Winnipeg Biosolids SAC Reference Slides

November 18, 2013
Follow Up from SAC Meeting #1

• Biosolids produced: 152 tonnes each day
  – 152 tonnes is the same weight as 27 elephants
• City produces enough biosolids to fill 21 Olympic sized swimming pools each year
• Cost of Biosolids Management
  – CCME states that biosolids management is approximately 50% of annual wastewater operating costs
CCME Disposal and End Product Options*

- Land Application
- Thermal Oxidation/Combustion and energy recovery
- Pelletization for soil conditioner
- Compost
- Land reclamation (mines, top cover in landfill)
- Landfill (not considered sustainable reuse)

*CCME Canada-Wide Approach for the Management of Wastewater Biosolids
Compost

- Biosolids, woodchips, air, and mixing make compost
- Used as soil conditioner/amendment: alternative to peat moss
Land Reclamation

• Mine reclamation
  – Biosolids applied to mining land to promote plant growth, prevent erosion

• Landfill top cover
  – Biosolids cover landfill to prevent erosion, runoff and promote plant growth
Landfill

- Biosolids landfilled with residential, commercial waste
- Not considered sustainable reuse
Land Application

- Biosolids are hauled to agricultural or forested land and used as fertilizer
- Manitoba: allows land application during growing season (April–November)
Thermal Oxidation

- Biosolids are burned to produce heat and energy
- Ash can be reused:
  - Fertilizer (must have low metals)
  - Asphalt mix
  - Cement mix
Pelletization

- Biosolids are dried to form pellets
- Pellets used as biofuel or fertilizer
Biosolids in Europe*

• France:
  – 65% land application
  – 15% thermal oxidation with energy recovery
• United Kingdom:
  – 70% land application
• Germany:
  – Thermal oxidation with energy recovery
  – Land application
• Northern Europe:
  – Primarily thermal oxidation with energy recovery

*Dr. J. Oleszkiewicz, PhD, P.Eng, CENG, BCEE
Biosolids in Canada

- Land application most popular in Canada
  - Approx 80% of biosolids are land applied*

- Trends in Western Canada
  - Land application
  - Composting

- Manitoba:
  - Land application

- Saskatchewan
  - Land application
  - Composting

*CCME Statistic
## Biosolids in Canada

<table>
<thead>
<tr>
<th>Province</th>
<th>Thermal Oxidation</th>
<th>Landfilled</th>
<th>Land Application</th>
<th>Compost</th>
<th>Site Reclamation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quebec*</td>
<td>42%</td>
<td>31%</td>
<td>16%</td>
<td>9%</td>
<td>2%</td>
</tr>
<tr>
<td>Ontario**</td>
<td>40%</td>
<td>40%</td>
<td>20%</td>
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</tbody>
</table>

*Municipal biosolids: What is best the best option for the climate*

**City of Waterloo Biosolids Master Plan
Biosolids in the USA*

- 70% land application
- 20% thermal oxidation
- 17% landfilled
- 3% reclamation (mines and landfill top cover)

*Source: http://www.ecy.wa.gov/programs/swfa/biosolids/faq.html#production
Big Cities and Biosolids

- **Minneapolis:**
  - thermal oxidation

- **Calgary:**
  - land application, composting (future)

- **Toronto:**
  - pelletization, land application, landfill, thermal oxidation

- **Ottawa:**
  - land application (69%), landfill (19%), landfill top cover (12%)

- **Edmonton:**
  - Composting, land application