Turning Sludge into "Sold"

The cream of the crop from Devon, Alberta

by Paul an der Werf

Devon sludge is emptied into a bunker of sawdust and woodchips. When the sludge is soaked up a compost pile is formed.

The town of Devon is located along the North Saskatchewan River in Alberta, just south of Edmonton. With a population of 5,100, the town produces about 3,000 tonnes of municipal solid waste and another 2,200 tonnes of sewage sludge annually.

The town aims to constantly improve its waste diversion efforts in general and the removal of sewage sludge from the landfill stream in particular.

Most local communities direct their raw sludge into wastewater treatment facilities in Edmonton. Devon is unique in that it treats its own sludge at its own wastewater treatment facility. Sludge is subject to primary and secondary treatment and is discharged from the treatment system at 6 to 10 per cent solids.

Background

For many years the sludge was taken to the local landfill. Given the essentially liquid nature of sewage sludge there were operational problems. It was also realized that a valuable nutrient-rich resource was being discarded.

Cor Van Steenis, the director of Public Works and Utilities for Devon, relates that the town reviewed all the conventional methods for dealing with sewage sludge and found that the capital costs and other associated costs to change the system were prohibitive. →

Key partnership

In 1998 a local private company provided the solution. K.C. Environmental Group was just opening its Alberta Environment Class 1 Cleanit Greenit™ Composting Facility in Edmonton.

This facility was key for Devon and now provides a public-private partnership with a potentially long-term capital-free and economically viable solution to handle the town's sludge, without adding to transportation costs.

The sludge provides the facility with a significant source of moist, nitrogen-rich feedstock to compliment the large volumes of dry and nitrogen-poor wood wastes.

The residential swimming-pool-sized bunkers receive the sludge, which is combined with other suitable wastes. The wood wastes, consisting of sawdust and woodchips, are used like a large sponge to soak up incoming sludge and form an integral part of a balanced composting recipe.

A recipe is carefully engineered at an onsite laboratory using mini-compost vessels. The recipe focuses on nutrients, moisture and porosity. Because a static-pile composting method is used at the site special attention is paid to ensure sufficient porosity in order to ensure sufficient oxygen in the static pile (to facilitate composting between turnings). The ratio of wood products to sludge on a volume basis is about 2:1.

Importantly, the sludge is relatively contaminant free (i.e. free of metals). Table 1 depicts trace element concentrations, comparing them to the CCME guidelines for compost. The concentrations of metals such as copper, mercury and selenium may be higher than Category A of the CCME guidelines but decline as a result of the co-composting process.

Product development and sale of compost and value-added compost products are provides this process with long-term viability.

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"Done right, co-composting with biosolids is safe, it's accepted by all levels of government, and it is a long-term sustainable recycling option that results in a valuable building block for our landscape products," says Kirstin Castro-Wunsch of the Cleanit Greenit facility.

End markets

The high level of nitrogen conserved during the composting process results in a high-quality compost. The demand for bulk compost as a stand-alone product has a relatively limited market. But the team at the Cleanit-Greenit facility has developed a number of value-added bulk compost products. Additives such as sand, topsoil and mulch help to provide root zone mix and garden mix products.

Demand for these products has increased about 50 per cent annually. In 2002 it is expected that 15,000 yd3 of products will be sold. (*For more information on the Cleanit Greenit facility, see the article "Curbside Organics Recovery" in the June/July 2002 edition.*)

Mr. Van Steenis points out that the current tip fee to dispose of this waste is

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Trace Element Concentrations (Dry Weight Basis) In Devon Sewage Sludge And Compost

Element	Laboratory Results — Sludge	Laboratory Results — Compost	CCME Category A Maximum Concentrations
	(mg/kg)	(mg/kg)	(mg/kg)
Arsenic	3.1	4.5	13
Cadmium	1.77	0.336	3
Cobalt	2.43	4.05	34
Chromium	12.8	76.6	210
Copper	152	28.1	100
Mercury	0.94	0.13	0.8
Molybdenum	2.83	0.702	5
Nickel	12.7	12.4	62
Lead	2.83	11.8	150
Selenium	3.79	0.94	2
Zinc	362	84.4	500

Adapted from Vertzaya, 2000

$43 per tonne. He figures that with time, as markets are developed for the resultant product, the revenues generated will result in an incremental decrease in tipping fee and may one day, far into the future, provide net revenue.

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(*For more information about sewage sludge, visit* **www.solidwastemag.com** *— go to the "posted documents" section and see the August/September 2002 section.*)

Paul van der Werf owns and operates 2cg, a consultancy focusing on composting and other waste management issues. He can be reached at paulv@2cg.ca.