FNLMRC

Training, Mentorship and Professional Development

Solid Waste Management 101: Solid Waste Management and The Framework Agreement

TMPD Course Workbook
July 2019

FIRST NATIONS LAND MANAGEMENT RESOURCE CENTRE

A Welcome Message

Welcome to the printed version of our online course focusing on Solid Waste Management. This is the first of three courses on the subject, with more to come. The course is developed specifically to mirror the online version, for communities having limited internet access, or for learners who prefer print over screen.

The course is brief, introducing key terms and concepts related to the subject. It also has “knowledge checks” so that you can check yourself along the way.

We hope that you will find it informative for your work.

In the meantime, should you require any assistance, please let us know.

The Resource Centre’s “Training, Mentorship and Professional Development” team.

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Course Objectives

Upon completion of this course, you may be more familiar with:

The importance of Solid Waste in relation to overall ...

- Environmental governance as possible under the Framework Agreement on First Nation Land Management.
- Identifying the steps to develop a Solid Waste Management plan and subsequent laws under a land code.
- Various approaches to implementing land code developed laws, plans or policies operations & maintenance procedures in Solid Waste Management.

Module 1: What is Solid Waste Management?

What is Solid Waste?

Solid waste refers to any material, non-hazardous or hazardous that has no further use and which is managed at recycling processing or disposal sites.

Common types of solid waste include:

- Municipal Solid Waste (MSW) - trash from everyday items that are discarded by the public
- Hazardous Waste
- Industrial & Commercial Institutional Waste (ICI)

Major Waste Types

Hazardous Waste

Electronic Waste

Derelict Vehicles

Bulky Waste

Construction, renovation & demolition waste (CRD)

Scrap Tires

Organics

Reusable items & Recycleables

Solid Waste Management

Solid Waste Management is defined as the discipline associated with control of generation, storage, collection, transport or transfer, processing and disposal of solid waste materials in a way that best addresses the range of public health, conservation, economics, aesthetic, engineering and other environmental considerations.

In its scope, solid waste management includes planning, administrative, financial, engineering and legal functions. Solutions might include complex inter-disciplinary relations among fields such as public health, city and regional planning, political science, geography, sociology, economics, communication and conservation, demography, engineering and material sciences.

A Waste Management planning process will assess current and future waste generation in the community and evaluate options for waste management. Identify waste stream and options for reduction, diversion, collection, and disposal (including costs).

Elements of the Waste Management System

Waste Generation

Waste generation refers to activities involved in identifying materials which are no longer usable and are either gathered for systematic disposal or thrown away.

Onsite Handling, Storage and Processing

Onsite handling, storage, and processing are the activities at the point of waste generation which facilitate easier collection. For example, waste bins are placed at the sites which generate sufficient waste.

Waste Collection

Waste collection, a crucial phase of waste management, includes activities such as placing waste collection bins, collecting waste from those bins and accumulating trash in the location where the collection vehicles are emptied. Although the collection phase involves transportation, this is typically not the main stage of waste transportation.

Waste Transfer and Transport

Waste transfer and transport are the activities involved in moving waste from the local waste collection locations to the regional waste disposal site in large waste transport vehicles.

Waste Processing and Recovery

Waste processing and recovery refer to the facilities, equipment, and techniques employed both to recover reusable or recyclable materials from the waste stream and to improve the effectiveness of other functional elements of waste management.

Disposal

Disposal is the final stage of waste management. It involves the activities aimed at the systematic disposal of waste materials in locations such as landfills or waste-to-energy facilities.

Why is Solid Waste Management important?

Reduces Environmental risks, Climate change, GHG emissions	Good governance	Cultural responsibilities - stewards of the land	Provision of Economic opportunity - employment
Source Water Protection - reducing surface & ground water contamination	Limit liabilities for communities	Corporate & Social responsibility	Elder/youth mentoring
Makes effective use of natural resources less need for landfilling etc.	Integral to the health and safety of community	Future generations	Reduced costs over the long term - minimize current & future waste management costs

First Nation Challenges in Solid Waste

Environment

- Illegal dumping on reserve lands
- Stockpiles of divertible waste (e.g. End-of-life vehicles, scrap tires, etc.)
- Improper containment & disposal to prevent contaminants from entering the surrounding environment
- Air Quality – pollutants from burning
- Production of greenhouse gas emissions from organic waste
- Leaching of toxic contaminants from landfill into surface water and groundwater

Policies and Procedures

- Limited budgets
- High cost per capita of building and maintaining infrastructure
- Lack of culturally appropriate training/awareness programs delivered to First Nations
- Security of community sites – lack of fencing, etc.
- Need for policy and regulatory frameworks
- Need for emergency planning
- Lack of enforcement of First Nation Laws
- Lack of monitoring and evaluation
- Lack of record keeping
- Competing infrastructure priorities
- Funding is needed to develop plans & programs
- Most sites are not operated to meet modern environmental standards

What Does a Solid Waste Management Plan Do?

A SWM Plan may assist you in understanding the current situation.

A Solid Waste Management Plan may assist you in defining goals and priorities.

A Solid Waste Management Plan may assist you in identifying appropriate strategies.

A Solid Waste Management Plan may assist you in developing a plan for implementation, monitoring and evaluation.

A Solid Waste Management Plan is collaborative - shared responsibility at all levels.

A Solid Waste Management Plan may assist you in prioritizing infrastructure, operational activities and waste types to reduce the risks to humans and the environment.

A Solid Waste Management Plan may assist you in committing to continuous improvement to the waste management system over time - ways to improve the current capital and operating budget.

A Solid Waste Management Plan allows for a community to monitor and report on progress.

A Good Solid Waste Management Plan ...

- Should be for a 20 Year period (minimum).
- Should include design documents that are prepared by a licensed Professional Engineer with appropriate expertise and experience.
- Should engage relevant stakeholders.
- Should include a communication strategy that ensures community engagement and awareness.

What is Included in a Solid Waste Management Plan?

- ✓ Waste types and quantities
- ✓ Regulations & Laws
- ✓ Funding
- ✓ Partnerships
- ✓ Community Engagement & Awareness
- ✓ Leadership
- ✓ Technologies & Technical capacities
- ✓ Priorities (short & long term)
- ✓ Challenges and Needs
- ✓ Geoclimatic Setting

Knowledge Check

Please answer the (4) questions below.

1. Solid waste refers to any material that has no further use.

   a) True

   b) False

2. Burning is a good disposal method for Solid Waste?

   a) True

   b) False

3. Waste collection is the final stage of waste management.

   a) True

   b) False

4. Illegal dumping on reserve lands is an issue First Nations face with regards to Solid Waste.

   a) True

   b) False

Module 2: Beginning a Solid Waste Management Plan

Community Waste Assessment & Feasibility Study

A feasibility study examines the options for new solid waste management processes.

Steps could include:

- Developing a Terms of Reference
- Selecting contractor(s)
- Reviewing drafts
- Reviewing the final report
- Reviewing options
- Decision on how to proceed
- Waste Audit
- Assess the existing Waste Management Facility and potential new sites.
- Set waste management priorities for the community - engagement & awareness – educate, collect info, validate the conclusions & discuss options

Waste Audit

- Process to determine the types and quantity of waste being generated by the community
- The characterization of waste - this can be challenging because it is not weighed in most communities
- In Canada, 40% of waste comes from the residential sector. The other 60% comes from non-residential
- The numbers are different for First Nation communities. They tend to generate less waste per capital
- You can undertake a waste audit to get some data to base projections on
- A waste audit can be conducted at the site or curbside
- A waste audit can be a good activity to do with the youth

Assessing the Exisiting Facility & Potential New Sites

When assessing an existing facility or a potential new site, it is important to consider the following:

- ❒ Health, Safety & Environmental concerns
- ❒ Meeting Regulatory Requirements
- ❒ Materials requiring Off-site disposal
- ❒ Materials requiring On-site disposal
- ❒ Recyclables or compostables
- ❒ What is the remaining life of the current facility in terms of disposal capacity
- ❒ What possibilities exist for upgrading or expanding the current site or building a new one?
- ❒ The community may need a new site if they don't have an existing site, or if the current site is at capacity and cannot be expanded or upgraded

Identify and Evaluate Options

Are you ...

- ✓ Meeting existing federal, provincial and local regulatory requirements?
- ✓ Setting your communities to meet or exceed those requirements (provincial or federal)?
- ✓ Using appropriate technologies and adopting best practices?
- ✓ Exploring program and policy tools?
- ✓ Retaining qualified professionals?
- ✓ Identifying funding sources and potentail partnerships?
- ✓ Aligning your options with your Land Code?

Don't forget!

- ✓ Capacity building
- ✓ Land law development - prohibit unauthorized disposal, littering, etc.

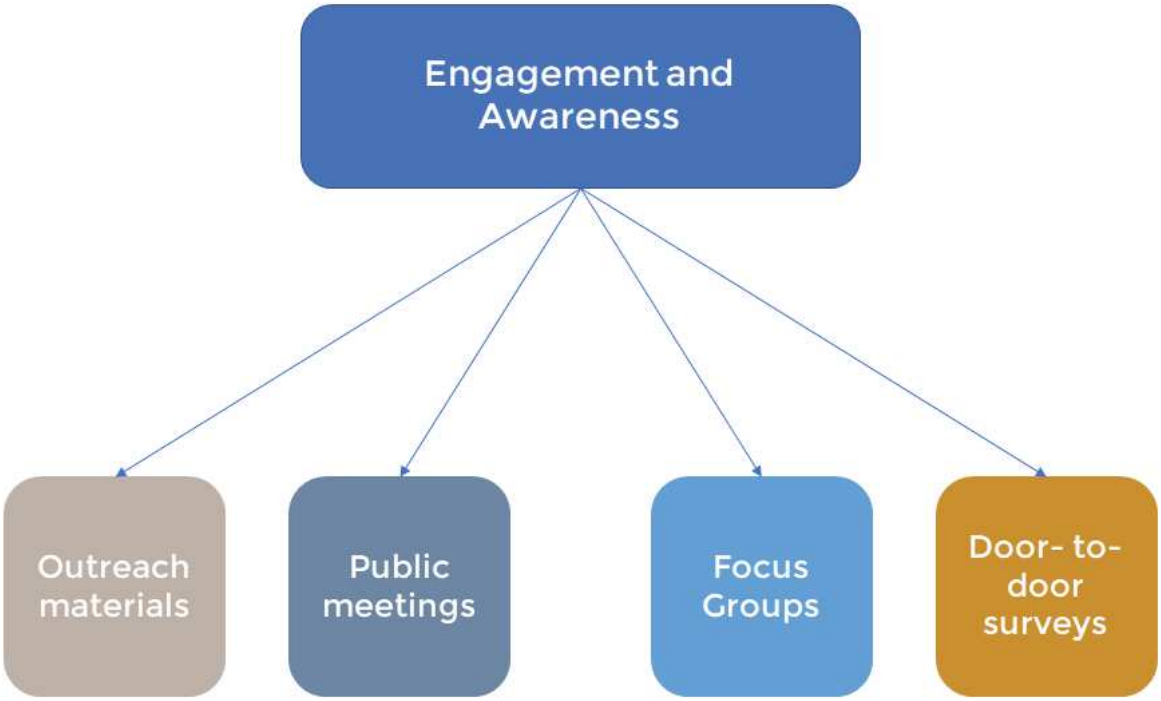
Exploring Partnerships

Exploring partnership opportunities can bring many benefits. See the list below.

- Necessary and beneficial to achieve the goals and implement actions of the strategy.
- Recognize service - waste collection and/or disposal and programs (e.g. education, recycling).
- Share equipment, staff, knowledge, experience and other resources of nearby communities.
- Educational institutions, research institutions and/or the private sector to explore new programs and technologies not otherwise available due to economies of scale.
- Recyclers may have mobile equipment that can be brought to the site temporarily to facilitate off-site transport (e.g. mobile crushers for end-of-life vehicles).
- Transportation companies may have available capacity and discounted rates for backhauling wastes.

Setting Waste Management Priorities for the Community

Setting Waste Management Priorities for the Community



Example of Waste Management Goals & Priorities

Prevent and reduce	Prevent and reduce waste generated at the source
Divert	Divert waste disposed at landfill (e.g. organic waste)
Improve	Improve waste facilities, practices, programs & initiatives
Establish	Establish new waste diversion programs & initiatives
Modernize	Modernize waste management facility operations
Segregate and manage	Segregate and manage hazardous waste
Develop	Develop policies and regulations to support community strategies in solid waste management
Gather	Gather information to facilitate decision-making at waste facilities

Knowledge Check

Please answer the (2) questions below.

1. It is highly recommended to seek out partnerships due to the wide range of benefits.

   a) True

   b) False

2. It is good practice to conduct a Waste Audit when developing a Solid Waste Management plan.

   a) True

   b) False

Module 3: SWM Operations & Maintenance Under a Land Code

Operations & Maintenance

Operations & Maintenance

- Safety of public, workers, environment
- Site control & nuisance management
- Schedule of recommended general operational activities for the site daily, weekly, monthly and annual basis
- Waste screening & segregation
- Develop standard procedures for waste screening (what is acceptable and from whom)
- Train staff on procedures
- Practice random load checking
- Educate generators & carriers on restrictions, have signage
- Require movement documents for hazardous and special waste acceptance

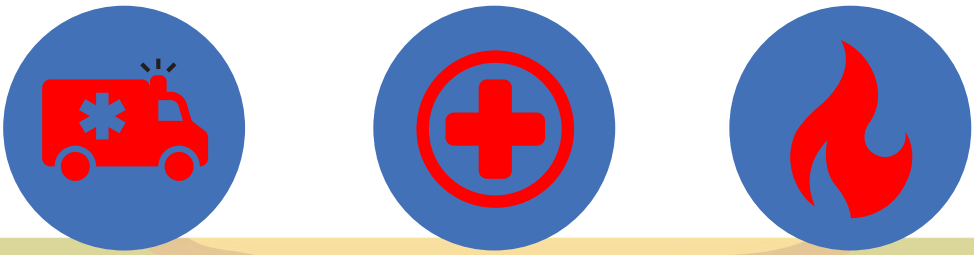
Health & Safety

Health and safety is an important aspect of the operations and maintenance of solid waste management. It is important to include:

- Adequately trained workers
- Personal protective equipment
- Eye wash station, first aid kit, fire extinguisher

Emergency Preparedness & Response

- Staff trained to respond effectively to emergencies
- Some common emergencies at waste sites are: fuel spills, chemical spills and fires
- Have an emergency preparedness plan



Wildlife Management

Keep animals away for their protection. Animals are attracted to odour.

Common Wildlife:

- Large predators (e.g. bears) can become habituated and aggressive towards operators and the public, presenting a safety concern
- Smaller predators (e.g. foxes, feral dogs) can become aggressive and may carry rabies
- Birds (e.g. vultures, ravens) can create litter issues as they rip up bags to get to food
- Rodents – burrowing animals can cause damage to berms and retention ponds

Main Methods to Mitigate Risk:

- Reducing ease of access to attractants (food scraps, glycol)
- Waste segregation by type
- Installation and maintenance of fence (electrified if possible)
- Cover landfilled waste and compost piles that present a food source and odour (e.g. In compost pile, cover with shredded paper or woodchips).

Record Keeping

- A historical record of operations, volumes and types of waste managed, investments and costs will provide the foundation for recognizing trends, better anticipating future needs of the site and will allow the community to plan for improvements.
- Tracking costs associated with operations.
- Materials used for construction and maintenance.
- Types and quantities of waste transported off-site for recycling, treatment or disposal.

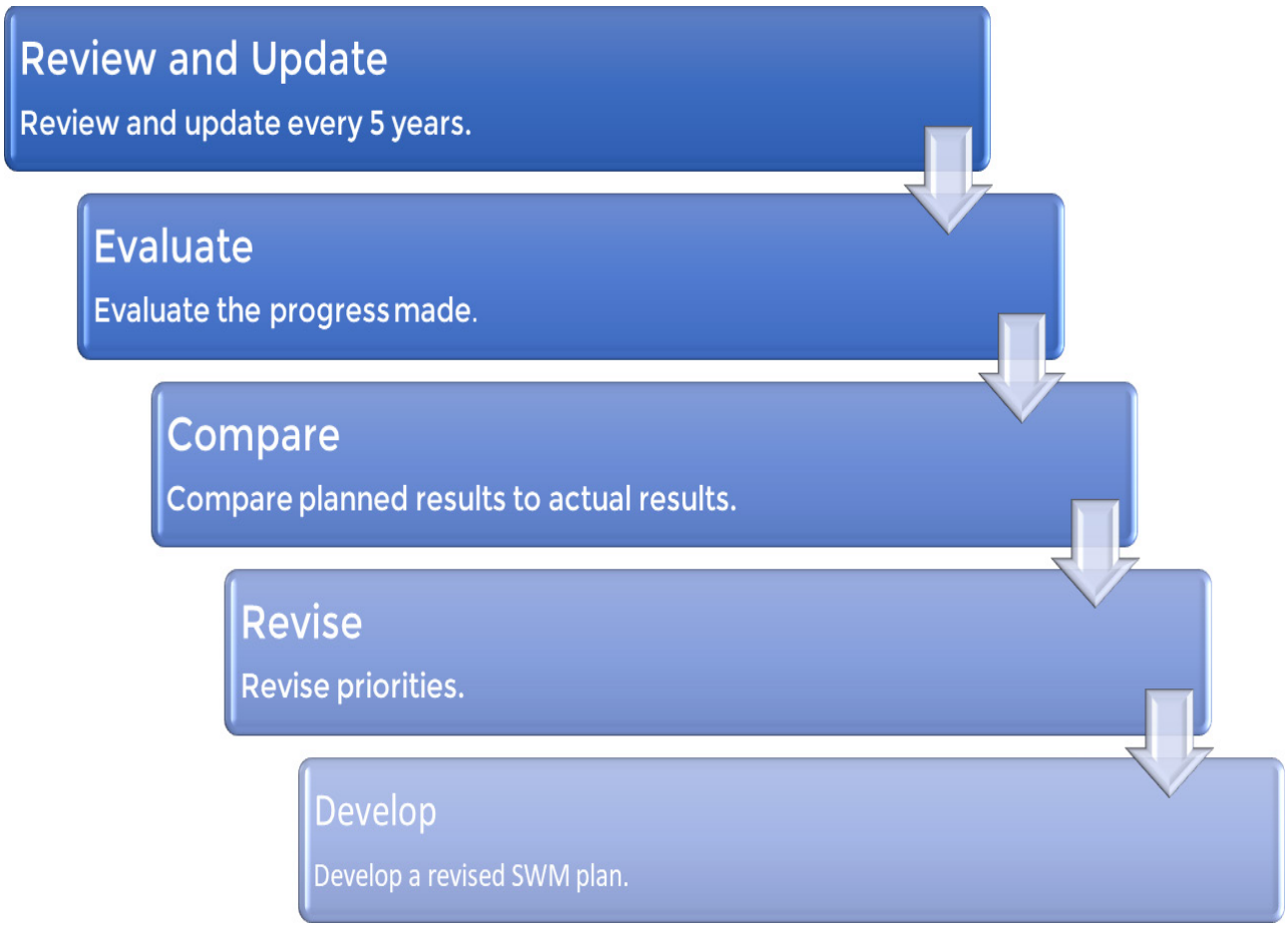
Performance Monitoring and Reporting

- Monitoring processes should be established in accordance with your land code.
- Monitoring programs should be established to detect contamination.
- Should be designed by suitably qualified professionals.
- Sampling including analysis, storage, shipping etc. This should be completed with appropriate training and experience.
- Laboratory analyzing samples should be certified by the Canadian Association for Environmental Analytical Laboratories.
- Important to keep accurate records for reporting purposes.
- Class 1 Landfills (solid, non-hazardous waste) - Groundwater, surface water and leachate at least twice per year and landfill gas quarterly.
- Class 2 Landfills (hazardous waste) - Groundwater, surface water and leachate at least once per year.

Site Closure & Post - Closure

Site Closure	Post - Closure
Where the area is decommissioned in a manner that promotes re-vegetation, minimizes leachate and ensures that buried residual waste does not pose a physical hazard to people or animals that may use the site.	Where the area is monitored over the long term for evidence of releases to the surrounding environment and maintained to ensure the integrity of the various engineered systems.

Implement, Evaluate & Improve the Solid Waste Management Plan



Measuring Success

1. Quantity of hazardous waste and special waste diverted.
2. Number of end-of-life vehicles shipped out of the community.
3. Quantity of compost produced.
4. Quantity of recyclables diverted.
5. Number of visits to the free store and current inventory.

Knowledge Check

Please answer the (4) questions below.

1. Staff should be trained to be able to respond effectively to emergencies.

   a) True

   b) False

2. Monitoring programs should be established to detect contamination.

   a) True

   b) False

3. Landfill waste and compost piles that present a food source and odors should NOT be covered.

   a) True

   b) False

4. During the post-closure of a site, the area should be monitored long-term for evidence of releases to surrounding environment.

   a) True

   b) False

Final Quiz

Please answer the (5) questions below.

1. A good Solid Waste Management plan should be for a 10 year period (max).

   a) True

   b) False

2. A Solid Waste Management planning process will assess current and future waste generation and evaluate options for waste management.

   a) True

   b) False

3. A community waste assessment and feasibility study should be conducted before a Solid Waste Management plan is developed.

   a) True

   b) False

4. It is NOT necessary to assess an existing waste management facility and potential new sites when developing a Solid Waste Management plan.

   a) True

   b) False

5. Some common emergencies at waste sites include fuel spills, chemical spills and fires.

   a) True

   b) False

Attachments

Framework Agreement on First Nation Land Management

EXECUTIVE SUMMARY

For Full Version of the Framework Agreement and other resources please visit our website.

INTRODUCTION

The Framework Agreement on First Nation Land Management (Framework Agreement) is an historic, government-to-government agreement signed on February 12, 1996 between the original First Nations who created and advocated for it, and the Minister of Indian Affairs and Northern Development. It is an initiative developed by these First Nations to opt out of the 44 lands related sections of the *Indian Act*. The Framework Agreement recognizes First Nations' inherent right to govern their lands.

Today, the Framework Agreement has expanded to include an ever-growing number of communities across Canada who are interested in replacing the lands restrictions of the Indian Act with the legal framework developed in a community land code. Only those First Nations who are signatory to the agreement are affected by its application.

Each signatory community to the Framework Agreement assumes the administration and full law-making authority of their reserve lands, environment and natural resources, when they ratify their land code. Canada ratified and implemented the Framework Agreement in the *First Nations Land Management Act*, which was assented to June 17, 1999.

Answer Key

Knowedge Check 1

1. True
2. False
3. False
4. True

Knowledge Check 2

1. True
2. True

Knowedge Check 3

1. True
2. True
3. False
4. True

Final Quiz:

1. False
2. True
3. True
4. False
5. True

Glossary of Terms and Acronyms

Dispute Resolution

Establishes procedures for when there is a disagreement between the parties.

Environmental Management Plan (EMP)

An EMP will identify environmental issues on reserve and outline the First Nation's proposed responses to those issues. It helps First Nations to meet their legal obligations and limit liabilities, and outlines the laws, policies, and procedures a First Nation wants to develop, setting out a detailed workplan and timeline for their development. EMPs are also good communication tools, providing direction to staff, community, other governments, businesses and institutions on the First Nation's environmental priorities and requirements.

Framework Agreement (FA)

The Framework Agreement is a government to government agreement signed in 1996. It gives First Nations the option of withdrawing their lands from the *Indian Act* in order to exercise control over their lands and resources.

Indian Act (IA)

The *Indian Act* is a legislation enacted by the Federal Government. The current act has been in place since 1951.

INAC: Indigenous and Northern Affairs Canada

ISC: Indigenous Services Canada

Land Use Planning (LUP)

Land Use Planning is the process of regulating the use of land in an effort to promote more desirable social and environmental outcomes, promoting the efficient use of resources, and fostering fair and transparent decision-making processes regarding the land and its uses. It may be a requirement of your Land Code.

Leachate

Liquid that drains or leaches from a landfill.

Memorandum of Understanding (MOU)

A formal document describing the broad outlines of an agreement that two or more parties have reached through negotiations. It is not a legally binding document but signals the intention of all parties to move forward with a contract.

Municipal Type Service Agreement (MTSA)

Municipal Type Service Agreement is defined as an agreement between the First Nation and another federal department, provincial government, city, town government, private contractor, individual, other First Nations or organization.

O&M: Operations and Maintenance

Service Agreements

A contract between a First Nation and a third party under which all or a portion of a First Nation's on-reserve solid waste is managed by a third party for an agreed upon duration and fee.

Service Area

Service Area identifies what specific single family or multi-family residences; community facilities; commercial, industrial, or institutional buildings; or areas in the community will receive the garbage collection services.

Site Closure

An area (land fill) that is decommissioned in a manner that promotes re-vegetation, minimizes leachate and ensures that buried residual waste does not pose a physical hazard to people or animals that may use the site.

Solid Waste

Solid Waste is any material, non-hazardous or hazardous that has no further use, and which is managed at recycling processing or disposal sites.

Solid Waste Management

Solid Waste Management is defined as the discipline associated with control of generation, storage, collection, transport or transfer, processing and disposal of solid waste materials in a way that best addresses the range of public health, conservation, economics, aesthetic, engineering and other environmental considerations. Solid Waste management includes planning, administrative, financial, engineering and legal functions.

Suspension and Termination

Suspension and Termination terms identify the conditions and procedures for temporarily stopping services (suspension) or ending an agreement before the end of its term (termination).

Terms of Agreement

The Terms of Agreement is the duration of the contract.

Waste Audit

A Waste Audit will assist you in determining the types and amount of waste generated by the community.

Recycling Program CheckList

- ❒ Estimate types and quantities of waste the community generates currently
- ❒ Check to see what can be recycled / reused (wood, soil, rock, concrete, etc.)

Decide how you will recycle:

- ❒ Can you arrange a site to accommodate several containers?
- ❒ Do you have the equipment to self-haul?
- ❒ How often might you need your containers picked-up?
- ❒ Research recycling options

Call Material Recovery Facilities (MRFs) and ask them:

- ❒ What materials do you accept?
- ❒ Is co-mingled recycling available?
  Single stream (Co-mingled –consumer convenience, no separation) vs. Dual stream (consumer separated their recycled goods before they are picked up)
- ❒ What are my collection options & costs?
- ❒ If I self-haul, can I drop off, and if so, what about tipping fees?
- ❒ Do you provide receipts to track recyclables?
- ❒ Do you set up and provide training?
- ❒ Decide what you will recycle
- ❒ Determine your costs
- ❒ Compare the cost of disposing waste with the cost of recycling
- ❒ Write out the waste management plan
- ❒ Which materials will be salvaged or reused?
- ❒ Which materials will be recycled?
- ❒ How will materials get to the recycler?
- ❒ Names of responsible crew member/team
- ❒ Set up and monitor
- ❒ Clearly designate recycling bins

- ❒ Provide promotional & education material to community -a list of what is recyclable and what is not
- ❒ Keep bins close to where waste is generated but not in traffic pattern
- ❒ Provide hauler and staff with site plan
- ❒ Check recycling bins for contamination
- ❒ Check garbage dumpsters daily for misplaced recyclables
- ❒ Call for pick-up before boxes are full
- ❒ Require quantity and cost tickets to track results and savings

Make your program work:

- ❒ Communicate your Waste Management Plans to crews, residents and businesses
- ❒ Include recycling requirements in all subcontracts and purchase orders
- ❒ Post quantities of materials reused and recycled
- ❒ Encourage suggestions from staff and community
- ❒ Reward employees and residents

Solid Waste Management CheckList

1. What is the state of solid waste management currently in your community?

Infrastructure & Equipment

- ❒ Do you have an open, unregulated land fill site?
- ❒ Do you have a fenced and supervised land fill site?
- ❒ Do you have a transfer station?
- ❒ Do you have a reuse centre?
- ❒ Does your site have signage to ensure proper waste segregation?
- ❒ Does your community have the necessary equipment to carry out operations?
- ❒ What infrastructure & equipment needs does your community need to effectively manage waste?

Current Practices & Services

- ❒ Do you have garbage curbside pickup service in your community?
- ❒ Do you burn garbage?
- ❒ Do you have recycling and what are you recycling? (i.e. pop cans, paper, electronics, tires)
- ❒ Do you collect and compost organic materials?
- ❒ Do you have stockpiles of divertable waste (e.g. end-of-life vehicles, scrap tires etc.)
- ❒ Do you have regular monitoring and evaluation programs?
- ❒ Is your environmental monitoring done by suitably qualified staff with appropriate training and experience?
- ❒ Does your site accept hazardous waste? Where does your hazardous waste go?
- ❒ Does your staff do regular waste screening & segregation? Random load checking?
- ❒ Do you have staff trained on procedures?

2. How much do you know about solid waste management? For example, do you know:

- ❒ How to properly operate, maintain and close a land fill site, as well as post-closure monitoring
- ❒ How many land fill sites are in your territory
- ❒ What you recycle currently and what else you might be able to recycle
- ❒ How to manage a large-scale composting system
- ❒ How much illegal dumping might be happening and why
- ❒ About alternative solid waste management systems such as gasification, or incineration?

3. How much do you know about levels of service and the cost for services? For example, do you know:

- ❒ How much waste your community produces
- ❒ What types of waste is being produced (i.e. household, hazardous, commercial, hospital, etc.)
- ❒ How the size or make up of your population is going to change within the next 10-20 years
- ❒ How much it costs to operate a land fill site, transfer station, recycling facility or composting system
- ❒ The range of pricing for solid waste management services
- ❒ The return rate on recycled materials (i.e. how much do you get for a ton of aluminum cans)?

4. Do you know what to include in a service agreement on solid waste? For example, do you know:

- ❒ If anyone in your group has ever negotiated a service agreement before
- ❒ What services you wish to share and who will supply what
- ❒ If your community needs additional infrastructure to be developed or upgraded and who would do that work
- ❒ Where funding for the capital investment or cost of services will come from
- ❒ What to do if a dispute with your partner arises in the implementation of the agreement?

5. Community engagement

- ❒ How will you gather information and feedback from the community? (ie. focus groups, door-to door surveys)
- ❒ How will your community set their Waste Management goals, priorities and targets?
- ❒ How do you intend to educate the community on your Solid Waste Management Plan & Waste Diversion programs? (ex. outreach materials, public meetings)

6. Take away questions:

- ❒ What information do you still need to complete the profile?
- ❒ What data currently exists that could help determine quantities and composition of waste?
- ❒ Have you done a waste audit?
- ❒ What resources do you have available to complete your solid waste plan?
- ❒ How will you engage your community and leadership in the planning process?
- ❒ What promotion & education activities will you undertake to bring awareness and compliance with your plan?
- ❒ Champions –who will help? Are there community members, planning teams, committees, working groups?
- ❒ How will you engage youth, elders, students, general community members to identify principles, goals and targets?
- ❒ If you intend to use a consultant, will you put capacity building into the scope of work?

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