



Niagara Falls and Rises

Composting in Niagara Region overcomes challenges

Food wastes may be composted in a variety of ways. Because of the great potential for process upset, many food composting approaches tend to be technologically more sophisticated than those for, say, for leaf-and-yard waste.

Composting is process driven — that is, certain parameters are manipulated to develop an optimal environment and to speed up the process. The more technologically sophisticated processes tend to focus on enhancing air exchange (into the composting pile and removal from the pile for treatment). Many of these systems work very well but come at a relatively high cost.

Windrow composting of food wastes is sometimes overlooked as a possible solution. The “safety net” of a composting vessel (to optimize aeration) and odour abatement infrastructure (such as biofilters) are absent. However, if the process is driven properly, composting can take place in an acceptable fashion.

To help meet its waste diversion goals (60 per cent by 2005 and 65 per cent by 2012), the Region of Niagara inaugurated weekly curbside source-separated organics (SSO) collection for its roughly 150,000 urban households beginning on April 1, 2004. Eighty per cent of the expected 24,000 annual tonnes of SSO is to be received and composted at the Port Colborne Elm Street windrow composting facility.

Windrow composting in Port Colborne

The compost facility is owned by the Region of Niagara and has been managed and operated by Compost Management of Elora since its inception. The company's relationship with the Region is essentially that of tenant. The facility operator generates revenues by charging tipping fees for most incoming wastes and through the sale of finished compost products.

The Elm Street composting facility opened

in 1990 as a leaf-and-yard waste composting facility. In 1993 the facility expanded and a one acre asphalt pad was constructed. The facility began to accept a wider range of organic wastes from the IC&I sector including paper mill wastes, commercial food wastes, fish residues, corn and flour processing wastes, and sludges from a chicken-processing facility. Total waste receipts in that first year were less than 2,000 tonnes.

The operation grew rapidly with incoming tonnages exceeding 10,000 tonnes per year (tpy) in 1999, then 20,000 tpy in 2000, and close to 40,000 tpy in 2003. This is expected to grow further in 2004. Over the years capital improvements to expand space for composting has been provided by the facility operators and more recently by the Region itself. Today, the facility consists of some 3 hectares (7.3 acres) of asphalt composting area, and a further 2.4 hectares (6 acres) of granular area for related product storage.

The adjacent landfill site continues to operate, and the entire property is located adjacent to an industrial park in Port Colborne. Residential subdivisions are not far away, and are directly downwind.

SSO processing and challenges

The Region made the decision to collect all of its curbside organic material in a combination of transparent plastic bags and hardwall plastic containers, leaving residents to choose the combination that works best for them.

After considerable testing and experimentation using a variety of different machines, methods were developed to fully separate the plastic bags from the organic materials, enabling the production of finished compost products that are completely plastic free. It was anticipated that the receipt of SSO in plastic bags would be the biggest startup challenge; yet it turned out that odour became a much more significant issue.

A cardinal rule of running composting facilities is that you do not let in more wastes than can be promptly processed on available composting space. *This transcends all composting technologies.* This is especially true when food waste is involved. Why so? Let's just say that food waste doesn't get any “fresher” sitting in a pile waiting to be processed. A full composting facility has significantly reduced operational efficiency; problems expand and compound almost exponentially.

The construction of additional composting pad space was required to handle this new SSO feedstock although poor site conditions delayed construction for a period of time. That was supposed to be ready in April was not ready for use until late August.

What happened after that is a case of history repeating itself.

The Region's food wastes continued to pour into a site that was not adequately sized to handle the influx. The spring and summer of 2004 yielded endless rain and this led to record volumes of grass-clipping collection (well into August). Tonnages collected in May and June were some 30 per cent above projections.

The excess tonnage was eventually handled by the creation of temporary stockpiles of unprocessed material, covered with bulking material. The plan was to incorporate these wastes upon completion of the planned composting pad expansion. Over time, space became more restrained while bulking materials were available only in limited quantities (i.e., wastes were stockpiled with less bulking material than required).

This led to odour problems during July and August.

The proactive approach of an otherwise well-run facility had to turn into reactivity to deal with a situation not entirely of its own making. The Region decided to move excess wastes that had become anaerobic into the

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landfill. This generated significant odours and this activity was metered out over a number of weeks.

In the end, moving the highly anaerobic waste from the compost facility and encapsulating it in the landfill simply shifted (rather than solve) the problem.

Within three weeks of landfilling, these wastes (which continued to decompose anaerobically) generated enough odorous off-gases to eventually breach the landfill's clay cap.

This led to a significant release and off-site movement of hydrogen sulfide in September. Obtaining necessary approvals and installation of a gas extraction system to collect and filter these off-gases prolonged the impact on local residents.

Of course, this led to great public frustration and concern from local municipal councils in the Cities of Port Colborne and nearby Welland. While it was clear that the compost facility no longer produced odours, residents

near the landfill were skeptical and called for the closure of both facilities.

Conclusion

During the entire period of the landfill problems, Regional staff (and from time to time environment ministry staff) routinely inspected the composting facility and reported general satisfaction with the level of control. The facility continued to receive and process all

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Moving compost windrows at the Port Colborne facility.



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tonnage delivered and to sell compost products every day.

Some in the surrounding community have made clear that *even if* the odours have returned to non-nuisance levels, they expect them to become an issue again some day in the future, and have pledged to lobby to have the composting facility and landfill closed. Clearly, both facilities lost a great deal of credibility in the community through the summer, and it will take time to regain this.

I have a rule of thumb that any composting

facility, regardless of technology, that has operated for 10 years or more must be doing a lot of things right. While there were clearly mistakes made and a variety of lessons learned in this situation, the facility operators and the Region should, with diligent and sustained effort, be able to convince local residents that

this composting facility can operate in a sustained nuisance-free manner. ♻️

Paul van der Werf is principal of composting and waste management consultancy 2cg based in London, Ontario. To contact Paul, visit www.2cg.ca

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