Odour Management at the Edmonton Waste Management Centre

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Presentation Outline

- Background
- Odour at the Edmonton Waste Management Centre
- Actions on Odours
Background
Where we used to be…
Where we want to be…

90% Diversion of Residential Waste Stream

- **MRF & Depots**: 55k t Commodities to Market
- **RDF Prep & Gasifier**: 35M L of Ethanol (35k t), CO₂ Capture, 15k t 60k & Rejected
- **Pre-Processing & Composting Facilities**: 280k t MSW, 60k t Recyclables, 15k t Recyclables to Market, 30k t Non-Recyclable
- **Landfill**: 28k t, 15k t

Legend:
- **Input Stream**:
  - MSW Municipal Solid Waste
  - Biosolids (wet)
- **Output Stream**:
  - Compost
  - Recycling
  - Gasifier Output
- **Symbols**:
  - Residential Waste
  - Commercial Waste
What we look like now...
Edmonton Waste Management Centre

- 550 acres
  - Twelve waste processing facilities
  - Two major research facilities
  - Closed Landfill
  - Sewage biosolids storage/recycling lagoons
- Nine contractors, partners, tenants
- Over 500 people employed on site
Odour is a Complicated Subject

- An odour is a perception of smell
- Of the 5 senses, sense of smell is the most complex
- Similar or dissimilar substances may have similar odours
- Nature and strength may change with dilution
- Weak odour not perceived in presence of strong odour
- Odours of same strength may blend & create different odour
- With constant intensity, person loses awareness of the odour until it changes intensity
- Unfamiliar odour more prone to a complaint than a familiar one
- Likes and dislikes may influence association of an odour with pleasant or unpleasant experiences
Why are we concerned about odours?

- Some odours are a nuisance
- Odours migrate
- Odours can be a public irritant
- Understanding odours aids in developing preventative measures
Odour at the Edmonton Waste Management Centre
Main Odour Sources

- Cloverbar Landfill
- Edmonton Composting Facility
- Integrated Process and Transfer Facility
- Biosolids Lagoons
- Curing Site
Cloverbar Landfill

- Over 13 million tonnes of waste disposed of from 1975-2012
- Landfill is now closed to the public
- Landfill gas recovery since 1992
- Continuous capping
Integrated Process and Transfer Facility

- Tipping Floor
- Pre-processing Plant
- Refuse Derived Fuel Plant
- Waste Transfer Station
Edmonton Composting Facility

- Composts biosolids and organic fraction of MSW
- Tip Floor
- Aeration Bays
- Finishing Circuit
- Biofilters
Curing Site Operation

- Gore Composting Facility for wood chips and biosolids
- Final composting and curing of MSW
- Final screening and storage
Biosolids Lagoons

- 5 Lagoons
- Biosolids storage and setting
- Dredging and piping of biosolids to dewatering operation
Regulation

- ESRD Approval for Clover Bar Landfill requiring:
  - Public nuisances report

- ESRD Approval for Edmonton Composting Facility requiring:
  - Wet air handling system to remove odours
  - Blower fan operation
  - Biofilter monitoring including olfactometer
  - Odour monitoring programs around EWMC

- ESRD Inspections
Odour Monitoring

- Compliance monitoring
- Baseline status for future planning
- Determine specific odour sources
- Complaint Investigation
- Performance evaluation
- Comparison of practices for evaluating alternatives
- Specific events or episodes for evidence
- Verification of odour dispersion modeling
Part of the Strathcona Industrial Association

- We’re not alone:
  - Asphalt plant
  - Rendering Plant
  - Feedmills
  - Capital Region Wastewater Plant
  - Industries
  - Goldbar WWTP
  - Agricultural (e.g. canola in bloom)
In Northeast Industrial Area

Northeast Industrial Area

Goldbar Industrial Area
Contributions to Odour Events

- 2000 - 2005: Initial years of Edmonton Composting Facility operation
- 2005 - 2010: Last years of Clover Bar Landfill operation
- 2011 – current: Closure of Clover Bar Landfill – Opening of Integrated Processing and Transfer Facility
- Higher than normal volumes of grass due to high rainfall
- Weather and process-related issues led to difficulty in processing waste in a timely manner
- Meteorological temperature inversions, combined with winds increased potential for odour detection
Prime Impact Areas
Actions on Odours
Odour Specialist Report
IPTF Eco Sorb Installation

- Eco Sorb is an odour eliminator
- Reacts with odour on a molecular level to neutralize
- Non-toxic
- Sprayed where odour will exit from the building
ECF Eco Sorb Installation

- Sprayed where odour will exit from the building
- Portable misting unit that can be placed at trouble spots
ECF Aeration Floor Rebuild

- Beds are aerated by pulling air through the compost
- Bed floors have been rebuilt to improve aeration
- Result will be a more stable compost product coming out of the bays and going to the outdoor curing area
ECF Biofilter Media Exchange

- Media on all three biofilters have been changed out since 2011
- Removed weed build-up
- Improve air distribution
Biosolids Lagoon Redesign of Discharge Station

- Odour emissions spike during time of discharge
- Discharge station is being redesigned to minimize turbulence from unloading
Biosolids Lagoon Water Cap

- Maintaining a water cap on the lagoons will reduce odour emissions that are caused by exposed solids
**Odour Response Procedure**

- Odour concerns are called into the City’s 311 hotline
- Operator fills out odour concern script and emails to EWMC staff
- Odour consultant provides weather station data and quick response after every concern within GBIA and NEIA
- If two calls from NEIA and GBIA are received within 6 hours, odour consultant will do a field and potentially a facility survey
  - Odour description, scale, Nasal Ranger, Jerome Meter readings
  - at location of odour complaint and surrounding neighborhood
  - If EWMC is source of odour consultant will conduct facility survey and record results as indicated
- Odour bosses on site will have operations altered to reduce odour emissions
Odour Monitoring Procedure

The Procedure created for the EWMC:

- Provides a framework to manage EWMC operations in low and high potential odour generation situations
- Outlines operational responsibilities for staff and contractors to properly manage operations to minimize odour generation at the EWMC
- Implements an EWMC Odour Management Committee to enhance communication and improve the operations of potential odour generating facilities at the EWMC
Community Liaison Committee

- Representation of surrounding communities: Fraser, Bannerman, Quarry Ridge, Kirkness, Hairsine, Kernohan and Canon Ridge
- 6-12 members
- Frequent meetings to provide an opportunity for information sharing
- The City listens to the committee’s comments and report on its odour management initiatives/progress at each meeting
Odour Monitoring and Forecasting System

- **E-nose**
  - monitors on-site odour emissions continuously

- **Weather Station**
  - acquires local weather conditions continuously

- **Wireless communication network**

- **Control Centre**
  - calculates odour impact
  - archives data
How the Enose “Works”

- Proprietary information
- Enose calibration:
  - sample the the odour source
  - sample is fingerprinted
  - sensors are selected
- Once Enose is installed at the source it continuously draws in the odour and sensors detect the strength
- The odour source is modeled in the software
Odour Monitoring and Forecasting System
Odour Monitoring and Forecasting System
Odour Monitoring and Forecasting System

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<th>Day</th>
<th>Odour Concentration (o.u./m³)</th>
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<tbody>
<tr>
<td>1</td>
<td>400</td>
</tr>
<tr>
<td>2</td>
<td></td>
</tr>
<tr>
<td>3</td>
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Graph showing odour concentration over time.
Odour Monitoring and Forecasting System

April 15th

Plume 3:45 PM

Plume 4:00 PM
Odour Monitoring and Forecasting System

- Odour impact calculations
  - Real-time odour plume calculation and display
  - Calculation of past odour plumes
- Remote access to database
- Alert Points
  - Can monitor up to 200 alert points
  - Odour concentration displayed for each alert point
- Allows verification or disproval of odour complaints
Questions?

Thank you