Solid Waste & Recycling

Canada's magazine on collection, hauling, processing and disposal
August/September 2014

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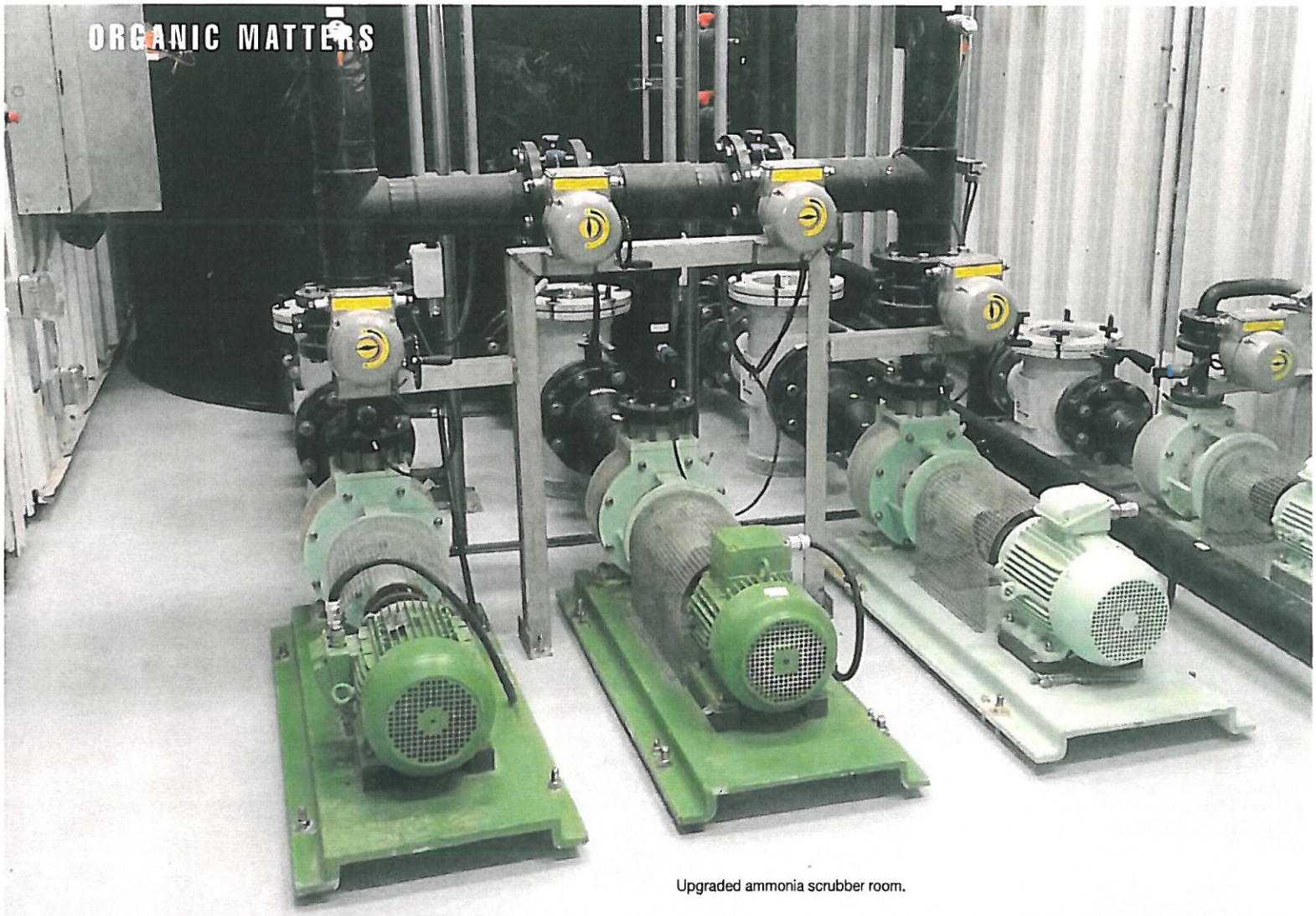

Upgraded ammonia scrubber room.

Orgaworld

Dutch technology succeeds in London, Ontario

by Paul van der Werf

"The farm is the most obvious destination for compost and there's plenty of scientific research on its benefits."

Orgaworld started in the Netherlands in 2000 building and operating organic waste processing facilities. Since 2007 it's been a division of UK waste giant Shanks Group, operating a variety of organic waste processing facilities in the Netherlands, Scotland and Canada.

The company arrived with some fanfare in Canada in 2006 as part of a "Dutch invasion" of composting technologies that saw in-vessel composting largely evolve away from agitated channel/bed technologies to composting tunnels and other less mechanical technologies. Ontario was then in the midst of a source-separated organics (SSO) collection boom that saw almost all large Golden Horseshoe municipalities develop SSO programs. Residents enthusiastically diverted SSO, which quickly and grossly outstripped available processing capacity. It was clear that new processing capacity was required.

York Region, and then the City of Toronto, agreed to send a portion of their SSO to a new facility to be built in London, Ontario. Construction of the first 40,000 tonnes per year (tpy) facility in London began in 2006 and began receiving York Region's SSO in 2007. By the end of 2008 construction of the second phase of the facility (which was then also processing SSO from Toronto and St Thomas) was complete and annual capacity rose to 150,000 tpy. A second 100,000 tpy facility in Ottawa became operational in 2010.

Challenges

All did not go well, and the company experienced the problems that usually accompany rapid growth.

The period from 2002-2012 represented a period of overall SSO processing instability, due to rapid growth. In 2002 Ontarians diverted 360,000 tpy of organic waste (essentially all leaf-and-yard waste); by 2012 this more than doubled to 930,000 tpy (almost half of which was SSO).

Orgaworld's London facility characterized the growing pains endured by Ontario's organics processing sector during this time. The facility suffered from poor odour management, compounded by limited stakeholder relations with neighbours. However, the company also exemplifies the power of transformative learning, surviving and coming out the other side intact, as a better operator and a better neighbour.

Orgaworld has accomplished two things: one reactive and existential, and the other proactive and (quite frankly) brilliant. The first was to revolutionize odour management and essentially save this large facility. The second was *figuring out how to sell compost to farmers*.

Orgaworld composting facility in London, Ontario.

Odour

At Orgaworld, the initial odour abatement equipment for the full-scale facility included two ammonia scrubbers, four biofilters, one bioscrubber, and a 40m stack with two stack fans.

Odour issues were evident shortly after the facility opened. A location whose first facility composted less than 10,000 tpy was now permitted to compost 150,000 tpy. Inadequate odour abatement equipment and operational issues overwhelmed the site's ability to consistently manage odour. This was exacerbated by a failure to manage the expectations of what neighbours would (and would not) be detecting.

The odour issue from 2010 recently culminated in a $250,000 fine, levied by the provincial Ministry of the Environment.

"It was clear that the infrastructure we had in place at the start was inadequate to manage all odours from SSO," says Dale Harley, General Manager of Orgaworld. "Also in those early days we did not engage our neighbours and other stakeholders as well as we should have."

2010 Odour Abatement Equipment Upgrades

- Ductwork modified to achieve even loading of process air to the ammonia scrubbers.
- Ammonia scrubbers modified to enable easier maintenance.
- Switched abatement train around so that the bioscrubber was moved ahead of the biofilters in the system. This enabled the installation of a cooling section to cool down the process air before entering the biofilters thereby obtaining a more stable temperature.
- Increased biofiltration capacity by 25% which in turn increased available air flows.
- Ambient air dilution valve and fan installed, adding up to 75,000m3/hr of fresh air to the process air prior to it exiting the stack, adding buoyancy and dilution of the process air.
- Addition of a third stack fan and stack height increased from 40m to 60m.

"Since that time we have worked hard to make things right, rather than simply walking away," says Harley. "This has included considerable investments in money, time and effort to manage odours and relationships."

In 2010 the company realized the only way to rectify ongoing odour issues was to proactively (and temporarily) shut the facility. They invested $5 million overhauling the odour abatement infrastructure and improving site operations. (*See side bars.*)

Since that time an additional $1 million was invested in the following improvements:

- Airflow sensors relocated and computer programming updated to improve SCADA control of abatement system;
- Ammonia scrubber room upgraded with the addition of redundant chemical dosing and circulation pumps, seamless pipework, larger circulation tank and optimized pH and conductivity control to improve reliability of the system; and
- Addition of a pilot-sized reverse osmosis unit to treat VOCs in the bioscrubber waters.

All of these efforts have yielded positive results. Stack outputs have decreased from 1 Odour Unit in 2009 to 0.08 Odour Units in 2013.

"The benefits have been real and tangible," says London Plant Manager Sandra Drouillard. "In 2011 we had 165 odour complaints, which was reduced to 58 in 2013, and then 14 during the first half of this year."

Adds Harley, "While our goal is to get to zero we have made significant progress in improving our performance and the relationship with our neighbours."

Agricultural use of compost

Prior to Orgaworld's arrival there was little agricultural use of compost in Ontario.

The farm is the most obvious destination for compost and there's plenty of scientific research on its benefits. Yet for years, like some unsolvable Rubik's cube, this market remained barren.

Shredding source-separated organic waste.

Orgaworld's development of agricultural market was largely accomplished with the support and partnership of crop consultants, staff at the Ontario Ministry of Agriculture and Rural Affairs (OMAFRA), and progressive farmers. The Dutch connection also helped. Farmers from Europe had previously experienced the benefits of applying compost.

"Key for us was taking our message and value proposition directly to farmers so as to ultimately develop a level of trust," says Harley. This included attending farm shows and events and inviting farmers to see how the compost was produced.

"Farmers need to understand what's in the compost, especially the nutrient value but also organic matter content," Harley says.

Orgaworld staff worked closely with A&L Laboratories to carefully characterize compost quality and then share this information with farmers. (*See side bar.*) The company has been a major supporter of OMAFRA field trials, through compost supply, plant tours, and sample testing and analysis (to show the benefits agricultural compost brings).

"Farmers are very important customers," says Harley. "Once we were able to demonstrate the benefits to them they were willing to buy our product. We are now essentially sold out with a waiting list."

Orgaworld is now leading the way in developing some innovative and novel uses for products developed from SSO, and this is driving demand for products. This includes an animal-bedding product and an ammonium sulphate (derived from the ammonia scrubbers) that's a CFIA-approved fertilizer sold to farmers.

"Moving forward, Orgaworld is focused on a continuous improvement program, increasing the effectiveness of its operation and the quality and uses of its products," Harley says. "We are here to stay and we want to make a positive contribution, not just where we operate, but also for the industry in general."

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PROCESSING/OPERATIONAL IMPROVEMENTS

- Whole composting operation refined: timely incorporation of incoming SSO into a mix; first in, first out; mix ratios optimized; intensive loader operator training to ensure consistent and dedicated operation of mixing, filling and screening.
- In-depth preventative maintenance plan. Competent, trained maintenance team implemented. Reliability of plant vastly improved.
- Addition of a dedicated composting supervisor to monitor the composting process.
- Enhanced Community Odour Monitoring Program (ECOMP). 360 odour sniff tours carried out by independent third-party trained personnel. (Commissionaires, who are also used for the city landfill sniff tours).
- Increased frequency of biofilter inspections, sample analysis and media replacement.

Compost Quality
N, P, K, OM, pH, EC and moisture
40lb/tonne N
25lb/tonne P as P2O5
20lb/tonne K as K20
750lb/tonne Organic Matter
Average pH between 6-7
Complete inactivation of EC and Salmonella