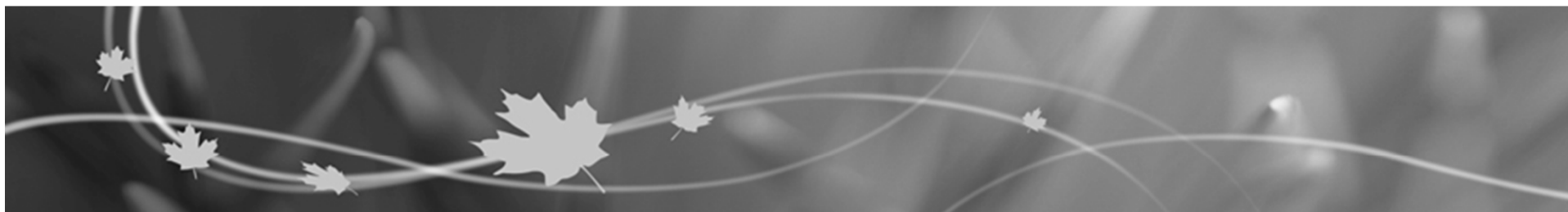




Environment and  
Climate Change Canada

Environnement et  
Changement climatique Canada

Canada



# ***Solid Waste Management for Northern and Remote Communities***

## **Planning and Technical Guidance Document**

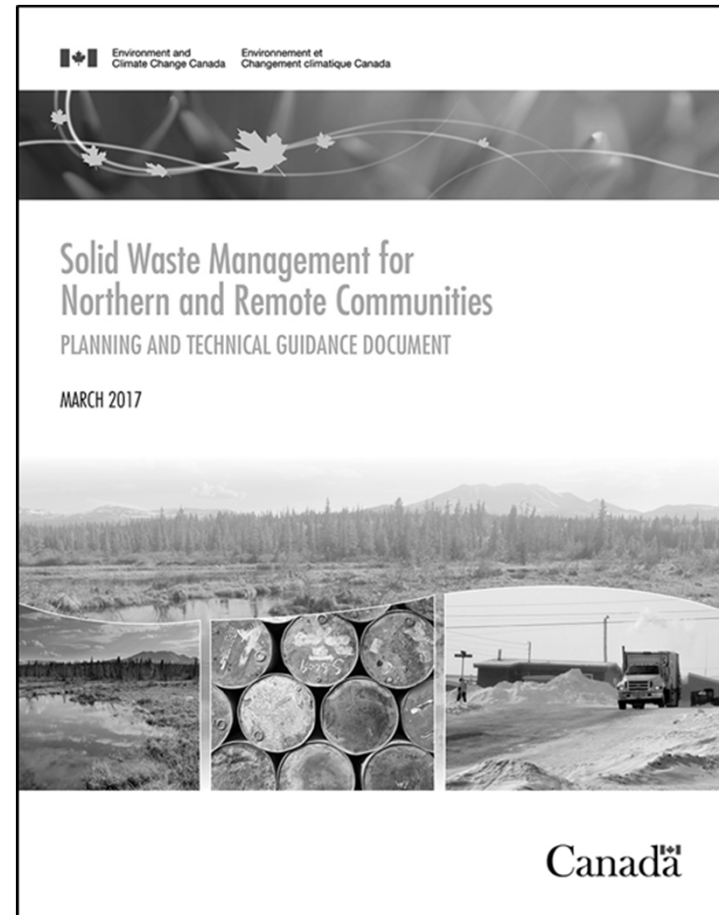
**Solid Waste Association of North America (SWANA)  
Northern Lights Chapter  
May 18, 2017**

**Molly Morse, Senior Program Scientist  
Waste Reduction and Management Division  
Environmental Protection Branch**

# Outline

---

- Context
- When to use the document
- Guiding principles
- Structure of the document
- A closer look:
  - Landfill design and operations
  - Hazardous and special waste
- Summary of MSW management tips
- Vision for the future
- Publication info and next steps
- Acknowledgements
- Questions



# Context

---

- **Mandate:** The mandate of Environment and Climate Change Canada's (ECCC) Waste Reduction and Management Division includes, *"To advance environmentally sound practices to manage and reduce waste and releases of toxic substances in Canada"*.
- **Collaboration:** Work collaboratively with provinces and territories through informal networks and through the Canadian Council of Ministers of the Environment (CCME) Waste Management Task Group. Also, internationally through the Arctic Council.
- **National Vision:** In 2014, environment ministers adopted a national waste vision and action plan that includes an objective, *"To address the challenges of remote and northern communities to improving their waste practices"*.

# Context (continued)

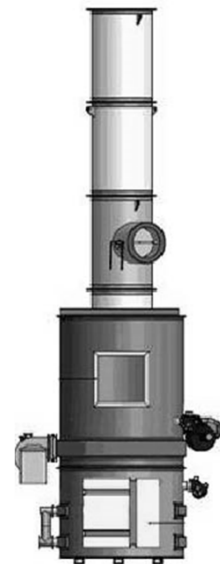
---

- **Issue:** Lots of guidance on environmentally-sound management of MSW, limited information tailored to the unique circumstances of small, remote, and/or northern communities in Canada.
- **Players:** Developed by ECCC with input from territorial governments, land & water boards, and waste experts, among others.
- **Purpose:** To provide voluntary guidance on best practices for the planning, design, operation, and closure of existing or new municipal solid waste facilities in northern and remote communities.

# Context (continued)





---

- **Target Audience:** Regulators, infrastructure departments, senior administrative officers, band managers, facility operators, consultants, etc.
- **Limitations:** Being a voluntary document, there was no broad public consultation. Not intended to replace any local, provincial/territorial, or federal regulatory requirements. Does not include detailed information on:
  - Waste collection systems;
  - Transfer stations; or
  - Incineration (refer to ECCC's *Technical Document on Batch Waste Incineration*, 2010).



# When to Use the Document

---

-  Improving operations at an existing MSW facility
-  Planning for a MSW facility expansion or upgrades
-  Decommissioning an old MSW facility
-  Planning and designing a new MSW facility

# What Sets this Document Apart?

---

- Practical guidance that recognizes the unique circumstances of northern and remote communities
- Guidance for planning and to improve existing operations
- Advice on key issues relevant to northern and remote communities such as:
  - legacy waste
  - waste from large industrial generators
  - permafrost
  - climate change
  - wildlife management
  - challenging wastes such as animal carcasses, asbestos waste, honey bags, and hydrocarbon-containing soil and snow



# Guiding Principles

---

- Take a risk-based approach to waste management which means prioritizing infrastructure, operational activities, and waste types to reduce the risks to human health and the environment.
- Commit to continuous improvement to the waste management system over time.



## Priority Level

**High:** basic infrastructure, practices, and training, short-term

**Medium:** community-specific measures, medium-term

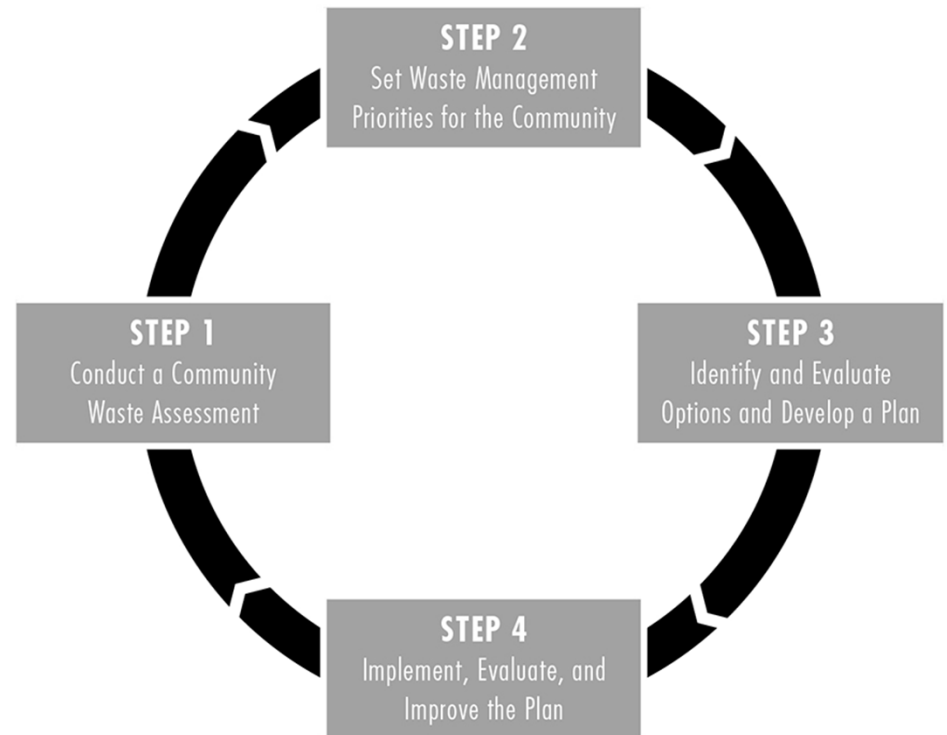
**Lower:** more advanced infrastructure and practices, longer-term



# Structure of the Document

---

- Section 1 – **Introduction**
- Section 2 – **Waste Management Planning and Continuous Improvement**
- Section 3 – **Municipal Solid Waste Facility Site Selection:**
  - Land
  - Water
  - Wildlife & Sensitive Ecosystems
  - Transport
  - Proximity to the Community



# Structure of the Document (continued)

---

- Section 4 – **General Operation of the Municipal Solid Waste Facility**
- Section 5 – **Landfill Design and Operations**
- Section 6 – **Management of Major Waste Types:**
  - Hazardous and special waste
  - Electronic waste
  - End-of-life vehicles
  - Bulky waste
  - Scrap tires
  - Construction, renovation, & demolition waste
  - Organic waste
  - Reusable items
  - Recyclables



# Structure of the Document (continued)



---

- Section 7 – **Performance Monitoring and Reporting**
- Section 8 – **Municipal Solid Waste Facility Closure and Post-Closure**
- Section 9 – **Summary and Next Steps**
- Appendix A – **Additional Resources:**
  - Waste management planning
  - Operations and maintenance
  - Landfills
  - Incineration and open burning
  - Hazardous and special waste
  - Electronic waste
  - End-of-life vehicles



# A Closer Look: Section 5.0 – Landfill Design and Operations

---

- Landfills 101 - meant to inform and encourage a shift away from open dumps towards engineered landfills.
- Type and quantity of “residual waste” to be disposed of will depend on what/how much can be diverted off-site.
- **Priority level:** HIGH 
- **Landfill Types:**  
(for the purposes of this document) 
  - **Class 1:** engineered with a base liner and leachate collection system (>5,000 tonnes per year)
  - **Class 2:** engineered, natural attenuation (<5,000 tonnes per year) provided certain hydrogeological and operational conditions are met

# A Closer Look: Section 5.0 – Landfill Design and Operations (cont.)

---

- **Design:**

- Base preparation and base liner with considerations for Class 1 and Class 2 landfills
- Leachate management with a focus on prevention
- Cover systems (daily, intermediate, and final cover)

- **Operations:**

- Compaction
- Waste to cover ratio
- Active face footprint
- Stormwater management
- Landfill gas management (where applicable)



# A Closer Look: Section 6.2 – Hazardous and Special Waste

---

- **What it is:** wastes that have hazardous properties e.g., fuel, motor oil, solvents, refrigerants, auto batteries
- **Priority level:** HIGH →
- **Best Practices for Design:**
  - controlled access
  - clear signage
  - emergency response equipment
  - flat impermeable surface
  - secondary spill containment e.g., containers, trays, berms
  - protected from elements e.g., sea can



# A Closer Look: Section 6.2 – Hazardous and Special Waste (cont.)

---

- **Best Practices for Operations:**

- proper operator training
- personal protective equipment
- segregate waste by type
- store incompatible substances separately
- maintain inventory of types and quantities of waste stored
- transport offsite to authorized treatment or disposal facility as frequently as practical



# Summary of MSW Management Tips

---

- ☐ Understand the waste stream, prioritize, and plan ahead with input from the community
- ☐ Seek out partnership and funding opportunities
- ☐ Train staff and, as needed, hire qualified professionals
- ☐ Engage the community on the importance of reducing and reusing waste before recycling and disposal
- ☐ Install a fence and a gate to keep people and wildlife safe and post clear signs



# Summary of MSW Management Tips (continued)

---

- ☐ Keep hazardous waste and substances out of the landfill and do not open burn waste
- ☐ Keep surface water, snow, and groundwater away from waste
- ☐ Save resources and premium landfill space by reusing, recycling, and composting
- ☐ Monitor for impacts to the surrounding environment
- ☐ Maintain facility records and report to regulators as required



# A Vision for the Future

---

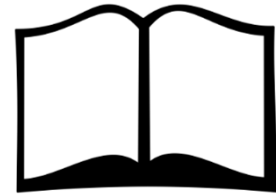
- Waste will be sorted, processed, and stored temporarily on-site for reuse, recycling, composting, or treatment
- Hazardous and special waste and hazardous substances will be separated, stored temporarily and safely, and directed to authorized facilities for proper treatment or disposal
- The open burning of waste will become a thing of the past
- The quantity of waste requiring disposal will be greatly reduced and any residual waste disposal on-site will be done in an environmentally sound manner



# Publication Information & Next Steps

---

- Published in March 2017 (English and French)
- A summary of the document is available on ECCC's website at:  
<http://www.ec.gc.ca/gdd-mw/default.asp?lang=En&n=97182135-1>
- A PDF of the full document is available on the Government of Canada Publications website at:  
<http://publications.gc.ca/site/eng/9.826705/publication.html>
- A limited number of hard copies are also available upon request
- Continue with dissemination and develop infographics if there is interest from partners and stakeholders



# Acknowledgements

---

- Governments of Northwest Territories, Nunavut, and Yukon
- Inuvialuit Water Board and Gwitch'in, Mackenzie Valley, and Wek'èezhìi Land and Water Boards
- ARKTIS Solutions, Inc., Dillon Consulting, Thomas G. Livingston, P. Eng., and Ron Kent, P. Eng.
- Dr. Tullio Caputo and Dr. Paul Van Geel, Carleton University
- Alaska Department of Environmental Conservation and United States Environmental Protection Agency
- Indigenous and Northern Affairs Canada, Health Canada, and Natural Resources Canada

THANK YOU!!!

# Questions

---

- Any questions or comments?
- For more information, please contact:

Molly Morse, Senior Program Scientist  
Waste Reduction and Management Division  
Environment and Climate Change Canada  
351 St. Joseph Blvd., Place Vincent Massey, 9<sup>th</sup> Floor  
Gatineau, Quebec K1A 0H3  
819-938-4505  
[molly.morse@canada.ca](mailto:molly.morse@canada.ca)