

**CIVIL AVIATION AUTHORITY,
AIRPORT OPERATORS ASSOCIATION
&
GENERAL AVIATION AWARENESS COUNCIL**

'Working in Co-operation'

SAFEGUARDING OF AERODROMES

Advice Note 5

Potential Bird Hazards from Landfill Sites

1. Introduction

Aerodrome safeguarding ensures the safety of aircraft and their occupants when in the vicinity of an aerodrome by controlling potentially hazardous development and activity around it. An overview of the Safeguarding process is given in the first Advice Note in this series. This Note considers in particular the detailed examination of proposed waste disposal sites due to their likely bird attractant features.

Aircraft are vulnerable to birdstrikes, i.e. collisions with large and flocking birds. They cost the aviation industry around £750 million per year in damage and delays to aircraft and are a major hazard. Occasional catastrophic losses have resulted in over 225 deaths and 70 aircraft destroyed in civil aviation. Over 80% of birdstrikes occur on or close to aerodromes and their operators are required to take necessary steps to ensure that the birdstrike risk is reduced to the lowest practicable level. Some of the largest bird concentrations and movements occur when birds exploit man's activities and man-made attractants, particularly landfill sites, but also other waste disposal facilities.

2. Safeguarding Consultation

In order to protect aerodromes against these hazards, safeguarding maps lodged with Planning Authorities include a 13 km radius dotted circle centred on the aerodrome to indicate the area within which developments that might attract birds require consultation.

3. Landfill Hazards

Many bird species visit landfills. Gulls, Carrion Crows, Jackdaws, Rooks (also Hooded Crows, Ravens and Buzzards in some areas) and Starlings do so to feed on the waste food. Other species such as Magpies, finches, House Sparrows, wagtails, pigeons and Pheasants are probably incidental because they live close by, or frequent the extensive tracts of weed-and scrub-infested waste ground typically associated with tips. Although a landfill very close to an aerodrome may cause hazardous concentrations of other species, the inevitable hazard from gulls so far outweighs all others that it is normal practice to assess safeguarding hazards in relation to gulls.

Gulls visiting a landfill near an aerodrome can be hazardous in several ways:

- a) **On the Aerodrome:** large numbers of gulls commute to a landfill daily and spend most of the day in its vicinity, even though they may feed on the site for only a few minutes or, perhaps, not at all. Characteristically, gulls 'wander' on the wing prospecting for potential feeding and resting sites. Consequently, numbers at 'secondary' sites (sports fields, aerodromes, lakes, sewage treatment plants, etc.) in the vicinity of a household waste landfill are increased by the presence of the landfill.
- b) **Overhead the Landfill:** gulls can soar up to 1500ft or more over landfills in fine weather. Also, soaring gulls may drift downwind. Therefore, aircraft may encounter flocks of gulls regularly if landfills are sited under or close to aircraft arrival and departure flight paths and within the visual circuit.
- c) **Bird Flightlines:** where an aerodrome is located between a gull roost and a landfill, flocks of up to several thousand gulls can fly across the aerodrome or through the approaches twice daily. This will be at least partly in low light conditions and cannot be influenced by action on the ground. Flight heights vary greatly between 'hedge-hopping' in poor visibility or headwinds and up to 1500ft or more in calm, clear conditions. Over-flying flocks will also attempt to alight (usually on the runway) in pre- and post-roost social gatherings. A roost on one side of an aerodrome therefore makes new landfill sites particularly hazardous over a large area of land on the far side of the aerodrome.

Changes in waste regulation and industrial practice have concentrated food wastes into a decreasing number of ever-larger landfills. It follows that individual landfills must be influential on the distribution of gulls in the UK on a larger scale than previously. Also, with fewer, larger landfills, there are examples of the location of a landfill influencing roost site selection. Some landfills now have roosts nearby on relatively small waters that would not previously have been considered to be 'typical' gull roosting habitat. Therefore, all landfills receiving food wastes within the 13 km consultation circle should now be considered as potentially hazardous. Also, bearing in mind gulls' daily ranges of up to 50 km, landfills located towards the edge of the 13 km circle cannot be considered to be borderline in terms of potential hazard.

4. Disposal and Treatment Processes and the Attraction for Gulls

Most waste goes directly to landfill and much of the remainder is landfilled after pre-treatment. Waste is usually tipped in cells enclosed by earth bunds. All exposed wastes on active tipping faces and flanks should be covered daily with inert material to a depth of not less than 150mm. The purposes of this 'primary cover' are to improve the site's appearance, minimise windblown litter, facilitate vehicle movements, reduce odours, inhibit rodent and fly infestation, control rainwater infiltration and minimise fire risk. Landfilling wastes in this way is commonly referred to as 'controlled tipping'. Covering wastes does not deter gulls. However, many applications for landfills include statements that suggest, or even claim, that primary cover can prevent, or reduce significantly, access by birds. Gulls feed as wastes are being tipped, levelled and compacted because, after these operations are completed, much of the food is already beneath the surface and more difficult to find. By the time primary cover is applied, most of the exposed food has been taken, or the gulls have consumed all they require. High standards of covering may limit food availability outside working hours but, generally, gulls are able to find food at all times.

Waste now increasingly undergoes some form of pre-treatment before landfilling, either the removal of metals, glass, paper, etc for recycling, and/or other treatments such as pulverisation, composting or baling. However, because none of these processes remove the food, or make it inaccessible, they do not significantly reduce the attraction for gulls.

5. Hazard Mitigation

Where gulls are permitted any access to food on landfills, they can exploit it merely by re-scheduling foraging sessions. Dawn and dusk bird flightlines persist, gulls loiter in the vicinity of the landfill throughout the day and, although for most of the time there appear to be no gulls on site, the hazard remains. Almost complete exclusion results in almost no reduction in hazard: exclusion must be total. A working landfill is a continuously disturbed environment in which gulls become habituated to high ambient noise levels, sudden loud noises, and the movements of large, brightly coloured machines with hazard warning lights and warning horns. Bird scaring devices are insignificant by comparison. Passive scarers (scarecrows, gas cannons, balloons and an ever-changing variety of 'novel' automatic devices and electronic noise generators) are, because of rapid habituation, effective only for a few days, if at all. They are totally inadequate for permanent exclusion of gulls from the rich food sources of landfills.

Feeding can be prevented by sustained aggressive bird dispersal action, but the constant level of vigilance and specialist manpower required means that such dispersal systems cannot not be relied upon to contain the hazard and cannot, therefore, form the primary part of any mitigation measures.

A more reliable method of excluding gulls is to surround the area where waste food is exposed with a netting enclosure, similar in principle to a giant fruit cage. With sound engineering and an appropriate operating regime, it does not need continuous attention and monitoring. Even so, netting systems have weaknesses:

- a) Nets do not exclude starlings and it is difficult to keep out *corvids* (particularly Rooks, Carrion Crows and Jackdaws). Therefore, where the site is so close to the aerodrome that local concentrations of these birds are judged to be hazardous, an enclosure may not control the hazard.
- b) Mechanical failures due to design faults, high winds or snow loading.
- c) Physical damage from collisions with the structure by waste transporters, compactors, etc., or from vandalism.
- d) Wastes uncontained by bunds or in an overloaded enclosure spilling against the side netting or through the vehicle entrance.
- e) Gulls entering through the vehicle entrance.
- f) Food wastes available outside the net: carried out on vehicle wheels and deposited on the haul road; residues spilling from vehicles still 'tipped' exiting the enclosure; residues being swept out of vehicles on site; vehicles with uncovered loads waiting on site to discharge.

6. Safeguarding Strategy

If it is assessed that a proposed landfill will be hazardous a robust and detailed Bird Hazard Management Plan will be necessary. An example of a Bird Hazard Management Plan is outlined at Attachment 1.

Where a landfill for inert wastes only is in a location that would be hazardous if waste food were to attract gulls, a condition might be sought requiring the developer to monitor waste types and bird usage, and to implement remedial action or suspension of tipping in the event of unacceptable bird activity. This condition would be attached to any planning permission that may be granted.

Active bird control systems and netting enclosures have different characteristic breakdown patterns. The former fail frequently but for short periods when, for example, staff are distracted by other duties, arrive late for work, take meal breaks, etc. Gull flocks feed in brief intensive sessions and spend most of the day loafing on inactive areas of the landfill or in nearby fields. Their foraging strategy is, therefore, already adapted to exploit short-term breakdowns in active bird scaring/dispersal systems.

Failures of exclusion nets follow a different pattern. They operate without problems for weeks at a time and fail occasionally but for longer: the netting may be damaged; or a relaxation in operating standards may lead to food wastes being tipped outside the net. Gulls fly many miles specifically to feed on the dependable food source on landfills. Where the food remains completely inaccessible for weeks because it is inside a netting enclosure, it is obviously not worthwhile for large numbers of gulls to fly to the site daily. Therefore, when it eventually does suffer a breakdown, the gulls are not immediately there to exploit it, and the breakdown would need to continue for some days before they discovered the 'new' feeding site. Also, the intermittent failures of bird controllers to protect a site are difficult to detect, whereas a mechanical failure of the net structure - or the dumping of food waste outside the net - are immediately obvious.

Netting systems are more reliable and their operation is easier to monitor. Therefore, where it has been determined that birds visiting a proposed landfill would be hazardous, the primary means of controlling the hazard should be a netting enclosure. Where it is judged that a failure of the net would be particularly hazardous, e.g. close to the coast where gulls would be quicker to detect and exploit failures of the netting system, active bird control should be available as a back-up. However, it is important that the landfill operator should never rely on active bird control as a substitute for a poorly managed netting system.

Where netting enclosures, and any back-up active bird control system, are considered appropriate to manage a bird hazard, it will normally be appropriate to secure the netting and control system within the terms of a legal agreement or condition on any planning permission that may be granted. The importance of continued good management is vital. Therefore, it will normally be appropriate for the aerodrome to request in the legal agreement/planning condition that a bird hazard management plan be agreed before development commences and be enforceable in the event of poor ongoing management.

Further guidance on bird hazards associated with landfill and other waste disposal procedures is contained in *Civil Aviation Publication CAP 680 Aerodrome Bird Control*, particularly Part 4 (available on the CAA website <www.caa.co.uk>).

This Advice Note has been produced for information only jointly by the Aerodrome Standards Department of the Civil Aviation Authority, the Airport Operators Association and the General Aviation Awareness Council. Its contents may be reproduced as long as the source is acknowledged. The other Aerodrome Safeguarding Advice Notes available are:

Advice Note 1: Safeguarding - An Overview

Advice Note 2: Lighting near Aerodromes

Advice Note 3: Potential Bird Hazards from Amenity Landscaping and Building Design

Advice Note 4: Cranes and Other Construction Issues

Attachment 1: Landfill Bird Hazard Management Plan

1. Introduction

Where deemed necessary, a landfill bird hazard control system be achieved by:

- a) The production and implementation of a Bird Hazard Management Plan by the developer to ensure that, for example, a net does not fail to prevent gulls from feeding.
- b) The inclusion of the Bird Hazard Management Plan as a Planning Condition of the planning permission or waste licence.
- c) The acceptance of the Bird Hazard Management Plan by the aerodrome and LPA.

2. Example of a Landfill Bird Hazard Management Plan

The following paragraphs outline the design and implementation of a Bird Hazard Management Plan for a landfill site.

Content of the Plan

The following statements comprise a typical Bird Hazard Management Plan to ensure that gulls cannot gain access to food at a landfill site:

- a) No landfilling, other than the deposit of inert waste, will take place except under and within the exclusion net.
- b) The net must enclose the active and uncovered landfilling area on all sides and overhead with an unbroken surface of netting, except for a gateway to permit vehicle entry and exit.
- c) The gateway must be designed and operated in a way that ensures that birds cannot gain access.
- d) Wastes shall be prevented from piling against the netting and spilling from the gateway (e.g. by internal bunds or limiting deposition to a minimum of 10m from the net and gateway).
- e) The net shall not be moved or removed until the waste has been covered to a sufficient depth and with an appropriate inert material to deny access by birds.
- f) Waste, other than inert waste, will only be accepted on the landfill site in enclosed or sheeted transporters and will remain covered until the transporters have entered the netted area.
- g) Transporters shall only be swept out or otherwise cleaned on the landfill site within the netted area.
- h) Effective measures must be continuously operated on the site roads and tracks to ensure that any wastes carried from within the net on vehicle wheels or spilt are removed before they become available to birds.
- i) The haul road must be kept in good consolidated condition so that sweepers can efficiently remove spilt debris.
- j) There must be effective security arrangements to prevent vandalism, sabotage and access to the net by unauthorized persons.
- k) In the event of a failure or removal of the netting, wastes, other than inert wastes, shall be deposited under a replacement net or not accepted on the site.
- l) Active bird control measures to be taken in case of failure of the netting system.

Monitoring of the Plan

The effectiveness of the Bird Hazard Management Plan should be regularly monitored and reviewed by the applicant or developer. Common signs of breakdown are:

- a) Food waste outside the netting enclosure on the active landfill, on covered and reclaimed areas, or in open waste containers and transporters.
- b) Damage to the net, its supporting structure or gateway of a type that could permit birds to enter or gain access to food wastes.
- c) Tipping and handling procedures that could enable birds to gain access to food wastes.
- d) Flocks of gulls (or, for some sites, concentrations of corvids or starlings) in the netting enclosure or feeding or resting on the landfill site.
- e) Signs of gulls having visited the landfill site: feathers, droppings, pellets, footprints in mud, etc.
- f) Flocks of gulls (especially Herring and Lesser and Great Black-backed Gulls, which feed mostly on landfills when inland) resting on adjacent sites (e.g. fields, roofs) for which there is no obvious other nearby attractant.
- g) Also on adjacent sites: signs of gull presence as above or wastes (e.g. bones, food containers) that are too heavy to have been windblown and must have been carried by birds.

The developer or owner of the site should notify the LPA of any departure from the Planning Conditions or of proposed changes to the approved Bird Hazard Management Plan.

Means of enforcement action by the LPA if the Management Plan is not implemented.