cré
COMPOSTING ASSOCIATION of IRELAND
Newsletter 7— July 2004

Cré meeting/Site visit in Waterford, October 7

Waterford City Council commissioned the building of a 5,000 tonne per annum in-vessel composting facility in May 2003. The facility went into operation January 2004 and has processed source separated organics from the City's 16,000 households since then. Over the spring and summer periods, commercial food waste, drop-off green waste and wood waste have been added.

Most recently, a brown bin program has been rolled out in the County also, with an expected 15,000 more homes being serviced in the coming months. This has resulted in the expansion of the facility to a level in excess of 10,000 tonnes per annum of combined in-vessel and aerated static pile capacity. The facility was delivered through a DBO contract with the partnership of Celtic Composting Systems and Onyx Ireland.

The facility comprises an enclosed tipping, mixing and filling building, in-vessel composting containers, a series of aerated static pile composting zones and a screening and compost storage building. The facility also provides civic amenity through a dropoff green waste area and compost sales outlet.

The next Cré themed meeting will visit the Facility on Thursday, October 7, 2004 from 10am to 2pm. The first part of the meeting will occur at the Ard Ri Hotel, Ferrybank, Waterford (on top of the hill across the bridge just north of the City) followed by a site visit.

Soup, sandwiches and coffee/tea, will follow the talk session. A tour of the Waterford Composting Facility will follow at 1pm-2pm. If interested in attending this event, please contact Lorraine Herity at info@compostireland.ie

Cré annual Seminar - success

The fourth Cré annual Seminar was held in Tullamore May 6, 2004. The event was very well attended, was well received, and this reflects ongoing interest and growth in the industry.

The photograph (right) shows, Lorraine Fitzgerald of RPS-MCOS, Minister for State, Pat 'The Cope' Gallagher, and Fiacra Quinn, Chair of Cré at the Seminar where the Minister launched the "Composting is easy" leaflet.

Bioaerosols – Cré deliver report to EPA

Dr. Munoo Prasad, Mr. Paul van der Werf and TES carried out a literature survey into bioaerosols and composting for Cré that was part funded by the EPA.

The study found that composting is a microbial process and therefore agitation of the compost produces bioaerosols. Bioaerosols are fungus, bacteria, endotoxins and fine dust. The major emphasis has been on Aspergillus fumigatus which is ubiquitous and is found widely in nature, such as in a forest floor, where there is decaying organic matter.

The levels of bioaerosols found in compost sites are not higher that those found in other industries.

Nonetheless, one needs to take precautions as certain groups of people e.g. immune-compromised individuals. In addition, people working in composting sites need to take precautions. However keeping the compost moist can reduce bioaerosol generation at compost sites, turning windrows frequently and keeping them as high as possible. The full report can be found on Cré website www.compostireland.ie

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AES and VCU facility in Navan

Advanced Environmental Solutions Ltd and technology partners VCU Technology have recently completed the establishment of a state-of-the-art composting facility for the treatment of the biological fraction of municipal solid waste. With a starting capacity of 5,000 tonnes per annum, the VCU will take the organic MSW fraction removed from the waste of 20,000 homes in and around Navan, Co. Meath. In operation for three months now, the plant is operating smoothly and the treated organic product from the plant is regularly tested to demonstrate that it meets the requirements of Class 3 stabilised biowaste and above.

A financially viable addition to its recycling infrastructure, AES invested in VCU technology to make sure of odour, pest and pathogen control as well as to ensure the technology selected could be operated to ensure compliance with existing and incoming national and European legislation.

Recap on National Targets and the Landfill Directive

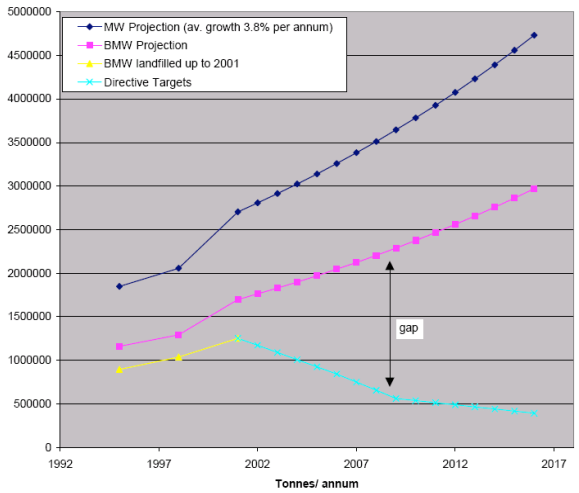
The National Biowaste Strategy draft 2004 (NBS) indicated that biological treatment would play a key role to in delivering the Strategy objective, reduction of dependence on landfill as per Landfill Directive.

The 2009 Landfill Directive target is to landfill just 562,000 tonnes of BMW. In 2002, Ireland landfilled 1,186,000 tonnes of BMW. The table (below) indicates the targets established.

1995	(Baseline BMW generation)	1,160,690*
Year	Target	BMW tonnes allowed in landfill
2006	75%	843,303
2009	50%	562,202
2016	35%	393,541

The figure (opposite) from the NBS, outlines the annual tonnage of waste that must be diverted from landfill, bearing in mind the waste growth predicted for the future. The 'gap' represents the amount of BMW that must be channeled away from landfill (by recycling, biowaste treatment, thermal treatment / MBT) to meet our mandatory requirements.

The NBS requires biological treatment to divert 18% of Biodegradable Municipal Waste (BMW) generated in 2009 - approximately 424,700 tonnes. (Approximately 100,000 tonnes of municipal biowaste were treated in Ireland in 2003.) Capacity to treat non-municipal biowastes (sludges / industrial wastes etc) is required ***in addition*** to this and does not count towards the target.



Failure to deliver Landfill Directive targets will result in penalties per tonne over the target in that year. While these penalties have not yet been announced in Ireland, DEFRA recently reported that, in the UK, these penalties will amount to stg£200/tonne – an amount derived as approximately four times the cost of landfill. In Ireland, the cost of landfill is higher that in the UK. *The possible penalties amount to €100 million by some estimates.*

These penalties could be headed off by funding diversion infrastructure now.

Recycling & Waste Management show November 11th

The Irish Recycling & Waste Management show will be held in the RDS in Dublin November 10-11. Craig Benton of Celtic Composting Systems will present on the topic "Building Successful Composting Facilities" in the workshop area within the exhibit area at 2:20-2:50pm. Craig will address feasibility & siting, technologies & design, planning, permitting & licensing & building, operations and keys to success

Cré officers elected for 2004-2005

At the Cré AGM, officer elections were held for positions for 2004-2005. Fiacra Quinn of Greenstreets was elected Chair, Conor McGovern of *greenstar* was elected Treasurer, and Lorraine Herity of MCOS was elected as Secretary. *The photograph (right) shows Lorraine, Fiacra, and Conor at the Cré annual seminar in Tullamore.*

Operator exercise - Bulk Density Determination and Conversion of Mix Recipe from Weight to Volume

The bulk density (BD), determined by bucket drop method, is the ratio of the mass of the materials (wet or dry) to its volume. BD is used to convert compost recipes from a weight (mass) basis to a volume basis for field mixing. The bulk density figures will be used to convert the recipe from weight to volume.

Equipment: Tape measure or ruler & black marking pen; 20-liter plastic bucket (20 litres of water should measure to the brim of the bucket with no additional holding capacity); 0-25kg scales, (fish-scale / platform type).

Procedure

1. Make a series of dash-marks around the inside circumference of the bucket 1/3 and 2/3 from the rim of the bucket (the 20-liter fill level). This marks the 1/3 and 2/3 fill levels.
2. Obtain a weight of the clean, dry empty bucket and record the weight.
3. Gather a sample of the compost to be analyzed.
4. Fill the bucket 1/3 full with material.
5. Pick-up the bucket by the handle and drop the bucket containing the sample onto a firm flat surface from a height of 15cm ten times, being careful to guide it with the handle so it stays upright and doesn't tip.
6. Now add additional feedstock and fill to the two-thirds full level.
7. Repeat the procedure (# 5) a second time, dropping bucket ten times from 15cm.
8. Add material to the bucket to fill it to the top,
9. Repeat the dropping procedure (# 5) a third time. After the third time, fill the bucket to the rim, but do **not** repeat the dropping procedure (# 5).
10. Weigh the bucket and its contents as accurately as possible.
11. Record the weight of the 20-liter bucket filled to the top with sample material.
12. Subtract the weight of the empty bucket to obtain the weight of the sample.
13. Subtract the weight of the empty bucket (perhaps 1.0kg) to obtain the weight of the sample contained in the bucket and record, i.e. 12.0 – 1.0 = 11.0kg.
14. Divide the weight of the material by 0.02 (the volume of the bucket in cubic yards.). Record result on space for Bulk Density (BD).

Feedstock _____

1. Weight of 20-liter bucket filled with feedstock _____ kg.
2. Subtract the weight of the empty 20-liter bucket (-) _____ kg (=)_____ kg.
3. Divide by 0.02M3 (volume of bucket) _____ = Bulk density (BD) (kg/M3)

Convert Recipe from Weight to Volume

To be practical in a typical composting situation, the quantities of feedstocks (calculated above) must be converted to volume, i.e. how many front-end loader buckets of each material to use in the mix?
The following formula may be used.
V = Q/D (Volume = Quantity / Density)

Q1 and Q2 (for two-feedstock recipes) are weights in kilograms of each feedstock determined by solving simultaneous equations for Carbon: Nitrogen ratio and for Moisture Content. Calculation spreadsheet tool available from info@compostireland.ie

V1 = Q1/BD1 = _____ M3.
V2 = Q2/BD2 = _____ M3.

This will result in tiny volumes for both materials. To make this amount useable in terms of buckets, divide $\mathbf{V_2/V_1}$ = _____.

This result is (number of bucket loads of) V2 that must be mixed with each full bucket of V1. If the answer is a percent that is not easily expressed as a fraction i.e., _, _, etc. round to the nearest useful measure for a bucket such as "a little over a half, a little under a half, etc."

This article appears at member's requests for information useful to operators. Let us know if you find it useful and we will continue with a series of articles.

The above article is adapted from an original article that appeared in the summer 2004 edition of the Carolinas Composting Council newsletter by Craig Coker, President of the Carolinas Composting Council www.carolinascompostingcouncil.org and Chief Engineer of McGill Environmental Systems of NC Inc. (Sister company to McGill Ireland). Conversions to metric by Cré.

Kind thanks to Craig Coker and the Carolinas Composting Council for permission to reproduce the article

McGill Environmental Systems – new facility

Walter Ryan-Purcell, Ronan Beasley, McGill Environmental Systems

McGill Environmental Systems (Ireland) Limited build and operating much needed composting infrastructure. In officially opening their Cappoquin facility Minister Cullen said that 50 such facilities are needed in Ireland. Different companies successfully utilise different operating systems to compost different waste streams though the basic principles apply to all.

Molaisín facility, Cappoquin, Co Waterford

The McGill system is an indoor enclosed one, always operating under negative pressure with all air exiting the buildings going through biofilters. Concrete floors and walls are grouted and sealed. Side sheeting and roof are sprayed with 4cm of insulation to prevent fugitive emissions or condensation. The extraction fan creates negative pressure.

Each facility consists a preparation area and a series of aerated composting bays. Incoming wastes are mixed with finished compost, sawdust, woodchip and other dry amendments to allow air movement throughout the composting mix. Each bay has its own fan, inverter, air duct system and temperature probe, linked to a control panel. Operators check oxygen levels daily with a hand held oxygen meter. Bays are automatically aerated using set temperature parameters, dictated by regulatory requirements.

Minster for the Environment Martin Cullen, opening the Cappoquin facility

Without air, a bay can go anaerobic in minutes. Anaerobic conditions cause poor composting and odorous conditions, so intermittent aeration does not work. McGill have found that temperatures below 60Oc provide pathogen control as beneficial aerobic bacteria and fungi work best at these temperatures.

One challenge facing the industry is imposed temperature limits in licences and approvals. Temperatures exceeding 60°C for one week are detrimental to, required microbial populations. The Animal By-Products regulations require 70°C for one hour at 12mm. The industry make regulators must understand that 'Hotter is not Better!'

McGill has been composting industrial and sewage sludges in Ireland since 1997. The system is based on their sister company's system in the U.S. www.mcgillcompost.com. Present quantities in the three Irish facilities average around 450 tonnes per week in total. Part of this tonnage is the organic fraction of household and catering waste. While top quality compost is consistently produced, that produced from household and catering waste is landfilled due to S.I.551 of 2002.

This Statutory Instrument unfortunately means that accepting composting household and catering wastes at reasonable rates is uneconomic. The Department of Agriculture is presently reviewing SI 551. Hopefully a new SI will be issued in due course and will allow use of this class I compost as a beneficial organic soil amendment and divert same from landfill.

Indoor Composting Bays at Cappoquin

Other regulatory challenges affect the industry. Neighbouring local authorities can differ in permit conditions. Waste collection permits should be issued on a national rather then a regional basis. Implementation of the Animal By-Product legislation must be clarified.

Manufacturing compost from biowaste is a well-known successful manufacturing process. The McGill system is just one method. There are many other successful systems for different applications. Proper management produces good compost and contented neighbours. The composting industry is still in its infancy and to expand, inconsistencies must be resolved and those producing permits, licences and other regulations must understand composting.

To submit an article for the next Cré newsletter issue, contact Cré at info@compostireland.ie