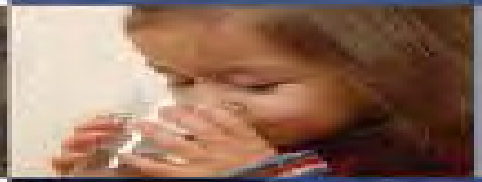
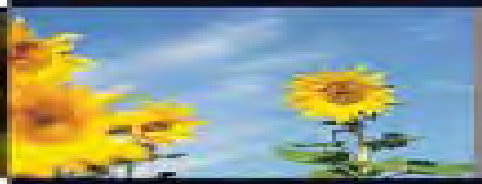
FIRST NATIONS

Environmental Public Health Program







Canada

Environmental Public Health Overview

- Conditions in the environment, both natural and human-built, can affect a person's ability to achieve and maintain good health.
- An Environmental Public Health Program prevents or identifies environmental public health risks that could impact the health of community residents.
- It also includes recommending corrective action to reduce these risks.
- In support of Health Canada's mission to help the people of Canada maintain and improve their health, the First Nations Environmental Public Health Program provides services to First Nations communities south of 60 degrees.

Role of Environmental Health Officers

- EHOs provide advice, guidance, education, public health inspections and recommendations to First Nations and their leadership to help them manage public health risks associated with the environment.
- They gather data required to analyze what steps can be taken to promote public health in First Nations communities.
- Some EHOs are employed by Health Canada and some by First Nations or Tribal Councils.
- All EHOs working in First Nations communities must have a Certificate in Public Health Inspection (Canada).

Ontario Regional Organization

Sioux Lookout

- Senior EHO - Sioux Lookout
- 4 EHOs: all in Sioux Lookout
- 31 First Nations

Thunder Bay West

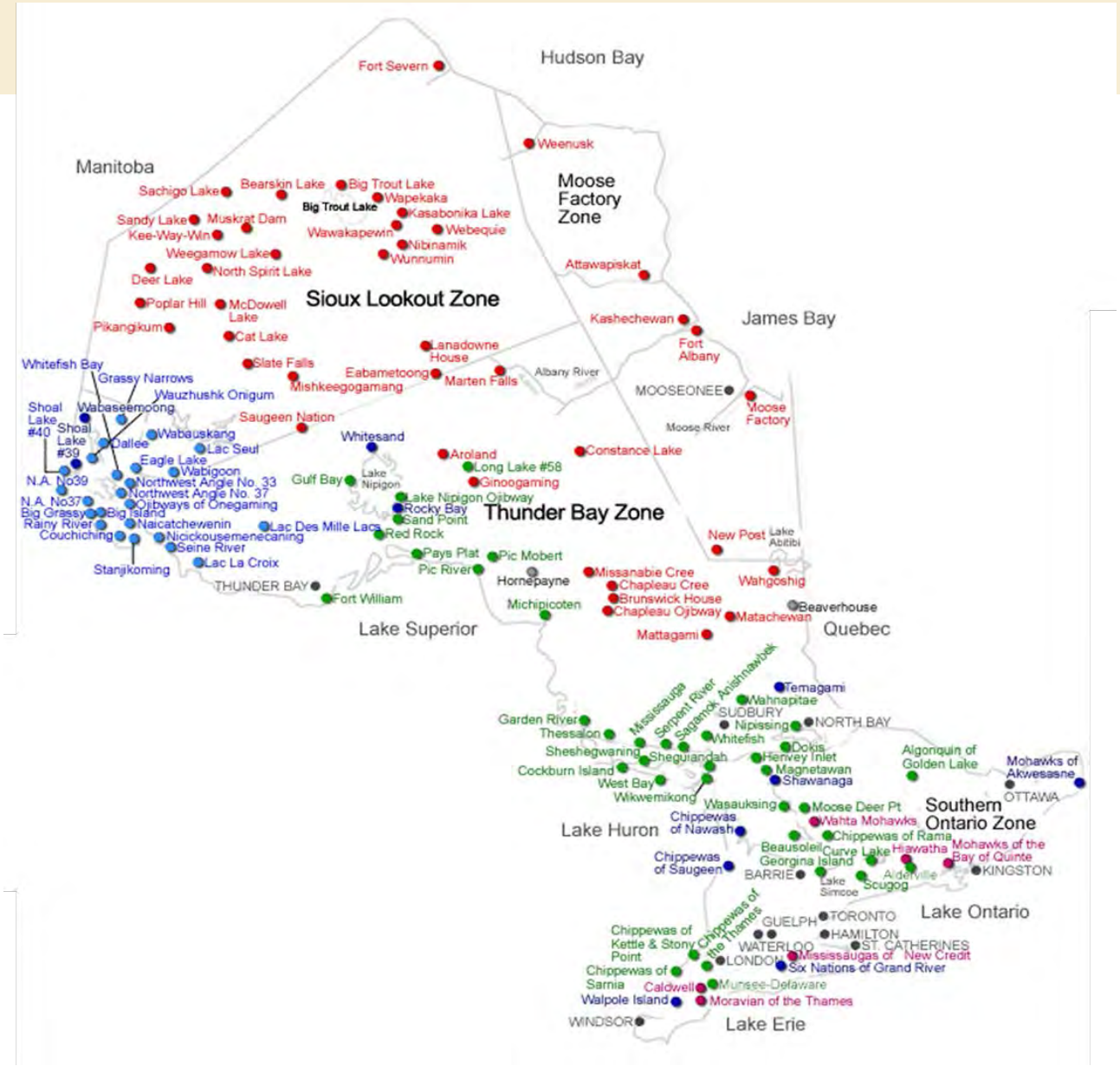
- Senior EHO - Thunder Bay
- 4 EHOs: Kenora, Fort Frances, Thunder Bay (2)
- 39 First Nations

Thunder Bay East

- Senior EHO – Sudbury
- 5 EHOs: Sault Ste Marie, Sudbury(2), Timmins(2)
- 39 First Nations

Southern Ontario

- REHM - Brantford
- Senior EHO - Brantford
- 5 EHOs: London, Brantford, Washago, Toronto, Ottawa
- 1 transferred EHO serving Akwesasne
- 25 First Nations


Hudson Bay
Fort Severn
Weenusk
Manitoba
Moose Factory Zone
Sachigo Lake
Bearskin Lake
Big Trout Lake
Wapekaka
Big Trout Lake
Kasabonika Lake
Sandy Lake
Muskrat Dam
Kee-Way-Win
Wawakapewin
Webequie
Nibinamik
Weegamow Lake
Wunnumin
North Spirit Lake
Deer Lake
Attawapiskat
Poplar Hill
McDowell Lake
Sioux Lookout Zone
Pikangikum
Cat Lake
Kashechewan
James Bay
Fort Albany
Lanadowne House
Whitefish Bay
Slate Falls
Grassy Narrows
Eabametoong
Marten Falls
Albany River
Mishkeegogamang
Wauzhushk Onigum
MOOSEONEE
Moose Factory
Shoal Lake #40
Wabaseemoong
Saugeen Nation
Moose River
Shoal Lake #39
Wabauskang
Whitesand
Dallee
Lac Seul
Aroland
Constance Lake
Eagle Lake
Wabigoon
Long Lake #58
N.A. No39
Northwest Angle No. 33
Gull Bay
Lake Nipigon
Ginoogaming
Northwest Angle No. 37
Lake Nipigon Ojibway
N.A. No37
Ojibways of Onegaming
Rocky Bay
Thunder Bay Zone
Big Grassy
Big Island
Sand Point
Rainy River
Naicatchewenin
Lac Des Mille Lacs
Red Rock
Couchiching
Nicickousemenecaning
New Post
Lake Abitibi
Seine River
Pays Plat
Pic Mobert
Stanjikoming
Lac La Croix
Pic River
Hornepayne
Missanabie Cree
Wahgoshig
THUNDER BAY
Chapleau Cree
Fort William
Brunswick House
Michipicoten
Chapleau Ojibway
Beaverhouse
Matachewan
Lake Superior
Quebec
Mattagami
Temagami
Mississauga
Serpent River
Sagamok Anishnawbek
Wahnapitae
Garden River
SUDBURY
NORTH BAY
Thessalon
Nipissing
Whitefish
Sheshegwaning
Sheguiandah
Dokis
Henvey Inlet
Algonquin of Golden Lake
Cockburn Island
Magnetawan
Mohawks of Akwesasne
West Bay
Shawanaga
Wikwemikong
OTTAWA
Wasauksing
Moose Deer Pt
Southern Ontario Zone
Chippewas of Nawash
Wahta Mohawks
Lake Huron
Chippewas of Rama
Beausoleil
Curve Lake
Mohawks of the Bay of Quinte
Georgina Island
Chippewas of Saugeen
BARRIE
KINGSTON
Lake Simcoe
Scugog
Lake Ontario
TORONTO
GUELPH
Chippewas of Kettle & Stony Point
HAMILTON
WATERLOO
ST. CATHERINES
LONDON
Mississaugas of New Credit
Six Nations of Grand River
Chippewas of Sarnia
Munsee-Delaware
Caldwell
Walpole Island
Moravian of the Thames
WINDSOR
Lake Erie

Authorities

- FNIHB provides or funds environmental public health programs services to First Nations based on discretionary government policy and considerations in the absence of any statutory authority.

Policies are consistent with:

- The 1979 Indian Health Policy
- The *Department of Health Act*
- The federal jurisdiction over “Indians, and Lands reserved for the Indians” under s. 91(24) of the *Constitution Act, 1867.*

Authorities

- The Program is funded or delivered pursuant to parameters set out in the *National Framework for the Environmental Public Health Program in First Nations Communities South of 60°*, and it is at the request and/or with the agreement of First Nations Authorities.

- The Department owes a duty of care when activities are undertaken and can be held liable in negligence if services are not performed diligently.

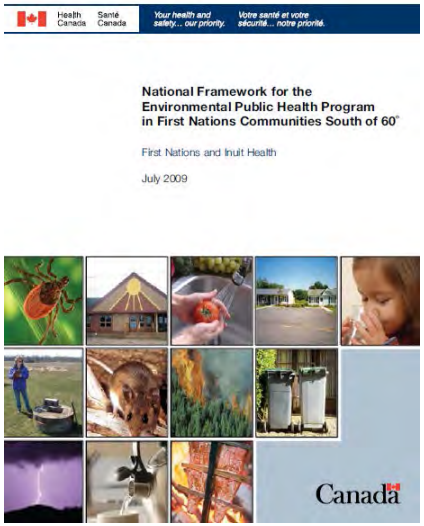
Environmental Public Health Programming

- The following slide lists our eight core programs that may be delivered depending on community needs.

- Each core program has aspects of inspection, training and public education as per community workplans.

Core Programs

- Drinking Water
- Food Safety
- Health and Housing
- Wastewater



- Solid Waste Disposal
- Facilities Inspection
- Communicable Disease Control
- Emergency Preparedness and Response

Wastewater

Wastewater, also known as sewage, can be harmful to humans as it is capable of spreading diseases and polluting surface and groundwater sources.

The Environmental Public Health Program identifies existing and potential hazards associated with wastewater disposal in order to reduce and prevent public health risks.

Program activities focus on community wastewater treatment plants as well as on-site sewage disposal systems.

Wastewater

- Wastewater is used water which is contaminated with human waste, food wastes, and chemical wastes.

- Also referred to as sewage

Disposal of Wastewater

Proper disposal of wastewater is beneficial to the community in numerous ways:

- Protection of river/streams/lakes/oceans from pollution
  - » Which in turn can affect fish populations and promote weeds/algae
- Protection of the community drinking water sources
  - » Prevention of communicable diseases
- Protection of recreational water areas
- Employment opportunities

Composition of Wastewater

- Mainly composed of water
    - Toilets, showers, sinks, dishwasher, washing machine, etc.

- Small amounts of solid waste products
    - Primarily composed of organic material of animal and vegetable origin

- Because they are organic, the solid waste products will eventually decay/decompose

- This organic material needs to be converted to a form which will not cause the spread of disease or pollute water

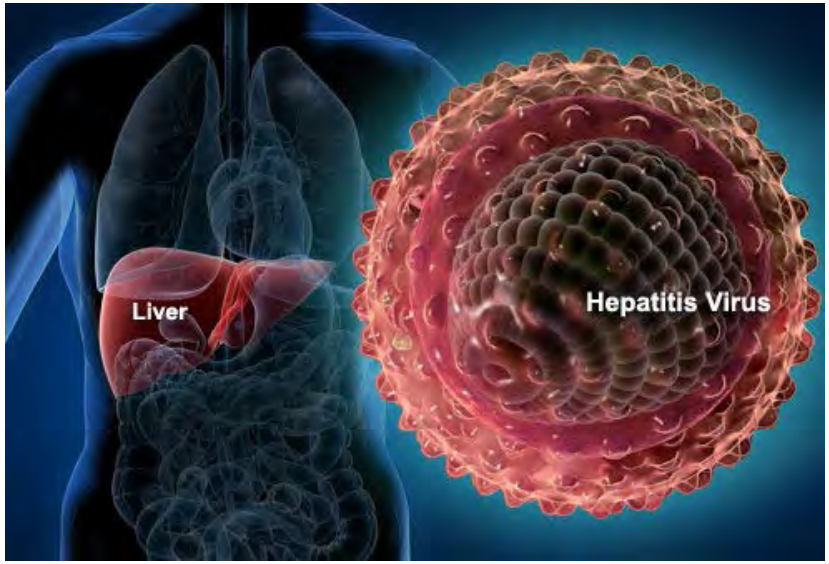
Composition of Wastewater

- Also contains many bacteria – billions!!
- Some may be pathogenic (or disease causing)
- Most are harmless or non-pathogenic
    - Are useful because they decompose the organic material in the wastewater
    - Form the basis of any biological treatment

Health Hazards and Sewage

Biological Hazards

- There is a potential for illnesses from contact with viruses, bacteria and other microorganisms in sewage
- The most serious viral risk is hepatitis and the most serious bacterial risk is tetanus
- The main route of exposure is hand to mouth contact.
- Breathing in a suspension of particles (aerosols) is a less common means of exposure but may occur whenever sewage is agitated (Eg. Near incoming wastewater inlets)



http://www.webmd.com/hepatitis/ss/slideshow-hepatitis-overview15

Work Safe Alberta – Workers Exposure to Sewage Bulletin
http://work.alberta.ca/documents/GH017.pdf

Health Hazards and Sewage

How Do Sewage Microorganisms Enter the Body?

- Hand to mouth contact during eating, drinking and smoking
- Wiping the face with contaminated hands or gloves or by licking splashes from the skin
- Skin contact through cuts, scratches, or penetrating wounds, i.e. from discarded hypodermic needles
- Aerosols landing on surfaces of the eyes, nose and mouth
- By breathing them in, as either dust aerosol or mist

Health Hazards and Sewage

Who Is At Risk?

People who may be at risk of exposure are:

- Employees involved in sewer inspection and maintenance work (unstoppage of sewer lines)
- Construction workers who repair or replace live sewer lines
- Sewer spill clean up
- Plumbers

Health Hazards and Sewage

Chemical Hazards

- Sanitary sewers and similar confined spaces containing sewage can sometimes be deficient in **oxygen**
- They can also contain flammable gases such as methane and toxic gases such as carbon monoxide and hydrogen sulphide.
- Carbon monoxide, carbon dioxide, and other exhaust gases may sometimes be present due to a poorly located gasoline engine or generator exhausting into the confined space.

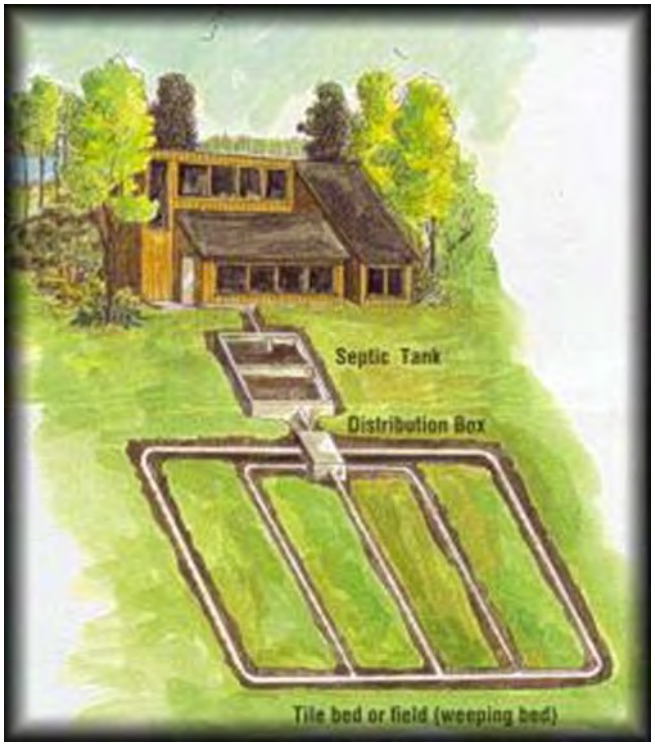
Work Safe Alberta – Workers Exposure to Sewage Bulletin
http://work.alberta.ca/documents/GH017.pdf

Types of Wastewater Systems

Individual Systems

- Sewage system or also called an onsite sewage/septic system

- Onsite treatment units that eliminate the need for municipal sewers
- Comprised of a tank, a network of pipes and billions of organisms that process the waste

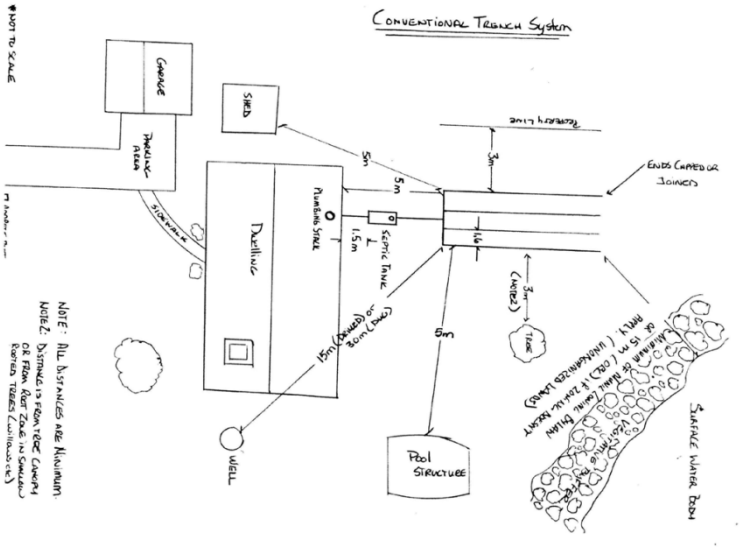


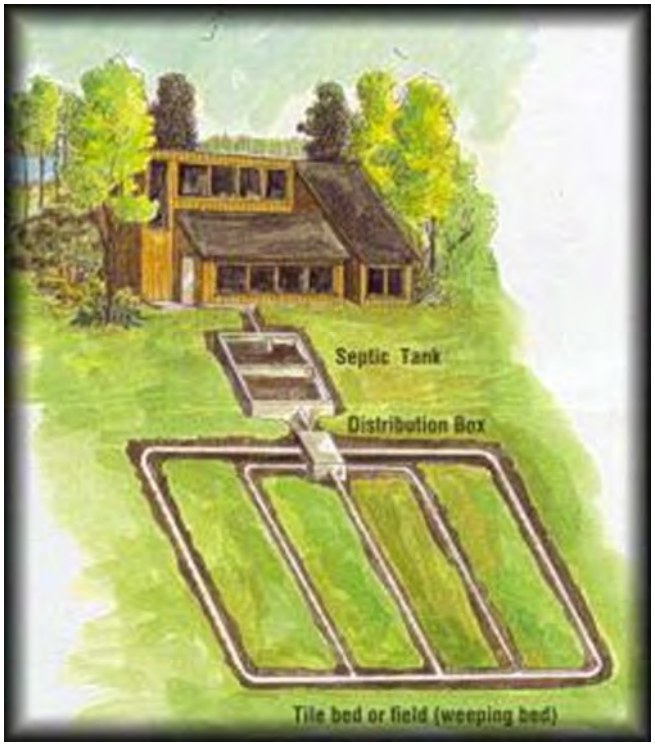
Environmental Public Health Assessment – Individual Systems

- Provide site and installation inspections for new and expanded on-site sewage (wastewater) disposal systems.
- Provide advice, guidance and recommendations related to on-site sewage disposal systems, including information on appropriate decommissioning of sites.
- Respond to complaints by providing public health inspections of existing on-site sewage disposal systems when appropriate.
- Review plans for new and upgraded on-site sewage disposal systems from a public health perspective.

Environmental Public Health Assessment – Individual Systems

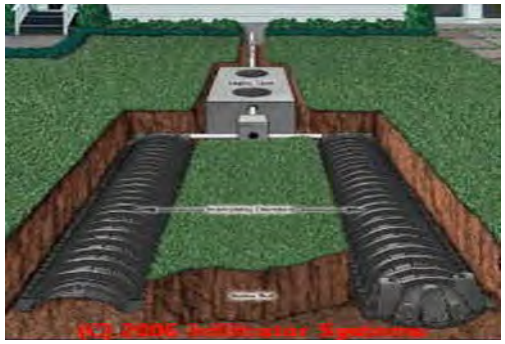
- Recommend compliance with
  - **Part 8 of the Ontario Building Code**
- Licenced Installer with BCIN #
- Review of site plans and applications for homes or other community buildings

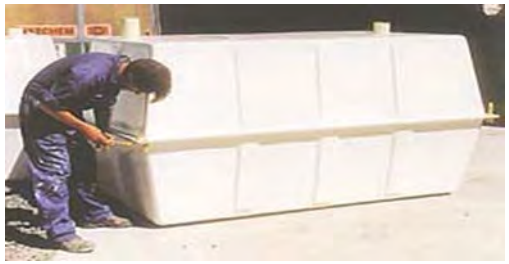




Environmental Public Health Assessment – Individual Systems

- On-site assessment is completed
  - Test pits
  - Percolation tests
  - Soil analysis
  - Ensuring separation distances
- Review of site plan/application
  - Provide recommendations prior to installation
  - Work with community and contractor
  - Report to Chief and Council
- Inspection of each individual system to ensure proper installation as per the OBC
  - While system is open
  - Observe components
- Final Inspection and Report
  - After system is covered and seeded/sodded

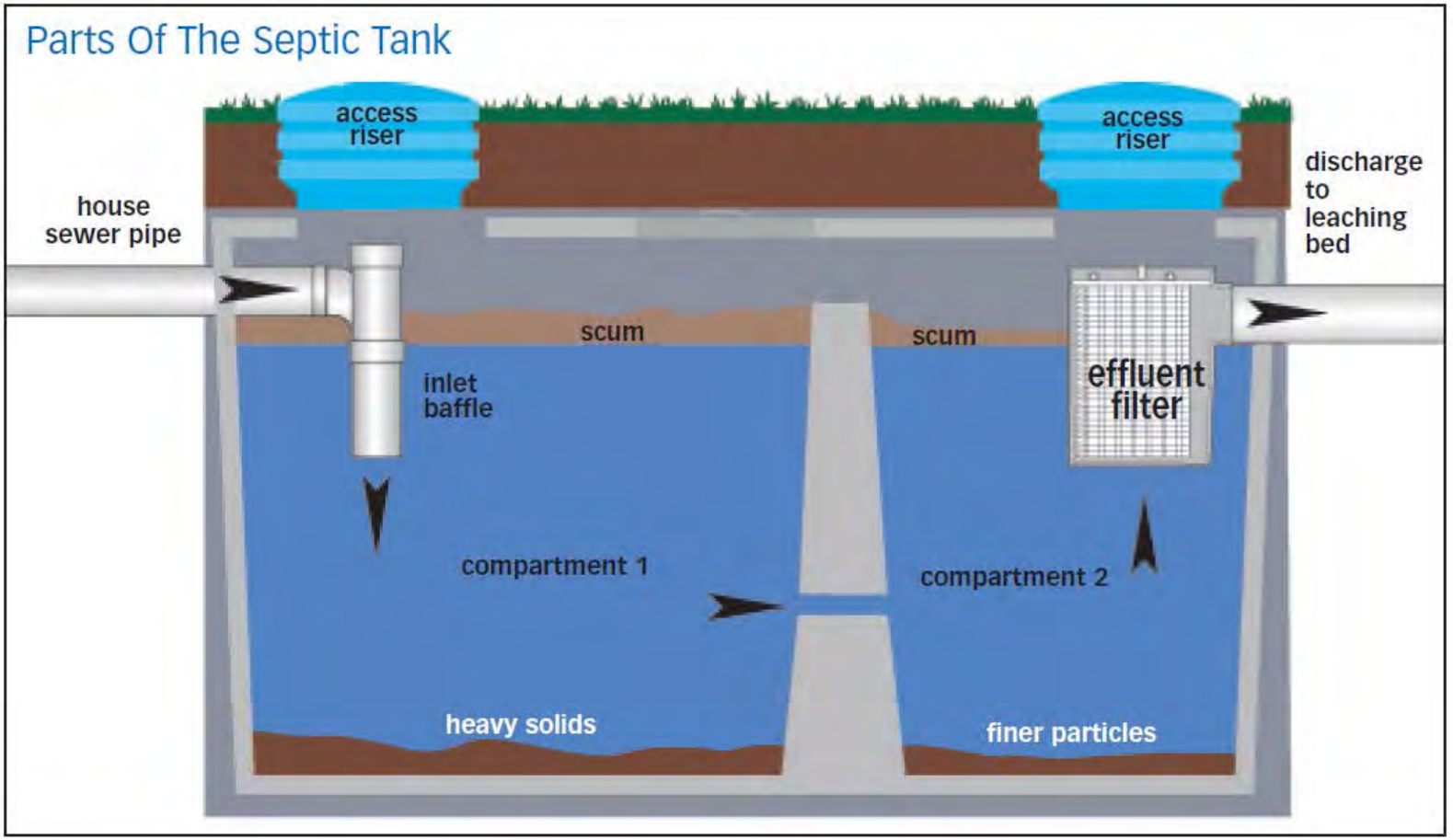




Environmental Public Health Assessment – Individual Systems

- All household wastewater exits your home through an underground pipe that leads to the buried septic tank.
- The waste flows to the first compartment of the tank where the heavy solids settle and the lighter materials (fats, oils and grease) float to the top as scum.
- Baffles and screens keep this scum layer from escaping the tank and flowing to the leaching bed. This scum is removed when the tank is pumped during regular maintenance
- In the second compartment of the tank, finer particles settle to the bottom. Organic materials break down in the tank.
- On newer systems, any remaining organic material is trapped and decomposes on a screen called the effluent filter located at the outlet of the tank.
  - As of January 2007, effluent filters became mandatory in Ontario

Environmental Public Health Assessment – Individual Systems



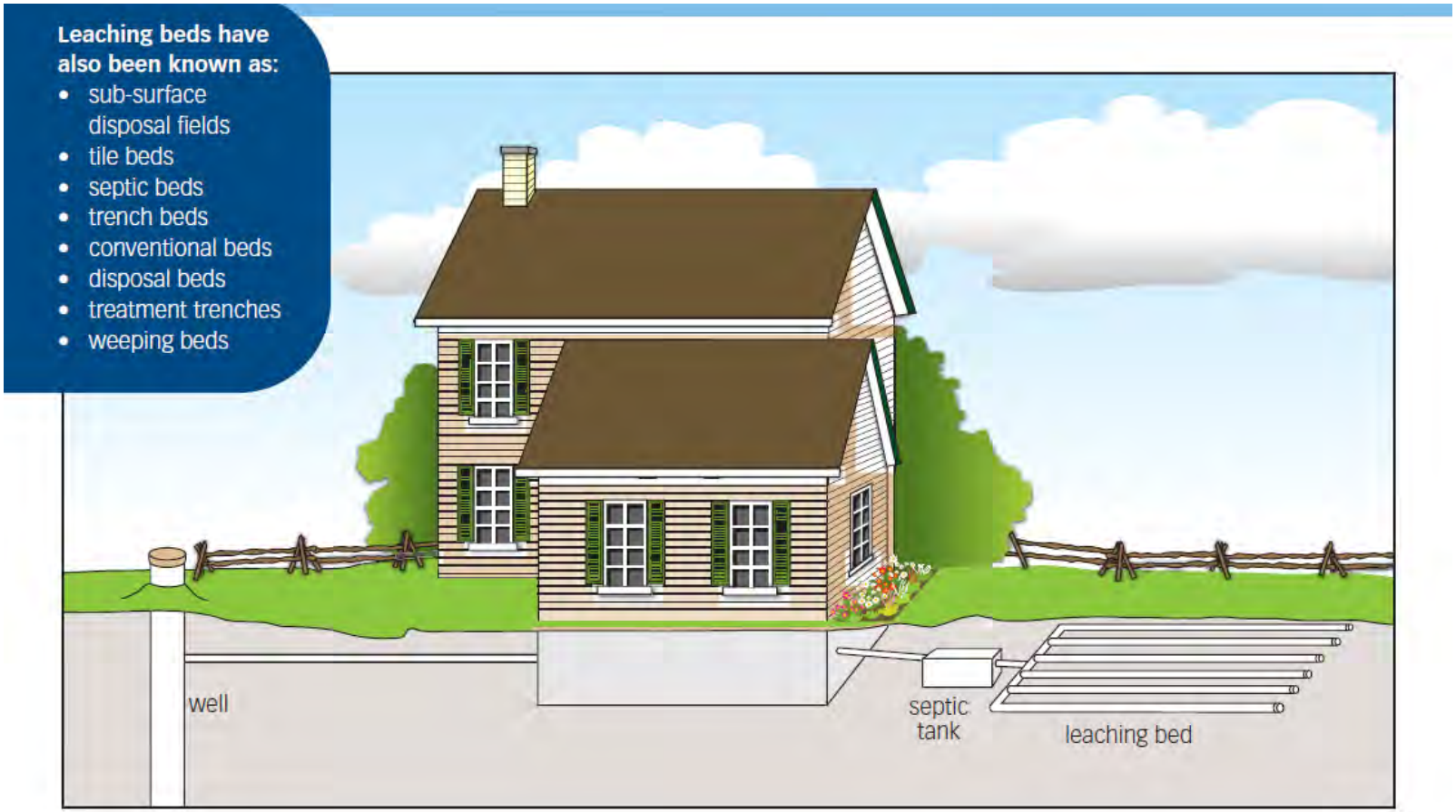
Environmental Public Health Assessment – Individual Systems

- From the tank, the effluent moves to a leaching bed made up of a network of perforated polyvinyl chloride (PVC) drain pipes.
- Stone and a layer of unsaturated native soil or imported sand surround these pipes.
- The effluent flows to the leaching bed either by gravity or a pump depending on site conditions.
- The leaching bed's perforated PVC drain pipes disperse the effluent, allowing the liquid to seep into the ground where bacteria and other organisms process the wastewater further.
- Soils below the stone in the trench bottom act as a biological, chemical, and physical filter to remove most remaining organic and biological contaminants.

Did You Know?

The soil under the stone in the trench bottom of a properly working system can remove 99 percent of the *E.coli* for every 30 centimetres (12 inches) of unsaturated soil.

Environmental Public Health Assessment – Individual Systems



Types of Wastewater Systems

Community Systems

- Collects all wastewater from the individual residences and transports to a wastewater treatment plant for final disposal

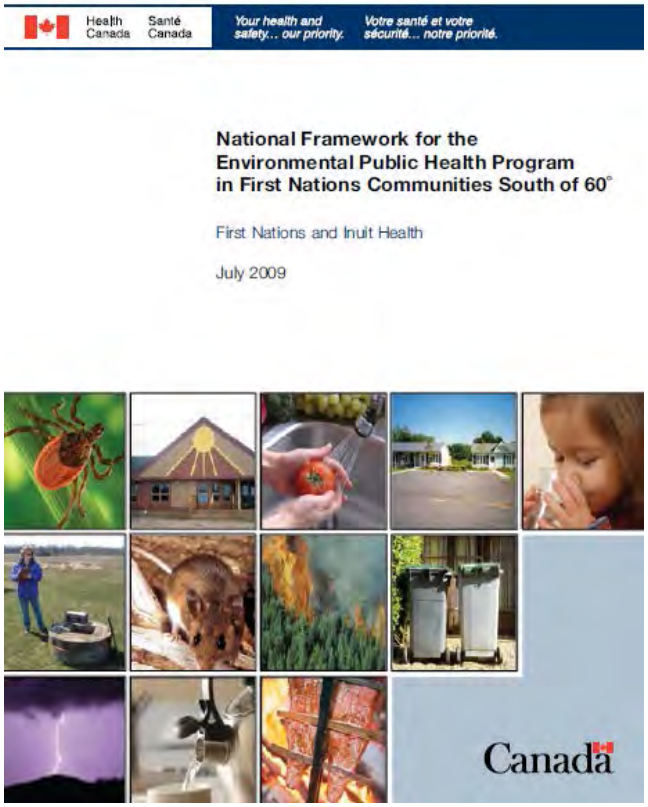
  - Lagoons
  - Rotating Biological Contactor (RBC)
  - Community haul system – less common

- Inspect wastewater treatment plants if there is a public health concern.
- Provide advice, guidance and recommendations related to wastewater treatment plants.
- Review plans for new and upgraded wastewater treatment plants from a public health perspective.

Guidelines for the Review of Water and Wastewater Project Proposals in First Nations Communities South of 60°

First Nations and Inuit Health Branch

Plan Review of New or Upgraded Sites



This document was created following the development of the *National Framework for the Review Process of Water and Wastewater Systems in First Nations Communities* to assist FNIH regional offices in their review of project proposals.

- Step by step guide to assist FNIHB staff to review projects from a public health perspective
- Details elements to consider for process, procedures, roles and responsibilities and required documentation.

Review focus for wastewater servicing projects includes assessment of aspects such as:

- Location of outfall and sludge disposal
- Proximity to other uses
- Site security as it affects public health and safety
- Source water protection

Reviews may take place during each of the three stages:

- Feasibility
- Pre-design
- Design

Environmental Health Officer

Public Health Engineer

Wastewater Servicing Project Review

- Overall objective is to ***protect public health***

- Ensure that wastewater servicing systems minimize adverse impacts on all water use practices, including drinking water and recreational development

Wastewater Servicing Project Review

- Sewage Collection Systems
  - Physical layout and infrastructure routing:
    - » Horizonal/vertical separation between sewer and water pipes
    - » Overflow/outfall discharge routes
    - » Alarm mechanisms to control the collection system
    - » Overflow mechanisms and related discharge protocol
- Effluent Discharge
  - Potential impact on other water uses
    - » Location, frequency of discharge
  - Receiving water body:
    - » Water levels
    - » Flow data
    - » Capacity
- Physical Integrity and Access Restriction
  - Prevention of cross contamination :
    - » Fencing of lagoons an open tankage
    - » Appropriate signage

Plan Review of New or Upgraded Sites

Wastewater Servicing Projects

Feasibility Stage

- Review of proposed locations of facilities
- Review of surrounding land use
- Information on the effluent quality

Pre-design Stage

- Location of proposed discharge
- Detailed land use mapping
- Proposed effluent discharge criteria
- Proposed set-back criteria
- Proposed method of sludge disposal

Design Stage

- Detailed drawings and specifications for review by PHE
- Discharge location, frequency of discharge, and effluent discharge criteria
- Proposed method of sludge disposal
- Set-back distances
- Fencing and other security measures

Wastewater Systems Effluent Regulations

- On Jan 1, 2013, elements of Environment Canada's Wastewater Systems Effluent Regulations (WSER) came into effect.
- This federal regulation under the Fisheries Act includes new testing and reporting requirements for wastewater plants across the country, including First Nation's lagoons and RBCs.
- Environment Canada has been communicating the upcoming changes and has directly contacted every applicable First Nation in Ontario to help them meet the mandated requirements.

Health Canada Santé Canada

Wastewater Facility Inspection Form

*First Nation:	*Community:	*Facility Name:
Operator:	Address:	Phone Number:
Land Location/GPS: Zone:_____ Longitude: Degrees ____ Minutes ____ Seconds____ Latitude: Degrees ____ Minutes ____ Seconds____ Altitude :___		
*Facility's Operating Status: Pending ◻ Active ◻ Temporary/Special Event ◻ Inactive ◻	Ownership: Band ◻ Gov't ◻ Leased ◻ Private ◻	
*EHO:	Accompanied by:	*File Status: Active☐ Closed ☐
*System Type (select one): Absorption Field ⊔ Community Lagoon ⊔ Holding Tank ⊔ Leaching Chamber ⊔ Peat System ⊔ Pit Privy ⊔ Pressurized Sand Mound ⊔ Private Lagoon ⊔ Raised Absorption Field ⊔ Wastewater Treatment Plant ⊔ Treatment Mound ⊔ Trench System ⊔ Municipal System ⊔		
Tank Type: Septic ◻ Holding ◻	Tank Construction: Concrete ◻ Fiberglass ◻ Plastic ◻	Tank Capacity: ____ litres	Total length of perforated pipe/chamber: _____ meters
Dosing of Distribution: Pump ◻ Syphon ◻ Gravity Feed ◻	Daily Flow: _____litres	Percolation Rate: _____	Population Served: _____
Water Supply: Public ◻ Semi Public - Well ◻ Semi Public – Cistern ◻ Individual - Well ◻ Individual - Cistern ◻		Wastewater Disposal: Community ◻ Onsite ◻	
Inspection Type (select one): Request ◻ Request-Follow Up ◻ Routine ◻ Routine-Follow Up ◻		*Inspection Date (yyyy/mm/dd):	
If request, *Why Requested? (select all that apply): Mould ◻ Pests ◻ Design/Construction Issues ◻ Indoor Air Quality - Other ◻ Sewage Malfunction ◻ Water Infiltration ◻ Drinking Water Issues ◻ Emergency ◻ Suspected/Confirmed Foodborne Illness ◻ Suspected/Confirmed Waterborne Illness ◻ Suspected/Confirmed Vectorborne Illness ◻ Other ◻, *Provide details:			
*Existing Onsite Sewage Disposal System Inspected?: Yes ◻ No ◻ N/A ◻ ***If yes, complete the existing onsite sewage checklist form.**			

Wastewater Facility Checklist

S – Satisfactory; U – Unsatisfactory; N/AP – Not Applicable[1]; N/AS – Not Assessed[2]; C- Corrected During Inspection

	S	U	N/AP	N/AS	C	*Details/Comments (if U and C are selected) If more space is required, write your comments on blank paper and note the category title or #.
Operations and Maintenance						
*1. System Maintenance						
*2. Operator Training/Qualification						
Effluent Discharge						
*3. Effluent Discharge						
Cleaning, Sanitation, and Hygiene						
*4. Cleaning and Disinfection						
General Safety Issues						
*5. Storage/Supply of Chemical/Hazardous Products						
*6. Security/Signage						
Policies and Procedures						
*7. Policies and Procedures						

Wastewater Activities

Public education:

- Provide public education to home occupants and owners about how to properly maintain an on-site sewage disposal system and reduce risks related to sewage discharge.

- Occupational Health and Safety information/recommendations to communities

Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA)
http://www.omafra.gov.on.ca/english/environment/facts/sep_smart.htm

Protecting Workers

- Education of workers – proper instruction, training and supervision.
- Proper assessment of risk is required, but this should not include analysis of sewage for micro-organisms (constantly changing).
- Exposure to sewage should be eliminated or minimised by, for example, using remote-controlled robotic cameras for sewer inspection;
- First aid kits available.

PPE Required For Clean Up

- PPE should be readily available in event of an emergency
- Water-proof boots for sewage spills
- Coveralls for splash proofing your clothes (Tyvek suit)
- Utility Gloves for clean up
- Goggles/mask or face shield for splashes
- Spray Disinfectant (Eg. bleach)
- Provide adequate hand hygiene facilities, including clean water, soap, nailbrushes, disposable paper towels

Thank you!