – EPA contacted by phone – advised that a response was due shortly (May 2015)	Kilberry (Environmental)
	Investigate site expansion to increase the overall footprint of the site	2015	Complete Still under discussion with senior management	Kilberry (Environmental)

Licence Compliance EOT 1.4

Objective	Target	Target Date	2015 Review	Person Responsible
Carry out monitoring as per Licence W0198-1	Noise – Once per annum	2015	Complete	Newbridge (Environmental)
	Bioaerosols – Annually	2015	Complete	Newbridge (Environmental)
	Dust - Quarterly	2015	Complete	Kilberry (Environmental)
	Groundwater – Quarterly	2015	Complete	Kilberry (Environmental)
	Surface Water - Quarterly	2015	Complete	Kilberry (Environmental)

Operating Requirements EOT 2.1

Objective	Target	Target Date	Person Responsible
Meet Operating Capacity Requirements.	Increase tonnage entering site – investigate new waste types	Continuous 2016	Newbridge (Horticulture)
	Implement new marketing strategies to increase customer base	Continuous 2016	Newbridge (Horticulture)

Training / EMS EOT 2.2

Objective	Target	Target Date	Person Responsible
Training / EMS	Carry out one spill drill.	Q3 2016	Environmental (Kilberry)
	All staff members to receive Environmental training.	Continuous 2016	Environmental (Kilberry)
	Carry out annual review of all EMS procedures	Q2 2016	Environmental (Kilberry)

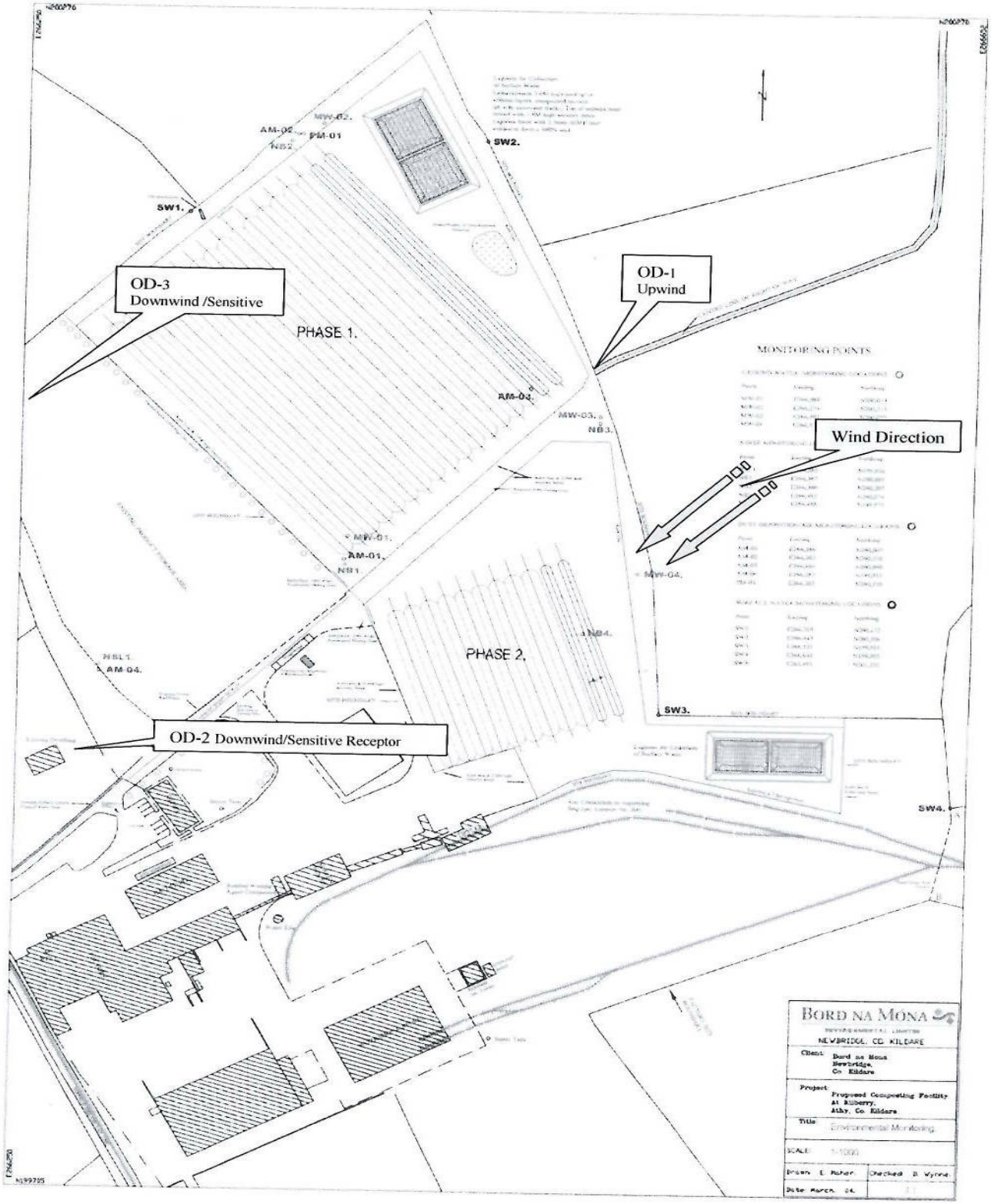
Once Off Projects EOT 2.3

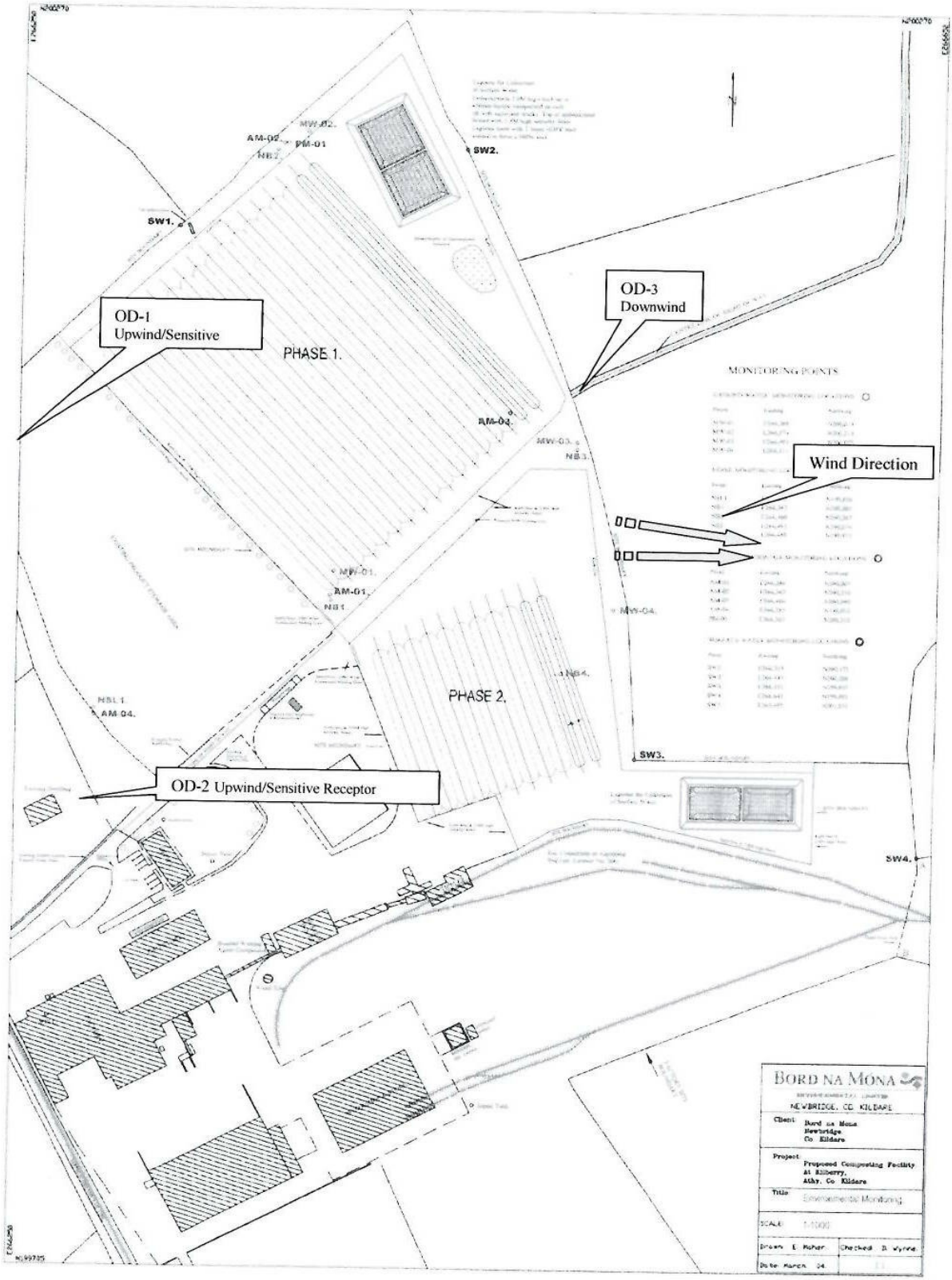
Objective	Target	Target Date	Person Responsible
Once off Projects	Investigate site expansion to increase the overall footprint of the site.	2016	Kilberry (Environmental)
	Assess new conditions of the IED licence and implement any changes.	Q2 2016	Kilberry (Environmental)

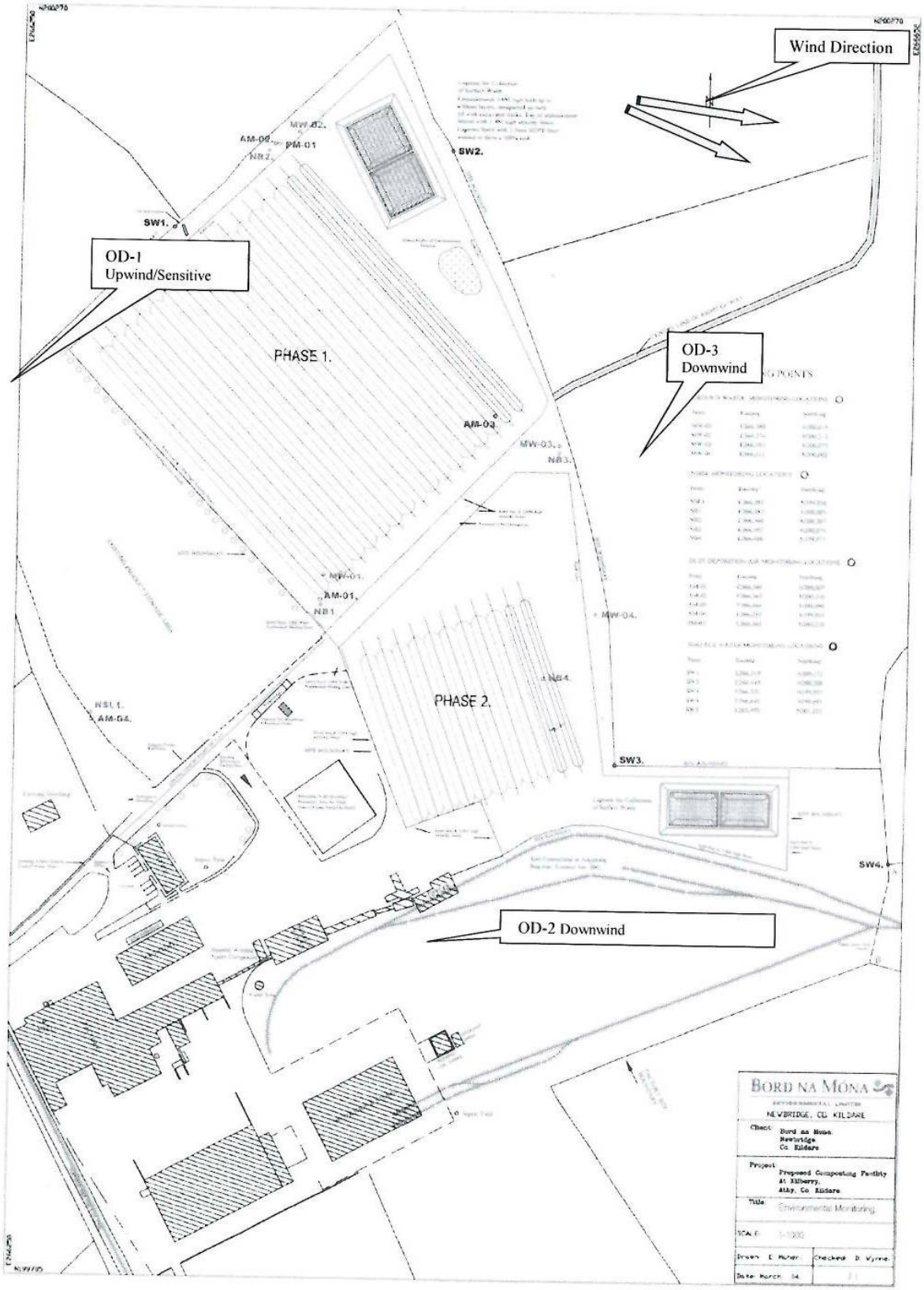
Licence Compliance EOT 2.4

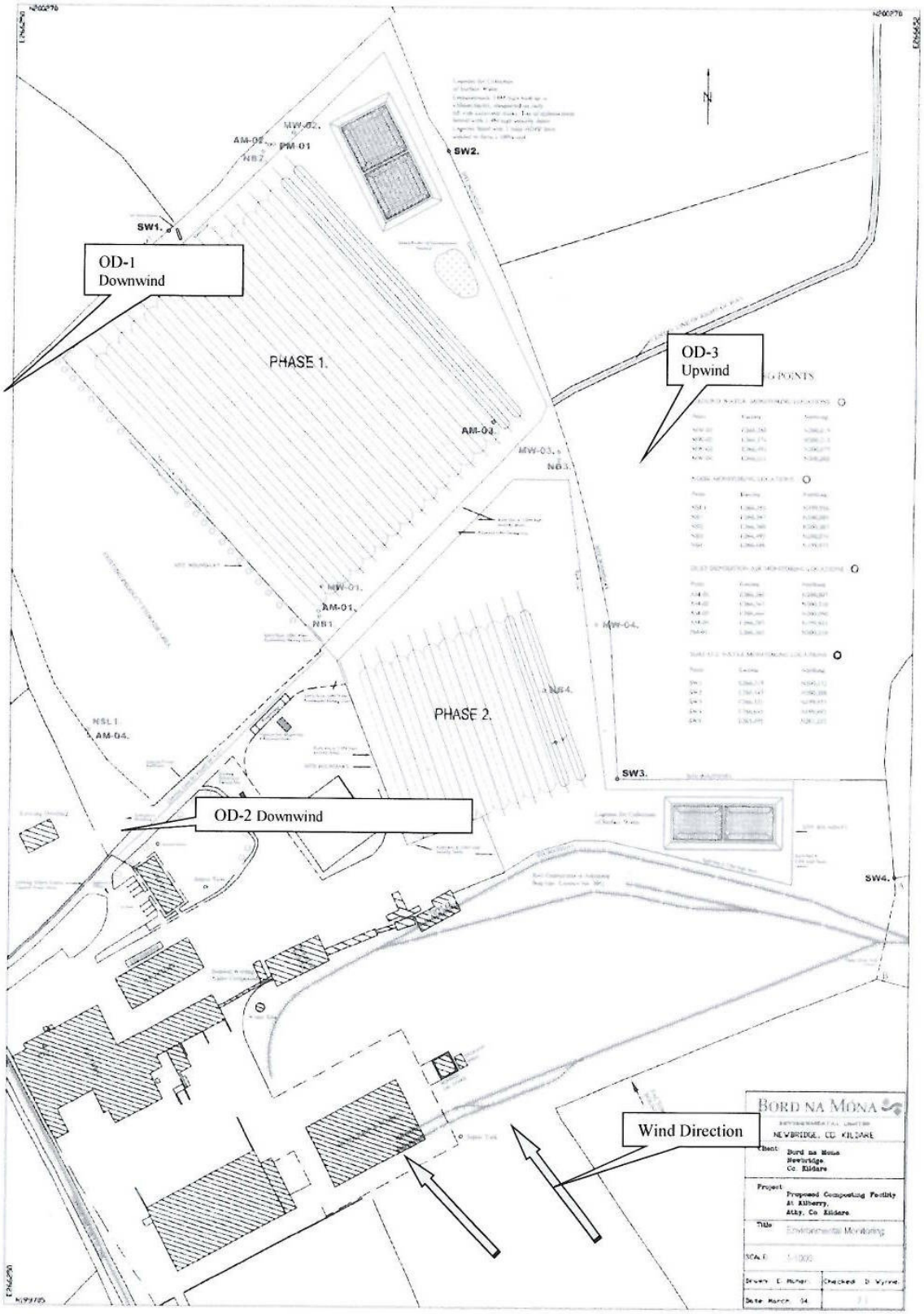
Objective	Target	Target Date	Person Responsible
Carry out monitoring as per Licence 198-1	Noise – Once per annum	2016	Environmental (Newbridge)
	Bioaerosols – Once per annum	2016	Environmental (Newbridge)
	Dust - Quarterly	2016	Kilberry (Environmental)
	Groundwater – Quarterly	2016	Kilberry (Environmental)
	Surface Water - Quarterly	2016	Kilberry (Environmental)

APPENDIX 1
Odour Monitoring Location Maps


OD-3
Downwind /Sensitive
OD-1
Upwind
PHASE 1.
PHASE 2.
MONITORING POINTS
Wind Direction
OD-2 Downwind/Sensitive Receptor
SW1.
SW2.
SW3.
SW4.
AM-02
NS2
PM-01
MW-02.
AM-04.
MW-03.
NB3.
MW-01.
AM-01.
NB1
MW-04.
NB4.
NSL1
AM-04.
BORD NA MONA
NEWBRIDGE, CO. KILDARE
Client: Bord na Mona Newbridge Co Kildare
Project: Proposed Composting Facility At Kilberry, Athy, Co. Kildare
Title: Environmental Monitoring
SCALE: 1:1000
Drawn: E. Maher
Checked: B. Wynne
Date: March. 04.


OD-1
Upwind/Sensitive
OD-3
Downwind
PHASE 1.
PHASE 2.
MONITORING POINTS
Wind Direction
OD-2 Upwind/Sensitive Receptor
SW1.
SW2.
SW3.
SW4.
AM-02
PM-01
AM-03
AM-01
AM-04
BORD NA MONA
NEWBRIDGE, CO. KILDARE
Client: Bord na Mona Newbridge Co. Kildare
Project: Proposed Composting Facility At Kilberry, Athy, Co. Kildare
Title: Environmental Monitoring


Wind Direction
OD-1
Upwind/Sensitive
OD-3
Downwind
OD-2 Downwind
PHASE 1.
PHASE 2.
SW1.
SW2.
SW3.
SW4.
AM-01.
AM-02.
AM-03.
AM-04.
PM-01
MW-01.
MW-02.
MW-03.
MW-04.
NB1.
NB2.
NB3.
NB4.
NSL1.
BORD NA MÓNA
NEWBRIDGE, CO. KILDARE
Bord na Mona
Newbridge
Co. Kildare
Proposed Composting Facility
At Kilberry,
Athy, Co. Kildare
Environmental Monitoring
Drawn: E. Maher
Checked: D. Wynne
Date: March '04


OD-1
Downwind
OD-3
Upwind
OD-2 Downwind
Wind Direction
PHASE 1.
PHASE 2.
SW1.
SW2.
SW3.
SW4.
MW-01.
MW-02.
MW-03.
MW-04.
AM-01.
AM-02.
AM-03.
AM-04.
PM-01
NB1
NB2
NB3
NB4
NSL1
BORD NA MÓNA
NEWBRIDGE, CO. KILDARE
Client: Bord na Mona
Newbridge
Co. Kildare
Project: Proposed Composting Facility
At Kilberry,
Athy, Co. Kildare.
Title: Environmental Monitoring
Drawn: E. Maher
Checked: D. Wynne
Date: March '04

APPENDIX 2
Compost Analysis Report

BORD NA MÓNA

BORD NA MÓNA HORTICULTURE LIMITED

QM Doc. Name:	Final Compost Results IS441
QM Doc. Ref.:	QM-GC-01K
Issue No.:	1
Revision No.:	1
Date:	15/08/2012
Page:	**1 OF 7**

MONTHLY ANALYSIS OF WINDROWS AT KILBERRY

2015

REPORT NO: **KILBERRY MONTHLY ANALYSIS 2015**

PREPARED BY: Colman Hynes
Bord na Móna ltd.

DATE: 26/02/2016

BORD NA MÓNA

BORD NA MÓNA HORTICULTURE LIMITED

Final Compost Results IS441	
QM-GC-01K	
1	
1	
20/07/2012	
2 OF 7	

Introduction

Samples are collected monthly for analysis according to the EPA licence 198-1 *Schedule F: Standards for Compost Quality* and also I.S. 441:2011
Samples are collected by the Bord na Mona Horticulture lab. Analysis begins on the day of sampling and held in cold storage during analysis.

Note – No piles passed in March 2015

BORD NA MÓNA

BORD NA MÓNA HORTICULTURE LIMITED

Final Compost Results IS441	
QM-GC-01K	
1	
1	
20/07/2012	
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Compost Testing and Analysis Service

Report ref: KC15

Results

Sample matrix: Composted greenwaste and spent grain/Sludges

PLANT Nutrient , CAT Soluble Nutrients, and Physical Analysis

TEST Method	I.S. EN13037	I.S.EN13038	I.S.EN13651	I.S.EN13651	I.S.EN13651	I.S.EN13651	I.S.EN13040
2015	**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** $mg.L^{-1}$	**M/C %**
Jan	7.41	592	0	2	22	686	61.3
Feb	7.15	468	181	7	50	545	65.6
Mar							
Apr	6.91	687	6	2	54	748	57.1
May	7.64	618	79	16	24	910	53.4
Jun	7.36	566	96	1	55	689	58.7
July	6.69	626	2	0	47	766	49.7
Aug	7.39	621	1	47	27	1180	50.6
Sep	7.58	653	39	91	22	77	45.2
Oct	6.94	754	4	71	30	1060	57.8
Nov	6.68	557	186	1	65	888	54.0
Dec	6.51	227	277	11	277	11	15	266	64.0

BORD NA MÓNA

BORD NA MÓNA HORTICULTURE LIMITED

Final Compost Results IS441
QM-GC-01K
1
1
20/07/2012
4 OF 7

Maturity

Germination of Cress

Method IS EN 16086-2 2011	% AGR	RI %
Jan	**100**	**139.9**
Feb	**100**	**104**
Mar		
Apr	**100**	**115.1**
May	**100**	**85.8**
June	**100**	**102.9**
July	**100**	**91.6**
Aug	**100**	**88.9**
Sept	**100**	**85.3**
Oct	**100**	**96**
Nov	**100**	**85.3**
Dec	**100**	**101.1**

% AGR	**%Average Germination Rate**
RI %	**Root Index %**

C:N Ratio

Test Method Sample no (month)	% Organic Matter	I.S.EN13039 C:N Ratio
Jan	71	13
Feb	82	12
Mar		
Apr	74	15
May	72	20
Jun	73	11
July	73	13
Aug	59	13
Sep	50	17
Oct	55	13
Nov	73	14
Dec	71	12

BORD NA MÓNA

BORD NA MÓNA HORTICULTURE LIMITED

Final Compost Results IS441
QM-GC-01K
1
1
20/07/2012
5 OF 7

Foreign Matter over 2mm

	Foreign Matter > 2mm	Stones >4mm	%N	%P	%K
Method	PAS 100:2005		Based on I.S EN 13654-1	ISEN13650	ISEN13650
Jan	0	0	2.91	0.47	0.73
Feb	0	0	3.73	0.50	0.52
Mar					
Apr	0	0	2.65	0.40	0.55
May	0	0	2.01	0.54	0.81
Jun	0	0	3.57	0.56	0.55
July	0	0	3.11	0.45	0.62
Aug	0	0	2.43	0.51	0.72
Sep	0	0	1.65	0.53	0.69
Oct	0	0	2.40	0.65	0.85
Nov	0	0	2.92	0.38	0.67
Dec	0	0	3.20	0.36	0.28

***Based on BP PAS100:2005**

BORD NA MÓNA

BORD NA MÓNA HORTICULTURE LIMITED

Final Compost Results IS441
QM-GC-01K
1
1
20/07/2012
6 OF 7

Heavy Metals (Dry weight basis)

Sample no	Cu mg.kg^{-1}	Zn mg.kg^{-1}	Pb mg.kg^{-1}	Cd mg.kg^{-1}	Hg mg.kg^{-1}	Ni mg.kg^{-1}	Cr mg.kg^{-1}
Method used		**I.S.EN13650**			**ISO16772**	**I.S.EN13650**	
Standard	**100**	**350**	**150**	**1.5**	**1**	**50**	**100**
Jan	28	135	27.8	0.53	<0.05	19.6	48.9
Feb	26.8	125	21.1	0.45	<0.05	6.18	5.5
Mar							
Apr	41.8	136	34.1	0.55	0.09	11.6	10.9
May	43.2	198	47.5	0.67	0.11	9.56	7.82
Jun	31.6	159	38.5	0.5	0.07	8.09	6.35
July	28.5	153	35.9	0.52	0.07	13.3	11.8
Aug	43	156	47	0.72	0.11	15.5	9.91
Sep	39	160	41.1	0.73	0.12	14.4	11.3
Oct	34.8	168	33.2	0.76	0.1	13	10
Nov	29.9	112	46	0.46	0.06	8.32	11.5
Dec	32.2	166	40.6	.77	.07	12.6	11.6

Microbiological Analysis

Sample no	E Coli CFU/g)	Salmonella (spp/25g)
Method used	**Based on ISO 16649-2 (2001)**	**RayAL ELISA OPTIMA**
Jan	<10	Absent
Feb	<10	Absent
Mar		
Apr	630	Absent
May	<10	Absent
Jun	<10	Absent
July	250	Absent
Aug	230	Absent
Sep	<10	Absent
Oct	60	Absent
Nov	<10	Absent
Dec	n/a	n/a

BORD NA MÓNA

BORD NA MÓNA HORTICULTURE LIMITED

Final Compost Results IS441
QM-GC-01K
1
1
20/07/2012
7 OF 7

Stability Analysis

Method prEN16087-1

Sample no	Mmol/O_2/kg OS/h
Standard	
Jan	3.4
Feb	4.2
Mar	
Apr	12.7
May	9.3
Jun	11.2
July	13.1
Aug	12.7
Sep	5.42
Oct	4.64
Nov	7.95
Dec	13.2

* Repeat of individual piles in brackets

Weed Test

Method BGKe.V2006

Sample no	Weeds/L
Standard	
Jan	<0.5
Feb	<0.5
Mar	
Apr	<0.5
May	<0.5
Jun	<0.5
July	<0.5
Aug	<0.5
Sep	<0.5
Oct	<0.5
Nov	<0.5
Dec	

APPENDIX 3
PRTR Scans

Environmental Protection Agency

Guidance to completing the PRTR workbook

PRTR Returns Workbook

Version 1.1.19

REFERENCE YEAR	2015

1. FACILITY IDENTIFICATION

Parent Company Name	Bord na Mona Public Limited Company
Facility Name	Bord na Móna Plc (Kilberry)
PRTR Identification Number	W0198
Licence Number	W0198-01

Classes of Activity

No.	class_name
-	Refer to PRTR class activities below

Address 1	Kilberry
Address 2	Athy
Address 3	
Address 4	
	Kildare
Country	Ireland
Coordinates of Location	-7.0108 53.0473
River Basin District	IESE
NACE Code	3832
Main Economic Activity	Recovery of sorted materials
AER Returns Contact Name	Craig Mallinson
AER Returns Contact Email Address	craigmallinson@inbox.com
AER Returns Contact Position	Env Consultant
AER Returns Contact Telephone Number	0872886848
AER Returns Contact Mobile Phone Number	0872886848
AER Returns Contact Fax Number	
Production Volume	0.0
Production Volume Units	
Number of Installations	1
Number of Operating Hours in Year	0
Number of Employees	5
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?	
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 ?	

ERROR: stackunderflow
OFFENDING COMMAND: ~

STACK: