ODOUR COMPLAINTS CONTINUE TO HAUNT FACILITIES

20th National Composting Conference
Ottawa, Ontario
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OUTLINE

• Recent adverse publicity
• Reasons for odour problems
WASTE INDUSTRY

This company really stinks

Orgaworld sees big money in compost. But first, there’s the matter of that stench.

induced, the smaller the waste, the more money it stands to make.

Such is the problem in London that last week, the ministry stepped in to suggest that Orgaworld shut down | meanwhile. The company agreed, calling the voluntary closure a welcome dividend. “We have been upgrading the site and now we’re told, ‘Okay, let’s deal with it, finally,’” says Ward Janssen, Orga-
“Residents struggle to describe the odour but when pressed reach for analogues like “vomit” or a “rotting corpse.”

“Barbecues on the back porch? Not in this neighbourhood. The locals speak of checking the way the wind is blowing before inviting guests, …..”

Circulation: 355,000 copies but claims over 2.4 million readers per issue
“The stench, says Tipping, emanated from the nearby ...... composting plant, which began processing thousands of tons of green bin refuse from Toronto, York Region and St. Thomas, Ont., in 2007—the same year it also started generating smell complaints from neighbours, at this point close to 1,000 in as many days of operation.”
Article deals with odour problems, shipping SSO to landfills, sodium content of compost, etc.

Saturday circulation: 566,706
$550,000 to fix 'barnyard smell'

City shelling out to upgrade compost-plant aroma

THE HAMILTON SPECTATOR
(Mar 23, 2010)
“.... the Ontario Environment Ministry's Ian Parrott told this newspaper, "odour is clearly a documented issue at compost plants. That's why the province is getting even stickier with the owners and operators .....”

The Guelph Mercury  March 4, 2009

Guelph’s new CoA apparently includes a requirement prohibiting use of plastic bags even though MOE has no authority to demand such action?
REASONS FOR ODOUR PROBLEMS

1. Lack of SSO processing capacity in Ontario
   - overloading
2. Poor plant design
3. Poor process design
4. Poor operational practice
LACK OF CAPACITY

1. “Towards 60% Diversion” - push by Queen’s Park to recycle organics

2. Source Separated Organic collection implemented before building processing plants [e.g. Greater Toronto Area]
   Similar to situation with Blue Box programs in 1990’s (e.g. CBC W5)
GREATER TORONTO AREA’S SSO PROGRAM

1. Collection available to all 510,000 single-family household across the GTA.

2. The Green Bin Program has a 90% participation rate.

3. GTA generates about 110 000 to 121 000 t/y.

4. High-rise collection to add SSO from 500,000 families.
GTA’S SSO PROCESSING CAPACITY

1. **ONE** Anaerobic Digestion Plant – Dufferin with 25,000 t/y capacity
   Generates about 10,000 t/y of digestate to be composted

2. Five contractors for SSO and solids from AD Orgaworld Canada – 40% (25%?) of TO’s organics needed to be processed elsewhere when plant closed for two months this summer *(Toronto Star - July 4, 2010)*
LACK OF CAPACITY MADE WORSE


*Conrad & Otten. 18th National Composting Conference, Château Mont-Sainte-Anne, Québec September 17-19, 2008*
# PLANT OVERLOADING

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<thead>
<tr>
<th>SITE</th>
<th>CAPACITY</th>
<th>INTAKE</th>
<th>REFERENCE</th>
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<tbody>
<tr>
<td>Orgaworld, London Hamilton</td>
<td>150 000 t/y (700 t/d)</td>
<td>1000 t/d</td>
<td>Orgaworld FAQs Toronto Star – July 4, 2010</td>
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<td>60 000 t/y (1200 t/wk)</td>
<td>2000-2500 t/wk</td>
<td>Media Release, City of Hamilton, June 24, 2006</td>
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<td>The Hamilton Spectator, March 23, 2010</td>
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*Values in italics are my estimates of the conversion of the published data.*
POOR PLANT DESIGN - GUELPH

1. Structural Failure: *(Guelph Tribune, Nov. 23, 2007)*

   “The (Guelph) plant was decommissioned last year* after serious structural problems were discovered.”

   a) Corrosion problem was predicted before plant was built – particular metal roof not suitable!
   b) Corrosion was obvious within two years!
   c) Subject of senior student design study in 1999.
   d) Council refused funds to remediate problem!

2. Biofilter Problem:

   Not designed to treat high ammonia exhaust (not considered necessary by consultants)

*The city's wet plant processed its last green bag in June 2006 and closed shortly thereafter.*
POOR PLANT DESIGN

3. Failure to match plant design with collection systems or to build in sufficient flexibility

“By nature you have more waste, per capita, and the waste is more contaminated by plastics.” (London Free Press, July 8, 2009)

a) Plastic bags of any kind are a nuisance but can be dealt with in the plant design.


b) Diapers are readily composted using appropriate technology.
4. Failure to include adequate odour emissions controls in the original design
   a) “….. recycling company invested millions of dollars over the summer, installing new pollution-control equipment.” Welland Tribune Oct. 25, 2009

   b) “That .... be retained to design and construct upgrades to the Central Composting Facility’s curing building and biofilter as described in Report PW10032 as Appendix A.” Public Works Department, City of Hamilton – March 22, 2010
PROCESS DESIGN FLAWS

1. Inappropriate technology:
   Waterdown Gardens – static pile system for SSO, food processing waste, and AD digestate

   [Waterdown Garden Supplies Ltd. was fined $50,000 for 10 environmental violations in April 2008 (The Hamilton Spectator – June 30, 2009) and was shutdown in 2009]

2. Process technology does not provide adequate process control:
   temperature, moisture content, airflow, mixing
PROCESS DESIGN FLAWS

3. Insufficient residence time –

One to two weeks of high-rate composting of SSO is too short to prevent subsequent odour problems in an uncontrolled second-phase.

“Compost piles were smellier than in Europe because compost here readily absorbs rain that stimulated further decomposition.”

London Free Press July 8, 2009
OPERATIONAL PRACTICES THAT VIOLATE BASIC SCIENCE OF COMPOSTING GUARANTEE ODOUR PROBLEMS

1. Low C/N ratio (<20:1)
   a) budgetary restrictions (interference) prevents operators from purchasing carbon sources
   b) high ammonia levels (corrosion and biofilter failures)
      (“Pay me now or pay me later!”)
OPERATIONAL PRACTICES THAT VIOLATE BASIC SCIENCE OF COMPOSTING GUARANTEE ODOR PROBLEMS

2. Moisture Content
   a) Excessive moisture (>60%)
      i) impedes airflow
      ii) anaerobic pockets
   b) Insufficient moisture (<40%)
      i) most micro-organisms become inactive
      ii) degradation slows and/or stops
OPERATIONAL PRACTICES THAT VIOLATE BASIC SCIENCE OF COMPOSTING GUARANTEE ODOUR PROBLEMS

3. Excessively high temperatures (>65 °C)
   a) thermal death of microorganisms
   b) rapid drying of substrate
   c) slow decomposition rate
   d) at end of process the compost is still too active for curing/storage, delaying odour emissions to later
PROPER PROCESS CONTROL AND PLANT OPERATION WILL REDUCE ODOUR PRODUCTION AND EMISSIONS
REDUCTION IN ODOUR EMISSIONS AFTER PROCESS CHANGES

Ref. Conrad & Otten. 18th National Composting Conference, Château Mont-Sainte-Anne, Québec September 17-19, 2008

-76%

-88%
CONCLUSIONS

• Recent publicity is highly detrimental to all SSO programs and composting industry.
• Need more correctly designed and properly operated composting and/or AD plants before more green bin programs are started.
• Vast majority of odour problems at composting facilities are self-inflicted.
• Odour problems can often be resolved by redesigning the plant, process and/or operation.