



Odour and Bio-aerosol Risk Assessment;
Odour Management Plan for the proposed Aerobic Green waste
composting and Aggregate Recycling

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EXECUTIVE SUMMARY

Marc Davies (MD recycling) is upgrading his existing compost site and aggregate recycling facility. Waste from the aggregate recycling will be used as part of the construction material.

Aggregate and green waste materials will be transported to the sites from various local sources within a 25 mile radius.

This report provides an assessment of the risks posed by odours and bio-aerosols which could potentially be generated at the proposed facilities. The risk assessment is used to identify sources which require containment, and goes on to provide a semi-quantitative assessment of the residual risks posed by odour and bio-aerosols emissions, following implementation of the proposed controls at the facility.

The closest existing residential area is 250m from the centre of the site and 200 m from the site boundary. The site is located in an agricultural area.

The stages in undertaking a risk assessment are as follows:

- Identifying hazards
- Estimating exposure to the hazards
- Estimating the risk posed by the exposure
- Managing the risk - how significant is the risk and are steps needed to deal with it?



The risk assessment methodology took account of the quantities of materials to be handled; the potential for releases of odour and bio-aerosols; and the extent of dispersion in the atmosphere and how odours could potentially affect local amenity.

The following conclusion has been drawn from the risk assessment:

- Un-disturbed windrows poses no significant risk to the local environment due to odours or bio-aerosols.
- The facility will be designed and operated as set out in the Planning and Environmental Permit applications, emissions of bio-aerosols and odours from the proposed facility do not pose a significant risk to the health or well-being of those living and working in the local area.

An odour and bio-aerosols management plan to include a complaints procedure has been prepared for the site as part of the environmental management system. This includes measures to minimise odour and bio-aerosol releases from the proposed facility. The management plan sets out a procedure for dealing with any odour complaints received from members of the public.

1.0 INTRODUCTION

This report provides an assessment of the risks posed by odours and bio-aerosols which could potentially be generated at the proposed facility. The risk assessment is used to identify sources which require containment, and goes on to provide a semi-quantitative assessment of the residual risks posed by odour and bio-aerosols emissions, following implementation of the proposed controls at the facility.

The Natural Resources Wales horizontal guidance H4 Odour Management has been used to carry out the risk assessment. The Natural Resources Wales Position statement on composting and potential health effects from bio-aerosols (2010) states:

"applicants will have to provide us with a site-specific bio-aerosol risk assessment if there is a workplace or dwelling within 250 metres of the composting site boundary ..."

As there is a premises within 250m of the site, an odour and bio-aerosol risk assessment has been completed.



2.0 PROCESS SUMMARY

The total quantity of waste materials accepted at the site will be approximately 120,000 tonnes per annum split; 20,000t green waste 100,000t aggregate wastes . The waste accepted at the site will consist of the following materials at varied tonnages:

- Green waste
- Aggregate wastes

Materials will be transported to the sites from various local sources within a 25 mile radius of the site. Some of the deliveries will be frequent such as local green waste. Other waste types, such as aggregate, will be delivered more frequently but only when required as mentioned above.

It is expected and planned within site operations that all wastes delivered will be possessed on day of delivery; in regards to green waste, aggregate waste may be stored within the aggregate sit, followed by waste area site cleaning procedures, e.g. Waste tipping areas will be cleaned at the end of each working day. The following points summarise the process;

Green waste in- Green waste will be shredded as it arrives and put into windrows on the same day if possible. This lowers the omission of odors as the waste is fresh and then packed into windrows.

Aggregate waste in- This type of waste generally has no odor, however site staff will check loads entering , that no odors are present.

3.0 IDENTIFYING POTENTIAL ODOUR AND BIO-AEROSOL SOURCES

3.1 Risk Assessment Methodology

The odour risk assessment was based on the approach given in the H1 Environmental Risk Assessment as advised in the H4 odour management guidance. Discussions with the Natural Resources Wales have confirmed that bio-aerosols/odours are present with windrow composting

3.2 Processes

From the process outlined in Section 2, a number of potential sources of odour were identified. The main source of odours from the process is likely to be turning of windrows..

Windrow turning is expected to be the time when odor requires suppressing and controlling.

3.3 Materials

The materials expected and stored within the proposed facility are set out below.

- * Green Waste
- * Aggregate waste.

3.4 Estimating Exposure

This stage of the risk assessment focused on the potential sources of odour and bio-aerosol. Potentially sensitive locations in the area which is a predominantly rural area, with mixed agriculture have been identified as;

- Dwelling located 200m from site.
- SSSI 400m (historic).

The characteristics of the potentially significant sources of odour and bio-aerosols have been identified on the basis of information provided by operators of similar sites operating nationally.

3.5 Estimating the Risk

Windrow composting is well established in the UK and has been around for thousands of years, the risks of potential odour and bio aerosol emissions are well known.

3.6 Managing the Risk

There are robust management procedures in place for reducing the risk of odours and preventing fugitive emissions. These are detailed below in Table 3.6.

A detailed Odour Management Plan to include complaint procedures is shown in *Appendix A* of this document.

Table 3.6 – Results of the Risk Assessment

Risk Description	Odour Risk Ranking	Management procedure	Normal Operating Conditions Risk to local Receptors	Abnormal Conditions Risk to local Receptors	Operating Risk to local Receptors
Transport of Green waste and aggregate waste to the site.	Low	Waste is treasured buy registered carries	LOW	MEDIUM Accidental spillage has the potential to cause a localised odour, all spillages would be cleaned up immediately to minimise impact.	
Unloading and processing green waste and aggregate wastes	Medium	The green waste risk is low but there is a heightened risk with aggregate waste if the loads contain dust in dry times of year. If this is the case and site staff are aware then the load will be tipped with water spray put over the load as tipping.	LOW	LOW	
Storage of aggregate waste/ green waste	Low	Storage of aggregate waste possess no risk or very low risk. The risk may come during high winds, in this case site staff will responded and contain ether with water if its aggregate dust or water spraying or covering if it's from windrows.	LOW	MEDIUM Accidental spillage has the potential to cause a localised odour, all spillages would be cleaned up immediately to minimise impact.	





APPENDIX A ODOUR AND BIO-AEROSOL MANAGEMENT PLAN

1 INTRODUCTION

This Odour and Bio-aerosol management plan (OBMP) has been specifically developed for the purposes of managing odours and bio-aerosols released from the MD Recycling Ltd Green waste composting and aggregate recycling facility at Crugmore Farm.

The purpose of this plan is to identify potential sources of odour and bio-aerosol generated by the operations on site, including the aerobic composting, aggregate recycling and the storage, and transport of materials. It provides a systematic action programme that will be carried out to minimise the release of odours and bio-aerosols.

This odour and bio-aerosol management plan is designed to identify and prioritise the range of potential odour and bio-aerosol sources at the site, it also provides for a weekly odour monitoring survey.

It is intended to be used as a reference working document for operational staff on a day to-day basis and shows what actions should be taken to minimise odour events and who is responsible for authorising or undertaking the action. It should be reviewed regularly and revised as required.

From the process outlined in Section 2 of this report, a number of potential sources of odour and bio-aerosols were identified. The main source of odours from the process is likely to be from the turning of windrows on the site.

Table 6.1 below details the results of the risk assessment for each stage of the process where odour and bio-aerosols could be generated. The odour and bio-aerosol management plan for each of these sources is set out in Section 6.2 of this report.

Table 1 – Results of Odour and Bio-aerosol Risk Assessment

Risk Number	Operation	Risk assessment of odour and or Bio-aerosol
1	Transport of green waste and aggregate wastes to the site.	LOW
2	Unloading and processing of green waste and aggregate wastes	MEDIUM
3	Storage of Green waste and Aggregate wastes	LOW

RISK 1-Transport of green waste and aggregate wastes to the site. This has a very low risk attached to it, and the site will only use registered waste carries for the movement of waste to this site. Unloading and processing of green waste and aggregate wastes

RISK 2- Unloading and processing of green waste and aggregate wastes. This can create a risk with both green and aggregate wastes if the are very dry in the warm months of the year. Site staff will be trained to recognise these conditions and will be given the options to be used in the event. High winds with dusty materials will create the risk.

RISK 3- Storage of Green waste and Aggregate wastes. Very low risk attached to storage of these materials. The storage is linked into RISK 2 above, e.g. stored waste can dry out.

3 Odour Monitoring Survey

A weekly odour monitoring (olfactory) survey will be carried out around the site boundary and at the closest property. The survey will be designed to ensure that the site is not producing significant odour outside the site boundary. The survey will also give an indication of the effectiveness of the current operating conditions at the site as it allows for an investigation into the sources of odour it requires action to be taken.

Odour monitoring survey will be timed to coincide with potentially odorous activities. The methodology described in Appendix 1 will be used.



4 Bio-aerosol Monitoring

The risk of adverse health impact associated with bio-aerosol emissions from the facility is extremely low. If required the methodology of the survey and evaluation benchmarks will be taken from therelevant guidance.

5 Odour Complaints Procedure

MD Recycling Ltd ensures that any complaints received from members of public in respect of any of their sites are taken very seriously. The history of complaints received by a site is a good indicator of its potential risk of causing future annoyance, and is therefore a factor in assessing the extent and detail of assessment required. When an odour complaint (or any off-site environmental complaint) is received a log of the complaint will be recorded. The log is consistent with that advocated by the Environment Agency H4 guidance and includes details of the complainant, date and time of the incident and details of the complaint plus any other relevant information such as weather conditions and operations. This log will also include details of any actions taken in response to the complaint.

The primary role of the odour complaint procedure is to ascertain whether the odour complaint is associated with the applicant's activities and what action may be taken to prevent or minimise the probability of recurrence. It is important to stress at the outset the need for sharing of information with Natural Resources Wales and / or the local authority throughout any investigation and that all steps and decisions are documented. In the event of a justifiable odour complaint being received either by the operator, member of the public, the local authority or the Natural Resources Wales, the following steps must be followed:

- Fill out the complaints record form in Annex 3.
- Cease any odour generating activities on site immediately
- Carry out an odour monitoring survey using the procedures described in Annex 1 and the reporting form in Annex 2
- Identify the potential source of the odour
- Review the techniques used on site to reduce odour generation and implement appropriate measures.
- Report the odour complaint to the Natural Resources Wales along with any corrective measures that have been carried out.
- Provide complainant with an odour diary form as described in Annex 4 to monitor the situation.



If corrective methods fail to deal with the occurrence of justifiable odour complaints being received at an excessive level the site will stop accepting waste and identify temporary alternative disposal routes until further methods are put in place to reduce the generation of odour.



Annex 1 - Odour Monitoring Procedure

An odour monitoring survey will be carried out as part of the Odour Management Plan for the Green waste site and the aggregate site.

Who will carry out this survey?

The odour monitoring survey will be carried out by a member of staff, who:
Is not subject to process odours in their normal duties; and who has been trained in carrying out this procedure. Furthermore, the person carrying out the survey shall:

- Be a non-smoker;
- Not be routinely involved with site activities;
- Consumes only water within half an hour of commencing the survey;
- Not wear perfume or other fragranced products.
- Not have a cold or sore throat.

When to undertake this survey

The frequency of monitoring shall be a minimum of weekly monitoring surveys or following detection of off site odour by staff or members of the public

Where to carry out the survey

An assessment has been carried out to identify those off site locations which are most sensitive to potential odorous emissions from the site or which are most likely to be exposed to potential odours. These locations are identified in the odour Monitoring Survey form in Appendix 2 and should be visited as a minimum.

How to record the results of the survey

The results of the survey are recorded on the form in Annex 2. The completed forms shall be retained in the site office. Completed forms will be routinely reviewed by the site manager.

How to carry out the survey

- Record the time and date of the survey
- Record the name of the person carrying out the survey
- Take a note of the prevailing weather conditions at the time of the survey
- Walk slowly and breathe normally whilst in the general vicinity of the individual points identified in the reporting form

- To ensure any faint odours are noted, inhale deeply whilst standing still at the exact locations
- Spend approximately 3 – 5 minutes at each of the locations points while undertaking the
- survey
- Describe the intensity; persistence and characteristic of any detectable odours (refer to the reporting form for descriptions of these).
- As far as practicable (with full regard to your safety), attempt to identify the most likely source of any moderate odours and define them on the survey sheet. To help identify the source of the odour find out what main processes are taking place within the facility during the survey.

What to do in the event of detection of an odour offsite

If significant odours are detected during the odour monitoring survey, the person carrying out the survey will report the findings to the site manager.

The manager will then review the operations of the site.

What to do in the event of detection of an odour complaints being received

In the event of a justifiable odour complaint being received, the following steps must be followed:

Fill out the complaints record form in Annex 3.

- Cease any odour generating activities on site immediately
- Carry out an odour monitoring survey using these procedures and the reporting form in Annex 3
- Identify the potential source of the odour
- Review the techniques used on site to reduce odour generation and implement appropriate measures.
- Report the odour complaint to the site manager and Natural Resources Wales along with any corrective measures that have been carried out.

Annex 2 Odour Monitoring Survey

odour monitoring report form					Date
Time of test					
Location of test					
Weather conditions (dry, rain, fog, snow etc):					
Temperature (very warm, warm, mild, cold, or degrees if known)					
Wind strength (none, light, steady, strong, gusting) Use Beaufort scale if known					
Wind direction (e.g. from NE)					
Intensity (see below)					
Duration (of test)					
Constant or intermittent in this period or persistence					
What does it smell like?					
Receptor sensitivity (see below)					
Is the source evident?					

Sketch a plan of where the tests were taken, the potential source(s).

Intensity	Receptor sensitivity where odour detected
0 No odour	Low (e.g. footpath, road)
1 Very faint odour	Medium (e.g. industrial or commercial workplaces)
2 Faint odour	High (e.g. housing, pub/hotel etc)
3 Distinct odour	
4 Strong odour	
5 Very strong odour	
6 Extremely strong odour	
Ref: German Standard VDI 3882, Part 14	

Annex 3 Odour Complaint Form

Odour Complaint Report Form	
Time and date of complaint:	Name and address of complainant:
Telephone number of complainant:	

Date of odour:	
Time of odour:	
Location of odour, if not at above address:	
Weather conditions (i.e., dry, rain, fog, snow):	
Temperature (very warm, warm, mild, cold or degrees if known):	
Wind strength (none, light, steady, strong, gusting):	
Wind direction (eg from NE):	
Complainant's description of odour:	
☐ What does it smell like?	
☐ Intensity (see below):	

o Duration (time):		
o Constant or intermittent in this period:		
o Does the complainant have any other comments about the odour?		
Are there any other complaints relating to the installation, or to that location? (either previously or relating to the same exposure):		
Any other relevant information:		
Do you accept that odour likely to be from your activities?		
What was happening on site at the time the odour occurred?		
Operating conditions at time the odour occurred (eg flow rate, pressure at inlet and pressure at outlet):		
Actions taken		
Form completed by:	Date	Signed

Intensity

0 No odour

3 Distinct odour

5 Very strong odour



- 1 Very faint odour 4 Strong odour 6 Extremely strong odour
- 2 Faint odour



Appendix 4 = Odour Diary

Name: _____

Address:

Telephone Number:

Form version 110319

Sheet No

[illegible]

Wind direction (eg from NE):							
What does it smell like? How unpleasant is it? Do you consider this smell offensive?							
Intensity – How strong was it? (see below 1-5):							
How long did go on for? (time):							
Was it constant or intermittent in this period:							
What do believe the source/cause to be?							

Any actions taken or other comments:							
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Intensity

0 No odour

3 Distinct odour

5 Very strong odour

1 Very faint odour

4 Strong odour

6 Extremely strong odour

2 Faint odour