

Case Study: NHS Ayrshire and Arran Food Waste Collection



Case study outlining food waste collection services from NHS Ayrshire and Arran hospital sites

Food waste collection from NHS Ayrshire & Arran hospital sites

NHS Ayrshire and Arran was founded in 2004 as one of the 14 regional NHS Boards in Scotland. It operates ten hospitals of which two, Girvan Community Hospital and Ayrshire Central, segregate food waste for separate collection. Both sites operate a vacuum food waste collection system, with the collected waste sent to a local contractor for treatment by In Vessel Composting (IVC).

The food waste collection and treatment contractor is Billy Bowie Special Projects Ltd. Food waste is collected by Billy Bowie and transported by tanker to their 8,000 tonne per annum IVC facility.

Background

NHS Ayrshire and Arran's main driver for implementing the segregation and separate collection of food waste was to end the use of maceration and disposal of food waste to sewer. This fits with the NHS Ayrshire and Arran Environmental Strategy and action plan for energy, waste, carbon management and water. It will also help them to address the requirement for recycling of food waste and ban on maceration to public sewers which has been introduced by the Waste (Scotland) Regulations 2012, although this requirement will not be in place for hospitals¹ until the beginning of 2016.

The system has been in place at both sites for around four years. The vacuum waste system at the Girvan Community Hospital was installed as part of BREEAM² package of measures for the new build; the Ayrshire Central Hospital's vacuum system was installed during the construction of new-build kitchen facilities, which opened in 2010. The Girvan site is a mixed community facility with just 30 beds. Ayrshire Central currently

¹ ***Note the food waste recycling and maceration requirements of the Regulations exclude sites in specified rural locations.***

² *Building Research Establishment Environmental Assessment Methodology (BREEAM) is a widely used method of assessing, rating and certifying the sustainability of buildings.*

has a 150 bed capacity with ongoing redevelopment work which will increase bed capacity to 300. Both sites have footfall from visitors and outpatients given their community hospital role and the Ayrshire Central site also includes administrative offices and the new Central Decontamination Unit (CDU) for the Board's surgical instruments and medical devices.

Key facts

Topic	Fact
Number of beds in total	180 beds with food waste collection
Number of hospitals under the control of NHS Ayrshire & Arran	10: Ailsa Hospital, Arran War Memorial Hospital, Ayrshire Central Hospital, Biggart Hospital, East Ayrshire Hospital, Girvan Community Hospital, Kirklandside Hospital, Lady Margaret Hospital, University Hospital Ayr, University Hospital Crosshouse
Charging mechanism	Charged as a fixed fee per collection and per tonne for treatment
Accepted materials	Food waste only
Internal container type	Vacuum unit
External container type	Tank
Liner provision	None
Collection frequency	Ayrshire Central every 4-6 weeks. Girvan every 8-10 weeks.
Vehicle type	30,000 litre vacuum tanker
Crew size	Driver only
Annual tonnage	77 tonnes per year ³ (both sites)
Point of arising	8 wards (180 beds) plus 3 day centres 2 staff canteens 2 restaurants (public facing)
Kgs /bed /week collected	8.22
Treatment point	Billy Bowie Special Projects 8,000 tpa vertical composting IVC system

³ Based on a recent year data. This figure includes both sites and waste from wards, kitchens and restaurant facilities.

Contract procurement

The current food waste collection and treatment contract was procured through a competitive exercise using the Public Contracts Scotland portal's 'quick quote' system for low value contracts. The process was considered straightforward and effective by both the Trust and the successful bidder.

The evaluation of quotes was based on lowest cost only given the ability to meet the collection and treatment requirements.

Food waste collection operations

At both hospital sites, food is prepared in centralised kitchens before distribution to the wards. Food waste consists of preparation waste from the kitchens, plate waste / excess food waste from the wards that is returned to the catering facility for disposal and waste from canteen / restaurant facilities.

Packaging is not accepted in the system. Preparation waste and plate waste from the wards are scraped directly into the vacuum unit (**Figure 1**) which is emptied periodically into the external storage tank by pressing the green button. A draw-back of the system has been that the vacuum pipe is large enough for cutlery and small soup bowls to enter the vacuum pipe; these can contaminate the waste stream and block the system. In order to avoid these items falling into the system staff use a colander to screen the waste as it is deposited in the vacuum unit. Although this was initially a make-shift solution, it works well for staff operating the vacuum unit and has been retained. No interim storage of food waste is required (i.e. no food waste caddies) and no pre-treatment is required. Minimal water is required, for cleaning around the vacuum inlet only.

Figure 1: Food waste vacuum unit disposal point



The vacuum unit is connected to the pumping unit and storage tank (**Figure 2**) by a short run of piping concealed in ducting in the walls of the catering facility. The storage tank and pump are located in a container, installed against the external kitchen wall (Figure 3) and waste is stored in the storage tank pending collection. The storage tank is emptied every 4-6 weeks at the Ayrshire Central and every 8-10 weeks at Girvan.

Figure 2: Food waste tank and pump



Figure 3: External container containing food waste tank and pump



The external container is located in an area with sufficient access for the tankers collecting the waste. The NHS staff are responsible for the waste disposal process up until the collection point with the facilities staff taking responsibility for any maintenance and operational issues with the external container system. The collection vehicle pumps the food waste from the tank using the access point shown in Figure 4.

Figure 4: Access point for pumping



In addition to the regular removal of food waste, hardened sludge residue is periodically cleaned out of the tanks by the contractor.

Communications

Communication with staff regarding the operation of the food waste collection service is the responsibility of the NHS waste management officer. The scheme is communicated through internal training of the catering staff who are responsible for the operation of the system and ensuring only food waste enters the system. The estates department also receives communication regarding the scheme. There is considered to be no need for physical signage or communication materials given the limited staff who have access to the vacuum unit.

Performance

NHS Ayrshire and Arran receives weighbridge based data on tonnages received for treatment by their food waste collection contractor. Across both sites, around 77 tonnes per year of food waste is collected currently. The cost savings made by introduction of the system are difficult to identify as they relate to a comparison with sewerage costs and power savings rather than diversion from alternative residual waste disposal such as landfill. Both sites underwent building and refurbishment programmes at the same time as introduction of the new scheme. Although NHS Ayrshire and Arran was not able to undertake a direct cost-benefit analysis of the system it intends to calculate the likely savings that have been made using the Resource Efficient Scotland Hospital food waste disposal tool⁴.

The collection contractor charge is made up of two elements; a collection charge at a fixed rate per collection, and a treatment charge at a standard rate per tonne. This is considered a good mechanism by the hospital as it highlights the high cost of collection. Initially, the collection schedules were fixed, however collections are now undertaken when the tanks are around three quarters full (as indicated by digital readouts on the tank). This is important given the significant and separate collection charge.

The NHS catering staff are responsible for ensuring no contamination occurs and to date no charges have been imposed by the contractor related to contamination. It should be noted that the Billy Bowie collection staff cannot visually assess the food waste at the hospital sites as it is extracted using a pumped system.

The service is considered clean and easy to operate by both NHS Ayrshire and Arran and the contractor. A key operational element for the contractor is the ease of access to the external container, at other

⁴ Information provided in NHS Scotland food waste calculator tool
<http://www.resourceefficientscotland.com/resource/managing-nhss-food-waste-2013>

hospital sites the collection process could be complicated if containers are located in a waste compound.

During the visit, the catering staff were very positive about the system. The only problem experienced by staff has been with the vacuum pipe being large enough for cutlery and small soup bowls, however this has now been mitigated by the screening process adopted by staff.

Potential future improvements

- The Ayrshire Central site will be expanding to include a large mental health unit. The new unit will include apartments for patients; these will include kitchens for use by patients. The current expectation is that food waste will be collected and returned to the main kitchen for disposal through the vacuum unit.
- Due to the requirements of the Waste (Scotland) Regulations 2012, NHS Ayrshire and Arran is also looking at how food waste can be diverted from maceration to sewer to AD or composting at their other sites.
- NHS Ayrshire and Arran plan on undertaking a cost-benefit analysis using data from the Resource Efficient Scotland Hospital food waste disposal tool where necessary inform any future changes to sites.

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