Cambridge Composting

Pest Management Plan

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DOCUMENT CONTROL

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Project:	Cambridge Pest Management Plan
Author Name & Title:	Author Name(s) : James Cooper

I. DOCUMENT STATUS AND REVIEW SCHEDULE

Report No.	Date	Status	Reviewed By
V1	17/06/2021	Final	AS, MG, NH, AS
V2	24/05/2022	Reviewed in prep for ISO	SG
V3	04/4/2024	Reviewed as management systems checks were changed to include fly monitoring records to be kept	James Cooper & Katie Lees

1. Introduction

1.1. Scope of Documentation & Regulation

This document provides information to support Envar's Integrated Management System and provides controls to be taken to minimise the risk of infestations of pests on site. This Pest Management Plan has been prepared regarding the EA Guidance documents; 'Fly management: how to comply with your environmental permit' April 2013.

The objective of this Pest Management Plan is to:

- Reduce the likelihood of pests causing nuisance at local receptors
- Reduce fly activity on site
- Maximise efficiency of the use of chemical control to minimise pollution

1.2. Permit & Site Locations

Cambridge Composting Facility is permitted to accept and treat organic wastes. Operations at the site include:

R3 – Recycling and reclamation of organic substances

R4 – Recycling & reclamation of other inorganic materials (reference to dredging spoil other than those mentioned in 17 07 05 (from inland waters only))

R13 – Storage of waste for the purposes of recycling/transfer

Associated activities including the storage of fuel, office activities general maintenance and administrative/welfare functions.

2. Pests

2.1. Speciation

As is common with most waste processing facilities there is a risk of flies being transported to the site within waste. The waste types being processed at the Cambridge site include kerbside collected food and green co-mingled waste which is attractive to flies due to the warmth created from biodegradation and the putrescent nature of the waste.

The main species of flies associated with composting and in vessel composting are the Common Housefly, the Lesser Housefly.

Occasionally, but not often, fruit flies may be found where there is a high concentration of soft vegetable matter. However due to the process, the shredding and blending of wastes and the subsequent mixing it is unlikely that significant concentrations of fruit flies would be found.

A list of fly species and their typical locations can be found in the EA guidance "Fly Management, How to Comply with Your Environmental Permit"

Table 1, Fly Species - Reference: EA Fly Management Guidance

Fly species	**Typical pest status**	**Notes**
Common housefly (*Musca domestica*)	Can cause widespread and severe problems	Larvae found in poultry, pig, and calf manure, and in refuse. Adult readily disperses and enters buildings.
Lesser housefly (*Fannia canicularis*)	Can cause widespread and severe problems	Larvae found in poultry manure, and in refuse. Adult readily disperses and enters buildings.
Blow flies: Bluebottles / Greenbottles (*Calliphora / Lucilia*)	Localised problems only	Larvae found in carrion and faecal material, commonly associated with putrescible waste. Adults tend not to disperse far.
Stable flies (*Stomoxys calcitrans*)	Localised problems only	Larvae found in manure of large animals, e.g. cattle and pigs. Adult is blood-feeding, and tends not to disperse far.
Fruit flies (*Drosophila spp.*)	Localised problems only	A small (2mm) fly. Larvae found in rotting vegetation or vegetable waste, e.g. green-waste composting. Tends not to disperse far.
Cluster flies (*Pollenia rudis, Eudasyphora cyanella, Musca autumnalis*)	Localised problems only	The larvae of these flies are not found in livestock or waste facilities, but the adults do enter buildings in the autumn, and may be confused with houseflies by complainants.

2.2. Sources of Flies in Composting

The EA Guidance states "In general, fly larvae occur in damp, decaying organic waste. However, each species will have its preferred niche in terms of temperature, moisture levels, and the nature of the organic material."

Flies commonly occur during warmer weather and are rarely a problem in the cooler months of the year. Eggs are usually laid on putrescible waste at the point of waste generation and are transported to sites within the waste mass.

Wastes received at Cambridge recycling centre consist of kerbside collected food and green wastes. It is often the case that fly eggs and larvae are present within the waste before it reaches the site. Despite the aggressive nature of waste collection, transport and processing where the waste is physically tipped, compacted, unloaded and mechanically handled some fly eggs, larvae and pupae survive.

Flies from external sources are also present and may lay eggs within the processing material. However fly migration from external sources will be apparent it is not considered to be a significant contributor. Flies from other sources nearby which may affect sensitive receptors are discussed in section 4.2.

2.3. Development in Relation to Composting

Fly life cycles are very sensitive to temperature. The speed at which flies develop is over four times greater in 30-degree ambient temperature than when the temperature is at 16 degrees. At temperatures, less than 12 degrees Celsius development is halted.

The material being handled and processed at Cambridge Composting Facility is self-heating. This is a requirement of the permit. Generally incoming wastes are between 30 and 40 degrees Celsius. This quickly rises to 70 degrees and above during stockpiling and processing.

At Temperatures above 45 degrees Celsius fly larvae and pupae are destroyed. The table below shows the areas where the temperatures are within the correct range for fly development to occur. However, it must be noted that seasonal temperature variations and energy levels within the material affect the ambient temperature and the subsequent development of fly issues.

Table 2, Material Risk Analysis

Material	Temperature Range	Risk	Notes
Incoming Pre-Shredded Waste	20-30 Degrees C	High	Often already containing larvae, stockpiled immediately following delivery
Stockpiled Pre-Shredded Waste	30-50 Degrees C	Medium	Stockpile main mass is hotter in the centre. The edges of the mass are at higher risk
Windrow Material	55-70 Degrees C	Low	Stockpile main mass is hotter in the centre. The edges of the mass are at higher risk. The material is aggressively turned which destroys larvae
Waste Inside IVC Tunnels	55-70 Degrees C	Low	Temperatures within composting tunnels are too hot for flies to survive

Taking the above table into account in fly control measures attention should be paid to material at the edges of waste piles where fly larvae are more likely to survive. Please see section 5 of this plan for more information on fly control measures.

2.4. Dispersal of Flies from Composting Processes

Although flies can disperse a significant distance from their breeding ground it is most often the case that they will stay nearby where there is ample sustenance for them to breed. Flies tend to be attracted to the material, which is handled at Cambridge Composting Facility, flies navigate to decaying material through sense of smell so it is likely that Cambridge Composting Facility would maintain its attractiveness to adult flies. Flies would usually migrate to find food when there is not an ample supply nearby or to mate, attracted by pheromones. Because there is more than adequate food supplies and mating opportunity on site it is unlikely flies would migrate off site to find the same.

2.5. Local Receptors

There are potentially a number of local receptors for flies. The EA guidance states that for receptors within 500m of the source there is most likely to be a problem.

Picture 1 below shows there are no receptors within 300m of the site active areas. Previous complaints have come from local villages village which are between 1 and 2 miles from the site. The closest potential receptor is 550m from the site.

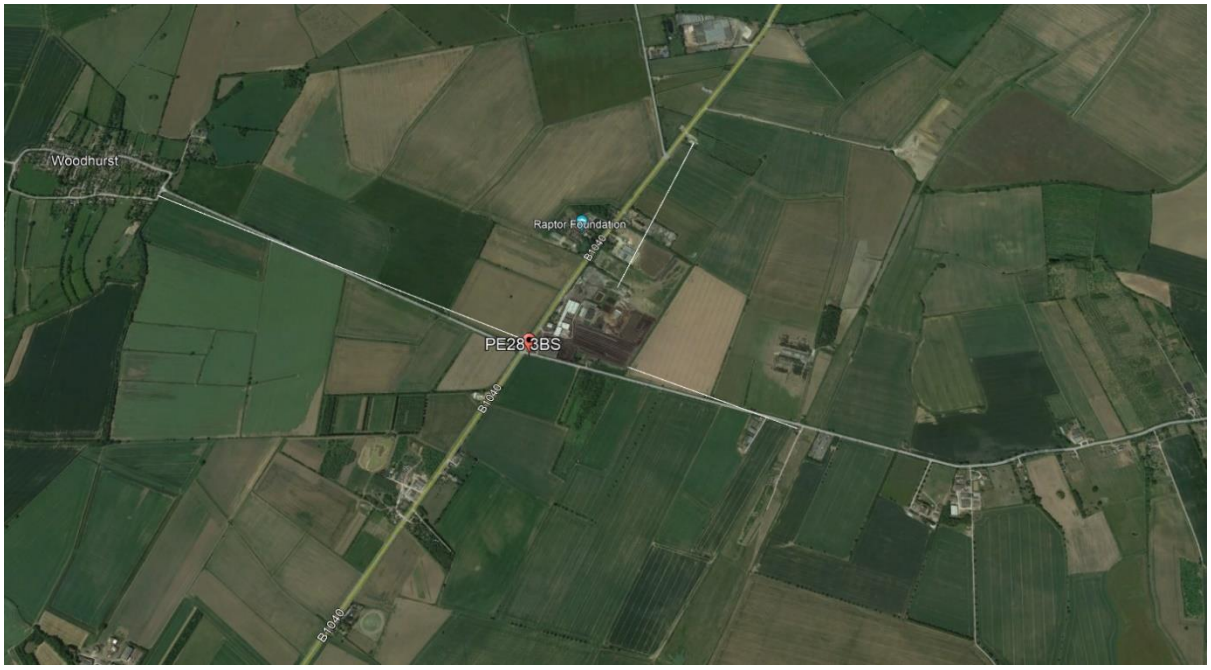

Figure 1, Local Receptors

Due to natural dispersal, the prevalence of other attractants in the area and the rural setting it is unlikely there will be significant risk of flies migrating to receptors in significant numbers especially as the receptors become further away. Notwithstanding this adequate control measures shall be undertaken as discussed in section 5 of this plan.

3. Monitoring

3.1. Monitoring Techniques

Trends in fly numbers shall be monitored and used to direct control measures. Monitoring shall be carried out daily. Monitoring shall consist of the following:

- Indoor Resting Counts

Fly activity. The main requirement for this monitoring is to observe change in fly numbers over time, especially during the warmer months between April and October. The person seeing shall make observations across the whole site while conducting the weekly site audit.
This will be done using resting fly counts. A fly count shall be made on surfaces at various points around the site, located in areas where flies are regularly seen to be resting, within the waste Reception buildings, on the walls of composting vessels and on the windrows on the composting pad. flies within a roughly 30cm square area counted. A qualitative record is then entered into weekly site audit held on the electronic compliance system, thus monitoring adult fly numbers regularly. Any significant increase in activity/numbers counted will prompt fly control to be implemented.

Scrape and count

Larvae monitoring shall be carried out following the scrape and count method. This is where the surface of the pre-treated material shall be scraped back and larval stages of fly development observed and recorded. This will be done weekly in areas containing material not disturbed regularly, eg: drainage channels. One or two larvae would be considered normal, but if more than 5 are recorded in any one area action should be taken. Results of the monthly scrape and count will also be recorded on the site audit, held on the electronic compliance system.

- General Inspection

As per the sites general inspection and cleaning regime the site will be inspected daily. Any notice of build-up of material or material which has become spilled or left rotting shall be noted and cleared. General good housekeeping practice shall be followed to prevent the build-up of waste in inaccessible areas

3.2. Records

Indoor resting information and the larval count shall be noted weekly and monthly as applicable in the site audits which are stored on the electronic compliance system . This record shall be maintained in a format which is legible and readily available for inspection.

Records of fly control shall also be noted in Envar MS 5.28 Fly Control Record . Including:

- Type of Pesticide Applied
- Any Traps Set
- Amount of Knock Down Sprays Applied
- Amount of Larvicide Applied and into Which Waste
- Amount of Contact Residual Applied and Location of Application
- Amount of Bait Traps Applied and Locations

- Any Complaints Received

Records of Training for site staff in the routine use of pesticides and the basic principles of pest control shall be recorded and available for inspection.
Records or purchases of pest control products shall be recorded and available for inspection (invoices etc)
Records of visits from pest control consultants shall be recorded within the site diary.

4. Complaints

4.1. Investigation

Any complaints received by the site regarding flies shall be investigated by the site staff. Responses to complaints about flies include the following actions;

- Re-Inspection of site and discussion with staff to ascertain tasks being completed and any unusual instances or observations of flies.
- Inspection of monitoring areas and control measures to ensure optimum working conditions are being maintained
- Consultation of weekly trends to view monitored conditions and observe any increasing or decreasing indicators
- Investigation and logging of the complaint on the central Envar complaints system
- Details are also collated in site diary
- Adjustments are made on site as appropriate. Possible actions include, depending on the situation and any trends observed:
    - Application of Knock Down Spray
    - Increasing in frequency of applications
    - Application of other control methods to prevent fly build up
    - Offsite inspection to ascertain the level of the problem
    - Offsite search for other potential sources
- Reporting back to complainant (if requested), EA and management about actions and investigations undertaken.
- Cumulative records will be used in a review of site procedures and operations at regular intervals

4.2. Other Sources

Houseflies, Lesser Houseflies, Cluster Flies and others are prevalent in nature. They can commonly be found on waste and dung heaps which are left to decay and subsequently spread on fields nearby to Cambridge Composting Facility.

Cambridge Composting Facility is in a rural setting, the local land is used for a mixture of arable and pastoral farming including livestock holding; namely pigs and chickens. Local activities which will likely lead to breeding, dispersion and release of flies include:

- Pig Farming (Somershasm)

- Chicken Farming (Bluntisham, Needingworth, st ives,)
- Slurry Spreading (Arable Land Around Site)
- HWRC

When assessing fly sources Envar staff shall consider sources of flies from these categories and make notes to any activity hot spots seen in the vicinity.

5. Management

5.1. Prevention Methods

Prevention of fly populations reaching infestation levels should be prioritised. The following methods may be deployed to control fly populations. Where an increase in fly activity is seen through monitoring the controls shall be increased in line with the increase seen in fly population. The following methods are already used at Envar Cambridge Composting Facility.

- Red top fly bags are effective in the physical capture of many flies without using any harmful chemicals and should be used where possible as large numbers of flies can be caught effectively. Do not place near canteens or open windows as they naturally smell bad.
- Larval Spraying using NEPOREX or similar larvicide using Cyromazine as an IGR (Insect Growth Regulator). This chemical inhibits the production of chitin which stops the formation of a larval exoskeleton. This prevents the larvae from pupating by inhibiting the formation of a chrysalis or any hard parts. The larvae eventually die as they cannot complete their life cycle. NEPOREX may be mixed with water and applied as a foam to the waste or where maggots are seen. Attention in particular should be paid to the edges of the waste pile.
- **NEPOREX** may also be applied in granular form to any liquid containing maggots or especially high moisture waste. The granules naturally dissolve and inhibit pupae formation in the applied area.
- **Cypermax** by VAZOR is a contact residual alpha-cypermethrin (pyrethroid) based pesticide which can be applied to walls and the waste in a low pressure sprayer to kill flies which come into contact with it.
- **Aqua PY** is a butoxy-pyrethroid based knockdown spray which is water soluble. It is used to quickly knock down large numbers of adult flies through the use aof a vaporising backpack sprayer or fan sprayer
- **Pybuthrin 33** another pyrethroid based knockdown spray which is oil based for fogging use
- **Perbio-Choc**, a permethrin based misting liquid used similar to Aqua-Py with a different active ingredient to manage resistance
- **Twenty One** is an insecticidal bait for the control of domestic house flies. For use in animal unit or agricultural buildings or interior structural surfaces of buildings storing household waste or green household waste. The appeal of the bait to flies derives from its sugar base, the unique mix of a flavouring and a pheromone. It contains 0.5% imidacloprid. It attracts **female** flies and disrupts breeding
- **Fly Trap Refillable Bottles** – Containing natural trap odour. May be used on fences around site, not effective at complete control. However, may aid in the capture of migrating flies can capture up to 20k flies each so are good as an ongoing control and are non-insecticide based
- **Electro UV traps** – to be used in the offices only

- **Fly Papers** – may be used in offices only or in the shed. Not expected to contribute to controls significantly.
- **Vazor® Phepra CSA** microencapsulated insecticide in aqueous suspension, for professional use, with rapid knockdown and residual effect of 12 weeks on non-porous and porous surfaces. A non-staining, water-based surface spray, of neutral odour. For the control of crawling and flying insect pests for spray application indoors, e.g. in homes, warehouses, animal shelters, industrial plants, public buildings and spaces including food handling and storage areas as well as hospitals. Can be used in agricultural premises, stables, chicken and poultry farming, livestock units, empty grain storages, farm outbuildings and dairies. Effective against a broad spectrum of insect pests including ants, bed bugs, German and Oriental cockroaches, litter beetles, poultry red mites. flies such as house fly, stable fly and horn fly, mosquitoes, food moths, wasps and European hornets. This has different pyrethrins and reduces resistance build up

In general preventive applications of twenty one and the use of red top fly bags is enough to maintain low levels of flies even in the summer. But the treatment must be started in spring to maintain control.

5.2. Physical Control

Physical controls shall be undertaken to limit the escape and subsequent spreading of flies. These include –

- Keeping doors closed when not in use on the main building
- The application of Twenty One around door openings in summer months
- Application of Twenty One around site boundary to attract and destroy escaping flies
- The office may use fly tapes, UV traps and Bottle Traps – Bottle traps may be deployed around site.
- Turning of the composting mass has a significant effect on larval destruction

Turning and waste movement

- The movement of waste, shredding, turning and general pushing up limits the ability of flies to gain prolonged access to food sources, heat and mechanical action kill larvae and break the life cycle.
- Waste shall be processed following the wider management systems. All controls are not listed here as the full SOP for waste management on site is covered in detail.

5.3. Chemical Control

Chemical Controls shall only be undertaken when the temperature is above 5 degrees Celsius and there is fly activity present as per the daily monitoring.

When there is fly activity present above normal low activity:

- At least weekly application of NEPOREX to edges of waste piles and where maggots can be physically found
- At least weekly application of a knockdown spray in the reception building
- Weekly re-application of a residual contact pesticide – this pesticide remains active for weeks and kills any insects which land on it giving long lasting protection
- Weekly re-application of twenty-one to the site boundary traps and the door surrounds (so far as is practicable, not where cannot be reached)

Where fly activity is increasing the controls shall also be increased and the monitoring consulted. Where controls are seen to be not coping with the increase of fly breeding a fogging system shall be used to fumigate the shed and possibly the windrows if required.

6. Management Summary & Review

Management of flies shall briefly include the following as previously discussed within the plan:

1. Monitoring on site of larvae and adult observations
2. Logging of results and analysis weekly/monthly as required.
3. During summer months preventative controls, chemical and physical
4. As increased activity is seen increase in control measures
5. Recording of control measures
6. Actions as defined in response to complaints
7. Identification of offsite sources
8. Recording of all actions as discussed in this plan
9. Review of the plan on a 24-month basis or after significant incident